Crafted in Switzerland

PC-12 NG

PILOT'S INFORMATION MANUAL
PC-12/47E MSN 1001-1719 / 1721-1942

PILATUS

PILOT'S INFORMATION MANUAL

WARNING

- This PC-12 Pilot's Information Manual is published for general and familiarization purposes only.
- This Pilot's Information Manual does NOT meet FAA, FOCA or any other civil aviation authority regulations for operation of ANY Aircraft.
- This Pilot's Information Manual is a reproduction of a PC-12 Airplane Flight Manual, however, it is NOT revised or updated.
- This Pilot's Information Manual does NOT reflect the configuration or operating parameters of any actual aircraft.
- Only the Approved Airplane Flight Manual/Pilot's Operating Handbook issued for a specific serial number aircraft may be used for actual operation of that serial number aircraft.

Pilatus Aircraft Ltd
P.O. Box 992
6371 Stans, Switzerland
Phone +41 41 619 67 00
Fax +41 41 619 92 30
info@pilatus-aircraft.com
www.pilatus-aircraft.com

PILATUS

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

PC-12/47E

MSN 545, 1001 - 1719, 1721 - 1942

Report No. 02277

Manufacturer's Serial No. - ____________________

Registration No. - ___________________________

EASA Type Certificate No: EASA.A.089
FAA Type Certificate No: A78EU

PILATUS AIRCRAFT LTD.
CH-6370 STANS
SWITZERLAND

APPROVED IN THE NORMAL CATEGORY BASED ON FAR 23 THROUGH AMENDMENT 42. THIS DOCUMENT MUST BE CARRIED IN THE AIRPLANE AT ALL TIMES.

THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY THE FEDERAL AVIATION REGULATIONS AND ADDITIONAL INFORMATION PROVIDED BY THE MANUFACTURER AND CONSTITUTES THE EASA APPROVED AIRPLANE FLIGHT MANUAL (AFM).

This Handbook meets General Aviation Manufacturer's Association (GAMA) Specification No. 1, Specification For Pilot's Operating Handbook, issued 15 February 1975, revised 1 September 1984.

This Handbook is also FAA approved for U.S. registered aircraft in accordance with FAR 21.29.

AFM approved by European Aviation Safety Agency (EASA)
Ref – EASA.0010004233-001

Signature - R. Lau

Date - 27.07.2010

Bundesamt für Zivilluftfahrt - Federal Office of Civil Aviation - BERN

Pilatus Aircraft Ltd
P.O. Box 992
CH-6371 Stans
Switzerland
Tel +41 (0)41 619 6111
Fax +41 (0)41 610 9230

TO HOLDERS OF PC-12 PILOT'S OPERATING HANDBOOK

PC-12 PILOT'S OPERATING HANDBOOK

REPORT NO. 02277

REVISION 20

DATED Jan 06, 2020

INCORPORATION INSTRUCTIONS

Remove and insert the pages which are listed below:

Remove	Insert	Remove	Insert
Title page	Title page	3A-7 and 3A-8	3A-7 and 3A-8
LOEP-1 thru LOEP-4	LOEP-1 thru LOEP-4		
LOTR-3 and LOTR-4	LOTR-3 and LOTR-4	**Section 4**	
-	LOR-37 thru LOR-40	4-7 and 4-8	4-7 and 4-8
		4-13 thru 4-16	4-13 thru 4-16
Section 1		4-25 and 4-26	4-25 and 4-26
1-7 and 1-8	1-7 and 1-8		
		Section 5	
Section 2		5-i and 5-ii	5-i and 5-ii
2-i thru 2-iv	2-i thru 2-iv	5-2-i thru 5-2-iv	5-2-i thru 5-2-iv
2-1 thru 2-4	2-1 thru 2-4	5-3-i thru 5-3-iv	5-3-i thru 5-3-iv
2-17 and 2-22	2-17 and 2-22	5-3-15 and 5-3-16	5-3-15 and 5-3-16
2-31 thru 2-42	2-31 thru 2-42		
2-47 thru 2-48	2-47 thru 2-48	**Section 6**	
		6-1 and 6-2	6-1 and 6-2
Section 3		6-15 and 6-16	6-15 and 6-16
3-5 and 3-6	3-5 and 3-6	6-19 and 6-20	6-19 and 6-20
3-17 and 3-18	3-17 and 3-18	6-01-1 thru 6-01-6	6-01-1 thru 6-01-6
3-21 and 3-22	3-21 and 3-22	6-03-3 and 6-03-4	6-03-3 and 6-03-4
3-25 thru 3-28	3-25 thru 3-28	6-04-1 thru 6-04-4	6-04-1 thru 6-04-4
3-33 and 3-34	3-33 and 3-34	6-05-1 thru 6-05-4	6-05-1 thru 6-05-4
3-39 and 3-40	3-39 and 3-40	6-06-1 thru 6-06-6	6-06-1 thru 6-06-6
3-65 thru 3-72	3-65 thru 3-72	6-07-1 thru 6-07-6	6-07-1 thru 6-07-6
3-75 and 3-76	3-75 and 3-76		
3-83 thru 3-90	3-83 thru 3-90	Title page - Vol. 2	Title page - Vol. 2
3-97 thru 3-102	3-97 thru 3-102		
3-111 and 3-112	3-111 and 3-112		

Remove	Insert	Remove	Insert
Section 7		7-22-7 and 7-22-8	7-22-7 and 7-22-8
7-1-i and 7-1-ii	7-1-i and 7-1-ii	7-25-1 and 7-25-2	7-25-1 and 7-25-2
7-1-v thru 7-1-viii	7-1-v thru 7-1-viii	7-26-1 and 7-26-2	7-26-1 and 7-26-2
7-2-1 and 7-2-2	7-2-1 and 7-2-2	7-26-7 and 7-26-8	7-26-7 and 7-26-8
7-4-11 and 7-4-12	7-4-11 and 7-4-12	7-28-1 and 7-28-2	7-28-1 and 7-28-2
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7-8-1 and 7-8-2	7-8-1 and 7-8-2	7-28-13 thru 7-28-20	7-28-13 thru 7-28-20
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7-13-11 and 7-13-12	7-13-11 and 7-13-12	7-30-13 and 7-30-14	7-30-13 and 7-30-14
7-14-1 and 7-14-2	7-14-1 and 7-14-2	7-33-1 and 7-33-2	7-33-1 and 7-33-2
7-17-1 thru 7-17-8	7-17-1 thru 7-17-8		
7-17-11 and 7-17-12	7-17-11 and 7-17-12	**Section 9**	
7-19-1 thru 7-19-4	7-19-1 thru 7-19-4	9-i and 9-ii	9-i and 9-ii
7-22-1 and 7-22-2	7-22-1 and 7-22-2	9-00-1 and 9-00-2	9-00-1 and 9-00-2

Disposition of Temporary Revisions listed below:

Temp Revision No. and Issue Date	Disposition
TR 41	Remove and destroy

Remove and insert the Supplement pages listed below (if applicable):

Supplement/Report No.	Remove	Insert
4 - Aircraft with RVSM capability	9-4-3 and 9-4-4	9-4-3 and 9-4-4
	9-4-7 thru 9-4-10	9-4-7 thru 9-4-10
6 - PC-12/47E registered in the Rep. of Argentina	9-6-3 and 9-6-4	9-6-3 and 9-6-4
	9-6-7 thru 9-6-10	9-6-7 thru 9-6-10
	9-6-13 and 9-6-14	9-6-13 and 9-6-14
7 - PC-12 Series aircraft registered in the People's Republic of China	9-7-3 and 9-7-4	9-7-3 and 9-7-4
	9-7-7 thru 9-7-12	9-7-7 thru 9-7-12
11 - Electro-mechanical landing gear	9-11-3 and 9-11-4	9-11-3 and 9-11-4
	9-11-7 thru 9-11-24	9-11-7 thru 9-11-24
	9-11-29 thru 9-11-32	9-11-29 thru 9-11-32
13 - PC-12/47E aircraft registered in Chile	9-13-3 and 9-13-4	9-13-3 and 9-13-4
	9-13-7 thru 9-13-12	9-13-7 thru 9-13-12
02474 - German Placards	--	All

This list of Service Bulletins provides the operator a means of recording the applicable SBs that are mentioned in the various sections of the POH.

It is not a complete list of SBs. The purpose is to show the modification status of the aircraft to assist the pilot in the correct understanding of the procedures and the system description.

SB No.	Title

SB No.	Title

SB No.	Title

SB No.	Title

LIST OF EFFECTIVE PAGES

LIST OF EFFECTIVE PAGES

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The incorporation of Temporary Revisions into this manual are to be recorded on the sheet below. Instructions for the removal of Temporary Revisions will given in the Instruction Sheet issued with each regular revision.

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY
1	MMDR KTR2280 operation in 8.33 KHz airspace	Mar 26/08	Post SB 23-005
2	ENGINE NG & ITT OSCILLATIONS AT GRD IDL	May 20/08	POH TR 4
3	ABNORMAL PROCEDURES	Oct 21/08	POH Rev 7
4	ENGINE NG & ITT OSCILLATIONS AT GRD IDL	Oct 21/08	POH Rev 7
5	WEATHER RADAR GROUND OPERATION	Oct 21/08	POH Rev 7
6	ADAHRS PART No. 985.99.12.101 and APEX SOFTWARE BUILD 5.4	Oct 31/08	Post SB 34-018
7	MF CONTROLLER PART No. 985.99.12.170	Dec 5/08	Post SB 46-001
8	NORMAL PROCEDURES - PARKING	Apr 1/09	Post SB 24-025
9	ADAHRS – INCORRECT ROLL ATTITUDE INDICATION	Feb 9/09	TR 11
10	DATABASE LOADING	Apr 15/09	POH Rev 8
11	ADAHRS - INCORRECT ROLL ATTITUDE INDICATION	Mar 30/09	Post SB 34-022
12	PCL THRUST REVERSE LATCH LEVER	Aug 6/09	Post SB 76-002

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY
13	ADAHRS – HIGH AND LOW LATITUDE OPERATIONS	Aug 31/09	Post SB 34-022
14	SECTION 7 – TABLE OF CONTENTS	Oct 30/09	POH Rev 9
15	SECTION 2 – USE OF FMS DIRECT-TO-RECOVERY FUNCTION PROHIBITED	May 19/10	Post SB 45-005
16	HONEYWELL FMS – PROBLEM WITH CHANGING RUNWAY INFORMATION	May 19/10	Post SB 45-005
17	ADAHRS – RESTRICTED FLIGHT ENVELOPE	Sep 28/10	Post SB 34-028
Supp 9 TR1	COUPLED VNAV – SOFTWARE ANOMALY	Apr 18/11	TR 18
18	FMS/VNAV SOFTWARE ANOMALY	Jul 28/11	Post SB 45-005
19	PFD MISCOMPARISON ALERTS	Aug 22/11	POH Rev 11
20	PRIMUS APEX – FLIGHT MANAGEMENT SYSTEM	Sep 23/11	Post SB 45-008
21	GROUND DE-ICING/ANTI-ICING OPERATIONS	Oct 31/11	POH Rev 12
22	EXTENDED STORAGE	Oct 19/11	Post SB 31-015
23	SECTION 9 SUPPLEMENTS - LOEP	Oct 14/11	POH Rev 11
24	FUEL FILLER PLACARD	Mar 22/12	POH Rev 12

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY
25	ENGINE OIL PLACARD	Mar 22/12	POH Rev 12
26 Supp 5	LPV APPROACH CAPABILITY	Jul 10/12	POH Rev. 15
27	PROPELLER PITCH	Nov 15/13	POH Rev. 13
28	BRAKE CARE (Aircraft with Parker Brakes)	Mar 17/15	POH Rev. 15
29	NOT ISSUED	-	-
30	MODEL 2016 ENHANCEMENTS (Limited distribution MSN 1576 thru 1578 only)	Nov 06/15	POH Rev. 15
31	CAGED FMS DISPLAY CURSOR	Dec 14/15	TR 34
32	ELECTRICAL POWER LOSS	Feb 18/16	POH Rev. 16
33	PRE-FLIGHT INSPECTION	Feb 17/16	POH Rev. 16
34	CAGED FMS DISPLAY CURSOR	May 02/16	
35	ABNORMAL PROCEDURES - DISPATCH UNDER MEL CONDITION	Jun 22/16	POH Rev. 16
36	LIMITATIONS	Jul 05/16	POH Rev. 16
37	PRIMUS APEX - STUCK DATABASE UPLOAD (CONNECTED FLIGHT DECK ONLY)	Sep 27/16	POH Rev. 18

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY
38	PRIMUS APEX BUILD 10 AND 10.9 - VGP APPROACH DEVIATION DRIFT	Feb 08/17	
39	AIRFOIL DEICE SYSTEM	Oct 17/17	POH Rev. 18
40	WEIGHT AND BALANCE	Dec 18/18	TR 41
41	COMMUTER SEAT MODEL 2044	Jun 12/19	POH Rev. 20

LOG OF REVISIONS

Revision Number and Date	Page Number	Description
6 26 March 08	All	Complete re-issue as initial version for PC-12/47E certification Approved under EASA.A.C.07610 (Initial issue) 27.03.2008 Bundesamt für Zivilluftfahrt - Federal Office of Civil Aviation - BERN -

LOG OF REVISIONS

Revision Number and Date	Page Number	Description
7	Sect 2	
14 Nov 08	2-ii and iii	Contents pages updated
	2-1	Wording changed to EASA Approved
	2-11	Green arc normal ops RPM figure updated
	2-23 and 24	Primus Apex FMS Limitations updated
	2-25	PC-12/47E with APEX added to beginning of sentence
	2-26	Primus Apex Transponder Limitations updated
	2-26	Primus Apex ADAHRS Limitations updated
	2-26	Primus Apex Electronic Checklist Limitations added
	2-26	Primus Apex Electronic Charts Limitations added
	2-27	Primus Apex XM Sat Weather Limitations added
	2-27	Primus Apex Weather Radar Limitations from TR No. 5 added
	2-27	Primus Apex INAV Map Limitations added
	2-28 thru 39	Pages run on
	2-40	Control wheel placards updated
	2-41	Page run on
	2-42	PCL placard updated. (Note: old page 2-42 deleted)
	Sect 3	
	3-i thru iv	Contents pages updated
	3-1	Circuit breaker reset explanation added
	3-5 thru 9	Format and standardized layout changes made
	3-11 thru 19	Format and standardized layout changes made
	3-20 and 22	Cockpit/cabin Fire and Smoke procedures updated
	3-23	Page run on
	3-24 thru 26	Format and standardized layout changes made
	3-27	Page run on
	3-28	Batteries endurance changed to 33 minutes
	3-29 thru 46	Format and standardized layout changes made
	3-47 and 48	Batteries endurance changed to 33 minutes
	3-49 thru 73	Format and standardized layout changes made
	3-74	New step added to Pax and Cargo Door in flight procedure
	3-75 and 76	Note added to DU Check and Overheat procedures
	3-77 thru 81	Format and standardized layout changes made
	3-82 and 83	Note added to MAU Failures procedure
	3-84 thru 86	Format and standardized layout changes made
	3-87 and 88	AHRS A+B Fail procedure updated
	3-89 thru 95	Format and standardized layout changes made
	3-96	Second Note para added
	3-A-2	CAS advisory updated for APEX Software Build 5
	3-A-3	Temporary Revision No. 4 info added
	3-A-4	PFD and GPS advisories procedures updated
	3-A-5	CAS advisories updated for APEX Software Build 5
	3-A-6	Engine & Aircraft Exceedences TR No. 4 info added & updated
	3-A-7 and 8	Pages run on
	Sect 4	
	4-2	Landing approach speeds aligned with Section 5
	4-3	Color type removed from step 5 and step 9 updated

LOG OF REVISIONS

Revision Number and Date	Page Number	Description
	4-5	Info added ref checking security of engine oil dipstick
	4-6	Page run on
	4-7	4.3.8 Step 2, Com capitalized, step 12 updated, WX step added
	4-8	Steps re-numbered
	4-9	EPU output disconnect voltages updated
	4-10	Passenger oxygen switch changed to selector
	4-13	Stick pusher test step 6.e. updated
	4-14	Note information updated
	4-15	4.8.1 step 5. Flap position 30° added. Step 8 clarified
	4-19	4.11 step 7 clarified
	4-24	Step 8 Oxygen shut-off lever changed to main oxygen lever
	4-30	New para added to AFCS operation in Amplified Procedures
	Sect 7	
	7-ii thru vii	Contents pages updated
	7-16	Landing Gear schematic corrected
	7-18	Air/Ground System updated for APEX Software Build 5
	7-40	ODM if installed Pre SB 79-006 added
	7-42	Starting - first para, CAS Fire callout sentence added
	7-43	Temporary Revision No. 4 info added
	7-44 thru 47	Pages run on
	7-48	Analog range Warnings and Cautions clarified
	7-49	Engine oil temperature Caution parameter
	7-50 thru 59	Pages run on
	7-60	Fuel System schematic vent/fuel line detail correction
	7-61 thru 64	Pages run on
	7-65	External Power Controller voltage range corrected
	7-66 thru 102	Pages run on
	7-103 thru 105	Main oxygen lever and passenger oxygen selector terminology changes
	7-106	Optional larger oxygen cylinder in rear fuselage RH side added
	7-107	Main oxygen lever and passenger oxygen selector terminology
	7-108	Page run on
	7-109	Main oxygen lever and passenger oxygen selector terminology
	7-110 thru 126	Pages run on
	7-127 thru 129	Primus APEX General topic updated for APEX Software Build 5
	7-130	APEX Equipment Bus Bars schematic simplified
	7-131	Page run on
	7-132 & 133	Primus APEX topic updated for APEX Software Build 5
	7-134	Page run on
	7-135 thru	Primus APEX topic updated for APEX Software Build 5
	7-151	New Fig. 7.24 (Sheet 6) Multi Function Display added
	7-152 thru 7-161	Primus APEX Attitude & Heading topic updated for APEX Software Build 5
	7-162 thru 7-164	Primus APEX Comms & Nav topic updated for APEX Software Build 5

LOG OF REVISIONS

Revision Number and Date	Page Number	Description
	7-165 thru 7-169	Pages run on
	1-170 thru 7-174	Figures updated for APEX Software Build 5
	7-175 & 176	Optional HF Comms system topic added
	7-177 thru 7-178	Primus APEX Situation Awareness topic updated for APEX Software Build 5
	7-179	Page run on
	7-180 thru 7-191	Primus APEX Situation Awareness topic updated for APEX Software Build 5
	7-192 thru 7-194	Lightning Sensor System topic added
	7-195	XM SAT Weather System topic added
	7-196	Primus APEX MWF System updated for APEX Software Build 5
	7-197 & 198	Page run on
	7-199	Primus APEX MWF System updated for APEX Software Build 5
	7-200	Page run on
	7-201 & 202	CAS Messages updated for APEX Software Build 5
	7-203	Page run on
	7-204 thru 7-208	CAS Messages updated for APEX Software Build 5
	7-209	Figure 7-37 CAS updated for APEX Software Build 5
	7-210 thru 7-212	Pages run on
	7-213	HDG mode statement added
	7-214	Page run on
	7-215	Figure 7-38 AFCS Schematic simplified
	7-216	Page run on
	7-217	Primus APEX FMS System updated for APEX Software Build 5
	7-218	Page run on
	7-219	PRAIM spelling correction
	7-220	Page run on
	7-221 thru 7-223	Primus APEX FMS System updated for APEX Software Build 5
	7-224 & 225	Pages run on
	7-226 thru 7-228	Primus APEX ACMS System updated for APEX Software Build 5
	7-229	Page run on
	7-230 & 231	Primus APEX ADMS System updated for APEX Software Build 5
	7-232 thru 7-234	Primus APEX Optional Electronic Charts topic added for APEX Software Build 5
	7-235	Primus APEX Optional Electronic Checklist topic added for APEX Software Build 5
	7-236	Intentionally Left Blank Page added

Revision Number and Date	Page Number	Description
	Sect 8	
	8-ii	Contents page updated
	8-16	Engine oil replenishment procedure updated
	8-23	VCCS winter servicing information added
	8-32	Interior Care cleaning updated
	8-34	Primus Apex Data Uploading & Downloading para deleted
	Sect 9	
	9-i	Contents page updated
	9-001	Supplements LOEP updated
	9-1-1 thru 9-1-5	Supplement No. 1 initial issue
	9-2-1 thru 9-2-5	Supplement No. 2 initial issue
	9-3-1 thru 9-3-8	Supplement No. 3 initial issue
		Approved under P-EASA.A.C.10684
		Bundesamt für Zivilluftfahrt - Federal Office of Civil Aviation - BERN

Revision Number and Date	Page Number	Description
8	Sect 1	
31 Aug 09	1-3	Aircraft turning clearance Figure updated
	1-5	Fuel anti-icing additive specification superseded
	1-15	Minor formatting correction
	Sect 2	
	2-24	Primus Apex – FMS limitations two minor changes
	2-25	Primus Apex – FMS instrument approaches limitations updated
	2-25	Primus Apex – FMS high latitude limitation mGauss value change
	2-26	Primus Apex – FMS new LNAV approach limitation added
	2-26	Primus Apex – ADAHRS high lat limitation mGauss value change
	2-27	Primus Apex – XM SAT WX limitations effectivity added
	Sect 3	
	3-iii & iv	Contents pages updated
	3-2	3.1.3 Cabin pressurized FAS message wording corrected
	3-6	3.4.2 Maximum recommended bank angle added
	3-9	3.4.5 step 8 typo removed
	3-10	3.5.1 Relight Envelope extended to 240 KIAS
	3-12 & 13	3.6.2 Engine NP procedure updated
	3-14	3.6.3 Engine NG procedure updated
	3-15 thru 18	Pages run on
	3-21	3.7.3 Cockpit/cabin Fire step 7 updated
	3-22	3.7.3 Cockpit/cabin Fire caution step numbers corrected
	3-33	3.9.9 step numbering corrected
	3-36	3.11 use of Flap Reset switch added. Flap CB location added
	3-47	3.15.10 Condition: minor format change
	3-50	3.15.13 first Caution more info added and bus location corrected
	3-50	3.15.14 sentence between steps 3 and 4 minor format change
	3-51	3.15.14 first Caution more info added
	3-52	3.15.16 Step 1 minor typo corrected
	3-52	3.15.18 Condition: minor typo corrected
	3-53	3.16.1 step 4 minor format change
	3-60	3.17.2 new step 10 added
	3-64	3.17.5 D In Flight step 6 addition info added
	3-65	3.17.7 new procedure added
	3-68	3.18.3 step 5 minor format change
	3-76	3.21.1 step 7 addition info added
	3-77	3.21.1 step 8 addition info added
	3-80	3.21.3 Condition: typo deleted
	3-84	3.21.8 step 3 CB name added and Caution updated
	3-89	3.21.14 Indication: minor typo corrected
	3-93	3.21.18 step 8 addition info added
	3-96	3.21.21 new procedure added
	3A-3	Minor format change and CCD option info added
	3A-4	Post SB 45-003 new CAS advisory message added
	3A-5 thru 8	Page run on

Revision Number and Date	Page Number	Description
	Sect 4	
	4-2	4.2 Maximum Flaps Extended values clarification added
	4-9	4.4 step 2 additional info added, steps 8 re-arranged & new step
	4-10	4.4 steps 16 & 17 clarified
	4-13	4.6 stick pusher test updated for Post SB 45-003 Build 6
	4-19	4.12 new fuel state step and a Note added
	4-20	4.14.1 flap settings revised and a Note added
	4-21	4.14.2 flap settings revised and a Note added
	Sect 5	
	5-49 thru 52	Max endurance cruise tables cx to higher margin to stall speed
	Sect 6	
	6-22	Completion of loading form first para clarified
	6-23	Combi Conversion Example table figures corrected
	6-29	Example Loading Form header and figures updated
	6-30	Loading Form header updated
	6-01-4	Weight and Moment denominations changed to lower case
	6-02-4	Weight and Moment denominations changed to lower case
	6-03-4	Weight and Moment denominations changed to lower case
	6-04-4	Weight and Moment denominations changed to lower case
	6-05-4	Weight and Moment denominations changed to lower case
	6-06-4	Weight and Moment denominations changed to lower case
	6-07-4	Weight and Moment denominations changed to lower case
	Sect 7	
	7-vii	Contents page updated
	7-18 & 19	Air ground system updated, page 19 now blank
	7-34	Fig 7-8 Typo corrected
	7-42	Typo corrected
	7-43	Low Ng condition description changed
	7-58	Fuel values updating in flight added
	7-73	Fig 7-14 MFD bat indication + signs removed
	7-74	Fig 7-14 CB configuration updated for CCD
	7-75	Fig 7-14 CB configuration updated for CCD
	7-81	Interior lighting cockpit switches configuration updated for CCD
	7-99	Cabin pressure warning clarified
	7-107	Cockpit description updated for optional ADAHRS heading override switch and CCD§
	7-108	Page run on
	7-109	Fig 7-18 Cockpit Layout updated for optional ADAHRS heading override switch and CCD§
	7-124	Optional 110 VAC power system max power output added
	7-128 &129	Primus APEX abbreviations updated
	129A & B	Pages added
	7-135 & 136	Temp Rev No. 10 info added
	7-137	CCD info added
	7-138 thru 140	Pages run on
	7-144	Fig 7-23 Sheet 2 updated for CCD
	7-145	Fig 7-23 Sheet 3 updated for CCD

Revision Number and Date	Page Number	Description
	7-146 thru 148	Figure7-24 Sheets 1 thru 3 APEX displays updated
	7-150	Figure 7-24 Sheet 5 APEX display updated
	7-153	ADAHRS High and low latitudes and field strength info added
	7-154	ADAHRS optional HDG/TRK override switch info added
	7-155 & 156	Pages run on
	7-157	Fig 7-25 Sheet 1 changed from Sheet 2
	7-158	7-25 Sheet 2 changed from Sheet 1 and updated for GNSSU
	7-162	Optional ADF function updated
	7-168	GPS description updated for GNSSU WAAS capability
	7-169	New CAS Advisory message added
	7-170	Fig 7-27 updated for GNSSU and optional second GNSSU
	7-171 thru 179	Pages run on
	7-192	Lightning Sensor System description updated
	7-193	Lightning Sensor System operation updated
	7-195	XM SAT Weather operation updated
	7-196	New Fig 7-37 APEX Situation Awareness schematic added
	7-197 thru 199	Pages run on
	7-200	Fig number changed
	7-201	Monitor Warning Function (MWF) clarified
	7-202 thru 206	Pages run on
	7-207	New CAS advisory message added
	7-208	Page run on
	7-209	New CAS status message added
	7-210	Fig re-numbered
	7-211 & 212	Pages run on
	7-213	VNAV push button added
	7-214 & 215	Pages run on
	7-216	Fig re-numbered
	7-217	Fig re-numbered and VNAV push button added
	7-218	Fig re-numbered and ref to RVSM ref to Supplement added
	7-219	Page run on
	7-220	Effectivity added to two Notes
	7-221	Page run on
	7-222	FMS window size corrected
	7-223	Page run on
	7-224	Temp Rev No. 10 info added
	7-225	Page run on
	7-226	Fig re-numbered, AFCS panel and GPS units updated
	7-227 thru 232	Pages run on
	7-233	Fig re-numbered
	7-234	Page run on
	7-235	Fig re-numbered
	7-236	Optional Checklist topic updated

Revision Number and Date	Page Number	Description
	7-237 thru 240	New topic Coupled VNAV Approach added
	7-241 & 242	New topic Optional LPV Approach added
	Sect 8	
	8-4	Towing by lifting nosewheel statement added
		Volume 2 Title page added
	Sect 9	
	9-i	Contents page updated
	9-00-1	Supplement LOEP updated
	9-02-1 thru 9-02-6	Supplement No.2 Cold Conditions Revision 1
	9-03-1 thru 9-03-8	Supplement No. 3 Canada Registration Revision 2
	9-04-1 thru 9-04-7	Supplement No. 4 RVSM Capability Initial issue
	9-05-1 thru 9-05-5	Supplement No. 5 LPV Approach Capability Initial issue
	9-06-1 thru 9-06-13	Supplement No. 6 Argentine Registration Initial issue
		Approved under EASA.A.C.11807
		15. 10. 2009

Revision Number and Date	Page Number	Description
9	Title page	Copyright information added. Fill in the MSN and Registration Number on the new page.
30 Jun 10	LOSB-1 and 2	List of Service Bulletins issued. Complete as appropriate for the aircraft MSN.
	LOEP-1 and 2	List updated
	LOTR-2	List updated
	Section 1	
	1-3 & 4	Ground turning clearance illustrations clarified
	Section 2	
	2-ii	Contents page updated
	2-iii	Page run on
	2-2	VO values corrected
	2-5	Oil Qty annunciator changed to Engine Oil Level
	2-10	Chip annunciator changed to Engine Chip
	2-21	MSN 1231 & UP. Brakes limitations added
	2-22thru 23	Pages run on
	2-24 and 25	Primus APEX FMS updated
	2-26	AHRS dead reckoning paragraph clarified with latitude areas
	2-27	Terminology standardized for ADAHRS high latitude operation
	2-28	Build 5 only added
	2-29	Page run on
	2-30	Cargo retaining angle changed to retaining bar.
	2-31 thru 40	Page run on
	2-41	Vo Placard changed
	2-42 thru 54	Page run on
	Section 3	
	3-ii thru iv	Contents pages updated
	3-5	MSN 1231 & UP. Brake Caution added
	3-18	SB number corrected
	3-19	Information moved forwards
	3-20 & 21	Smoke goggles added
	3-22	Page run on
	3-24 and 25	All occupants seat belts added
	3-26	Step 7 added, paragraphs renumbered
	3-32	MSN 1231 & UP. Brake Caution added
	3-33	Page run on
	3-37	MSN 1231 & UP. Brake Caution added
	3-53 thru 59	Fuel procedures enhanced
	3-60 thru 64	Page run on
	3-65	Step 6 altitude changed to 10,000 ft
	3-66 thru 68	Page run on
	3-69	MSN 1231 & UP. Brake Caution added
	3-70 thru 74	Page run on
	3-75	Passenger and cargo door procedure enhanced
	3-76	Cracked window procedure added
	3-77 thru 89	Page and paragraph numbering run on

Revision Number and Date	Page Number	Description
9 30 Jun 10 (Cont'd)	3-90	Note added ref FMS failure CPCS default
	3-91 thru 98	Pages run on
	3A-3	FMS Fail advisory updated with CPCS default info
	3A-4	MF CTLR Fail advisory info terminology standardized
	3-A5	No Altitude Reporting advisory info terminology standardized
	Section 4	
	4-ii	Contents page updated
	4-1	Hypoxia Cautions moved to Section 7
	4-10	Check ESIS aligned added
	4-13	ESIS alignment completed added
	4-35	Prevention of frozen brakes info deleted
	4-36	Procedure re-numbered
	4-37 and 4-38	Remove and destroy pages
	Section 6	
	6-i	Contents page updated
	6-13	General Loading Recommendations info updated
	6-16 thru 28	Cargo loading information completely revised
	6-29	Page run on
	6-30 thru 37	Figure Numbers revised
	6-38 thru 40	Pages run on
	Section 7	
	7-iv thru vii	Contents pages updated. TR 14 incorporated. Remove and destroy TR 14
	7-13	CAS changed to FAS
	7-20	Brakes description updated with MSN split for new brakes
	7-40	SB number corrected
	7-42	CAS Fire callout removed.
	7-50	Np changed to 930 rpm. Warning time changed to 25 seconds.
	7-57 and 58	Boost pump caption description changed
	7-81	CCD terminology standardized
	7-89 and 90	Text moved
	7-96	CPCS default position for FMS failure info added
	7-97 thru 99	Pages run on
	7-104	Reference to inapplicable SB deleted and text corrected
	7-105	Hypoxia Cautions added from Section 4
	7-106	Page run on
	7-107	CCD terminology standardized
	7-108	Cockpit divider walls description and smoke goggles added
	7-109	Figure 7-18 added Sheet No. 1
	7-110	Figure 7-18 new Sheet 2 added
	7-111 thru 116	Pages run on
	7-133	FMS hosted on AIOP b (was on AGM)
	7-134 thru 137	Page run on
	7-138	CCD terminology standardized

Revision Number and Date	Page Number	Description
9	7-139	HSI added
30 Jun 10	7-140 thru 143	Page run on
(Cont'd)	7-144	Illustration changed – FMS hosted on AIOP b
	7-145	Figure Title CCD terminology standardized
	7-146 thru 168	Page run on
	7-169	GNSSU terminology standardized
	7-170	Primus APEX Build 6 terminology standardized
	7-171 thru 197	Page run on
	7-198	FAS added
	7-199 thru 201	Page run on
	7-202	SEL softkey changed to MW softkey
	7-203 thru 218	Page run on
	7-219	FMS databases enhanced
	7-220 thru 245	Page run on
	Section 8	
	8-1	Pilatus contact details updated
	8-29	Information added to Note
	Sect 9	
	9-i	Contents page updated
	9-00-1	Supplement LOEP updated
	9-5-1 thru 9-5-5	Supplement No. 5 LPV Approach Capability Revision 1
	9-7-1 thru 9-7-6	Supplement No. 7 PC-12 Series registered in PRC Initial issue
	Section 10	
	10-i	Contents page updated
	10-2	High mass/speed braking info added
	10-5 & 6	Aircraft de-icing info updated to allow engine running
	10-7 thru 12	Pages run on
		Approved under P-EASA 0010004233-001

Revision Number and Date	Page Number	Description
10 20 Dec 10	LOSB 1 and 2	List updated
	LOEP-1 and 2	List updated
	LOTR-2	List updated
	LOR 13 thru 16	New pages.
	Section 2	
	2-i thru 2-iv	Contents updated
	2-1	Tripped circuit breaker reset paragraph added
	2-4	Airspeed limitation table deleted – duplicated information..
	2-8	Anti-icing additive warning added
	2-17	L3 ESIS added, Standby Magnetic Direction Indicator was Magnetic Compass.
	2-24	Speed mode limitation added.
	2-25 thru 2-28	Page run on.
	2-29	Primus APEX Electronic Charts limitations updated. Primus APEX Video Input limitation added.
	2-30 thru 2-54	Page run on.
	Section 3	
	3-i and 3-iv	Contents list updated.
	3-1	Tripped circuit breaker reset added.
	3-2 thru 3-5	Page run on.
	3-15 and 3-16	Low oil temperature procedure added.
	3-17 and 3-18	Page run on.
	3-36	CAS caption corrected to CAS caution.
	3-53	Glide capacity corrected to glide capability
	3-77 and 78	Note changed to include Dual charts option.
	3-81	Standby Magnetic Direction Indicator was Standby Compass.
	3-82	Miscomparison Condition statements clarified. IAS and ALT miscompare procedures updated.
	3-83	Standby Magnetic Direction Indicator was Standby Compass.
	3-84 thru 3-90	Page run on.
	3-91 and 92	Standby Magnetic Direction Indicator was Standby Compass. FMS-GPS Indications updated.
	3-93 thru 3-97	Page run on.
	3-98 and 99	HSI TRK Indications updated.
	3-100	Page run on.
	3A-2	Configuration Management System was Monitoring. AFCS reset procedure added..
	3A-3	AFCS Fault added. FMS Fail updated. FMS 1 + 2 added.
	3A-4	CCD added.
	3A-5	Build 6 added to No Altitude Reporting.
	3A-8 and 3A-9	Build 5, 6 and 7 details for exceedance messages added.
	3A-10	Page run on.

Revision Number and Date	Page Number	Description
10 (Continued) 20 Dec 10	Section 4	
	4-i and 4-ii	Contents list updated.
	4-11	Oil temperature check added. CAS cyan messages and Note added.
	4-12 to 4-38	Page run on.
	Section 5	
	5-i thru 5-iii	Contents list updated.
	5-1	Note added.
	5-2 to 5-94	Page run on.
	Section 7	Complete section split into sub-sections and re-issued. Changes are listed against the new sub-sections.
	7-1-1 and 2	Contents list updated.
	7-3-1	Static wicks removed from ailerons.
	7-13-11 and 12	Circuit breaker panel layout updated.
	7-26-2	Effectivity added. New ESIS added for MSN 1271 and up.
	7-27-2	Optional second FMS added.
	7-27-5	Build 5, 6 and 7 interactive window function detailed.
	7-27-6	Optional Video system added.
	7-27-7	Build 5, 6 and 7 interactive window function detailed.
	7-27-8	Build 5, 6 and 7 CCD pushbutton functions detailed.
	7-27-9	PFD display areas corrected.
	7-27-15	MAU configuration updated.
	7-27-18, 19, 20 and 22	YD indication added.
	7-28-4	Build 5, 6 and 7 HSI messages added.
	7-28-7	Effectivity added.
	7-28-9, 10 and 11	Effectivity added.
	7-28-12 thru 20	New ESIS added for MSN 1271 and up.
	7-28-21	Standby Magnetic Direction Indicator was Standby Compass.
	7-29-6	Crew/Pax ICS Vol outer knob function removed.
	7-29-16	Build 5 and 6 added.
	7-29-17	New illustration for Build 7 added.
	7-30-4, 10, 11 and 20	OVRLY corrected.
	7-31-12 thru 14	Build 5, 6 and 7 CAS messages added.
	7-32-3	YD indication added.
	7-32-4	Modes explained in more detail.
	7-32-5	YD indication added.
	7-32-7	YD indication added. AFCS Fault added.
	7-32-8 and 9	AFCS Fault added.
	7-33-1	Time period removed from Vertical Track Alert generation.
	7-33-2, 7 and 9	Build 6 and higher added, Build 7 updates added.
	7-33-11	Optional Dual FMS added.

Revision Number and Date	Page Number	Description
10 (Continued) 20 Dec 10		
	7-34-3	Build 5, 6 and 7 details added for exceedances.
	7-36-1	RT software added for database loading.
	7-36-2	Optional Dual Charts added. CCD scroll function added.
	7-36-3	RT software added for database loading.
	7-36-5	Optional Video Input added.
	7-38-5 and 6	Vertical Situation Display added.
	7-40-1 thru 4	Optional CVFDR added.
	Section 8	
	8-ii	Bi-Weekly Corrosion check added.
	8-18	Fuelling procedure caution added.
	8-20	Anti-icing additive warning added.
	8-26	Oxygen pressure chart updated.
	8-35 and 8-36	Bi-Weekly Corrosion check added.
	Section 9	
	9-i	Supplement 4 Revision 1 issued. Supplement 2 Rev 2 issued. Supplement 9 issued.
	9-00-1	Supplement 4 Revision 1 issued. Supplement 2 Rev 2 issued. Supplement 9 issued.
		Approved by: European Aviation Safety Agency (EASA) EASA Project No: 0010008185-001 Approval Date: 16 December 2010

16.12.2010

EASA-0010008185-001

Revision Number and Date	Page Number	Description
11 20 Dec 2011	LOSB 1 and 2	List updated.
	LOEP-1 and 2	List updated.
	LOTR-2	List updated.
	LOR 16 thru 18	New pages.
	Section 1	
	1-17	Tare weight added.
	Section 2	
	2-ii	Contents updated.
	2-17	PFD Controller quantity changed to 2. ADAHRS Channel A & B clarified.
	2-21	Interior code STD-6S-3B removed.
	2-24	Primus APEX Build 6 and 7 added.
	2-26	MNPS paragraph added.
	2-30	INAV Map and Vertical Situation Display paragraphs added.
	Section 3	
	3-i thru 3-iv	Contents updated.
	Section 3 all	Procedures separated by “END” statement.
	3-4	V_O speeds corrected.
	3-5	Software Build 8 statement added.
	3-18	Engine Oil Level procedure standardized.
	3-19	Engine Oil Debris procedure standardized.
	3-20	Fire Detect procedure standardized.
	3-23	Fire, Smoke or Fumes, Smoke Evacuation procedure standardized.
	3-30	Landing with Main Gear Unlocked – Note corrected to rear right cabin window.
	3-38	Software Build differences added.
	3-44	Avionics 1 Bus procedure standardized.
	3-46	Avionics 2 Bus procedure standardized.
	3-47	Standby Bus procedure standardized.
	3-82	Displays procedure – Note added for more than one display failure.
	3-88 and 3-89	PFD Miscomparison Alerts – procedure clarified and improved.
	3-91	Baro annunciation – Condition added.
	3-92	APEX Miscellaneous – Indication CAS caution Gear Actuator Cntl added. MAU failures – CBs removed, procedure simplified.
	3-100	FLT CTLR procedure – Note added.
	3-100 and 3-101	FMS-GPS procedure – Indication simplified, procedure simplified.
	3-109 and 3-110	HSI TRK procedure – Build 5 removed.

Revision Number and Date	Page Number	Description
11 20 Dec 2011 (Continued)	3A-3	FMS Synch Error added.
	3A-4	In Flight Only added to FLT CTRL Ch failure.
	3A-5	GPS Fail explanation simplified.
	3A-8	Build 5 removed – two places.
	Section 4	
	4-i and 4-ii	Contents updated.
	4-2	V_O speed corrected.
	4-3	Software Build 8 statement added.
	4-4 thru 4-29	Page roll-on.
	4-31	Noise level certification data updated.
	4-32 thru 4-38	Page roll-on.
	Section 6	
	6-i	Contents updated.
	6-3 and 6-4	Weighing procedure clarified.
	6-5 thru 6-34	Page roll-on.
	6-35 and 6-36	Loading Forms updated.
	6-37 thru 6-39	Page roll-on.
	6-40	Interior code STD-6S-3B removed.
	6-02-1 thru 6-02-6	Interior code STD-6S-3B removed.
	Section 7	
	7-1-1 thru 7-1-8	Contents reformatted.
	7-4-4	Gear Up declutter indication corrected.
	7-17-6	Passenger oxygen selector added.
	7-17-10	Schematic updated.
	7-27-3	APEX top level software P/N location added.
	7-27-4	MAU Configuration for Build 8 added.
	7-27-5 and 7-27-6	Software Build 5 removed. SB 45-005 removed.
	7-27-7	Page roll-on.
	7-27-8 and 7-27-9	Software Build 5 removed.
	7-27-12	Software Build 8 added.
	7-27-15 thru 7-27-19	Figure 7-27-2 title – Software Build 6 and 7 removed. Typical added to titles.
	7-27-20	Figure 7-27-3 added.
	7-27-26	Illustration title corrected
	7-28-4	Software Build 5 removed.
	7-29-9	GNSSU information updated.
	7-29-10	Software Build 6 removed.
	7-30-21	Declutter ranges Table updated for Software Build 8.
	7-31-6	Wording change for the sentence to read correctly.
	7-31-8 thru 7-31-12	CAS cautions Table updated, Gear Actuator Cntl added.
	7-31-13	FMS Synch Error added.
	7-31-14	AFCS Fault – Taxi removed.

Revision Number and Date	Page Number	Description
11 20 Dec 2011 (Continued)	7-32-4	SPD – Software Build information added.
	7-33-1 and 7-33-2	Software Build information added.
	7-33-5	Software Build 8 or higher added.
	7-33-7	Database loading – extra information added.
	7-33-11	FMS Synchronization clarified.
	7-33-12	Note corrected for PDC mode. Software Build 8 added to second note.
	7-33-13	FMS Synch Error added.
	7-34-3	Software Build 5 removed.
	7-35-2	Data transfer information updated.
	7-36-3	Software Build 8 added. Database downloading – extra information added.
	7-38-6	Vertical profile sentence added.
	Section 8	
	8-ii	Contents updated.
	8-32	Interior care updated.
	8-33	Primus APEX Display Care added.
	8-34 thru 8-38	Page roll-on.
	Section 9	
	9-i	Contents updated
	9-00-1	LEP updated. TR 23 incorporated.
		Supplement 8 Rev 1 issued.
		Supplement 9 Rev 1 issued.
		Supplement 10 issued.

Approved by: European Aviation Safety Agency (EASA)
EASA Project No: 001001513-001
Approval Date:

19.12.2011

Revision Number and Date	Page Number	Description
12 01 Dec 2012	LOSB 2	List updated.
	LOEP 1 and 2	List updated.
	LOTR 2 thru 4	List updated.
	LOR 19 and 20	New pages.
	Section 2	
	2-ii	Contents updated.
	2-iii	Page roll-on.
	2-5	TR 25 incorporated. Oil mixing restriction removed.
	2-14	Pneumatic de-icing boot system requirements added.
	2-15	GEN failure requirement removed. Pneumatic de-ice boot text moved to page 2-14.
	2-23	Pneumatic De-ice System paragraph moved to page 2-14.
	2-36	TR 25 incorporated. Oil mixing restriction removed.
	2-37	TR 24 incorporated. New & optional fuel filler placard added.
	Section 3	
	3-i, 3-iii and 3-iv	Contents updated.
	3-4	Glide speeds updated.
	3-10	Glide speeds updated.
	3-25	Glide speeds updated.
	3-29	Glide speeds updated.
	3-44	Left gear/left window changed to right gear/right window.
	3-45	Note to leave and not fly in icing conditions added.
	3-46 thru 3-49	Page roll-on.
	3-50	Items added to list of automatically load shed systems.
	3-51 thru 3-60	Page roll-on.
	3A-6	Aural Warning Fault added for Build 8.5 and subsequent.
	Section 4	
	4-10	Extra steps added to ensure EXT PWR output quality.
	4-13	Note added. Step added to EXT PWR disconnect procedure.
	Section 5	
	5-42 thru 5-45	"Values applicable with inertial separator closed" added.
	5-74 thru 5-76	New graphs representing updated glide speeds.
	Section 6	
	6-35	Zero Fuel, Ramp and Takeoff weight moments corrected.
	Section 7	
	7-1-5	Page numbers corrected.
	7-13-17	Prop De-Ice added to automatically load shed items.
	7-18-1	Storage cylinder charge pressures changed.
	7-19-1	Clock power supply source changed.
	7-31-4	Aural Warning Fault CAS advisory description added.
	7-31-13 and 7-31-14	Aural Warning Fault added.

Revision Number and Date	Page Number	Description
12 01 Dec 2012 (continued)	**Section 8**	
	8-i and 8-ii	Contents updated.
	8-6	Check of blanks and covers added.
	8-7 and 8-8	Figure title changed.
	8-9	New figure added.
	8-10 thru 8-14	Figures renumbered.
	8-15	Page roll-on.
	8-16	Statement removing mixing of oils removed.
	8-17 thru 8-25	Page roll-on.
	8-26	Cylinder pressure changed and figure renumbered.
	8-27	Figure renumbered.
	8-28 thru 8-35	Page roll-on.
	8-36	Battery removal moved from 30 day to 14 day intervals.
	8-37 and 8-38	Page roll-on.
	Section 9	
	9-i	Addition of supplements 11, 12 and 13.
	9-00-1	Addition of supplements 11, 12 and 13.
	9-3-1 thru 9-3-2	Revised pages of supplement 3.
	9-3-6	Revised page of supplement 3.
	9-11-1 thru 9-11-34	Issue of supplement No. 11.
	9-12-1 thru 9-12-10	Issue of supplement No. 12.
	9-13-1 thru 9-13-22	Issue of supplement No. 13.
	Section 10	
	10-i	Contents updated.
	10-4 thru 10-18	Incorporation of TR 21.
	10-19 thru 10-22	Page roll-on.
		Approved under P-EASA 0010017928-001
		FOCA signed original held on file by Pilatus Aircraft Ltd.

Revision Number and Date	Page Number	Description
13 01 Jun 2014	LOEP 1 and 2	List updated.
	LOTR 3	List updated.
	LOR 21 and 22	New pages.
	Section 2	
	2-ii	Contents updated.
	2-6 and 2-7	Note 10 added regarding permitted RPM variation.
	2-9	Fine pitch changed. TR 27 incorporated.
	2-18	KOEL updated to include LED lights.
	2-30	Seat limitations consolidated.
	2-38	Placard note updated.
	2-40	Placard change.
	2-49	Placard change.
	2-54	Placard change.
	Section 3	
	3-iv	Contents updated.
	3-82	Autopilot/DU independence note added. Layout change.
	3-102 thru 3-112	Procedure completely revised. Page roll-on.
	Section 4	
	4-16	Note added.
	Section 7	
	7-1-5 thru 7-1-7	Contents updated.
	7-4-5	Gear warning condition change.
	7-8-1	Cargo door opening instructions clarified.
	7-10-11	Propeller feather mechanism corrected.
	7-12-5	Fuel system diagram updated.
	7-13-7 and 7-13-8	Aircraft power-up sequence adjusted and augmented. Page roll-on.
	7-14-2	Exterior lights description added for S/N 1451 and up.
	7-15-8 and 7-15-9	ECS operation instructions added. Page roll-on.
	7-21-4	Dynamic Speed Bug added.
	7-29-6 thru 7-29-8	Dual KMA 29 operation description added. Page roll-on.
	7-29-19	“PRS W” and “PRS F” indications added.
	7-30-8	EGPWS Mk VI installation reference removed.
	7-30-12	Database detail for S/N 1451 added. EGPWS Mk VI installation reference removed.
	7-33-7 thru 7-33-16	Wireless Fastload system added. Page roll-on.
	7-34-3	Event Button description added.
	7-35-2 and 7 35-3	Data download possibilities consolidated. Wireless Fastload System added.
	7-36-2 thru 7-36-4	Editorial changes. Title changed.

14109

Revision Number and Date	Page Number	Description
13 01 Jun 2014 (continued)	**Section 8**	
	8-ii	Contents updated.
	8-31 and 8-32	Brake care added. Page roll-on.
	Section 9	
	9-00-1	List updated.
		The Revision No. 13 to the AFM ref. 02277 is approved Under the authority of DOA ref. EASA.21J.357. Approval date: 05.06.2014

Revision Number and Date	Page Number	Description
14 02 March 2015	LOEP 1 thru 4 LOR 23 and 24	List updated, additional pages added. New pages.
	Section 3	
	3-30 and 3-31	Editorial corrections.
	3-34	Editorial corrections.
	3-67	New procedure step added.
	Section 7	
	7-1-4	Contents updated.
	7-10-8	Editorial correction.
	7-10-29 and 7-10-30	Fuel flow range change. Engine NP and Oil Temperature condition change.
	7-14-1	Interior lighting change.
	7-25-1 thru 7-25-4	Kannad Integra ELT and eNAV unit added.
	Section 8	
	8-34	Cleaning instructions updated.
	Section 9	
	9-00-1	List updated.
		The Revision No. 14 to the AFM ref. 02277 is approved Under the authority of DOA ref. EASA.21J.357. Approval date: 11.02.2015.

15088

Revision Number and Date	Page Number	Description
15 06 Nov 2015	LOEP-1 thru 4 LOTR-3 and 4 LOR-24 thru 28	LOEP updated TR No. 26, 28 and 30 cancelled by this revision LOR for Revision 15. New pages LOR-25 thru 28
	Section 0	
	0-i	Contents page updated
	0-3	Copyright and legal statement added
	Section 1	
	1-i	Contents page updated
	1-5	Heading updated for 4-bladed propeller
	1-6	Description of 5-bladed propeller added
	1-7 thru 1-22	Pages run on. New pages 1-21 and 1-22.
	Section 2	
	2-i thru 2-iii	Contents pages updated
	2-9	4-bladed propeller text updated
	2-10	Limitations of 5-bladed propeller added.
	2-11 thru 2-56	Pages run on. New pages 2-55 and 2-56
	2-16	Flight in icing conditions updated
	2-18	KOEL updated: Compass optional. Clock not required with APEX Build 10 and higher
	2-19	EPS and active Propeller De Ice caution added
	2-24	Limitation on autopilot coupled go-arounds clarified
	2-27	Compliance with oceanic or remote navigation added for APEX Build 7 or higher
	2-33	PED text added
	2-34	MSN effectivity added to illustration.
	2-35	Placard for new exterior cabin door. NSN effectivity added to illustrations
	Section 3	
	3-iv	Contents page updated
	3-38	Failed flap system with potential flap asymmetry clarified
	3-71	Procedure for propeller vibration updated
	3-80	Procedure for Boots Temperature Limit Exceeded and Flaps Extended Limit Exceeded cautions added
	3-81 thru 3-114	Pages run on. New pages 3-113 and 3-114
	3-83 thru 3-85	Red X or blank display procedure added
	3-101	AHRS procedure updated
	3-101 and 3-102	ESIS/Standby Magnetic Direction Indicator changed to Standby Instrument System
	Section 4	
	4-4	Battery compartment subject moved to next page
	4-5	New preflight checks inside battery compartment added
	4-31	Noise level text revised. Noise level for 5-bladed propeller added

15254

Revision Number and Date	Page Number	Description
15 06 Nov 2015 (continued)	4-36	Description of Flaps EXT Limit caution added
	4-37	Page run on
	Section 5	Section 5 is now divided into 4 sub-sections as follows: • Standard tables now located in 5-1 • Stall speeds and performance data for aircraft with a 4-bladed propeller (MSN 1001 and Up) now located in 5-2 • New data. Stall speeds and performance data for aircraft with a 5-bladed propeller (MSN 1576 and Up) located in 5-3 • Flight planning example now located in 5-4
	5-i and 5-ii	Contents pages for Section 5
	5-1-i and 5-1-ii	Contents pages for Section 5-1
	5-1-1 thru 5-1-12	Pages for standard tables have the prefix 5-1. No technical change
	5-2-i thru 5-2-iv	Contents pages for Section 5-2
	5-2-1 thru 5-2-78	Pages for stall speeds and performance data for aircraft with a 4-bladed propeller (MSN 1001 and Up) have the prefix 5-2. Terminology for de ice boots standardized
	5-2-77	AOA sensing clarified. Stall speeds revised
	5-3-i thru 5-3-iv	Contents pages for Section 5-3
	5-3-1 thru 5-3-96	Pages for stall speeds and performance data for aircraft with a 5-bladed propeller (MSN 1576 and Up) have the prefix 5-3
	5-4-i and 5-4-ii	Contents pages for Section 5-4
	5-4-1 thru 5-4-6	Pages for flight planning example have the prefix 5-4. No technical change. Editorial.
	Section 6	
	6-i and 6-ii	Contents pages updated.
	6-29	LG extension and retraction W&B effect statement updated
	6-01-04	FR34 Baggage net weight and moment corrected
	6-03-04	FR34 Baggage net weight and moment corrected
	6-04-04	FR34 Baggage net weight and moment corrected
	6-05-04	FR34 Baggage net weight and moment corrected
	6-06-04	FR34 Baggage net weight and moment corrected
	6-07-04	FR34 Baggage net weight and moment corrected
	Section 7	
	7-i thru 7-viii	Contents pages updated. Page numbering change to Roman numerals
	7-3-3	Flap asymmetry clarified
	7-3-4	Page run on
	7-3-5	Figure title corrected
	7-8-1	Description of new type of passenger door handle added
	7-8-2	Page run on

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Revision Number and Date	Page Number	Description 15254
15 06 Nov 2015 (continued)	7-10-7	Figure reference updated
	7-10-25	White tick marks on engine's analog torque gauge clarified
	7-11-1	Description of 5-bladed propeller added
	7-11-2 thru 7-11-8	Page run on
	7-11-3	Figure 7-11-1 title updated
	7-11-4	New figure for 5-bladed propeller pitch mechanism
	7-11-5 thru 7-11-8	New pages
	7-11-5	5-bladed propeller pitch mechanism added
	7-11-6	Propeller de-ice text moved to this page. 5-bladed propeller de-ice timer cycles added
	7-11-7	IOAT sensing header introduced. Built-in test function timing increased to 20 seconds
	7-11-8	New page
	7-13-1 and 7-13-2	Description of optional inflight heated batteries added. Editorial correction to figure reference
	7-13-11 and 7-13-12	Location of inflight battery heater circuit breakers added
	7-14-1	50% cabin flood lights and stair lights description added for MSN 1576 and up
	7-15-4 and 7-15-8	Air regulator for cockpit air foot outlets description updated
	7-15-12	Illustration updated for foot outlet lever
	7-17-4	Format change
	7-17-7	Editorial.
	7-19-1	Cockpit clock is now a factory option. If installed added
	7-21-1	Dynamic speed bug added
	7-21-2	Description of how AOA is measured is clarified
	7-21-4	Dynamic speed bug added. Stick shaker and stick pusher operation clarified
	7-22-1	Deicer boots adhesion and thickness description removed
	7-22-2	Figure reference corrected. Boots TEMP Limit' and 'Flaps EXT Limit' Warning added
	7-22-3 thru 7-22-5	Figure sheet references updated
	7-22-4	New figure for APEX Build 10 (or higher) CAS messages
	7-22-5 and 7-22-6	New pages. Page run on
	7-27-11	Alternative DRCP
	7-27-12	Figure reference added for Primus APEX Build 10 and higher
	7-27-13	Primus APEX Build 10 changes to the PFD described
	7-27-21	New figure. Primus APEX Build 10 ADI HIS screen
	7-27-22	Page run on. Figure reference updated
	7-27-26	Figure reference updated
	7-28-1	Magnetic compass is now a factory option. If installed added
	7-28-21	Magnetic compass is now a factory option. If installed added. Component terminology correction

Revision Number and Date	Page Number	Description
15 06 Nov 2015 (continued)	7-30-1	Figure title update. Description of the WX Overlay
	7-31-12	'Boots TEMP Limit' and 'Flaps EXT Limit' cautions added to message table
	7-33-7	CFD note added
	7-33-8	Terminology for Connected Flight Deck (CFD) standardized
	7-33-10	FMS messages added
	7-33-17 and 7-33-18	New pages
	7-33-17	Description of new Primus Apex Build 10 features: Pilot Entered Waypoints, Route Flight Log Information, ETE on Cross Flight Log, Temperature Compensation and Orbital Patterns added
	7-34-1	Data Transfer title updated. CFD note added
	7-34-2	Trend data download with CFD description added
	7-34-3 and 7-34-4	Page run on
	7-35-2	CFD note added. Download of FHDB via RT or CFD added
	7-35-3	Maintenance Data Download with CFD
	7-36-3	CFD note added. Electronic chart database loading with CFD description added
	7-38-5	Excessive vertical deviation during ILS approach; Apex Build 10 description and illustration added
	7-38-6 thru 7-38-8	Page run on. New pages 7-38-7 and 7-38-8
	Section 8	
	8-ii	Contents pages updated
	8-4	Propeller towing restraint added
	8-6	Page run on. Propeller towing restraint caution added
	8-17	Oil replenishment procedure updated
	8-31	TR Number 28 Brake Care (Aircraft with Parker Brakes) incorporated.
	8-32	Propeller care description updated and included care for 5-bladed propeller
	8-33 thru 8-40	Pages run on. New pages 8-39 and 8-40
	Section 9	
	9-i	Supplement 14 added. Editorial corrections
	9-00-1	LOEP updated
	Supplement 4	Revised: Compass option. Clock not required for APEX Build 10 and higher
	Supplement 5	Revised, see LOR in the Supplement
	Supplement 14	Issued
		The Revision No. 15 to the AFM Ref. 02277 is approved under EASA Approval No. 10055425 Approval date: 06 November 2015

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Revision Number and Date	Page Number	Description
16 16 Sep 2016	LOSB-1 and 2	Deleted
	LOEP-1 thru 4	LOEP updated
	LOTR-3 and 4	TR No. 32, 33, 35, and 36 cancelled by this revision
	LOR-28 thru 30	LOR for Revision 16. New pages LOR-29 and 30
	Section 0	
	0-i	TOC updated to add Revision/Issue Dates heading
	0-2	Revision Markings paragraph updated Revision / Issue Dates heading added
	Section 2	
	2-2	Editorial (date in footer updated)
	2-4	Editorial (date in footer updated)
	2-6	Editorial (date in footer updated)
	2-8	Editorial (date in footer updated)
	2-31	RF working distances added
	2-33	Note added
	2-42	110 VAC Power and MAU Data Load placards added
	2-45	TR Number 36 incorporated (figure updated)
	Section 3	
	3-i	Editorial (paragraph 3.3 title updated)
	3-ii	Editorial (date in footer updated)
	3-iii	Contents pages updated
	3-35	Maintenance Facility Note added
	3-35A and 3-35B	New pages for run over text
	3-36	Editorial (date in footer updated)
	3-37	Editorial (updated CB to circuit breaker)
	3-39	In Flight Stick Pusher Failure procedure updated
	3-40 thru 3-41B	Inadvertent Pusher/Shaker Operation procedure updated. Pages run on. New pages 3-41A and 3-41B.
	3-42	Editorial (date in footer updated)
	3-44 thru 3-56	TR Number 32 incorporated. Introduced Electrical Power Loss paragraph. Updated subparagraph numbers accordingly.
	3-73 and 3-74	Boot failure caution added. Text run on
	3-76	AOA Probe Deice Failure in Icing Conditions procedure updated
	3-77	AOA Deice failure Caution added
	3-78	Text run on from page 3-77
	3-79	Pusher Ice Mode Failure in Icing Conditions procedure updated. Text run on from page 3-78
	3-80	Pusher Ice Mode failure Caution added. Text run on from page 3-79
	3-84	Editorial (updated ESS BUS to Essential Bus)
	3A-1	TR Number 35 incorporated. MEL proviso added
	3A-2	Text run on from page 3A-1
	3A-3	Editorial. Text run on from page 3-A2

16605

Revision Number and Date	Page Number	Description
16 16 Sep 2016 (continued)	3A-4	Editorial. Text run on from page 3-A3
	3A-5	Editorial. Updated naming of buses. Text run on from page 3-A4
	3A-6	Editorial (date in footer updated)
	3A-7	Removed asterisk from Maint Memory Full message
	3A-8	Editorial (date in footer updated)
	3A-10	Editorial (date in footer updated)
	Section 4	
	4-5	Terminology change to Lightweight Data Recorder (LDR)
	4-9	TR Number 33 incorporated (MASTER POWER switch to ON and check of condition of guard)
	4-10	Editorial (date in footer updated)
	4-22	Approach Check procedure updated
	4-27	Parking procedure updated
	4-28	Editorial (date in footer updated)
	4-37	Residual ice wording added.
	4-38	Residual ice wording added. Text run on from page 4-37
	4-39	New page. Text run on from page 4-38
	4-40	New page (intentionally left blank)
	Section 7	
	7-1-v	ESIS titles updated with SB 34-042 references
	7-1-vii	Terminology change to Lightweight Data Recorder (LDR)
	7-3-3	Editorial (spelling updates in 2^{nd} paragraph and table)
	7-26-2	Reference to sheet 3 and effectivity ranges added
	7-26-6	Editorial (sheet quantity changed)
	7-26-7	Effectivity range added
	7-26-8	New antenna location figure added as sheet 3 for MSN 1576 and up
	7-28-5	Editorial (sheet quantity changed)
	7-28-6	Pre SB 34-042 reference added
	7-28-7	New figure for Post SB 34-042 aircraft and MSN 1271 and up (figure moved from ESIS Chapter)
	7-28-8	Title updated with Pre SB 34-042 reference. Text moved to this page due to relocated figure on page 7-28-7
	7-28-9	Text moved to this page due to relocated figure on page 7-28-7
	7-28-10 thru 7-28-12	Pre SB 34-042 reference added
	7-28-13	Title updated with Post SB 34-042 reference for MSN 1001 thru 1270 System schematic reference updated Description updated
	7-28-14	Text moved to this page due to relocated figure on page 7-28-7
	7-28-15	Figure reference updated. Text moved to this page due to relocated figure on page 7-28-7

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Revision Number and Date	Page Number	Description
16 16 Sep 2016 (continued)	7-28-16 thru 7-28-20	Added effectivity MSN 1001 thru 1270 Post SB 34-042
	7-28-21	Editorial (footer layout updated)
	7-29-5	Updated description of Audio Control Panel to clarify that audio output to headsets is in stereo audio
	7-29-6	Updated description to include headset setting
	7-40-1 thru 7-40-4	Terminology change to Lightweight Data Recorder (LDR)
	Section 8	
	8-i	Contents pages updated
	8-6	Use of tail stand added
	8-15	Passenger seat removal and installation paragraph added
	Section 9	
	9-i	Supplement 15 added. Editorial corrections
	9-00-1	Supplements List of Effective Pages updated. Revision numbers added where necessary
	Supplement 1	Revision 1. Name changed to IAC AR. Updated to new format. See LOR in the Supplement for other changes
	Supplement 3	Revision 4. See LOR in the Supplement for changes
	Supplement 4	Revision 3. Updated to new format. See LOR in the Supplement for other changes
	Supplement 6	Revision 2. See LOR in the Supplement for changes
	Supplement 7	Revision 1. Updated to new format. See LOR in the Supplement for other changes
	Supplement 11	Revision 3 and 4. See LOR in the Supplement for changes
	Supplement 13	Revision 2. See LOR in the Supplement for changes
	Supplement 15	New Supplement for aircraft with a Passenger Oxygen Drop-Down Mask system installed
	Section 10	
	10-3	Editorial update of footer
		The Revision No. 16 to the AFM Ref. 02277 is approved under the authority of DOA ref. EASA.21J.357 Approval date: 15 September 2016

16605

Revision Number and Date	Page Number	Description 17382
17 12 Jul 2017	LOEP-1 thru 4 LOTR-3 and -4 LOR-31 thru 34	LOEP updated LOTR updated LOR for Revision 17. New pages LOR-33 and 34
	Section 1	
	1-12	17382 - Updated layout of "icing conditions" definition (editorial)
	1-17	17382 - Abbreviation added to Maximum Landing Weight and Maximum Takeoff Weight definitions (editorial)
	Section 2	
	2-ii	17382 Contents page updated
	2-7	16812 - Steady state operation note updated
	2-25	17295 - FAA guidance reference updated
	2-28	16616 - FMS instrument approach limitations updated
	2-29	16616 - Editorial (text run on from page 2-28) 17347 - Barometric VNAV limitation updated
	2-40	17328 - Drain Tank Dump Valve placard removed
	Section 3	
	3-i thru 3-iv	17382 - Contents pages updated
	3-1 thru 3-115	16847 - Editorial (added additional dividers where necessary to make separate sub procedures within a procedure more clear)
	3-4 and 3-5	17188 - Updated icing performance speeds
	3-7	16847 - Editorial (updated layout of step 1 in para 3.4.2)
	3-12	16847 - Editorial (Added “switch” or “switches” where applicable)
	3-15 and 3-16	16847 - Editorial (added "or caution" where applicable)
	3-17	16847 - Editorial (updated step numbering for para 3.6.7 (on ground). Added "or caution" where applicable)
	3-22	16847 - Editorial (text format updated)
	3-23	16847 - Editorial (text “switch” added)
	3-24	16847 - Editorial (footer updated)
	3-25 thru 3-27	16798 - Procedure updated to include drop down oxygen mask system
	3-28	16847 - Editorial (footer updated)
	3-30	16847 - Updated Note to emphasize the right main landing gear can be seen from the rear right cabin window
	3-32	16847 - Editorial (moved warning from page 3-33 to page 3-32)
	3-33	16847 - Editorial (moved warning to page 3-32)
	3-34	16847 - Editorial (footer updated)
	3-35	16905 - Editorial (updated reference to 3.15.2)
	3-51	16847 - Editorial (text "switches" added)

Revision Number and Date	Page Number	Description 17382
17 12 Jul 2017 (continued)	3-58	16787 - Updated BATT1 and BATT2 caution condition 16905 - Editorial (updated reference to 3.15.13 and 3.15.15)
	3-59 thru 3-62	16847 - Editorial (text "switches" added)
	3-65	16847 - Bus location added
	3-66	17330 - Updated pressure warning condition and procedure
	3-67	17330 MSN effectivity for updated CPCS added
	3-69	17330 - MSN effectivity for updated CPCS added
	3-70 and 3-71	16847 - Editorial (changed "CABIN PRESS" to "CABIN PRESSURE"
	3-72	16847 - Editorial (updated Manual Control and Cabin Pressure switch identification)
	3-74	17188 - Updated landing approach speed to 130 KIAS
	3-75	17188 - Updated landing distance to 160%
	3-77	16847 - Editorial (updated naming of LH and RH W/SHLD circuit breakers)
	3-78	17188 - Updated landing approach speed to 105 KIAS
	3-79	17188 - Updated landing distance to 71%
	3-80	17188 - Updated landing distance to 71%
	3-81	17188 - Updated landing distance to 71%
	3-82	16847 - Caution added. Moved paragraph 3.18.11 to next page 17188 - Updated landing approach speed to 105 KIAS Updated landing distance to 71%
	3-83	16847 - Editorial (moved paragraph 3.18.11 to this page)
	3-87	16847 - Editorial (paragraph title layout updated)
	3-88 thru 3-93	16847 - Editorial (paragraph letter added to steps)
	3-94	16847 - Editorial (changed normal text to new Step 13) 17188 - Updated landing distance to 71%
	3-95 thru 3-97	16847 - Editorial (paragraph letter added to steps)
	3-98	16847 - Editorial (updated step numbering)
	3-99	16847 - Editorial (layout of cautions updated)
	3-100 and 3-101	16847 - Editorial (paragraph letter added to steps)
	3-103 thru 3-106	16847 - Editorial (paragraph letter added to steps)
	3-109 and 3-110	16847 - Editorial (paragraph letter added to steps)
	3-112	16847 - Editorial (paragraph letter added to steps)
	3-114	16847 - Moved part of step 4 text outside the step
	3-115 and 3-116	16847 - Editorial (paragraph letter added to steps)
	3-117	16782 - “Stuck Mic” procedure added. New page 3-117
	3-118	16782 - Editorial (new page 3-118, intentionally left blank)
	3A-4	16847 - Editorial (“results in” added to meaning of dual channel failure)
	3A-5	16847 - Editorial (colon removed from text)
	3A-7	17330 - MSN effectivity for updated CPCS added

Revision Number and Date	Page Number	Description
17 12 Jul 2017 (continued)	**Section 4**	
	4-2	17188 - Updated icing performance speeds
	4-11	16565 - Updated procedure to set passenger oxygen selector to AUTO
	4-23 and 4-24	17188 - Updated icing performance speeds
	4-34	17188 - Updated icing performance speeds
	Section 5	
	5-2-i thru 5-2-iii	17382 - Contents updated to reflect Revision 17
	5-2-77 thru 5-2-96	16966 - Updated and introduced new icing condition performance information
	5-3-78 thru 5-3-95	16966 - Updated icing condition performance information
	Section 7	
	7-1-vi and 7-1-vii	17382 - Contents updated to reflect Revision 17
	7-3-3	16805 - Updated FLAP CB reset attempts
	7-4-5	16805 - Updated amount of strokes required for emergency LG extension
	7-7-1	16805 - Editorial (spelling corrections incorporated)
	7-10-21	16805 - Updated cold engine start description
	7-10-23	16805 - Editorial (spelling corrections incorporated)
	7-11-6	16805 - Updated phrasing of temperature ranges
	7-12-5 and 7-12-6	17376 - Figure title updated (editorial)
	7-12-7	17376 - Effectivity added
	7-12-8	17376 - New fuel system illustration added
	7-12-9	17376 - Figure title updated (editorial)
	7-15-2 and 7-15-3	16805 - Updated name of shutoff valves
	7-17-1 thru 7-17-12	17330 - Cabin Pressure Control System (CPCS) description updated
		17330 - Figure titles updated
	7-26-4	16616 - FGP added to list of abbreviations
	7-29-2	16782 - Stuck Mic information added
	7-30-1 thru 7-30-4	17291 - RDR2060 information added
	7-30-5 thru 7-30-22	17291 - Editorial (text run on)
	7-39-1 and 7-39-2	16616 - All LPV Approach information moved to Supplement 5

17382

Revision Number and Date	Page Number	Description 17382
17 12 Jul 2017 (continued)	**Section 9** 9-00-1 Supplement 2 Supplement 3 Supplement 5 Supplement 11	 17382 - Supplements List of Effective Pages updated. Revision numbers updated where necessary Revision 3. See LOR in the Supplement for changes Revision 5. See LOR in the Supplement for changes Revision 5. See LOR in the Supplement for changes Revision 5. See LOR in the Supplement for changes Changes made to Section 3 under reference number 17330 (see above for more information) are approved by the European Aviation Safety Agency (EASA) EASA Approval Number: 10062147 Approval date: 09 June 2017 The Revision No. 17 to the AFM Ref. 02277 is approved under the authority of DOA ref. EASA.21J.357 Approval date: 12 July 2017

Revision Number and Date	Page Number	Description
18 30 May 2018	LOEP-1 thru 4 LOTR-3 and 4 LOR-35 and 36	LOEP updated Incorporated TR 37 and TR 39 LOR for Revision 18. New pages LOR-35 and 36
	Section 3	
	3-82 3-83 3-84	17768 - Updated condition 17768 - Added Note 17768 - Editorial (text run on)
	3A-6 3A-7	17699 - Moved “check oil debris” caption to page 3A-7 17699 - Updated table header to "on ground CAS status message"
	Section 4	
	4-18 4-18	18426 - Updated step 1 18519 - Updated Note
	Section 7	
	7-1-iv 7-1-v 7-1-vi thru 7-1-viii 7-10-19 7-13-11 and 7-13-12 7-22-2 thru 7-22-8	18449 - Updated Section 7-22 page number 18093 - Updated to include ULB description 18449 - Editorial (text run on) 18519 - Updated Torque Limiter description 17330 - Updated CB panel figures to include new CPCS 18449 - Incorporated TR 39. New pages 7-22-7 and 7-22-8
	7-25-3 7-28-3 7-29-1 7-29-11 thru 7-29-17	18093 - Added Underwater Locator Beacon description 17506 - Added reference to Pilatus Pilot’s Guide 02336 18449 - Updated figure reference (editorial) 17992 - Added KTR2280A information 17992 - Added KTR2280A and Morse code identifier information
	7-33-8 and 7-33-9 7-33-10 thru 7-33-18	18449 - Incorporated TR37 18449 - Editorial (text run on)
	Section 8	
	8-i and 8-ii	18449 - Editorial (updated page numbers due to text run on)
	8-9 and 8-10	17853 - Updated figure 8-3 with 5-blade prop blanks and covers
	8-11 thru 8-40	17853 - Editorial (text run on)
		The Revision No. 18 to the AFM Ref. 02277 is approved under the authority of DOA ref. EASA.21J.357 Approval date: 30 May 2018

18449

Revision Number and Date	Page Number	Description
19 16 Oct 2018	LOSB-1 thru 4	18856 - Empty LOSB pages added
	LOEP-1 thru 4	LOEP updated
	LOR-36	LOR for Revision 19.
	Section 4	
	4-6	18734 - Added Note
	4-7	18734 - Editorial (text run on)
	Section 6	
	6-1	18939 - Editorial (updated page header)
	6-03-3	18879 - Seat part numbers added
	6-04-3	18879 - Seat part numbers added
	6-05-3	18879 - Seat part numbers added
	6-05-4	18879 - Editorial (text run on)
	6-06-3	18879 - Seat part numbers added
	6-06-4	18879 - Editorial (text run on)
	6-07-3	18879 - Seat part numbers added
	6-07-4	18879 - Editorial (text run on)
	Section 7	
	7-13-5	18552 Updated (VCCS) CPRSR PWR circuit breaker name on PEBJB to VCCS
	Section 9	
	9-i	18939 - Updated for Revision 19
	9-00-1	18939 - Updated for Revision 19
	Supplement 16	18702 - New Supplement for aircraft that are FATA certified to Russian standards
		The Revision No. 19 to the AFM Ref. 02277 is approved under the authority of DOA ref. EASA.21J.357 Approval date: 16 October 2018

18939

Revision Number and Date	Page Number	Description
20 Jan 06 2020	Title Page	Updated effectivity
	LOEP-1 thru 4	LOEP updated for Revision 20
	LOTR-4	LOTR updated for Revision 20
	LOR-37 thru 40	LOR for Revision 20. New pages LOR-37 thru 40
	Section 1	
	1-8	19880 - Updated passenger door name
	Section 2	
	2-ii and 2-iii	20566 - Updated to reflect Revision 20
	2-2	19857 - Updated layout and description for V_{MO}/M_{MO}
	2-3	19857 - Updated figure title
	2-18 and 2-19	20566 - Editorial (updated effectivity)
	2-22	20457 - Single pilot operation limitation added 20566 - Editorial (updated effectivity)
	2-31	20925 - Incorporated TR 41 and updated limitation phrasing
	2-32 thru 2-35	19880 - Updated passenger and cargo door name
	2-35	20566 - Editorial (updated effectivity)
	2-38	20566 - Editorial (updated effectivity)
	2-39	20566 - Editorial (updated effectivity)
	2-42	19182 - Added Note to oxygen placard 20566 - Editorial (updated effectivity)
	2-48	19880 - Updated passenger door name
	Section 3	
	3-6	20566 - Editorial (updated effectivity)
	3-18	19427 - Updated "oil quantity" procedure with a reference to Section 4
	3-21 and 3-22	20364 - Updated oxygen mask procedure
	3-25 thru 3-27	20364 - Updated oxygen mask procedure
	3-33	20566 - Editorial (updated effectivity)
	3-39	20566 - Editorial (updated effectivity)
	3-66	20364 - Updated oxygen mask procedure
	3-67	20364 - Updated oxygen mask procedure 20566 - Editorial (updated effectivity)
	3-68	20364 - Updated oxygen mask procedure
	3-69	20364 - Updated oxygen mask procedure 20566 - Editorial (updated effectivity)
	3-70 thru 3-72	20364 - Updated oxygen mask procedure
	3-75	20566 - Editorial (updated effectivity)
	3-83	20566 - Editorial (updated effectivity)
	3-85	20364 - Updated oxygen mask procedure
	3-88 and 3-89	20364 - Updated oxygen mask procedure
	3-97 and 3-98	19628 - Updated MAU A/B Fail procedure
	3-99	20566 - Editorial (text run on)
	3-101	20364 - Updated oxygen mask procedure
	3-112	20364 - Updated oxygen mask procedure
	3A-7	20566 - Editorial (updated effectivity)

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Revision Number and Date	Page Number	Description 20566
20 Jan 06 2020 (continued)	**Section 4**	
	4-7	19427 - Updated oil level check description
	4-8	19880 - Updated passenger door name
		20364 - Updated oxygen mask check
	4-13	19730 - Updated External Power Unit step
	4-16	20121 - Added beta range check
	4-26	20364 - Oxygen mask step added
	Section 5	
	5-i	20566 - Editorial (updated effectivity)
	5-2-i thru 5-2-iv	20566 - Editorial (updated effectivity)
	5-3-i thru 5-3-iv	20566 - Editorial (updated effectivity)
	5-3-16	19188 - Editorial (updated "distance" to "engine torque" in example)
	Section 6	
	6-2	19880 - Updated passenger door name
	6-16	19880 - Updated passenger door name
	6-19	19796 - Added restraint bars 525.25.12.276 and 525.25.12.277
	6-01-2 thru 6-01-6	20925 - Incorporated TR 41 and updated limitation phrasing
	6-03-3	20566 - Incorporated TR 41
	6-04-1	20566 - Editorial (corrected typo)
	6-04-3	20566 - Incorporated TR 41
	6-05-1	20566 - Editorial (corrected typo)
	6-05-3	20566 - Incorporated TR 41
	6-06-1 thru 6-06-6	20925 - Incorporated TR 41 and updated limitation phrasing
	6-07-1 thru 6-07-6	20925 - Incorporated TR 41 and updated limitation phrasing
	Title Page (Vol. 2)	Updated effectivity
	Section 7	
	7-1-ii	20566 - Updated to reflect Revision 20
	7-1-v thru 7-1-vii	20566 - Updated to reflect Revision 20
	7-2-1	19880 - Updated passenger door name
	7-4-12	20566 - Editorial (updated effectivity)
	7-7-1	20566 - Incorporated TR 41
	7-8-1	19880 - Updated passenger door name
		20566 - Editorial (updated effectivity)
	7-12-1 and 7-12-2	19696 - Added drain valve to air separator
	7-12-5	19696 - Added drain valve indication to air separator
	7-12-8	20566 - Editorial (updated effectivity)
	7-13-11 and 7-13-12	20566 - Editorial (updated effectivity)
	7-13-12	19472 - Added optional Aerowave 100 SATCOM system circuit breakers

Revision Number and Date	Page Number	Description
20 Jan 06 2020 (continued)	7-13-12	20092 - Added optional USB charging ports circuit breaker
	7-14-1 and 7-14-2	19880 - Updated passenger door name
		20566 - Editorial (updated effectivity)
	7-17-1 thru 7-17-3	20566 - Editorial (updated effectivity)
	7-17-5 thru 7-17-7	20566 - Editorial (updated effectivity)
	7-17-11	20566 - Editorial (updated effectivity)
	7-19-2 and 7-19-3	20092 - Added optional USB charging ports to description
	7-22-2	20566 - Editorial (updated effectivity)
	7-22-7	20566 - Editorial (updated effectivity)
	7-25-2	20566 - Editorial (updated effectivity)
	7-26-2	20566 - Editorial (updated effectivity)
	7-26-8	20566 - Editorial (updated effectivity)
	7-28-2	20566 - Editorial (updated effectivity)
	7-28-7	20566 - Editorial (updated effectivity)
	7-28-13	20566 - Editorial (updated effectivity)
	7-28-16 thru 7-28-20	20566 - Editorial (updated effectivity)
	7-29-9	20566 - Editorial (updated effectivity)
	7-29-20 thru 7-29-22	19472 - Added optional Aerowave 100 SATCOM system description
	7-30-13	20566 - Editorial (updated effectivity)
	7-33-2	20566 - Editorial (updated effectivity)
	Section 9	
	9-i	20566 - Updated for Revision 20
	9-00-1	20566 - Updated for Revision 20
	Supplement 4	Revision 4. See LOR in the Supplement for changes
	Supplement 6	Revision 3. See LOR in the Supplement for changes
	Supplement 7	Revision 2. See LOR in the Supplement for changes
	Supplement 11	Revision 7. See LOR in the Supplement for changes
	Supplement 13	Revision 3. See LOR in the Supplement for changes
	Supplement 02474	20084 - New Supplement for aircraft with placards in the German language
		The Revision No. 20 to the AFM Ref. 02277 is approved under the authority of DOA ref. EASA.21J.357 Approval date: 06 January 2020

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CONTENTS

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SECTION 0

INTRODUCTION

TABLE OF CONTENTS

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GENERAL

This Pilot's Operating Handbook (POH) is designed to provide the information required for the operation of the airplane. Each airplane is delivered with a POH that reflects the standard airplane with all of the approved options plus any special equipment installed on an individual basis.

WARNINGS, CAUTIONS, AND NOTES

The following definitions apply to the warnings, cautions, and notes as used in this manual:

WARNING

ANY OPERATING PROCEDURE, PRACTICE, OR CONDITION WHICH, IF NOT STRICTLY COMPLIED WITH, MAY RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

CAUTION

ANY OPERATING PROCEDURE, PRACTICE, OR CONDITION WHICH, IF NOT STRICTLY COMPLIED WITH, MAY RESULT IN DAMAGE TO THE AIRPLANE OR EQUIPMENT.

NOTE

Any operating procedure, practice, or condition that requires emphasis.

REVISION MARKINGS

Additions, technical changes and revisions to existing POH material will be identified by a vertical revision bar (black line) in the outside margin of the applicable page, next to the change.

The revision bar will only indicate the current change on each page. Physical relocation of material or the correction of typographical or grammatical errors, outside of the material revised, will not be identified by a revision bar.

REVISION / ISSUE DATES

At the bottom of each page, opposite the page number, there will be the original issue date of the manual. As the page is subsequently revised, the original issue date will be followed by the current revision number and date. If a new page is issued, it will be identified by having the same original issue and revision date.

REVISION PROCEDURE

To keep this POH current, revisions will be issued to latest registered owner of airplane. Revisions to this POH will consist of:

- Transmittal Letter
- Log of Revisions
- List of Effective Pages
- New or Revised Pages
- Temporary Revisions

The Equipment List is not included in the Revision Procedure. The Equipment List is a separate report and was current at the time of license at the manufacturer and must be maintained by the airplane owner.

TRANSMITTAL LETTER

The Transmittal Letter will show the revision number and date. All POH pages affected by the Transmittal Letter will be listed along with instructions for incorporating the revision into the POH.

LOG OF REVISIONS

The Log of Revisions provides a brief description of each revision.

LIST OF EFFECTIVE PAGES

The List of Effective Pages will list all of the current POH page numbers with the applicable revision number.

NEW OR REVISED PAGES

In accordance with the instructions of the Transmittal Letter, new or revised pages will be incorporated into the POH and superseded pages destroyed.

CAUTION

IT IS THE RESPONSIBILITY OF THE OWNER OR OPERATOR TO MAINTAIN THIS PILOT'S OPERATING HANDBOOK IN A CURRENT STATUS AND INCORPORATE SUCCESSIVE REVISIONS.

TEMPORARY REVISIONS

Temporary Revisions are issued when the POH must be revised between the regular formal revisions. They are issued on yellow paper and must be recorded on the Log of Temporary Revisions. Temporary Revisions should normally be put at the front of the POH, apart from Section 9 Temporary Revisions which should be put in front of the applicable Supplement. Temporary Revisions must only be removed from the POH when instructed to do so by, the Transmittal Letter of the next issue of a formal revision, superseded by another temporary revision and sometimes by the incorporation of a Service Bulletin. The Log of Temporary Revisions will be updated and issued with each formal revision.

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SECTION 1

GENERAL

TABLE OF CONTENTS

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GENERAL

This section contains basic data and information of general interest to the pilot. It also contains definitions and explanations of symbols, abbreviations, and terminology that is used throughout this POH.

INTRODUCTION

This POH includes the material required to be furnished by the Federal Aviation Regulations and additional information provided by the manufacturer and constitutes the FOCA Approved Airplane Flight Manual. This POH must be read, and thoroughly understood, by the owner and operator in order to achieve maximum utilization as an operating guide for the pilot.

This POH is divided into numbered sections which are separated by tabs. Section 3, Emergency Procedures, is further highlighted by the use of a red tab to facilitate quick recognition.

Pages that have been intentionally left blank will be so indicated by the statement "THIS PAGE INTENTIONALLY LEFT BLANK".

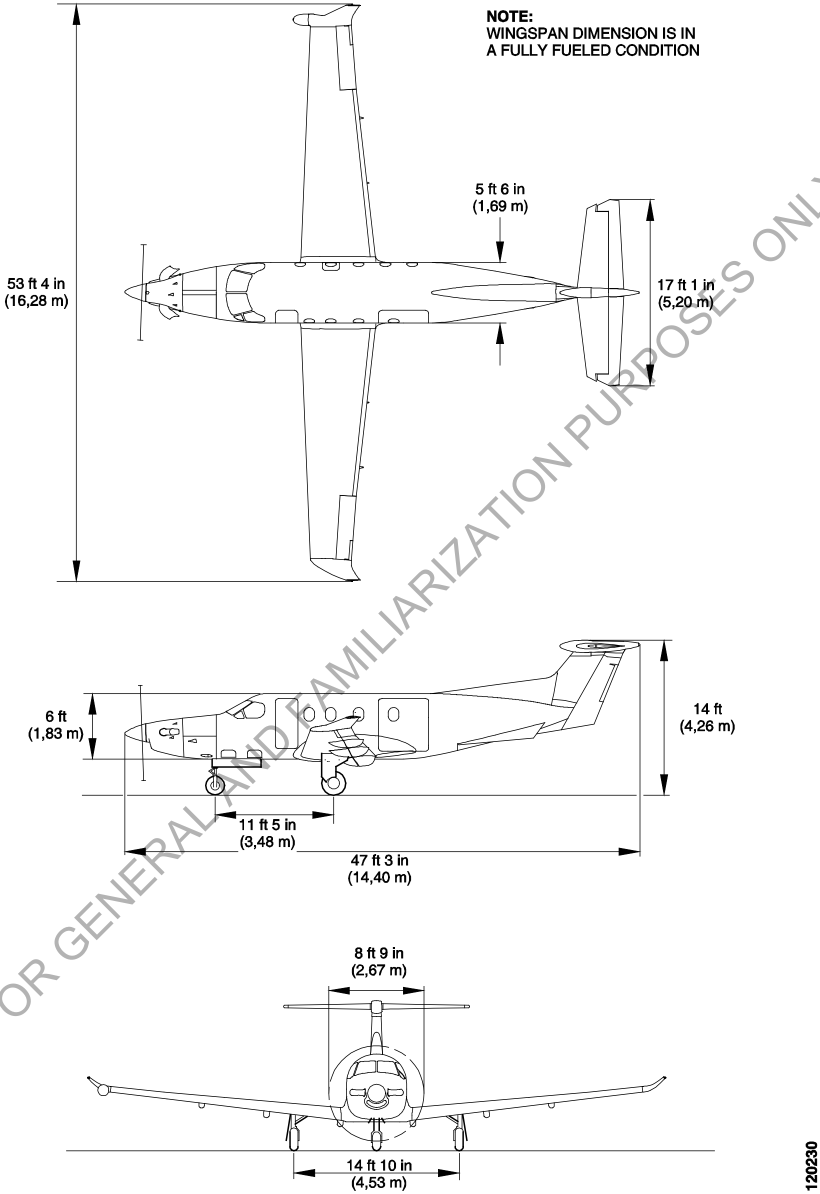


Figure 1-1. Airplane Three View and Dimensions

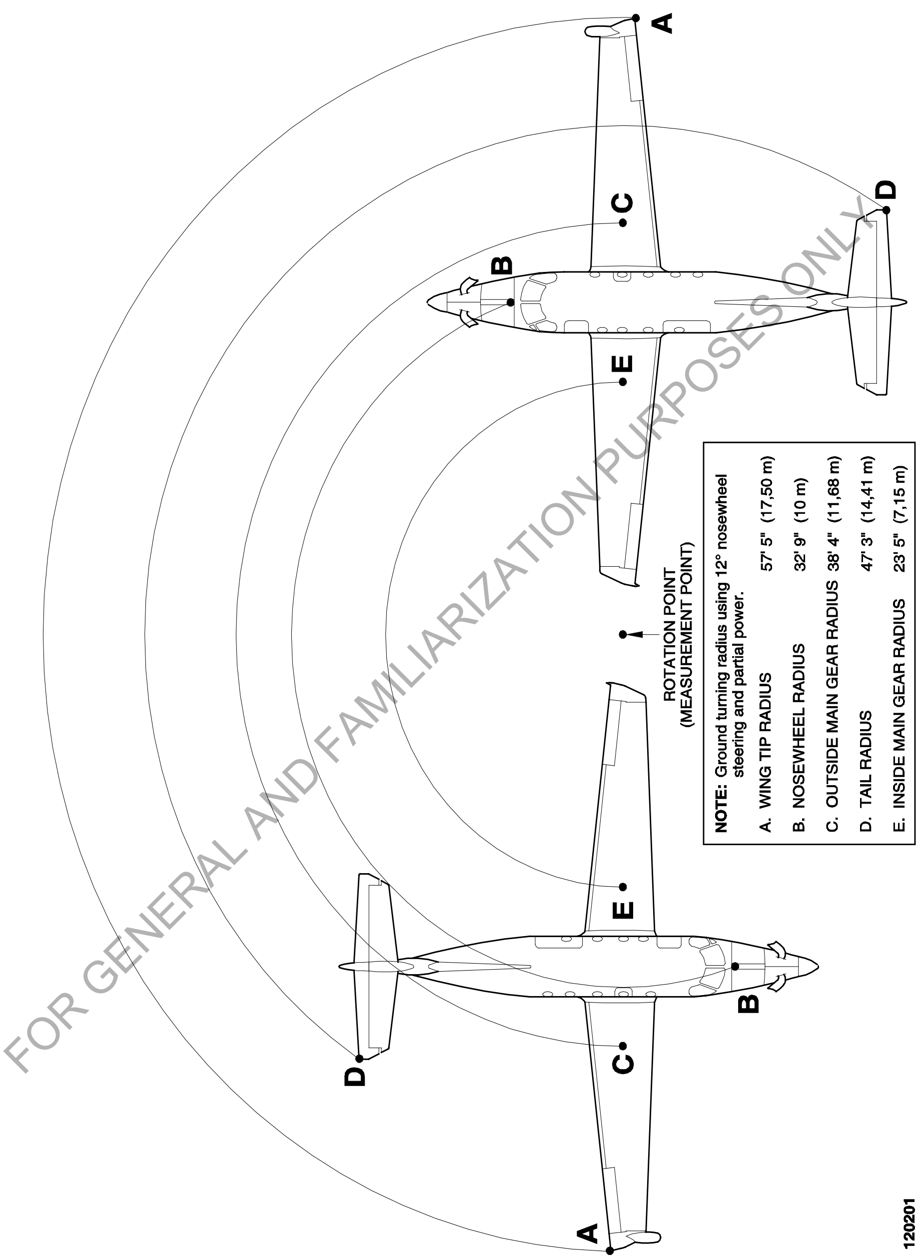
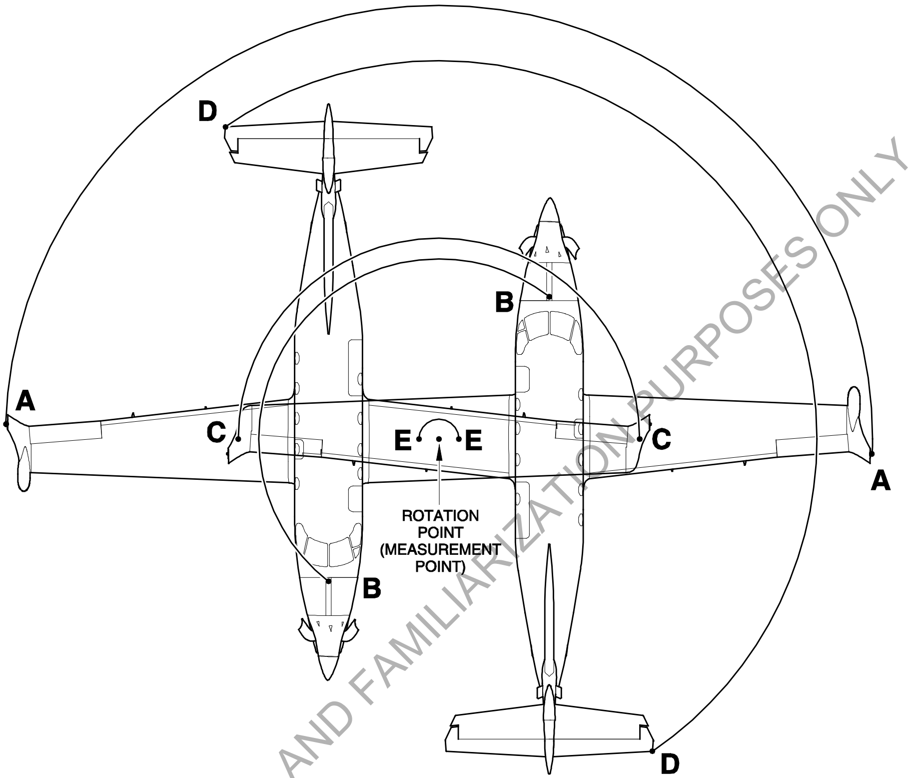


Figure 1-2. Airplane Ground Turning Clearance – NWS only (No Braking)



NOTE: Ground turning radius using nosewheel steering, inside brake and partial power.

A.	WING TIP RADIUS	35' 7"	10,864 m
B.	NOSEWHEEL RADIUS	14' 10"	4,513 m
C.	OUTSIDE MAIN GEAR RADIUS	16' 6"	5,03 m
D.	TAIL RADIUS	31' 1"	9,475 m
E.	INSIDE MAIN GEAR RADIUS	19.5"	0,5 m

120342

Figure 1-3. Airplane Ground Turning Clearance – NWS and Braking

DESCRIPTIVE DATA

ENGINE

Number of Engines	1
Engine Manufacturer	Pratt & Whitney Canada
Engine Model Number	PT6A-67P

Engine Type

This airplane incorporates a twin shaft turboprop engine with 4 axial and 1 centrifugal compressor stages, an annular combustion chamber, and a 3 stage turbine where one stage drives the compressor and two stages power the propeller.

Horsepower Rating and Engine Speed

Takeoff Power	1,200 shp
Maximum Climb/Cruise Power	1,200 shp
Compressor Turbine (N_g) Speed (104%)	38,967 rpm
Propeller Speed (N_p)	1,700 rpm

PROPELLER – AIRCRAFT WITH 4-BLADED PROPELLER

Number of Propellers	1
Propeller Manufacturer	Hartzell
Propeller Model Number	HC-E4A-3D/E10477SK
Number of Blades	4
Propeller Diameter	105" (2.67 m)

Propeller Type

The propeller assembly consists of a hub unit and four metal blades, and is a hydraulically actuated, constant speed, full feathering and reversible type.

PROPELLER – AIRCRAFT WITH 5-BLADED PROPELLER

Number of Propellers	1
Propeller Manufacturer	Hartzell
Propeller Model Number	HC-E5A-3A/NC10245B
Number of Blades	5
Propeller Diameter	105" (2.67 m)
Propeller Type	

The propeller assembly consists of a hub unit and five composite blades, and is a hydraulically actuated, constant speed, full feathering and reversible type.

FUEL

APPROVED FUELS

JET A, JET-A-1, JET B, JP-4

Any other fuel which complies with the latest revision of Pratt & Whitney Service Bulletin 14004.

TOTAL CAPACITY

406.8 US gal, 2,736.5 lb (1,540 liters, 1,241.3 kg)

USABLE FUEL

402 US gal, 2,703.6 lb (1,521.5 liters, 1,226.4 kg)

ANTI-ICING ADDITIVE

Anti-Icing additive conforming to MIL-DTL-27686 or MIL-DTL-85470.

Anti-icing additives should be in compliance to Pratt & Whitney Service Bulletin 14004.

OIL

OIL GRADE OR SPECIFICATION

Any oil specified by brand name in the latest revision of Pratt & Whitney Service Bulletin 14001.

OIL QUANTITY

Total Oil Capacity 3.6 US gal (13.6 liters)

Drain and Refill Quantity 2.0 US gal (7.6 liters)

Oil Quantity Operating Range 1.0 US gal (3.8 liters)

MAXIMUM WEIGHTS

Maximum Ramp Weight	10495 lb (4760 kg)
Maximum Takeoff Weight	10450 lb (4740 kg)
Maximum Landing Weight	9921 lb (4500 kg)
Maximum Zero Fuel Weight	9039 lb (4100 kg)
Maximum Cargo Weight	
Baggage Area	400 lb (180 kg)
Cabin Area	3300 lb (1500 kg)

TYPICAL AIRPLANE WEIGHTS

Empty Weight (approx)	6173 lb (2800 kg) *
Useful Load	4277 lb (1940 kg)

*Empty weight of standard airplane with standard interior, 9 passenger seats and cabin floor covering.

CABIN AND ENTRY DIMENSIONS

Maximum Cabin Width	5' 0" (1.52 m)
Cabin Floor Width	4' 3" (1.30 m)
Maximum Cabin Length	16' 11" (5.16 m)
Cabin Floor Length	15' 4" (4.68 m)
Maximum Cabin Height	4' 9" (1.45 m)
Passenger Door	
Width	2' 0" (0.61 m)
Height	4' 5" (1.35 m)
Cargo Door	
Width	4' 5" (1.35 m)
Height	4' 4" (1.32 m)

Overwing Emergency Exit

Width	1' 6" (0.49 m)
Height	2' 2" (0.68 m)

Compartment Volume

Baggage	34.3 ft^3 (0.97 m^3)
Cabin	326 ft^3 (9.23 m^3)

SPECIFIC LOADINGS

Wing Loading	37.6 lb/sq ft (183.7 kg/sq m)
Power Loading	8.71 lb/shp (3.95 kg/shp)

SYMBOLS, ABBREVIATIONS, AND TERMINOLOGY

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

CAS	Calibrated airspeed means the indicated airspeed of an aircraft, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.
GS	Ground speed is the speed of an airplane relative to the ground.
IAS	Indicated airspeed means the speed of an aircraft as shown on its airspeed indicator.
KCAS	Calibrated airspeed expressed in knots.
KIAS	Indicated airspeed expressed in knots. In APEX KIAS is corrected for position error.
M	Means Mach number. Mach number is the ratio of true airspeed to the speed of sound.
M_{MO}	Maximum operating limit speed is the speed limit that may not be deliberately exceeded in normal flight operations. M is expressed in Mach number.
TAS	True airspeed means the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature, and compressibility.
V_{FE}	Maximum flap extended speed is the highest speed permissible with wing flaps in a prescribed extended position.
V_{LE}	Maximum landing gear extended speed is the maximum speed at which an airplane can be safely flown with the landing gear extended.
V_{LO}	Maximum landing gear operating speed is the maximum speed at which the landing gear can be safely extended or retracted.

V_{MO}	Maximum operating speed is the speed limit that may not be exceed at any time. V is expressed in knots.
V_O	Maximum Operating Maneuvering airspeed is the maximum speed at which application of full available aerodynamic control will not overstress the airplane. NOTE V_O is defined in accordance with FAR 23 Amendment 45.
V_R	Rotation speed used for takeoff.
V_S	Stalling speed or the minimum steady flight speed at which the airplane is controllable.
V_{SO}	Stalling speed or the minimum steady flight speed at which the airplane is controllable in the landing configuration at maximum gross weight.
V_{S1}	Stalling speed or the minimum steady flight speed at which the airplane is controllable in the specified configuration at the specified weight.
V_X	Best angle of climb speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.
V_Y	Best rate of climb speed is the airspeed which delivers the greatest gain of altitude in the shortest possible time.

METEOROLOGICAL TERMINOLOGY

Indicated Altitude	The number actually read from an altimeter when the barometric subscale has been Pressure set to 29.92 in hg (1013.2 mbar).
ISA	International Standard Atmosphere in which - the air is a dry, perfect gas; - the temperature at sea level is 59° F (15° C); - the pressure at sea level is 29.92 in hg (1013.2 mbar); - the temperature gradient from sea level to the altitude at which the temperature is -69.7° F (-56.5° C) is -0.003564° F (-0.00198° C) per foot and zero above that altitude.
SAT	Static Air Temperature is the temperature of the air the aircraft is flying through. SAT indication on the groundmay not be accurate.
Pressure Altitude	Pressure Altitude measured from standard sea level pressure (29.92 in hg/1013.2 mbar) by a pressure or barometric altimeter. It is the indicated pressure altitude corrected for position and instrument error. In this AFM, altimeter instrument errors are assumed to be zero.
Station Pressure	Actual atmospheric pressure at field elevation.
Wind	The wind velocities recorded as variables on the charts of this AFM are to be understood as the headwind or tailwind components of the reported winds.
ELEV	Geographical altitude of landing field.
Icing Conditions	Can exist when the outside air temperature (OAT) on the ground and for take-off, or total air temperature (TAT) in flight, is 10°C or colder, and visible moisture in any form is present (such as clouds, fog or mist with visibility of one mile or less, rain, snow, sleet and ice crystals).

Icing Conditions (Continued)	Can exist when the OAT on the ground and for take-off is 10°C or colder when operating on ramps, taxiways or runways, where surface snow, ice, standing water, or slush may be ingested by the engine, or freeze on the engine, or the engine nacelle. Can exist when there are visible signs of ice accretion on the aircraft.
Severe Icing Conditions	Severe icing may result from environmental conditions during flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) which may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces.

POWER TERMINOLOGY

Cruise Climb Power	The power recommended to operate the airplane in a cruise climb (a continuous, gradual climb) profile.
Flight Idle Power	The power required to run an engine, in flight, at the lowest speed that will ensure satisfactory engine and systems operation and airplane handling characteristics. Power setting is achieved with the Power Control Lever at the Idle Detent and the Condition Lever in the Flight Idle position.
Ground Idle Power	The power required to run an engine on the ground, as slowly as possible, yet sufficient to ensure satisfactory engine, engine accessory, and airplane operation with a minimum of thrust. Power setting is achieved with the Power Control Lever at or immediately aft of the Idle Detent and the Condition Lever in the Ground Idle position.
Maximum Climb Power	The maximum power approved for climb.
Maximum Cruise Power	The maximum power approved for cruise.
Reverse Thrust	The thrust of the propeller directed opposite the usual direction, thereby producing a braking action. Power setting is achieved with the Power Control Lever aft of the Idle Detent and the Condition Lever in Flight or Ground Idle.
Takeoff Power	The maximum power permissible for takeoff (limited to 5 minutes).
Zero Thrust	The absence of appreciable thrust, in either direction.

ENGINE CONTROLS AND INSTRUMENTS TERMINOLOGY

Adjustable Minimum Prop Pitch in flight	The Power Control Lever position selects the minimum pitch in flight (6° to 12°) when forward of the idle detent. This pitch can only be reached when the propeller is underspeeding (below 1700 rpm) at low power and low airspeed conditions.
Beta Range	The range of propeller pitch where the beta valve in the Constant Speed Unit (CSU) controls the pitch. Forward of the Idle Detent only the minimum pitch is limited by the beta valve. In case of a propeller overspeed the CSU moves the propeller to a coarser pitch. Below flight regime, i.e. aft of the Idle Detent, the pneumatic section of the CSU limits the propeller speed to an underspeed condition and the beta valve, i.e. PCL position, directly controls the propeller pitch.
Condition Lever	This lever selects the gas generator idle speed and fuel cutoff, and feathers the propeller when in the CUTOFF/FEATHER position.
Constant Speed Range	The engine operating range where the propeller is out of Beta range and operating at a constant rpm, under control of the propeller governor.
ITT Gauge	A temperature measuring system that senses gas temperature in the turbine section of the engine.
Manual Override (MOR)	The device that controls engine power in case of a pneumatic failure in the engine control systems. It can also control engine power in case of a power control lever failure.
Power Control Lever	The lever used to control engine power, from reverse (see Beta Range) to maximum power (see Power Terminology).
Propeller Feather	This is a propeller pitch condition which produces minimum drag in a flight condition (engine shut-down).
Propeller Governor	The device that keeps propeller rpm constant by increasing or decreasing propeller pitch through a pitch change mechanism in the propeller hub. See Beta and Constant Speed Range.
Py Pressure	P3 pressure (after engine compressor) is regulated to Py pressure to limit fuel flow during engine acceleration in order to not cause compressor surges. The torque limiter and the N_f governor reduce Py pressure to limit fuel flow so that the torque and N_f limits are not exceeded.

Tachometer	An instrument that indicates rotational speed. Gas generator tachometers measure speed as a percentage of the nominal maximum speed of the turbine(s), while propeller tachometers measure actual propeller rpm.
Torquemeter	An indicating system that displays the output torque available on the propeller shaft. Torque is shown in reference terms, such as the oil pressure generated by the engine torquemeter piston.
Torque Limiter	A device which monitors torque pressure and adjusts the Py air pressure to the Fuel Control Unit to prevent an overtorque condition by limiting engine power.

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Climb Gradient	The demonstrated ratio of the change in height during a portion of a climb, to the horizontal distance traversed in the same time interval.
Demonstrated Crosswind Velocity	The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests. The value shown may or may not be limiting. Whether or not the value shown is limiting will be stated.
MEA	Minimum Enroute IFR Altitude.
Route Segment	A part of a route. Each end of that part is identified by: (1) a geographical location; or (2) a point at which a definite radio fix can be established.

WEIGHT AND BALANCE TERMINOLOGY

A.O.D.	Aft of Datum
Arm	The horizontal distance from the reference datum to the center of gravity (C.G.) of an item.
Basic Empty Weight	Standard empty weight plus optional equipment.
Center of Gravity (C.G.)	The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.
C.G. Arm	The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
C.G. Limits	The extreme center of gravity locations within which the airplane must be operated at a given weight.
Datum	An imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Maximum Landing Weight (MLW)	Maximum weight approved for the landing touchdown.
Maximum Ramp Weight	Maximum weight approved for ground maneuver. It includes weight of start, taxi, and run-up fuel.
Maximum Takeoff Weight (MTOW)	Maximum weight approved for the start of the takeoff run.
Maximum Zero Fuel Weight	Maximum weight exclusive of usable fuel.
Moment	The product of the weight of an item multiplied by its arm. Moment divided by a constant is used to simplify balance calculations by reducing the number of digits.
Payload	Weight of occupants, cargo, and baggage.
Standard Empty Weight	Weight of a standard airplane, standard interior, 9 passenger seats and cabin floor covering including unusable fuel, full operating fluids, and full oil.
Station	A location along the airplane fuselage usually given in terms of distance from the reference datum.

Tare Weight	The weight indicated by a scale before it is loaded.
Unusable Fuel	Fuel which may not be considered usable for flight planning.
Usable Fuel	Fuel available for flight planning.
Useful Load	Difference between takeoff weight, or ramp weight if applicable, and basic empty weight.

GENERAL ABBREVIATIONS AND SYMBOLS

C	Celsius
cu	Cubic
F	Fahrenheit
FAA	Federal Aviation Administration (U.S.A.)
FOCA	Federal Office for Civil Aviation (Switzerland)
fpm	Feet per Minute
ft	Feet
g	Unit of acceleration measured against the force of gravity
gal	Gallon (US)
hg	Mercury
IFR	Instrument Flight Rules
in	Inches
kg	Kilogram
KTAS	Knots True Airspeed
lb	Pound (mass)
m	Meter
MAC	Mean Aerodynamic Chord
max	Maximum
mbar	Millibar
mkg	Moment in meters/kilograms
min	Minimum
mm	Millimeters
nm	Nautical Mile
N/A	Not Applicable
psi	Pounds per Square Inch
rpm	Revolutions Per Minute
sec	Second
shp	Shaft Horsepower
sm	Statute Mile
TBD	To Be Determined
TBO	Time Between Overhauls
VFR	Visual Flight Rules
°	Degrees
'	Feet
"	Inches

NOTE: Refer to Section 7 Apex – Avionics Installation General for Avionic acronyms and abbreviations.

CONVERSION INFORMATION

All numerical data contained in this AFM is shown in standard format with the metric equivalent immediately following in parenthesis, ex. 7' 3" (2.1 m). The following formulas can be used to make required conversions.

GENERAL

Fahrenheit (°F) = (°C x 1.8) + 32

Celsius (°C) = (°F - 32) x 0.556

Statute Mile (sm) = Nautical Mile (nm) x 1.151

Nautical Mile (nm) = Statute Mile (sm) x 0.869

Jet Fuel (JET A) Standard Weights at 15° C (Relative Density 0.806)

One (1) Liter = 1.777 lb

One (1) U.S. Gallon (US gal) = 6.73 lb

One (1) Imperial Gallon (IMP gal) = 8.078 lb

STANDARD TO METRIC

Millimeters (mm) = Inches (in) x 25.4

Centimeters (cm) = Inches (in) x 2.54

Meters (m) = Feet (ft) x 0.305

Meters (m) = Yards (yd) x 0.914

Kilometers (km) = Statute Miles (sm) x 1.61

Kilometers (km) = Nautical Miles (nm) x 1.852

Liters = US Gallons (US gal) x 3.785

Liters = Imperial Gallons (IMP gal) x 4.546

Kilograms (kg) = Pounds (lb) x 0.454

Bar = psi x 0.069

METRIC TO STANDARD

Inches (in) = Millimeters (mm) x 0.039

Inches (in) = Centimeters (cm) x 0.393

Feet (ft) = Meters (m) x 3.281

Yards (yd) = Meters (m) x 1.094

Statute Miles (sm) = Kilometers (km) x 0.621

Nautical Miles (nm) = Kilometers (km) x 0.54

US Gallons (US gal) = Liters x 0.264

Imperial Gallons (IMP gal) = Liters x 0.22

Pounds (lb) = Kilograms (kg) x 2.205

psi = Bar x 14.504

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SECTION 2

LIMITATIONS

TABLE OF CONTENTS

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GENERAL

This section contains the EASA Approved operating limitations, instrument markings, color coding, and basic placards necessary for the operation of the airplane, its engine, systems, and equipment. Compliance with approved limitations is mandatory.

Limitations associated with systems or equipment which require POH Supplements are included in Section 9, Supplements.

With the exception of circuit breakers on the Essential Bus, and if not detailed otherwise in procedures, all tripped open circuit breakers are not allowed to be reset in flight. Circuit breakers on the Essential Bus, if tripped, may be reset once only in flight providing:

1. At least one minute has elapsed from the time of the circuit breaker trip
2. There is no remaining smoke or burning smell.

AIRSPEED LIMITATIONS

AIRSPEED	KIAS	SIGNIFICANCE
Maximum operating speed		Do not exceed this speed in any operations.
- V_{MO}	240	Maximum speed at or below 15,200 ft.
- M_{MO}	0.48	Refer to V_{MO} / M_{MO} schedule for maximum speed above 15,200 ft. (See Fig No. 2-1, V_{MO} / M_{MO} Schedule)
Maximum Operating Maneuvering Speed - V_O		Do not make full or abrupt control movements above this speed.
10450 lb (4740 kg)	166	
9921 lb (4500 kg)	161	
9480 lb (4300 kg)	158	
9039 lb (4100 kg)	154	
8380 lb (3800 kg)	148	
7940 lb (3600 kg)	144	
7500 lb (3400 kg)	140	
7060 lb (3200 kg)	136	
6610 lb (3000 kg)	132	
6170 lb (2800 kg)	127	
5730 lb (2600 kg)	123	
Maximum flap extended speed - V_{FE}		Do not exceed this speed with flaps extended.
$\leq 15°$	165	
$> 15°$	130	
Maximum landing gear operating speed - V_{LO}	180	Do not retract or extend landing gear above this speed.
Maximum landing gear extended speed - V_{LE}	240	Do not exceed this speed with landing gear extended.

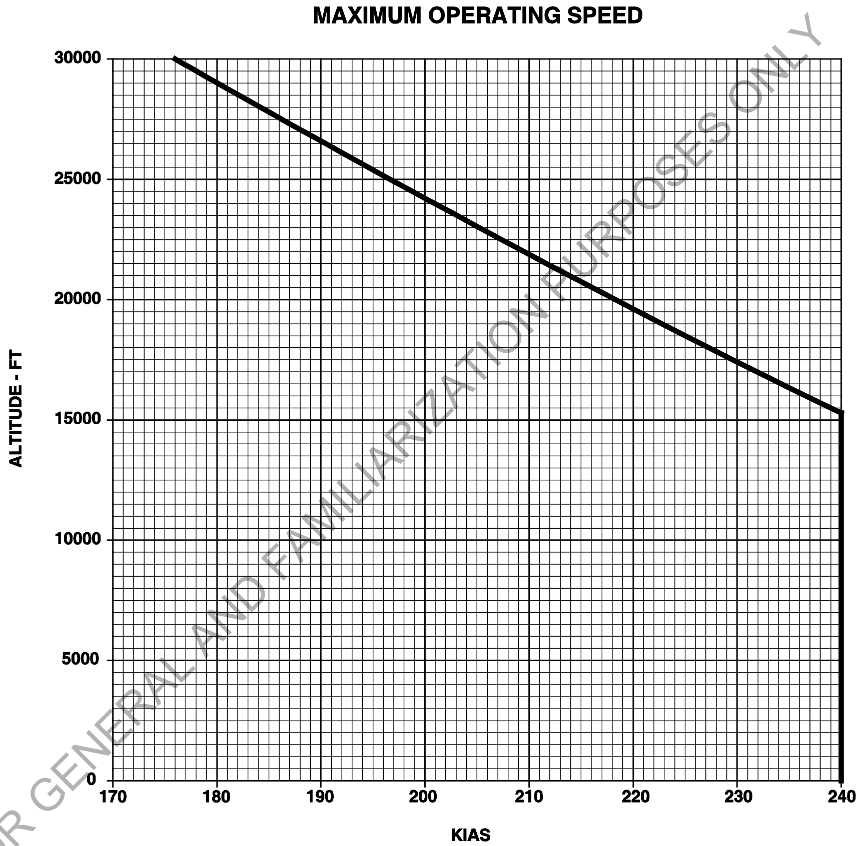


Figure 2-1, V_{MO} / M_{MO} Schedule

AIRSPEED INDICATION MARKINGS

INDICATION	KIAS VALUE OR RANGE	REMARKS
Red/White Barber Pole across and upwards on right side of tape	240 or 0.48 M whichever is lower	Maximum operating limit (V_{MO}/M_{MO})
Red (high speed) strip on right side of tape	180 V_{LO} 165 V_{FE} 15° 130 V_{FE} 30/40°	Extends downwards from V_{MO}/M_{MO} to the valid V_{LO} or V_{FE} as applicable. Not shown in clean config or with gear extended only
Labeled Placards on right side of tape	180 V_{LO} 165 V_{FE} 15° 130 V_{FE} 30/40°	Maximum flap operating and extended speed ($V_{FE:}$ 15 /30/40°) and maximum landing gear operating speed (V_{LO})
Red low speed awareness tape overlaid on right side of tape	Shaker speed	Extends upwards from bottom of tape to the shaker speed in the current configuration. Not shown on ground.

POWER PLANT LIMITATIONS

ENGINE

Number of Engines	1
Engine Manufacturer	Pratt & Whitney Canada
Engine Model Number	PT6A-67P

OIL

OIL GRADE OR SPECIFICATION

Any oil specified by brand name in the latest revision of Pratt & Whitney Service Bulletin 14001 is approved.

OIL QUANTITY

Total

Oil Capacity	3.6 US gal (13.6 liters)
Drain and Refill Quantity	2.0 US gal (7.6 liters)
Oil Quantity Operating Range	1.0 US gal (3.8 liters)

An oil quantity check is required for takeoff. Takeoff is not approved with the ENGINE OIL LEVEL warning annunciator illuminated.

ENGINE OPERATING LIMITS

The limits presented in each column shall be observed. The limits presented do not necessarily occur simultaneously. Refer to the Pratt & Whitney Engine Maintenance Manual for specific action if limits are exceeded.

OPERATING CONDITION	SHP	TORQUE PSI (1)	MAX ITT ° C	Ng % (8)	Np RPM (8)	OIL PRESS PSI (2)	OIL TEMP °C (6) (7)
TAKEOFF (9)	1200	44.34	850	104	1700 (10)	90 to 135	10 to 110
MAX. CONT. MAX. CLIMB/	1200	44.34	820	104	1700 (10)	90 to 135	10 to 105
CRUISE	1000	36.95	820	104	1700 (10)	90 to 135	10 to 105
MIN. IDLE			750 (5)	50.7 (G.I.) 64 (F.I.)		60 MIN.	-40 to 110
STARTING			1000 (3)			200 MAX.	-40 MIN.
TRANSIENT		61.00 (4)	870 (4)	104	1870 (4)	40 to 200 (4)	-40 to 110
MAX. REVERSE	900	34.25	760		1650	90 to 135	10 to 105

(1) Torque limit applies within a range of 1000 to 1700 propeller rpm. Torque is limited to 23.9 psi below 1000 propeller rpm.

(2) Normal oil pressure is 90 to 135 psi at gas generator speeds above 72%. With engine torque below 35.87 psi, minimum oil pressure is 85 psi at normal oil temperature (60 to 70° C). Oil pressures under 90 psi are undesirable. Under emergency conditions, to complete a flight, a lower oil pressure of 60 psi is permissible at reduced power level not exceeding 23.9 psi torque. Oil pressures below 60 psi are unsafe and require that either the engine be shut down or a landing be made as soon as possible using the minimum power required to sustain flight.

(3) These values are time limited to 5 seconds maximum.

(4) These values are time limited to 20 seconds maximum.

(5) Applies over a speed range of 50.7% to 61.4% Ng rpm.

(6) For increased service life of the engine oil, an oil temperature of between 60 to 70° is recommended.

(7) Oil temperature limits are -40° C to 105° C with limited periods of 10 minutes at 105 to 110°C.

(8) 100% gas generator speed corresponds to 37468 rpm. 100% power turbine speed (N_1) corresponds to 29894 rpm which also corresponds to 1700 rpm propeller speed.

(9) Takeoff power is time limited to 5 minutes.

(10) During steady state operation, operation from 1670 rpm up to 1730 rpm is permitted to allow for governing accuracy.

FUEL

APPROVED FUEL GRADES

JET A, JET-A-1, JET B, JP-4

Any other fuel which complies with the latest revision of Pratt & Whitney Service Bulletin 14004.

ANTI-ICING ADDITIVE

Anti-icing additive must be used for all flight operations in ambient temperatures below 0° C.

WARNING

OPERATING IN AMBIENT TEMPERATURES LESS THAN 0°C WITHOUT FOLLOWING THE PROCEDURE TO ADD ANTI-ICING ADDITIVES MAY LEAD TO ICE IN THE FUEL SYSTEM WHICH MAY EVENTUALLY BLOCK THE DELIVERY LINES AND COMPONENTS OF THE FUEL SYSTEM, INCLUDING THE FUEL FILTER, SUBSEQUENTLY RESTRICTING OR STOPPING THE FLOW OF FUEL TO THE ENGINE.

Use anti-icing additive conforming to MIL-DTL-27686 or MIL-DTL-85470.

Anti-icing additives should be in compliance to Pratt & Whitney Service Bulletin 14004.

Additive concentration must be between a minimum of 0.06 % and a maximum of 0.15 % by volume.

CAUTION

THE CORRECT MIX OF ANTI-ICING ADDITIVE WITH THE FUEL IS IMPORTANT. CONCENTRATIONS OF MORE THAN THE MAXIMUM (0.15% BY VOLUME) WILL CAUSE DAMAGE TO THE PROTECTIVE PRIMER AND SEALANTS OF THE FUEL TANKS. DAMAGE WILL OCCUR IN THE FUEL SYSTEM AND ENGINE COMPONENTS.

Refer to Section 8, Handling, Servicing, and Maintenance for blending instructions.

PROPELLER – AIRCRAFT WITH 4-BLADED PROPELLER

Propeller Manufacturer	Hartzell
Propeller Model Number	HC-E4A-3D/E10477SK
Number of Propellers	1
Number of Propeller Blades	4
Propeller Diameter	
Minimum	104" (2.642 m)
Maximum	105" (2.667 m)
Propeller Operating Limits (N_p)	
Maximum Normal Operation	1,700 rpm +/- 30 rpm
Maximum transient (20 sec)	1,870 rpm
Maximum reverse	1,650 rpm

Stabilized operation on the ground between 350 and 950 rpm is not permitted.

Blade Angles at Station 42	
Fine Pitch	19° +/- 0.2°
Maximum Reverse Pitch	-17.5° +/- 0.5°
Feather	79.6° +/- 0.5°
Minimum pitch in flight	6°

PROPELLER – AIRCRAFT WITH 5-BLADED PROPELLER

Propeller Manufacturer	Hartzell
Propeller Model Number	HC-E5A-3A/NC10245B
Number of Propellers	1
Number of Propeller Blades	5
Propeller Diameter	
Minimum	104" (2.642 m)
Maximum	105" (2.667 m)
Propeller Operating Limits (N_p)	
Maximum Normal Operation	1,700 rpm +/- 30 rpm
Maximum transient (20 sec)	1,870 rpm
Maximum reverse	1,650 rpm

Stabilized operation on the ground between 350 and 950 rpm is not permitted.

Blade Angles at Station 42	
Fine Pitch	14.7° +/- 0.2°
Maximum Reverse Pitch	-17.5° +/- 0.5°
Feather	80.0° +/- 0.5°
Minimum pitch in flight	6°

STARTER

The engine starting cycle shall be limited to the following intervals:

1. Sequence, 60 seconds OFF
2. Sequence, 60 seconds OFF
3. Sequence, 30 minutes OFF

GENERATOR

Maximum generator load limit as follows

GENERATOR	MAX CONTINUOUS LOAD	MAX LOAD FOR 2 MINUTES *
Generator 1	300 AMP	450 AMP
Starter/Generator 2	300 AMP	450 AMP
*Maximum load permitted for a 2 minute period per each one hour of operation.		

POWER CONTROL LEVER OPERATION

Power Control Lever operation aft of the idle detent is prohibited:

1. When engine is not running.
2. During flight. Such operation may lead to loss of airplane control and total power loss.
3. When engine is controlled by the Manual Override System. Such operation may lead to loss of airplane control or may result in an engine/propeller overspeed condition and consequent loss of engine power.

CHIP DETECTOR

Takeoff is not approved with ENGINE CHIP caution annunciator illuminated.

POWER PLANT WINDOW MARKINGS

	RED MARK Min. Limit	AMBER MARK Caution	GREEN ARC Norm Ops.	AMBER ARC Caution	RED MARK Max. Limit Indication
Torque (psi)	N/A	N/A	0 to 36.95 psi	36.95 psi	44.34 psi
ITT (° C)	N/A	N/A	400° C to 820° C	820° C	850° C
Engine Speed N_g (%)	N/A	60%	60% to 103.5%	103.5%	104%
Oil Temperature (° C)	N/A	10° C	10° C to 105° C	105° C	110° C
Oil Pressure (psi)	60 psi	90 psi	90 to 135 psi	N/A	135 psi

MISCELLANEOUS INSTRUMENT MARKINGS

Instrument	RED RADIAL Min. Limit	YELLOW ARC Caution	GREEN ARC Norm Ops.	YELLOW ARC Caution	RED RAD/DIA Max. Limit
Oxygen Pressure (psi)	N/A	N/A	N/A	N/A	1850 to 2000

WEIGHT LIMITS

Maximum Ramp Weight	10495 lb (4760 kg)
Maximum Takeoff Weight	10450 lb (4740 kg)
Maximum Landing Weight	9921 lb (4500 kg)
Maximum Zero Fuel Weight	9039 lb (4100 kg)
Maximum Baggage Weight	400 lb (180 kg)
Maximum Floor Loading -	
On Seat Rails	205 lb/ft^2 (1000 kg/m^2)
On Cabin Floor	125 lb/ft^2 (600 kg/m^2)

CENTER OF GRAVITY LIMITS

Weight Pounds (kilograms)	Forward Limit A.O.D.: In. / M	Aft Limit A.O.D.: In. / M
10450 (4740)	232.20 / 5.898	240.43 / 6.107
9921 (4500)	232.20 / 5.898	240.94 / 6.120
8158 (3700)	224.13 / 5.693	-
7938 (3600)	-	242.99 / 6.172
6615 (3000)	-	242.99 / 6.172
5733 (2600)	220.75 / 5.607	225.47 / 5.727

NOTES

Straight line variation between points given.

The datum is 118 in (3.0 m) forward of firewall.

It is the responsibility of the pilot to ensure that airplane is loaded properly.

See Section 6, Weight and Balance for proper loading instructions.

MANEUVER LIMITS

This airplane is certificated in the Normal Category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and turns in which the bank angle does not exceed 60°.

Aerobatic maneuvers, including spins, are not approved.

FLIGHT LOAD FACTOR LIMITS

Flight load limits with flaps up	+3.3 g, -1.32 g
Flight load limits with flaps down	+2.0 g, -0.0 g

FLIGHT CREW LIMITS

Minimum required flight crew is one pilot in the left hand seat.

KINDS OF OPERATION

The Pilatus PC-12 is approved for the following types of operation when the required equipment is installed and operational:

1. VFR Day.
2. VFR Night.
3. IFR Day incl. CAT 1 approaches, single pilot.
4. IFR Night incl. CAT 1 approaches, single pilot.
5. Flight into Known Icing Conditions.

PNEUMATIC DEICING BOOT SYSTEM

The pneumatic deice system boots are required to be installed for all flights.

Preflight function test required before takeoff and flight into known icing conditions.

The system is required to function properly for flight into known icing conditions.

Operation of the pneumatic de-ice boot system in ambient temperatures below -40°C and above +40°C may cause permanent damage to the boots.

The wing and tail leading edge pneumatic deicing boot system must be activated at the first sign of ice formation anywhere on the aircraft.

The wing and tail leading edge pneumatic deicing boot system may be deactivated only after leaving icing conditions and after the aircraft is determined to be clear of ice.

ICING LIMITATIONS

Icing conditions can exist when:

The outside air temperature (OAT) on the ground and for takeoff, or static air temperature (SAT) in flight, is 10°C or colder, and visible moisture in any form is present (such as clouds, fog or mist with visibility of one mile or less, rain snow, sleet and ice crystals).

The OAT on the ground and for take-off is 10°C or colder when operating on ramps, taxiways or runways, where surface snow, ice, standing water, or slush may be ingested by the engine, or freeze on the engine, or the engine nacelle.

There are visible signs of ice accretion on the aircraft.

Flight in icing conditions is only approved with all ice protection systems, generator 1 and generator 2 serviceable.

Flight in icing conditions is prohibited when the Propeller De Ice caution is active.

During flight in icing conditions, if there is a failure of any of the aircraft ice protection systems exit icing conditions. Immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the icing conditions.

During flight in icing conditions or flight with any visible ice accretion on the airframe, the following flap maximum extension limits apply:

- With operational airframe pneumatic deice boots 15° FLAP
- After failure of the airframe pneumatic deice boots 0° FLAP

In the event of a balked landing go-around with residual ice on the airframe, the flaps should not be retracted from the 15° position.

Flight in freezing rain, freezing fog, freezing drizzle and mixed conditions causing ice accretion beyond the protected areas of the pneumatic boots is not approved.

The aircraft must be clear of all deposits of snow, ice and frost adhering to the lifting and control surfaces immediately prior to takeoff.

In the event of a balked landing (go around) with residual ice on the airframe, the landing gear and flaps may not fully retract after selection.

The left wing inspection light must be operative prior to flight into forecast icing conditions at night.

SEVERE ICING CONDITIONS

Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems, and may seriously degrade the performance and controllability of the airplane.

During flight, severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues. If one or more of these visual cues exists, immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the icing conditions:

- unusually extensive ice accumulation on the airframe and windshield areas not normally observed to collect ice
- accumulation of ice beyond the active portions of the wing pneumatic boots

Care must be taken when using the autopilot that tactile cues, such as increased aileron forces, are not masked by the autopilot function. Periodically disengage the autopilot to check for abnormal forces.

KINDS OF OPERATION EQUIPMENT LIST

This airplane is approved for operations under day and night VFR, day and night IFR and flight into known icing conditions when the required equipment is installed and operating properly. The following systems and equipment list does not include specific flight and radio/navigation equipment required by any particular country's operating regulations. The pilot in command is responsible for determining the airworthiness of the aircraft and assuring compliance with current operating regulations for each intended flight.

The zeros (0) used in the list below mean that the system and/or equipment was not required for type certification for that kind of operation. When (AR) appears for the number required it indicates As Required.

Deviations from this KOEL may be approved for the operation of a specific aircraft if a proper MEL (Minimum Equipment List) has been authorized by the appropriate regulatory agency.

SYSTEM / EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING
PRIMUS APEX:					
Pilot PFD	1	1	1	1	1
MFD	1	1	1	1	1
MAU (Channel A & B)	1	1	1	1	1
PFD Controller	2	2	2	2	2
MF Controller	0	0	1	1	1
Audio Marker Panel	1	1	1	1	1
ADAHRS (Channel A & B)	1	1	1	1	1
Magnetometer	0	0	1	1	1
MMDR (COM/NAV)	0	1	1	1	1
Mode S Transponder	0	0	1	1	1
GPS	0	0	1	1	1
DME	0	0	1	1	1
Miscellaneous Instruments:					
Clock (not required with APEX Build 10 and up)	0	0	1	1	1
Electronic Standby Instrument (ESIS)	1	1	1	1	1
Standby Magnetic Direction Indicator (ESIS Heading (MSN 1271 - 1942 / SB 34-042) **OR** Magnetic Compass E2B)	1	1	1	1	1
Engine:					
No.1 Generator	1	1	1	1	1
No. 2 Generator	1	1	1	1	1
Inertial Separator	1	1	1	1	1
Engine Driven Low Pressure Fuel Pump	1	1	1	1	1
Electric Wing Tank Fuel Boost Pump	2	2	2	2	2
Firewall Fuel Shutoff Valve	1	1	1	1	1
FCU Manual Override System	1	1	1	1	1

SYSTEM / EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING
Torque Limiter	1	1	1	1	1
Ignition System	1	1	1	1	1
Fire Detect System	1	1	1	1	1
Electrical:					
No. 1 Battery	1	1	1	1	1
No. 2 Battery	1	1	1	1	1
Stall Warning/Stick Pusher System	1	1	1	1	1
AOA Probes	2	2	2	2	2
CAS	1	1	1	1	1
Longitudinal (Stab) Trim System	1	1	1	1	1
Alternate Stab Trim System	1	1	1	1	1
Lateral Trim System	1	1	1	1	1
Directional Trim System	1	1	1	1	1
Trim Interrupt System	1	1	1	1	1
Windshield Heat	2*	2*	2*	2*	2*
Position Lights (MSN 1001 thru 1450)	0	3	3	3	3
Position Lights (MSN 1451 - 1942)	0	4	4	4	4
Strobe Lights	0	2	2	2	2
Landing Lights	0	2	2	2	2
Taxi Light	0	1	1	1	1
Instrument and Panel Lighting	0	AR	AR	AR	AR
Audio System	1	1	1	1	1
Cockpit Speaker	1	1	1	1	1
Cabin Speaker	1	1	1	1	1
Deice Boot Timer	0	0	0	0	1
AOA Heater LH	1	1	1	1	1
AOA Heater RH	1	1	1	1	1
Probe Current Monitor	1	1	1	1	1
Propeller Deice Timer	0	0	0	0	1
Propeller Deice Brush	0	0	0	0	1
Propeller Deice MOV	0	0	0	0	1
Propeller Deice Boots	0	0	0	0	**
Propeller Deice OAT Sensor	0	0	0	0	2
Left Wing Inspection Light	0	0	0	0	1
Emergency Power Supply	0	1	1	1	1
Mechanical Systems:					
Landing Gear Actuating System	1	1	1	1	1
Emergency Gear Extension System	1	1	1	1	1
Flap Control	1	1	1	1	1
Flap Interrupt System	1	1	1	1	1
Seat Restraints (each occupant)	AR	AR	AR	AR	AR

* Refer to Section 2 System and Equipment Limits - Heated Windshield for the actual limitation.

** Flight into known icing conditions is prohibited if the Propeller De Ice Caution is active.

SYSTEM / EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING
Firewall ACS Shutoff Valve	1	1	1	1	1
Emergency Ram Air Scoop	1	1	1	1	1
Negative Pressure Relief Valve	2	2	2	2	2
Oxygen System	1	1	1	1	1
Deice Boot PRV	1	1	1	1	1
Deice Boot EFCV's	1	1	1	1	5
Deice Boot Pressure Switches	0	0	0	0	5
Deice Boot, Inner Wing LH	1	1	1	1	1
Deice Boot, Outer Wing LH	1	1	1	1	1
Deice Boot, Inner Wing RH	1	1	1	1	1
Deice Boot, Outer Wing RH	1	1	1	1	1
Deice Boot, Tail LH	1	1	1	1	1
Deice Boot, Tail RH	1	1	1	1	1
Fuel Control & Monitoring System	1	1	1	1	1
For Pressurized Flight:					
ACS	1	1	1	1	1
Cabin Pressure Control Unit	1	1	1	1	1
Outflow Valve	1	1	1	1	1
Safety valve	1	1	1	1	1

FUEL LIMITATIONS

Total Fuel Capacity	406.8 US gal, 2,736.5 lb (1,540 liters, 1,241.3 kg)
Total Usable Fuel	402 US gal, 2,703.6 lb (1,521.5 liters, 1,226.4 kg)
Total Unusable Fuel	4.8 US gal, 32.9 lb (18.5 liters, 14.9 kg)
Maximum Fuel Imbalance	26.4 US gal, 178 lb (100 liters, 80.6 kg) (Maximum 3 segments on indicator)

NOTE

Usable fuel can be safely used during all Normal Category airplane maneuvers.

MAXIMUM OPERATING ALTITUDE LIMITS

Maximum Operating Altitude	30,000 ft (9,144 m)

OUTSIDE AIR TEMPERATURE LIMITS

Minimum Outside Air Temperature	-55° C (-67° F)
Maximum Outside Air Temperature	+50° C (122° F)

CABIN PRESSURIZATION LIMITS

Maximum cabin pressure differential is 5.75 psi (400 mbar).

Pressurized landing is approved, up to 0.7 psid.

MAXIMUM PASSENGER SEATING LIMITS

Maximum number of occupants is 9 passengers plus pilot(s).

During single pilot operation, the pilot occupies the left hand cockpit seat and an additional passenger may occupy the right hand cockpit seat.

Refer to Section 6, Weight and Balance, for seat locations.

The PC-12 is certified with two basic cabin interior configurations, a Corporate Commuter and an Executive interior. Variations to the two basic interior configurations that are been approved together with general limitations are given below:

Corporate Commuter Interior Code STD-9S nine standard seats.

Executive Interior Code EX-6S-2 six executive seats.

Executive Interior Code EX-8S eight executive seats.

Leave seats 5, 6, 7 and 8 vacant during takeoff and landing unless seat in front is occupied.

Executive Interior Code EX-4S-3B four executive seats and three seat bench.

Executive Interior Code EX-6S-STD-2S six executive seats and two standard seats.

Leave seats 5, 6, 7 and 8 vacant during takeoff and landing unless seat in front is occupied.

Executive Interior Code EX-4S-STD-4S four executive seats and four standard seats.

Pilatus must be contacted to determine the modification work required to the aircraft, before any change to an interior configuration is made.

SYSTEMS AND EQUIPMENT LIMITS

STALL WARNING/STICK PUSHER SYSTEM

Preflight function test required before takeoff.

System is required to function properly in normal mode for all flights and in ice mode for flight into known icing conditions.

BRAKES (MSN 1231 - 1942)

To allow adequate cooling of the wheels and brakes the aircraft must remain on the ground for at least 45 min following the two events:

- Rejected takeoff with brake on speed greater than V_R -20 kts and heavy brake usage
- 0° flap full stop landing and heavy brake usage

TRIM SYSTEMS

Stabilizer normal and alternate, and rudder trim systems must function properly for all flights.

HEATED WINDSHIELD

Left Hand and Right Hand Heated Windshields must function properly for all flights. Exception, for IFR flights conducted into no known or forecast icing conditions at least one heating zone of the windshield on the side of the pilot in command must function properly.

FIRE DETECTION SYSTEM

Preflight Function Test is required for takeoff.

System must function properly for all flights.

ENGINE ICE PROTECTION

Preflight Function Test is required for takeoff.

OXYGEN SYSTEM

A minimum oxygen supply of 10 minutes duration for each occupant is required for dispatch for pressurized flight above FL250.

NOTE

Some National Operating Requirements may require that a larger quantity of oxygen be carried on the aircraft.

The oxygen system shut-off valve handle in the cockpit must be selected to on prior to engine start and throughout the duration of flight.

The oxygen masks for the crew must be connected for all flights.

For aircraft with the Corporate Commuter side wall paneling, oxygen masks must be connected and properly stowed for each passenger prior to takeoff when the aircraft is to be operated above 10,000 feet.

NOTE

In the executive interior configurations the oxygen masks are permanently connected.

PROBE HEAT

Preflight function test required before takeoff.

The system is required to function properly for IFR flight and flight into known icing condition.

FLAP SYSTEM CYCLE LIMITS

A flap cycle is defined as movement from 0° to 15° to 0° and from 0° to 15° to 40° to 0°. Maximum number of cycles per hour -

Up to 25° C OAT	10
25° C to 50° C OAT	8

PRIMUS APEX

The Honeywell PRIMUS APEX Integrated Avionics System for the Pilatus PC-12E – Pilot's Guide must always be on board the aircraft.

PRIMUS APEX - AUTOMATIC FLIGHT CONTROL SYSTEM

During autopilot operation, a pilot must be seated in a pilot position with seat belt fastened.

The autopilot (AP) and yaw damper (YD) must be OFF during takeoff and landing.

Minimum engagement height after takeoff is 400 ft AGL.

With the exception of the approaches defined below, the autopilot must be disengaged below 1000 ft AGL.

For non-precision approaches (at airspeeds <150 KIAS & VS <1500 ft/min) the autopilot must be disengaged below 400 ft AGL.

For approach procedures with vertical guidance in VGP mode, the autopilot must be disengaged below 200 ft AGL.

For autopilot coupled ILS approaches up to 4° the autopilot must be disengaged below 200 ft AGL.

The system is approved for Category 1 operation (Approach mode selected) and autopilot coupled go-arounds initiated at decision altitude or minimum descent altitude.

Maximum approved glideslope angle for all coupled approaches is 4°.

During normal operation do not overpower the autopilot to change pitch and roll attitude.

CAUTION

In accordance with FAA recommendation (AC 00-24C), the use of "PITCH ATTITUDE HOLD" mode is recommended during operation in severe turbulence.

Aircraft with Primus APEX Build 6 and 7 - Do not use SPD mode with the pre selected altitude (PSA) set at current aircraft altitude, because the aircraft would maintain PSA and may deviate from the target speed with SPD mode annunciated as active in the FMA. In case of total loss of engine power (NG below 60%), the system will ignore the PSA and descend at the target speed.

PRIMUS APEX – FLIGHT MANAGEMENT SYSTEM

From an airworthiness perspective, the PC-12/47E with APEX-FMS is certified for:

Use of GNSS	**AMC 20-5** Guidance Material on Airworthiness Approval and Operational Criteria for the use of the NAVSTAR Global Positioning System (GPS).
	AC 90-100A U.S. Terminal and En Route Area Navigation (RNAV) Operations.
B-RNAV	**AMC 20-4** Guidance Material on Airworthiness Approval and Operational Criteria for the use of navigation Systems in European Airspace Designated for basic RNAV Operations.
	AC 90-96A Approval of U.S. Operators and Aircraft to operate under Instrument Flight Rules (IFR) in European Airspace designated for Basic Area Navigation (B-RNAV) and Precision Area Navigation (P-RNAV). **NOTE:** B-RNAV is also termed ICAO RNAV 5
P-RNAV	**JAA TGL 10 Rev 1** Airworthiness and Operational Approval for Precision RNAV Operations in Designated European Airspace.
	AC 90-100A U.S. Terminal and En-route Area Navigation (RNAV) Operation
	AC 90-96A Approval of U.S. Operators and Aircraft to operate under Instrument Flight Rules (IFR) in European Airspace designated for Basic Area Navigation (B-RNAV) and Precision Area Navigation (P-RNAV)
	NOTE: COMPLIANCE WITH BOTH P-RNAV (TGL 10) AND U.S. RNAV (AC 90-100A) ASSURES COMPLIANCE WITH ICAO RNAV 1 AND RNAV 2.

BARO-VNAV	**AMC 20-27** Airworthiness Approval and Operational Criteria for RNP Approach (RNP APCH) Operations including APV BARO-VNAV Operations.
	AC 90-105 Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System.
	AC 20-129 Airworthiness Approval of Vertical Navigation (VNAV) Systems for the use in the U.S. National Airspace System (NAS) and Alaska.
RNP 1	**AC 90-105** Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System
RNP APCH	**AMC 20-27** Airworthiness Approval and Operational Criteria for RNP Approach (RNP APCH) Operations including APV BARO-VNAV Operations.
	AC 90-105 Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System.
MNPS	**AC20-138A.** The APEX FMS and KGS200 GNSSU as installed has been found to comply with the requirements for GPS oceanic and remote navigation (AC20-138A, Appendix 1), when used in conjunction with the onboard GPS RAIM and FDE. Full redundancy for the GPS navigation system is only provided if second FMS, second GPS and Cursor Control Device (CCD) are installed. This does not constitute an operational approval.
RNP 4 & RNP 10	**AC20-138D.** Primus APEX Build 7 or higher. The APEX FMS and KGS200 GNSSU complies with the requirements for GPS oceanic and remote navigation (AC20-138D), when used in conjunction with the onboard GPS RAIM and FDE. Full redundancy for the GPS navigation system is only provided if second FMS, second GPS and Cursor Control Device (CCD) are installed. This does not constitute an operational approval.

NOTE

Installation of relevant equipment and aircraft certification does not guarantee operational approval. It is the responsibility of the operator to apply for operational approval at the local authorities

The PC-12/47E with APEX-FMS has satisfied only the airworthiness requirements, this does not constitute an operational approval.

The FMS data base must incorporate the current update cycle for IFR operation.

FMS instrument approaches must be accomplished in accordance with approved instrument approach procedures that are retrieved from the FMS data base.

(a) Instrument approaches must be conducted in the FMS approach mode and GPS integrity monitoring must be available at the Final Approach Fix.

(b) APP (approach active) mode indication must be displayed on the PFD at the Final Approach Fix (FAF).

(c) Accomplishment of ILS, LOC, LOC-BC, LDA, SDF and MLS approaches using the FMS is prohibited.

(d) RNAV approaches are prohibited in non-WGS-84 airspace. Radio based (VOR, NDB, etc.) approaches are authorized using GPS updating provided the underlying NAVAID is tuned and monitored to ensure aircraft position accuracy relative to the published procedure. If at any time during the approach the GPS position does not match the radio based data, the radio based data shall be used for navigation (Refer to AC 90-108 for additional information).

The use of the FMS to perform RNAV operations in the designated European airspace is limited as follows:

Given a GPS constellation of 23 satellites or less (22 or less when the FMS incorporates automatic pressure altitude aiding) is projected to be operational, the availability of RAIM must be confirmed for the intended flight (route and time). Dispatch for RNAV must not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. For RAIM prediction the Honeywell Program “Preflight” or equivalent approved software must be used.

Traditional approved navigation equipment (e.g. VOR, DME, ADF) adequate for the route to be flown must be installed and serviceable for use of the FMS in accordance with the operational approval.

Dead reckoning mode of navigation based on AHRS is not available in the high latitude regions (approximately north of 82° north latitude and south of 82° south latitude) since the ADAHRS magnetometers do not provide accurate information near the poles.

When using the VNAV system, the altimeter must be used as the primary altitude reference for all operations.

When using the VNAV path deviation indicator during approach the LNAV/VNAV minimums apply as published on the approach charts. Below the minimum the crew must fly the aircraft based on visual references. Due to the large tolerances of the VNAV system the deviation indicator must not be relied on below the minimum.

If flying on LNAV approach using the vertical guidance provided by the FMS, the crew must at no point allow the aircraft to descend below the published LNAV MDA, unless required visibility of the runway is provided.

Primus APEX Build 6 or higher - Barometric VNAV guidance during approach including the approach transition, final approach segment, and the missed approach procedure is not temperature compensated. Unless a temperature limitation is reflected on the approach chart, operating at uncompensated minimum IFR altitudes will not provide expected terrain and obstacle clearance for temperatures below ISA.

Primus APEX Build 10 or higher - Barometric VNAV guidance during approach including the approach transition, final approach segment, and the missed approach procedure can be temperature compensated and minimum IFR altitudes will provide terrain and obstacle clearance for temperatures below ISA. Temperature can be compensated by the pilot by: entering the destination airport OAT into the FMW Tab for temperature compensation, calculate and crosscheck the corrected altitudes on the Waypoints list before activating the changes.

PRIMUS APEX - TCAS I

The flight crew must not use a TA on the PFD traffic display to initiate evasive maneuvering. ATC procedures and visual acquisition of the intruder prior to initiation of evasive maneuvers must continue to be the primary means of ensuring aircraft separation

PRIMUS APEX – TRANSPONDER

The transponder system complies with the criteria of ICAO Doc 7030/4 Regional Supplementary Procedures for operations where enhanced surveillance is required.

The transponder FL ID should never be cleared by the pilot without entering a legal FL ID or recycling the power to the XPDR (if a Blank ID is desired). The XPDR reads the FL ID at power up and if the FL ID is invalid it will default to the TAIL No.

PRIMUS APEX – ADAHRS

If CAS message “HSI IS MAG TRK” or “HSI IS TRU TRK” is displayed, then the system accuracy does not allow VOR, VOR/DME and NDB non-precision approaches. The flight crew must use (GPS) VOR/DME or (GPS) NDB overlay approaches, LNAV or LNAV/VNAV approaches, RNAV (GPS) approaches, RNAV (RNP) approaches or LPV and ILS precision approaches instead. CAS message “HSI IS MAG TRK” or “HSI IS TRU TRK” is displayed if operating north of approximately of 82° north latitude and south of 82° south latitude as well as in the following two regions:

North of approximately 73° north latitude between longitude 80° west and 130° west (Northern Canadian Domestic Airspace).

South of approximately 60° south latitude between longitude 120° east and 160° east (Region south of Australia and New Zealand).

YAW DAMPER

Above FL200, when the yaw damper is not operating, the aircraft must be flown only in balanced flight (slip ball centered +/- 1 ball).

PRIMUS APEX – ELECTRONIC CHECKLIST

The Electronic Checklist functionality allows implementation of a user defined Electronic Checklist database. With respect to airworthiness approval the AFM remains the primary reference for checklists.

Implementation of an Electronic Checklist Database is the responsibility of the aircraft owner/operator, use and operational approval is dependent on the rules of operation.

Implementation of Electronic Checklist functionality does not constitute operational approval.

Use of the Electronic Checklist Function is prohibited in the event of a lower MFD failure (operating on upper Multi Function Display only).

PRIMUS APEX – ELECTRONIC CHARTS

The APEX Electronic Charts provide supplemental situational awareness only and do not allow “blind taxi” procedures or flight navigation by use of these charts.

At any time the pilot shall remain responsible for taxiing by external visual references and for flying by airborne navigation by the use of primary navigation instruments.

The position accuracy of the aircraft symbol on the charts can decrease in the case of insufficient GPS signal reception or GPS sensor failure. The aircraft symbol is not in-scale with the APEX Electronic Charts.

The APEX Electronic Charts do not replace approved published paper or approved electronic systems for aeronautical charts, which must remain available as a backup reference for chart data.

NOTE

It is the responsibility of the operator to apply for specific operational approval at the local authority for the use of external electronic charts (e.g. Electronic Flight Bags Class 1 and Class 2) instead of paper charts. Class 3 EFBs require a Supplemental Type Certificate (STC) or certification design approval as part of the aircraft equipment.

PRIMUS APEX – VIDEO INPUT

It is the responsibility of the operator to make sure that no interference with the installed avionics systems results from the connection of a camera device to the Video Input Module.

PRIMUS APEX – XM SAT WEATHER

The XM Weather System does not work in PDC mode (STBY bus). Even though the layers can be selected, no data will be transmitted until the aircraft is powered by the batteries (or external power or the engine) and re-selection of the required XM layers is performed.

PRIMUS APEX – WEATHER RADAR

When the weather radar system is operated while the aircraft is on the ground, direct the nose of the aircraft so that the antenna scan sector is free of large metallic objects, such as hangars or other aircraft for a minimum distance of 15 feet (5 meters), and tilt the antenna fully upwards.

Do not operate the weather radar system during aircraft refueling or during refueling operations within 15 feet (5 meters).

Do not operate the weather radar system when personnel are standing within 15 feet (5 meters) of the 270° forward sector of the aircraft.

PRIMUS APEX – INAV MAP

The INAV topographical map shall not be used for navigation. The display of airspaces shall not be used as the sole means of reference.

PRIMUS APEX – VERTICAL SITUATION DISPLAY

The Vertical Situation Display provides situational awareness only and shall not be used for navigation purposes.

OTHER LIMITATIONS

PASSENGER SEAT LAP BELT EXTENSION

The lap belt extension Part No. 959.30.01.590 (used with restraint system Part No. 959.30.01.259) can be used on standard passenger seats Part Nos. 525.22.12.011/012. It’s use is limited to those who need it and it shall be handed out by the pilot on a case by case basis before flight. The lap belt extension must not be used for strapping small children sitting on a person’s lap.

ALL PASSENGER SEATS

For take-off and landing the seat lap and shoulder belts must be fastened, the lap belt tightened, and the seat headrest positioned to support the head.

STANDARD PASSENGER SEAT TYPES

There are two different types of standard seats (TYPE I and II). It is not allowed to install TYPE I and II seats behind each other.

LUGGAGE LIMITATIONS

The luggage area maximum load is given in the following table. The load is dependent on the aircraft interior configuration and the Part No. of the luggage net installed.

Interior Configuration	525.25.12.043
STD-9S	265 lb (120 kg)
EX-6S-STD-2S	265 lb (120 kg)
EX-4S-STD-4S	265 lb (120 kg)
EX-6S-2	400 lb (180 kg)
EX-8S	400 lb (180 kg)

A Luggage Net must be installed at Frame 34 when luggage is stowed.

The luggage area maximum load is 500 lb (225 kg) with an extendable luggage net installed. The extendable luggage net Part No. 525.25.12.026 and/or any luggage may not extend in front of frame 32. If the extendable luggage net is used without a three seat bench installed, there must be a clear area in front of the net as follows:

- at least 280 mm forward of frame 32, when the net floor attachments are placed at frame 32 (the most forward position of the net)
- at least 340 mm forward of frame 34, when the net floor attachments are placed at frame 34.

CARGO LIMITATIONS

Maximum Freight Load 3300 lbs (1500 kg)

Cargo must be arranged to permit free access to the passenger door and the right hand emergency overwing exit. No cargo must be placed on the seats.

All cargo must be secured by approved Cargo Restraints as described in Section 6. Tie Down Straps with a breaking strength of at least 1800 lb per strap must be used.
All Cargo/Containers must be located against a Retaining Bar secured laterally to the seat rails.

Items up to a total weight of 66 lb (30 kg) can be stowed in the cabin area without being strapped down providing a Cargo Net is installed in front of the items.
Cargo Nets may only be installed on the attachments at Frames 24 and 27.
No passengers must be seated rearward of a Cargo Net.

If an extendable baggage net is used the tie down fittings and the cargo strap fittings must have a minimum space of 5 inches between the fittings.

STRUCTURAL LIMITATIONS

Refer to Chapter 4 of the PC-12/47E Aircraft Maintenance Manual, Pilatus Report Number 02300.

SMOKING

Smoking is not permitted in the cabin of aircraft equipped with a standard interior unless ashtrays are installed.

PORTABLE ELECTRONIC DEVICES

The aircraft is Wi-Fi and Bluetooth frequency tolerant and tested according to *RTCA/DO-307 - Aircraft design and Certification for Portable Electronic Device (PED) Tolerance*.

Passenger door coupling susceptibility was tested in accordance with DO-307 (including Change 1), Section 4.

Cargo door coupling susceptibility was tested in accordance with DO-307 (including Change 1), Section 3.

There are no restrictions resulting from DO-307 testing therefore it is in the responsibility of the operator to define during which phases of flight PED usage is allowed.

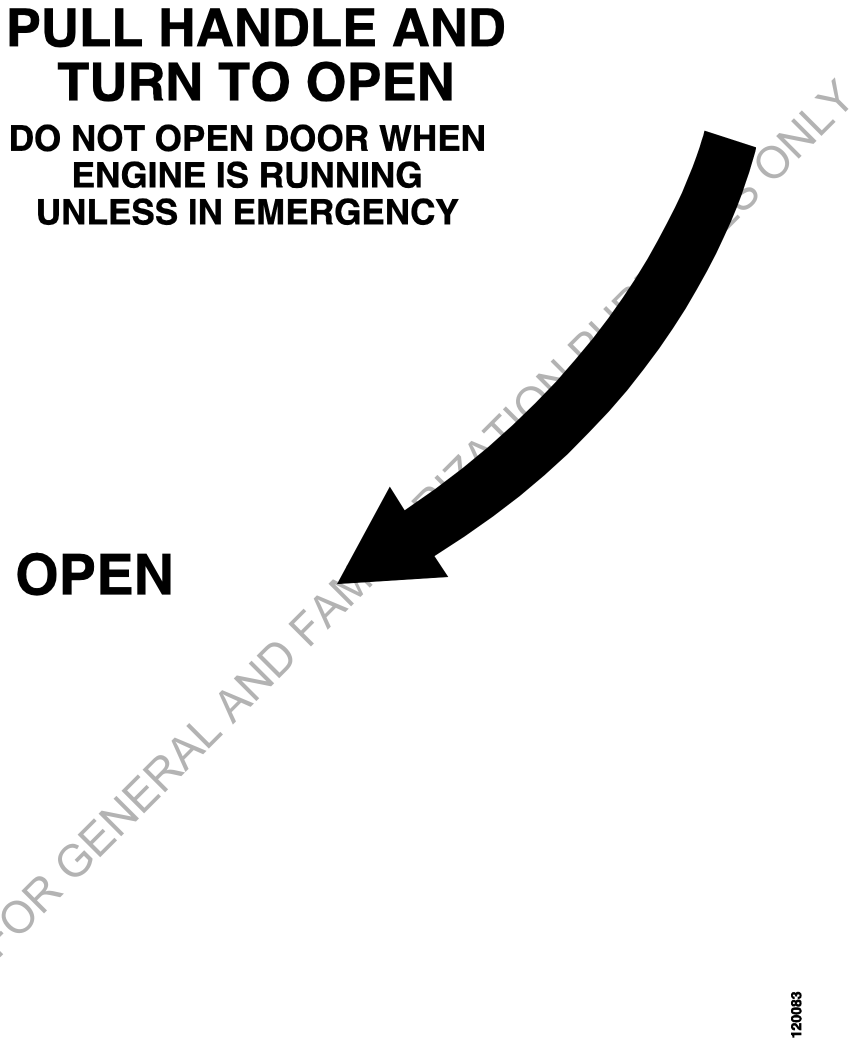
No test has been performed to check if the aircraft is Global System Mobile (GSM) frequency tolerant.

NOTE

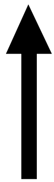
If electromagnetic interference is suspected, PED use should be discontinued or terminated.

PLACARDS - EXTERIOR

On exterior Passenger Door: (MSN 1001 - 1575)



On exterior Passenger Door: (MSN 1576-1942)



PRESS HERE TO OPEN
PULL HANDLE AND
PULL DOOR OUT

DO NOT OPEN DOOR WHEN
ENGINE IS RUNNING
UNLESS IN EMERGENCY

120434

On exterior Cargo Door:

**PRESS HERE TO OPEN
PULL HANDLE AND
PULL DOOR OUT**

**DO NOT OPEN DOOR WHEN
ENGINE IS RUNNING
UNLESS IN EMERGENCY**

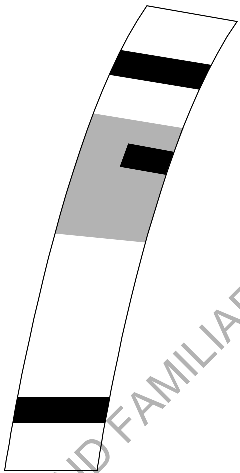
PULL TO OPEN

120084

Near Static Ports:

STATIC PRESSURE KEEP CLEAR

On left side Vertical Tail forward of Horizontal Stabilizer:



On Rudder (each side):

DO NOT PUSH

120085

On exterior Emergency Exit:
(Not to Scale)

EMERGENCY EXIT

PUSH

PUSH IN AFTER RELEASE

Inside left Engine Cowling:

TURBINE OIL

ACCEPTABLE OILS SEE P+W SB 14001

TOTAL SYSTEM CAPACITY
14,5 QRT 13,6 LTR

ENGINE OIL TYPE USED,
____
DO NOT MIX OIL TYPES

MSN 545, 1001-1299, 1301-1340
PRE SB 11-006

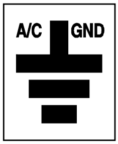
ENGINE OIL TYPE USED,
____

MSN 1300, 1341-1942
AND POST SB 11-006

NOTE: The engine oil type used will be added to the placard prior to delivery of the aircraft.

120402

On Nose Landing Gear (each side):



On Nose Landing Gear:

← DO NOT TURN BEYOND RED MARKS →

Near Fuel Filler:

FUEL:
ASTM-D-1655 JET A, JET A-1 AND JET B (CPW 204 SPEC)
TOTAL CAPACITY
770 LTR. 203 US. GAL.
USABLE CAPACITY
761 LTR. 201 US. GAL.
ANTI-ICE ADDITIVE MUST BE USED FOR ALL FLIGHT OPERATIONS IN AMBIENT TEMPERATURES BELOW 0°C.
SEE PILOT'S OPERATING HANDBOOK FOR QUANTITY AND TYPE OF ADDITIVE.

MSN 545, 1001-1299,1301-1340
POST SB 11-005

JET-A-FUEL
TOTAL CAPACITY
770 LTR. 203 US. GAL.
ANTI-ICE ADDITIVE MUST BE USED FOR ALL FLIGHT OPERATIONS IN AMBIENT TEMPERATURES BELOW 0°C.
SEE PILOT'S OPERATING HANDBOOK FOR APPROVED FUELS, QUANTITY AND TYPE OF ADDITIVE.

MSN 1300, 1341-1942

REFUELING BONDING POINT

On top surface of each Aileron and three places on top surface of each flap:

DO NOT PUSH

On the main landing gear doors:

TYRE PRESSURE 60 psi (4,1 bar)

On the nose landing gear doors:

TYRE PRESSURE 60 psi (4,1 bar)

120404

On each side of Engine Lower Front Cowling:

VERY HOT AREA
DO NOT TOUCH

On Forward Fuselage LH side Access Door:

FUEL COMPARTMENT

FUEL SYSTEM
MAINTENANCE VALVE
INSIDE

FUEL FILTER INSIDE

On Forward Fuselage RH side Access Door:

OXYGEN SERVICE POINT
USE NO LUBRICANTS

Note: When the optional larger oxygen bottle is installed, this placard is installed inside the battery compartment and outside on Rear Fuselage Bottom Access Door.

On Nose Landing Gear Doors:

NOSE LANDING GEAR SHOCK STRUT
N2 CHARGE PRESSURE

1st. STAGE 50 psi (3,5 bar)
2nd. STAGE 834 psi (57,5 bar)

120311

On Main Landing Gear Doors:

MAIN LANDING GEAR SHOCK STRUT N2 CHARGE PRESSURE	
1st. STAGE	**141 psi (9,7 bar)**
2nd. STAGE	**1668 psi (115 bar)**

On Rear Fuselage Bottom Access Door:

BATTERY COMPARTMENT

ELT

INSTALLED INSIDE

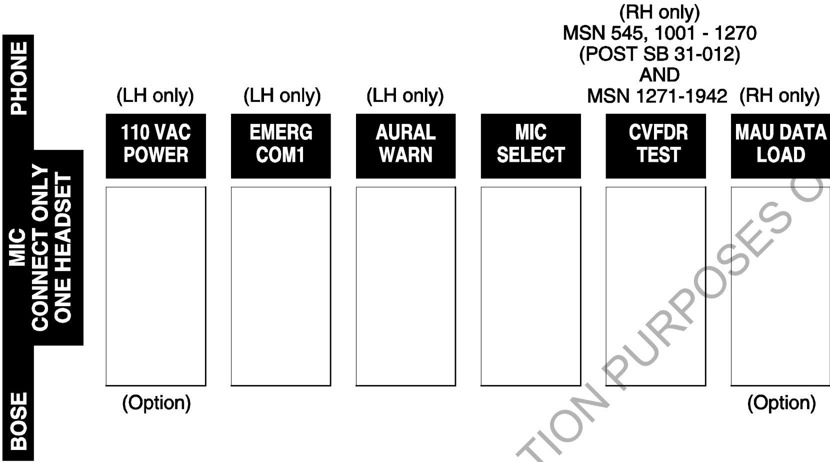
On Rear Fuselage Bottom LH side:

28 VOLT DC
EXTERNAL POWER POINT

120312

PLACARDS - COCKPIT

On Cockpit LH and RH Rear Panels:



On Cockpit LH Side Panels near oxygen system controls:

NOTE:
PLACARD BACKGROUND
CAN BE EITHER BLACK
OR RED

On Cockpit LH and RH Side Panels:

120313

On left Cockpit Side Panel and right Cockpit Side Panel
(LH Shown, RH Opposite):

OPERATIONAL LIMITATIONS

THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

NO ACROBATIC MANEUVERS INCLUDING SPINS ARE APPROVED.

THIS AIRPLANE APPROVED FOR VFR, IFR, DAY & NIGHT OPERATION & ICING CONDITIONS.

EMERGENCY GEAR EXTENSION

- AIRSPEED 110 KIAS
- ENSURE LANDING GEAR HANDLE DOWN
IF 3 GREENS NOT ILLUMINATED AFTER 30 SECONDS
- EMERGENCY GEAR PUMP HANDLE (AFT END OF CENTRE PEDESTAL) EXTEND AND PUMP (UP/DOWN) UNTIL 3 GREENS ARE OBTAINED
IF 3 GREENS STILL NOT ILLUMINATED
- YAW AIRCRAFT TO LOCK LH & RH GEAR
- REDUCE AIRSPEED TO LOCK NOSE GEAR

WARNING: DURING FLIGHT IN ICING CONDITIONS OR FLIGHT WITH ANY VISIBLE ICE ACCRETION ON THE AIRFRAME THE FOLLOWING FLAP MAXIMUM EXTENSION LIMITS APPLY:
-WITH OPERATIONAL AIRFRAME PNEUMATIC DE-ICE BOOTS 15° FLAP.
-AFTER FAILURE OF THE AIRFRAME PNEUMATIC DE-ICE BOOTS 0° FLAP.

Near DV Window:

DV WINDOW
PRESS BUTTON
AND PULL INWARDS

On the front side of the right cockpit bulkhead:

FIRE EXTINGUISHER

120241

On the LH and RH Instrument Panel:

V_O (4740KG)	166	KIAS
V_O (2600KG)	123	KIAS
V_{MO}	240	KIAS
M_{MO}	0.48	M
V_{FE} UP TO 15°	165	KIAS
V_{FE} ABOVE 15°	130	KIAS

Near Landing Gear Selector Handle:

V_{LO}	180	KIAS
V_{LE}	240	KIAS

Near MF Controller:

TOTAL USABLE
CAPACITY
1521 LTR
402 US. GAL
2704 LBS JET-A1

Near Pressurization Controls:

ENSURE CABIN $\triangle$P MAX. 0.7PSI
BEFORE LANDING

MAXIMUM CABIN
DIFF. PRESS. = 5.75 PSID

120254

On Cockpit LH and RH Lower Side Panels (valid for MSN 1001 thru 1575):

CLOSED

OPEN

Near optional Standby Magnetic Compass (if installed):

STANDBY COMPASS
FOR CORRECT READING SWITCH:
GENERATORS & BATTERIES ON
AVIONICS ON
NAV & INSTRUMENT LIGHTS AS REQUIRED
WINDSHIELD DE-ICE LH & RH OFF
PROBES DE-ICE OFF
ELECTRICAL HEAT/COOL SWITCH INHIBIT
FOOT WARMER OFF (IF INST.)

On Left and Right Control Wheel:

DN
LH RH
UP

AP DISC

TRIM ENGAGE

PUSHER INTR

PTT

TCS

INOP
OR
CKLST

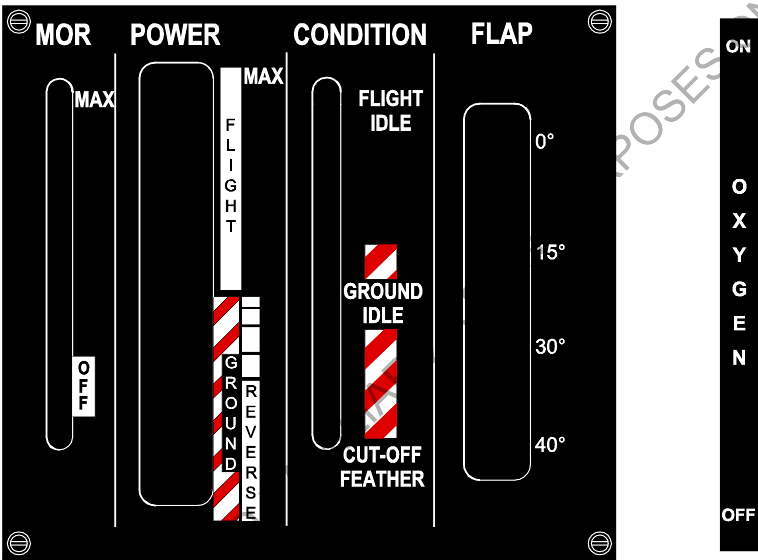
When optional electronic checklist installed

MAP LIGHT

120442

On Center Console:

FIRE EXTINGUISHER LOCATED BEHIND THE CO-PILOT SEAT



STABILIZED PROPELLER OPERATION ON GROUND (NOT FEATHERED) BETWEEN 350 AND 950 rpm IS PROHIBITED

At aft end of Center Console:

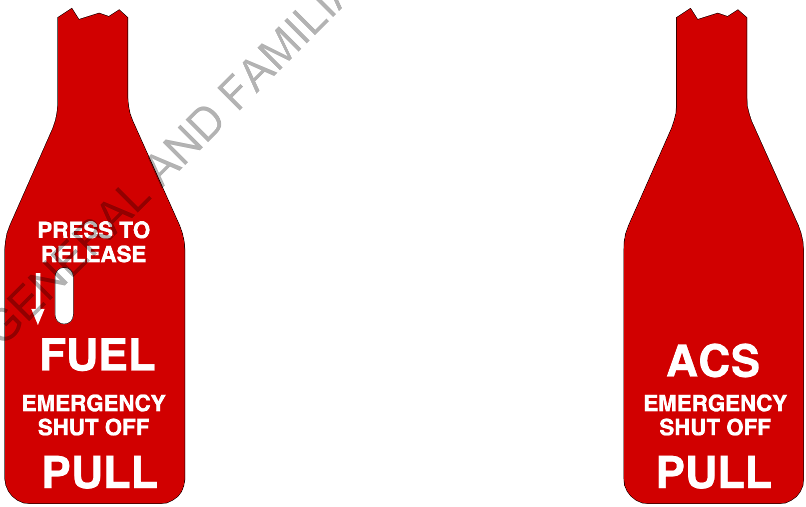
CAUTION **PCL OPERATION AFT OF IDLE DETENT IS PROHIBITED WHEN:**
- **ENGINE NOT RUNNING**
- **IN FLIGHT**
- **WITH MOR OPERATION**

120239

On the PCL:

At rear of Center Console:

On Fuel and ACS Firewall Shut off Valve Handles:

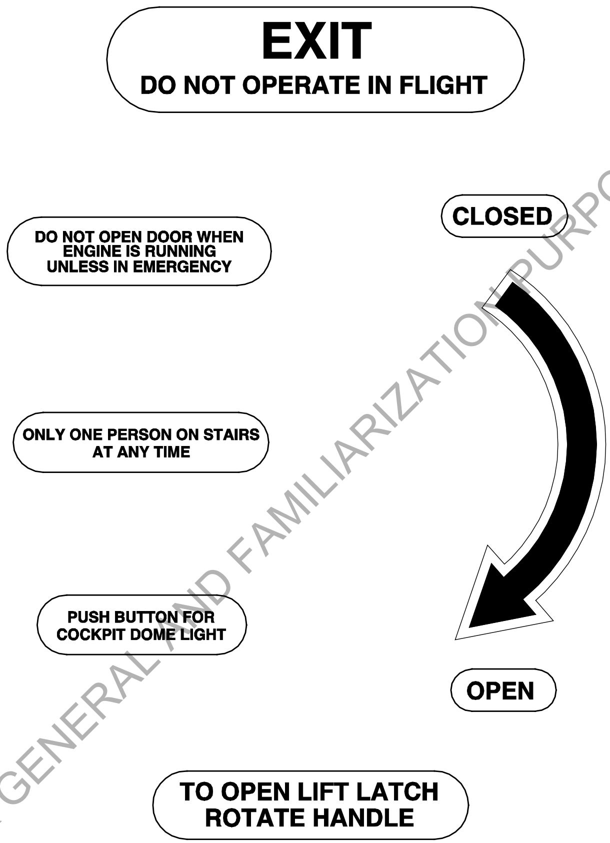


120255

PLACARDS - CABIN

The following standard placards are installed in all aircraft.

On Interior Passenger Door:



120070

On Interior Emergency Exit:

EXIT

On Interior Emergency Exit Handle:

PULL

On Interior Cargo Door Handle Cover:

DO NOT REMOVE COVER IN FLIGHT

On Interior Cargo Door Handle:

**LIFT LOCKING LEVER AND
PULL HANDLE PUSH DOOR OUT**

On Interior Cargo Door:

**DO NOT OPEN DOOR WHEN
ENGINE IS RUNNING
UNLESS IN EMERGENCY**

On Cabin to Baggage Area Step:

KEEP GRILL CLEAR

120160

On forward and rear Cargo Door Frame:

MAX FREIGHT LOAD = 1500 kg / 3300 lb	
Max Load on Seat Rails	**Max Load on Floor Panels**
1000 kg/m^2 205 lb/ft^2	**600 kg/m^2 125 lb/ft^2**
CARGO MUST NOT OBSTRUCT ACCESS TO CABIN DOOR AND EMERGENCY EXIT	

On lower Cargo Door Frame:

INSTALL TAIL SUPPORT STAND BEFORE LOADING CARGO

Above Baggage Area:

MAX BAGGAGE LOAD = 120 kg / 265 lb

or

MAX BAGGAGE LOAD = 180 kg / 400 lb

or

MAX BAGGAGE LOAD = 225 kg / 500 lb (ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

At interior fuselage cargo net attachment points:

FR 24	**FR 27**	**FR 34**

120316

PLACARDS - 9 SEAT CORPORATE COMMUTER (Interior Code STD-9S).

The cabin placards plus the following additional placards are those required for this interior.

On the rear of the left and right cockpit bulkheads, and on the rear of each seat:

FOR TAKEOFF AND LANDING
-FASTEN SEAT LAP AND SHOULDER BELT
-SEAT BACK MUST BE FULLY UPRIGHT

or

FOR TAKEOFF AND LANDING
- SEAT BACK MUST BE FULLY UPRIGHT
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT

On the rear of each seat,
except seat No.5:

OXYGEN MASK LOCATED UNDER YOUR SEAT

On the rear of the seat No.5:

OXYGEN MASK LOCATED UNDER SEAT IN FRONT

On the rear of the left cockpit bulkhead:

FIRE EXTINGUISHER LOCATED
ON COCKPIT SIDE RH BULK-
HEAD BEHIND CO-PILOT SEAT

NO SMOKING

Near each Passenger Oxygen Outlet and Cover:

OXYGEN

On the forward Cargo Door Frame:

INTERIOR CODE:
STD-9S
(SEE AFM/POH SECTION 6)

120317

PLACARDS - 6 SEAT CORPORATE COMMUTER AND A THREE SEAT BENCH (Interior Code STD-6S-3B).

The cabin placards, the 9 seat commuter placards and the following replacement/additional placards are required for this interior.

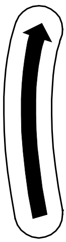
On the rear of seats 5 and 6:

OXYGEN MASK LOCATED UNDER YOUR SEAT

On the rear of seat 5:

LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

On the left side of the bench seat:



LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

When the large baggage net is installed:

MAX BAGGAGE LOAD = 225 kg / 500 lb
(ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

On the forward Cargo Door Frame:

INTERIOR CODE:
STD - 6S - 3B
(SEE AFM/POH SECTION 6)

120163

PLACARDS - 6 SEAT EXECUTIVE (Interior Code EX-6S-2).

The cabin placards plus the following additional placards are those required for this interior.

On the rear of the left bulkhead:

FIRE EXTINGUISHER LOCATED
ON COCKPIT SIDE RH BULK-
HEAD BEHIND CO-PILOT SEAT

On the inside of the lavatory doors:

NO SMOKING
IN LAVATORY

TO CLOSE
PULL HERE

OXYGEN MASK INSIDE

TOILET COMPARTMENT
NOT TO BE OCCUPIED
DURING TAKEOFF/LANDING
AND TURBULENCE

TO CLOSE
PULL HERE

PULL TAPE FOR
OXYGEN MASK

On the inside of the left and right cabinet drawers:

	Upper	Lower
Right cabinet	WEIGHT LIMIT 5 LB	WEIGHT LIMIT 7 LB
Left cabinet	WEIGHT LIMIT 10 LB	WEIGHT LIMIT 25 LB

Near each executive seat:

FOR TAKEOFF AND LANDING
- SEAT MUST BE FULLY UPRIGHT,
  FULLY TO THE REAR OF CABIN
  AND FULLY OUTBOARD
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT
- TABLE MUST BE STOWED

120314

On each Passenger Oxygen Mask Cover:

OXYGEN MASK INSIDE

On the armrest near each Passenger Oxygen Mask:

PULL TAPE FOR OXYGEN MASK ➡ **or** ⬅ **PULL TAPE FOR OXYGEN MASK**

By the ashtray near each seat:

**DO NOT SMOKE
WHILE OXYGEN
IN USE**

Near the optional coat rail in the baggage compartment:

MAX COAT RAIL 5 kg / 11 lb

On the forward cargo door frame:

**INTERIOR CODE:
EX - 6S-2
(SEE AFM/POH SECTION 6)**

120165

PLACARDS - 8 SEAT EXECUTIVE (Interior Code EX-8S) and a 6 SEAT EXECUTIVE AND 2 SEAT CORPORATE COMMUTER (Interior Code EX-6S-STD-2S)

The cabin placards, the 6 seat executive placards and the following replacement/additional placards are required for this interior.

Near seats 5, 6, 7 and 8:

LEAVE THIS SEAT VACANT DURING TAKEOFF AND LANDING UNLESS SEAT IN FRONT IS OCCUPIED

On the forward cargo door frame:

INTERIOR CODE:
EX - 8S
(SEE AFM/POH SECTION 6)

or

INTERIOR CODE:
EX - 6S - STD - 2S
(SEE AFM/POH SECTION 6)

On the armrest near Passenger Oxygen Mask for seats 7 and 8:

PULL TAPE FOR OXYGEN MASK ➡

or

⬅ **PULL TAPE FOR OXYGEN MASK**

PLACARDS - 4 SEAT EXECUTIVE AND 4 SEAT CORPORATE COMMUTER (Interior Code EX-4S-STD-4S)

The cabin placards, the 6 seat executive placards and the following placard is required for this interior.

INTERIOR CODE:
EX - 4S - STD - 4S
(SEE AFM/POH SECTION 6)

On the armrest near Passenger Oxygen Mask for seats 7 and 8:

PULL TAPE FOR OXYGEN MASK ➡

or

⬅ **PULL TAPE FOR OXYGEN MASK**

120166

PLACARDS - 4 SEAT EXECUTIVE AND A THREE SEAT BENCH (Interior Code EX-4S-3B).

The cabin placards, the 6 seat executive placards and the following replacement/additional placards are required for this interior.

On the rear of seats 3 and 4:

OXYGEN MASK LOCATED UNDER YOUR SEAT

FOR TAKEOFF AND LANDING
-FASTEN SEAT LAP AND SHOULDER BELT
-SEAT BACK MUST BE FULLY UPRIGHT

or

FOR TAKEOFF AND LANDING
- SEAT BACK MUST BE FULLY UPRIGHT
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT

Near to the left bench seat on the arm rest:

LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

On the left side of the bench seat:

LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

When the large baggage net is installed:

MAX BAGGAGE LOAD = 225 kg / 500 lb
(ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

On the forward cargo door frame:

INTERIOR CODE:
EX - 4S - 3B
(SEE AFM/POH SECTION 6)

120167

SECTION 3

EMERGENCY PROCEDURES

CONTENTS

EMERGENCY PROCEDURES

3.1 GENERAL

The recommended action to be taken in case of failure or in emergency situations are contained in this section. Some situations require rapid action, leaving little time to consult the emergency procedures. Prior knowledge of these procedures and a good understanding of the aircraft system is a prerequisite for safe aircraft handling.

KNOW YOUR AIRCRAFT AND BE THOROUGHLY FAMILIAR WITH IMPORTANT EMERGENCY PROCEDURES.

The emergency procedures use the terms “Land as soon as possible” and “Land as soon as practical”. For the purpose of these procedures the meanings are as follows:

- Land as soon as possible – Land without delay at the nearest airport where a safe approach and landing is reasonably assured.
- Land as soon as practical – Landing airport and duration of flight are at the discretion of the pilot. Extended flight beyond the nearest suitable airport is not recommended.

Emergency procedures alone cannot protect against all situations. Good airmanship must be used in conjunction with the emergency procedures to manage the emergency. It is good practice during the emergency procedures, where CAS messages are given, to check the circuit breaker panels to ensure there are no open circuit breakers related to the CAS annunciation.

If not detailed otherwise in the procedures, circuit breakers on the Essential Bus which trip in flight, one attempt only is allowed to reset the circuit breaker if the pilot in command determines that the system/equipment is needed for safe completion of that flight. The open circuit breaker can be reset after at least one minute has elapsed since the circuit breaker trip and if there is no remaining smoke or burning smell.

If an emergency procedure requires a circuit breaker to be reset, this means to open (pull out) the circuit breaker, wait for approx. 2 seconds and then close (push in) the circuit breaker. If a circuit breaker is found open, reset means close the circuit breaker.

3.1.1 CREW ALERTING SYSTEM

The Crew Alerting System (CAS) gives:

RED Warning messages which require immediate corrective action by the pilot.

AMBER Caution messages which requires the pilots attention but not an immediate action.

CYAN Advisory messages which indicate a system condition, which requires pilot awareness and may require action.

WHITE Status messages which are only shown on the ground and indicate a maintenance action is required.

Whenever a red or amber message illuminates on the Systems Multi Function Display (MFD), the MASTER WARNING or CAUTION lamp will illuminate.
A triple chime will sound, a voice callout will be given with some red annunciations in place of the triple chime. A single chime will sound with all amber messages.

CAS warnings and cautions will remain illuminated as long as the initiating condition exists. The MASTER WARNING and CAUTION lamps should be pressed to reset them for further failures once the failure is identified.

3.1.2 FLIGHT ALERTING SYSTEM

Flight Alerting System (FAS) messages are given when necessary on the pilot's PFD to warn of a condition that requires immediate action from the pilot. FAS messages are directly related to the operation of the aircraft. All the FAS messages are accompanied by a voice callout and can only be cancelled by correcting the aircraft condition.

3.1.3 FAS MESSAGES AND ACTIONS

FAS MESSAGE TEXT	**AURAL MESSAGE**	**REQUIRED ACTION**
STALL	Stall	Reduce AOA
GEAR	Gear	Extend Landing Gear
CAB PRESS (on ground only)	Cabin	Check Systems MFD ENVIRONMENT window, if shows $\Delta P \geq$ 0.072 psi: CPCS CABIN PRESSURE switch DUMP
NO TAKEOFF	No Takeoff	Check aircraft configuration is correct for Takeoff: Flaps — Set 15° or 30° CL — Set Flight Idle Aileron, Rudder, Stabilizer Trim — Set green range
OVERSPEED	Speed	Reduce airspeed

3.2 AIRSPEEDS FOR EMERGENCY OPERATIONS

All airspeeds shown are with airplane in clean configuration under ISA conditions.

A. Operating Maneuvering Speed (V_O):

10450 lb (4740 kg)	166 KIAS
9921 lb (4500 kg)	161 KIAS
9480 lb (4300 kg)	158 KIAS
9039 lb (4100 kg)	154 KIAS
8380lb (3800 kg)	148 KIAS
7940 lb (3600 kg)	144 KIAS
7500 lb (3400 kg)	140 KIAS
7060 lb (3200 kg)	136 KIAS
6610 lb (3000 kg)	132 KIAS
6170 lb (2800 kg)	127 KIAS
5730 lb (2600 kg)	123 KIAS

B. Best Glide (Propeller feathered):

10450 lb (4740 kg)	119 KIAS
9920 lb (4500 kg)	116 KIAS
9040 lb (4100 kg)	110 KIAS
8160 lb (3700 kg)	105 KIAS
7280 lb (3300 kg)	99 KIAS
6400 lb (2900 kg)	93 KIAS

C. Landing Approach Speeds with ice accretion on the airframe:

After failure of:	Minimum Approach Speed:
Pneumatic Deice Boots (flap position limit 0°)	130 KIAS
AOA Probe Deice and/or	105 KIAS
Pitot and Static Probe Deice and/or	105 KIAS
Pusher Ice Mode (flap position limit 15°)	105 KIAS

D. Balked Landing (Go Around)

After failure of:

Pneumatic Deice Boots
(flap position limit 0°)

(TO/Pwr, flaps 0°, LG down, Pusher Ice Mode)	130 KIAS

E. For APEX software Build 8 and higher, the Angle of Attack Fast/Slow indicator is replaced by the Dynamic Speed Bug on the Airspeed Tape. Therefore the term “AOA centered” used in this chapter refers to the speed represented by the Dynamic Speed Bug (1.3 V_{STALL}).

3.3 REJECTED TAKEOFF (Not engine related)

1.	**PCL**	**Idle**
2.	**Reverse**	**As required**
3.	**Braking**	**As required**

CAUTION

MSN 1231 - 1942. IF ANY FURTHER TAXIING IS REQUIRED SOFT BRAKE PEDALS AND/OR WHEEL FUSIBLE PLUGS RELEASE MAY OCCUR, DUE TO OVERHEATING.

If the aircraft cannot be stopped on the remaining runway:

4.	**PCL**	**Idle**
5.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
6.	**FUEL EMERG shut off**	**Press latch down and pull lever up**
7.	**MASTER POWER switch**	**EMERGENCY OFF**

After the aircraft has stopped:

8.	**Aircraft**	**Evacuate**

CAUTION

A REJECTED TAKEOFF MAY CAUSE OVERHEATING OF WHEEL AND BRAKE ASSEMBLY COMPONENTS. THE MAIN WHEELS AND BRAKES SHOULD BE INSPECTED FOR DAMAGE IN ACCORDANCE WITH THE RESPECTIVE COMPONENT MANUALS BEFORE THE NEXT FLIGHT.

END

3.4 ENGINE FAILURE

3.4.1 ENGINE FAILURE BEFORE ROTATION

1.	**PCL**	**Idle**
2.	**Braking**	**As required**

If runway overrun or collision is likely, then:

3.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
4.	**FUEL EMERG shut off**	**Press latch down and pull lever up**
5.	**MASTER POWER switch**	**EMERGENCY OFF**

After the aircraft has stopped:

6.	**Aircraft**	**Evacuate**

END

3.4.2 ENGINE FAILURE AFTER ROTATION - LANDING GEAR DOWN

A. If total power loss:

If altitude is not sufficient to select a runway or field:

1.	**Aircraft**	**Land straight ahead, turning only to avoid obstructions (maximum recommended bank angle 30° L/R)**
2.	**Flaps**	**40°**
3.	**Final Approach Speed for 10450 lb (4740 kg)**	**88 KIAS. AOA centered**
4.	**PCL**	**Idle**
5.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
6.	**FUEL EMERG shut off**	**Press latch down and pull lever up**

After touch down:

7.	**MASTER POWER switch**	**EMERGENCY OFF**

After the aircraft has stopped

8.	**Aircraft**	**Evacuate**

B. If partial power loss refer to 3.4.4

END

3.4.3 ENGINE FAILURE AFTER ROTATION - LANDING GEAR UP

A. If total power loss:

1.	**Landing Gear**	**Down, if landing site allows, otherwise keep landing gear up**	
2.	**Flaps**	**40°**	
3.	**Final Approach Speed for 10450 lb (4740 kg)**	**101 KIAS** **91 KIAS** **88 KIAS**	**Flaps 15°** **Flaps 30°** **Flaps 40°**
4	**PCL**	**Idle**	
5.	**CONDITION LEVER**	**CUT-OFF/FEATHER**	
6.	**FUEL EMERG shut off**	**Press latch down and pull lever up**	

After touch down:

7.	**MASTER POWER switch**	**EMERGENCY OFF**

After the aircraft has stopped:

8.	**Aircraft**	**Evacuate**

B. If partial power loss refer to 3.4.4.

END

3.4.4 ENGINE FAILURE IN FLIGHT - PARTIAL POWER LOSS

Indications: Un-commanded engine power reduction.

No response to PCL movement.

NOTE

Below NG 58% the ACS will go off. At approx NG 35% both generators will go off-line.

1.	**PCL**	**Idle**
2.	**Manual Override Lever**	**Pull upwards and move slowly forward until engine responds, wait and let engine stabilize**

If engine compressor stalls and/or ITT exceeded:

3.	**Manual Override Lever**	**Retard and move very slowly forward**

If Ng falls below 50%:

4.	**Starter**	**Push momentarily**

NOTE

When the starter is engaged both generators will go off-line and Main, AV2, Non Ess, Cabin, GEN 1 and GEN 2 busses go off. Upper MFD and copilots PFD will go blank. 7.5 seconds after NG is > 50% both generators will automatically come on-line and the ACS will come on at NG > 62%.

5.	**Manual Override Lever**	**Move forward to required power (NG > 80%)**
6.	**Aircraft**	**Land as soon as practical**

CAUTION

WHEN MOR IS IN OPERATION, DO NOT PERMIT NG TO FALL BELOW 75% AND OBSERVE ENGINE LIMITATIONS.

In descent and until touch down:

7.	**Manual Override Lever**	**Maintain at least 75% Ng**

WARNING

DEPENDING ON AIRFIELD CONDITIONS AND AIRCRAFT WEIGHT AND CONFIGURATION, THE AVAILABLE POWER MIGHT NOT BE SUFFICIENT TO ENSURE A GO AROUND.

After touch down:

8.	**CONDITION LEVER**	**CUT-OFF/FEATHER**

WARNING

DO NOT MOVE PCL AFT OF IDLE DETENT.

TOTAL LANDING DISTANCE IS INCREASED BY A FACTOR OF 2.

CAUTION

DO NOT USE MOR ON GROUND FOR TAXIING.

NOTE

For complete MOR description and operation refer to Section 7 Manual Override Lever.

END

3.4.5 ENGINE FAILURE IN FLIGHT – TOTAL POWER LOSS

1.	**Autopilot**	**Use SPD (best glide speed) and HDG/T or NAV mode** **Best glide (propeller feathered):**	
		10,450 lb (4740 kg)	**119 KIAS**
		9,920 lb (4500 kg)	**116 KIAS**
		9,040 lb (4100 kg)	**110 KIAS**
		8,160 lb (3700 kg)	**105 KIAS**
		7,280 lb (3300 kg)	**99 KIAS**
		6,400 lb (2900 kg)	**93 KIAS**
2.	**PCL**	**Idle**	
3.	**CONDITION LEVER**	**CUT-OFF/FEATHER**	
4.	**Aircraft**	**Proceed to nearest airfield or landing site avoiding high terrain**	
5.	**Remaining fuel**	**Check**	
6.	**Aircraft**	**Carry out Air Start (refer to 3.5)**	

If cabin altitude is above 10,000 ft:

7.	**Aircraft**	**Make an Emergency Descent (refer to Sect. 3.8)**

If engine air start is not successful:

8.	**Aircraft**	**Make a forced Landing (refer to 3.9.2)**

END

3.5 AIR START

3.5.1 AIR START ENVELOPE

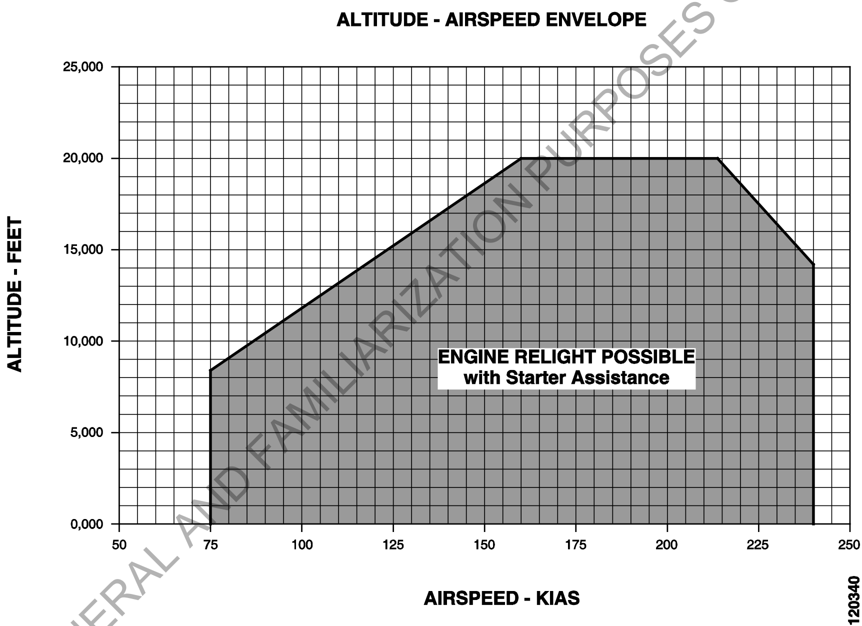


Figure 3-1. Relight Envelope

3.5.2 AIR START - WITH STARTER

WARNING

DO NOT ATTEMPT MORE THAN ONE AIR START. REPEATED AIR START ATTEMPTS COULD DISCHARGE THE BATTERY TO A LEVEL THAT WOULD NOT BE ABLE TO SUPPORT ESSENTIAL ELECTRICAL SERVICES.

1.	**PCL**	**Idle**
2.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
3.	**FUEL EMERG shut off**	**Full in**
4.	**BAT 1 and BAT 2 switches**	**ON**
5.	**Air start envelope**	**Check**
6.	**IGNITION switch**	**ON**
7.	**STARTER**	**Push momentarily**
8.	**CONDITION LEVER (NG >13%)**	**FLIGHT IDLE**
9.	**ITT and NG**	**Monitor**

When engine has relit NG >60%:

10.	**IGNITION switch**	**AUTO**
11.	**FUEL PUMP switches**	**AUTO**
12.	**GEN 1 and 2**	**Check volts and amps**
13.	**Electrical Equipment**	**As required**

If air start is unsuccessful:

14.	**Aircraft**	**Make a Forced Landing (refer to. 3.9.2)**

END

3.6 ENGINE EMERGENCIES

3.6.1 PROPELLER - LOW PITCH

Indication: CAS warning - Propeller Low Pitch and voice callout "Propeller Low Pitch"

1.	**PCL**	**Ensure forward of idle detent.**

If it is not possible to maintain speed and height:

2.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
3.	**Aircraft**	**Emergency Descent (Sect. 3.8) and landing (Sect. 3.9) procedures**

END

3.6.2 ENGINE NP

Indication: CAS warning or caution - Engine NP

A. ON GROUND IMMEDIATELY AFTER ENGINE START

1.	**NP**	**Check NP RPM indication**

If propeller RPM is below 950:

2.	**Select as convenient either:**	
	CONDITION LEVER	**FLIGHT IDLE**
	or	
	ELECTRICAL HEAT/COOL	**INHIBIT**
	or	
	ACS BLEED AIR	**INHIBIT**
	or	
	PCL	**Retard aft of idle detent until NP is above 950 rpm**

B. ON GROUND

1.	**NP**	**Check NP RPM indication**

If propeller RPM is below 930:

2.	**PCL**	**Retard aft of idle detent or increase power until NP is above 950 rpm**

If propeller RPM is above 1760:

3.	**PCL**	**Reduce power**

C. IN FLIGHT

1.	**NP**	**Check NP RPM indication**

If propeller RPM is below 1640:

2.	**PCL**	**Increase power**
3.	**Aircraft speed**	**Increase**

If propeller RPM is above 1760:

4.	**PCL**	**Reduce power**
5.	**Aircraft speed**	**Reduce**

If NP remains between 1760 and 1870 RPM

6.	**Aircraft**	**Continue flight, at low aircraft speed, using minimum possible power.**

If NP is above 1870 RPM:

7.	**PCL**	**Reduce power (to idle if necessary)**
8.	**Aircraft speed**	**Reduce to 120 KIAS or below**
9.	**Aircraft**	**Land as soon as possible, using minimum power. If possible always retain glide capability, to the selected landing airfield, in case of total propeller failure**

END

3.6.3 ENGINE NG

Indication: CAS warning or caution - Engine NG

1.	**NG**	**Check NG % indication**

If NG is above 103.5%:

2.	**PCL**	**Reduce power**

If NG is above 104%:

3.	**PCL**	**Reduce power**
4.	**Aircraft speed**	**Reduce to 120 KIAS or below**
5.	**Aircraft**	**Land as soon as possible, using minimum power. If possible always retain glide capability, to the selected landing airfield, in case of total engine failure**

If NG is below 60%:

A. ON GROUND IMMEDIATELY AFTER ENGINE START

1.	**Select as convenient either**	
	CONDITION LEVER	**FLIGHT IDLE**
	or	
	ELECTRICAL HEAT/COOL	**INHIBIT**
	or	
	ACS BLEED AIR	**INHIBIT**

B. IN FLIGHT

1.	**PCL**	**Increase power**
2.	**Aircraft speed**	**Increase**

If engine does not respond to PCL inputs:

3.	**Aircraft**	**Carry out Engine Failure in Flight – Partial Power Loss procedure (Sect. 3.4.4)**

END

3.6.4 ENGINE TORQUE

Indication: CAS warning or caution - Engine Torque

1.	**TORQUE**	**Check torque indication**

If torque above 44.3 psi

2.	**PCL**	**Reduce power**

If torque CAS warning or caution remains:

3.	**Aircraft**	**Land as soon as possible, using minimum power. If possible always retain glide capability, to the selected landing airfield, in case of total engine failure**

END

3.6.5 ENGINE ITT

Indication: CAS warning or caution - Engine ITT

1.	**ITT**	**Check ITT indication**

If ITT above 850° C:

2.	**PCL**	**Reduce power**

If ITT warning or caution remains:

3.	**Aircraft**	**Land as soon as possible, using minimum power. If possible always retain glide capability, to the selected landing airfield, in case of total engine failure**

END

3.6.6 ENGINE OIL PRESSURE

Indication: CAS warning or caution - Engine Oil Press

1.	**Oil**	**Check OIL P PSI indication**

If oil pressure warning or caution is confirmed:

2.	**NG**	**Check NG above 72 %**
3.	**Torque**	**Reduce to below 24 PSI**

If oil pressure warning or caution remains:

4.	**Aircraft**	**Land as soon as possible, using minimum power. If possible always retain glide capability, to the selected landing airfield, in case of total engine failure**

END

3.6.7 ENGINE OIL TEMPERATURE

Indication: CAS warning or caution - Engine Oil Temp

A. ON GROUND

1.	**Oil**	**Check OIL T °C indication**

If oil temperature is high:

2.	**Aircraft**	**Position into wind**
3.	**CONDITION LEVER**	**FLIGHT IDLE**
4.	**PCL**	**Increase power**

If oil temperature does not return to normal:

5.	**ELECTRICAL HEAT/COOL switch**	**INHIBIT**

If Engine Oil Temp warning or caution remains:

6.	**Engine**	**Shut down engine. Maintenance required.**

If oil temperature is low (below -40°C):

7.	**Engine**	**Do not start. Preheating is required.**

If oil temperature is -40°C or above

8.	**PCL**	**Use low power settings until oil temperature is above 10°C.**

B. IN FLIGHT

1.	**Oil**	**Check OIL T °C indication**

If oil temperature is high:

2.	**PCL**	**Reduce power**

If oil temperature does not return to normal:

3.	**Landing gear**	**Extend**

If Engine Oil Temp warning or caution remains:

4.	**Aircraft**	**Land as soon as practical.**

After landing:

5.	**Engine**	**Shut down engine. Maintenance required.**

END

3.6.8 ENGINE STARTER ENGAGED

Indication: CAS warning - Starter Engaged

A. ON GROUND (during an engine start)

1.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
2.	**START INTERRUPT switch**	**Push**
3.	**BAT 1 and BAT 2 switches**	**OFF**
4.	**EXT PWR (if available)**	**OFF**
5.	**Aircraft**	**Maintenance action required**

B. IN FLIGHT (following an air start):

1.	**BUS TIE circuit breaker (Electrical Power Management panel)**	**Pull**
2.	**STARTER circuit breaker (Essential Bus $_L$L1)**	**Pull**
3.	**GEN 1 and GEN 2 switches**	**OFF**

If Starter Engaged warning extinguished:

4.	**GEN 1 and GEN 2 switches**	**RESET then ON**
5.	**BUS TIE circuit breaker (Electrical Power Management panel)**	**Reset**

If Starter Engaged warning remains:

6.	**BAT 2 switch**	**OFF**
7.	**GEN 1 switch**	**RESET then ON**
8.	**BAT 1 switch**	**Check, ON**

NOTE

The CAS Starter Engaged warning will remain on.

END

3.6.9 ENGINE OIL LEVEL ON GROUND

Indication: CAS warning - Engine Oil Level

Condition: Low engine oil level on ground.

1.	**Engine**	**Servicing required as per POH Section 4.3.4.B step 10**

END

3.6.10 ENGINE OIL CHIP

Indication: CAS caution - Engine Chip

A. ON GROUND: Before engine start:

1.	**Do not start engine.**	**Maintenance required.**

B. ON GROUND: After engine start or after landing:

1.	**Aircraft**	**Return to parking area.**
2.	**Engine**	**Shut down engine.**

Maintenance required:

3.	**Engine**	**Inspect chip detectors and engine, as required.**

C. IN FLIGHT

1.	**Aircraft**	**Check and monitor engine parameters.**
2.	**PCL**	**Reduce power to minimum required for safe flight.**
3.	**Aircraft**	**Land as soon as practical**

After landing, maintenance required:

4.	**Engine**	**Inspect chip detectors and engine, as required.**

END

3.6.11 ENGINE OIL DEBRIS

(If ODM is installed, MSN 545, 1001-1100 Pre SB 79-007)

Indication: CAS caution - Engine Oil Debris

1.	**Engine**	**Check and monitor engine parameters.**
2.	**PCL**	**Reduce power to minimum required for safe flight.**
3.	**Aircraft**	**Land as soon as practical**

After landing, maintenance required:

4.	**Engine**	**Inspect engine (P&WC EMM) and reset chip counter.**

END

3.7 FIRE, SMOKE OR FUMES

3.7.1 FIRE DETECT

Indication: CAS caution – Fire Detector

Condition: A fault in the Fire detection system has occurred.

A. ON GROUND

1.	**Engine**	**Do not start engine, shut down engine.**
2.	**Engine**	**Maintenance action required.**

B. IN FLIGHT

1.	**Engine**	**Check indications**
2.	**Aircraft**	**Land as soon as practical**

END

3.7.2 ENGINE FIRE

Indication: CAS warning - Engine Fire and voice callout “Fire”. Possible smoke and/or fumes.

A. ON GROUND

1.	**PCL**	**Idle**
2.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
3.	**ACS EMER shut off**	**Pull**
4.	**FUEL EMER shut off**	**Press latch down and pull lever up**
5.	**Radio**	**Emergency call**
6.	**MASTER POWER switch**	**OFF**
7.	**Parking brake**	**OFF (if possible)**
8.	**Aircraft**	**Evacuate**
9.	**Fire**	**Extinguish**

B. IN FLIGHT

1.	**Engine Power**	**Reduce to minimum acceptable according to flight situation.**
2.	**ACS EMER shut off**	**Pull**

3.	**Main OXYGEN lever**	**Confirm ON**
4.	**Crew oxygen masks and smoke goggles (if equipped)**	**ON**

Procedure to don the crew oxygen masks

- **a. Remove the normal headset.**
- **b. Put the oxygen mask on.**
- **c. Put the smoke goggles on.**
- **d. Put the normal headset back on.**
- **e. Set MIC SELECT switch on the rear left panel to MASK.**

5.	**Crew Oxygen**	**EMGCY**
	If smoke goggles worn	
	a. Vent valve	**OPEN**
6.	**PASSENGER OXYGEN selector**	**ON**
7.	**Systems MFD PAX OXY advisory**	**Confirm on**
8.	**Passengers**	**Instruct to don masks**
9.	**Aircraft**	**Check fire**

If confirmed that fire exists:

a.	**FUEL EMER shut off**	**Press latch down and pull lever up**
b.	**CONDITION LEVER**	**CUT-OFF/FEATHER**

If smoke evacuation is required:

a.	**ACS EMERG shut off**	**PULL**
b.	**CABIN PRESSURE switch**	**DUMP**

When cabin differential pressure is zero:

c.	**DV window**	**Open**
d.	**FANS VENT switch**	**LOW**
10.	**Aircraft**	**Carry out Emergency Descent (Sect. 3.8) and/or Emergency Landing (Sect. 3.9) procedures**

END

3.7.3 COCKPIT/CABIN FIRE, SMOKE OR FUMES, SMOKE EVACUATION

1. **Main OXYGEN lever** — **Confirm ON**
2. **Crew oxygen masks and smoke goggles (if equipped)** — **ON**

   Procedure to don the crew oxygen masks

   a. **Remove the normal headset.**
   b. **Put the oxygen mask on.**
   c. **Put the smoke goggles on.**
   d. **Put the normal headset back on.**
   e. **Set MIC SELECT switch on the rear left panel to MASK.**
3. **Crew Oxygen** — **EMGCY**

   If smoke goggles worn

   a. **Vent valve** — **OPEN**
4. **PASSENGER OXYGEN selector** — **ON**
5. **Systems MFD PAX OXY advisory** — **Confirm on**
6. **Passengers** — **Instruct to don masks**
7. **Aircraft** — **Initiate descent to below 10,000 ft or to minimum safe altitude if higher**
8. **Aircraft** — **Proceed to nearest Airfield**

If smoke evacuation is required:

   a. **ACS EMER shut off** — **Pull**
   b. **CABIN PRESSURE switch** — **DUMP**

   When cabin pressure differential is zero:

   c. **DV window** — **Open**
   d. **VENT FANS** — **LOW**

9. **Fire Extinguisher** — **Use if required**

As soon as time permits and source is known electrical:

10. **Associated electrical equipment** — **Off (circuit breakers)**

WARNING

DO NOT PULL THE FOLLOWING CIRCUIT BREAKERS ASSOCIATED WITH THE AUXILIARY HEATING SYSTEM:

COND HTR CTL
CABIN FAN
U/F FAN

If smoke/fumes still persist and source is suspected electrical:

11.	**BUS TIE circuit breaker (overhead panel)**	**Pull**
12.	**GEN 2 switch**	**OFF**
13.	**BAT 2 switch**	**OFF**
14.	**CABIN HEATER, circuit breaker 1 (LHPJB)**	**Pull**

If smoke/fumes still persist and source is suspected electrical:

15.	**Aircraft**	**Attempt to regain VMC conditions if possible.**
16.	**EPS switch**	**CHECK ARMED**

Commence flying with reference to the ESIS

17.	**GEN 1 switch**	**OFF**
18.	**BAT 1 switch**	**OFF**

If smoke/fume still persist and source is suspected electrical:

19.	**MASTER POWER switch**	**EMERGENCY OFF**

Refer to Emergency Landing Gear lowering procedures (Sect. 3.10.3).

END

3.8 EMERGENCY DESCENT

3.8.1 GENERAL

The type of emergency descent will depend on the kind of failure and the aircraft situation.

Two types of descent are considered:

1. Engine failure, aircraft flown for maximum range.
2. Engine running, maximum descent rate.

The factors to be considered are:

- i) Cabin altitude and oxygen duration.
- ii) Electrical power endurance.
- iii) Distance to suitable landing area.
- iv) Flight conditions IMC, VMC, ICING.
- v) Minimum safe altitude.
- vi) Fuel reserves.

The pilot must consider the situation and priorities and adjust his actions accordingly.

3.8.2 MAXIMUM RANGE DESCENT - AFTER ENGINE FAIL

1.	**PCL**	**Idle**
2.	**CONDITION LEVER**	**CUT-OFF/FEATHER (to feather propeller)**
3.	**Aircraft configuration**	**Landing gear up and flaps to 0°.**

CAUTION

IF LANDING GEAR AND OR FLAPS ARE EXTENDED GLIDE RANGE WILL BE SEVERELY REDUCED. RETRACTING LANDING GEAR AND FLAPS WILL REDUCE BATTERY ENDURANCE SIGNIFICANTLY AND MAY PREJUDICE SUBSEQUENT FLAPS LOWERING. ADAHRS AND APEX DISPLAYS MAY FAIL DURING LANDING GEAR/FLAP OPERATION.

4.	**Airspeed**	**119 KIAS for 10450 lb (4740 kg)** **116 KIAS for 9920 lb (4500 kg)** **110 KIAS for 9040 lb (4100 kg)** **105 KIAS for 8160 lb (3700 kg)** **99 KIAS for 7280 lb (3300 kg)** **93 KIAS for 6400 lb (2900 kg)** **137 KIAS in icing conditions**
5.	**All occupants**	**Check seat lap and shoulder belts are fastened and the lap belt tightened**
6.	**Main OXYGEN lever**	**Confirm ON**
7.	**Crew oxygen masks**	**Prepare. Put on before cabin altitude exceeds 10,000 ft.**

If cabin altitude exceeds 10,000 ft:

Procedure to don the crew oxygen masks:

- **a.** **Remove the normal headset.**
- **b.** **Put the oxygen mask on. Check 100%.**
- **c.** **Put the smoke goggles on.**
- **d.** **Put the normal headset back on.**
- **e.** **Set MIC SELECT switch on the rear left panel to MASK.**

8.	**PASSENGER OXYGEN selector**	**ON. Check contents. Calculate Oxygen duration**
9.	**Systems MFD PAX OXY advisory**	**Confirm ON**
10.	**Passengers**	**Instruct to don masks**
11.	**Electrical load**	**Monitor battery amps**

CAUTION

MONITOR BAT 1 AND BAT 2 AMPS. IF ONE INDICATION IS POSITIVE, SWITCH OFF AFFECTED BATTERY. AFTER 5 MINS BATTERY CAN BE SWITCHED ON AGAIN. IF INDICATION STILL POSITIVE SWITCH BATTERY OFF.

NOTE

During extended glide period engine low oil quantity warning may appear - disregard for air start.

12.	**Engine**	**Restart as soon as possible (if applicable) (Refer to 3.5.1)**

If engine restart was not successful or not applicable:

13.	**Rate of descent**	**Adjust to achieve cabin altitude of 10,000 ft before oxygen supply exhausted.**

Below 10,000 ft:

14.	**ACS EMER shut off**	**Pull (cabin ventilation)**
15.	**Aircraft**	**Carry out Forced Landing procedure (Sect. 3.9.2).**

END

3.8.3 MAXIMUM RATE DESCENT

1.	**PCL**	**IDLE**
2.	**Landing gear**	**Below 180 KIAS, down**
3.	**Aircraft speed**	**M_{MO}/V_{MO}**
4.	**All occupants**	**Check seat lap and shoulder belts are fastened and the lap belt tightened.**
5.	**Main OXYGEN lever**	**Confirm ON**
6.	**Crew oxygen masks**	**Prepare. Put on before cabin altitude exceeds 10,000 ft.**

If cabin altitude exceeds 10,000 ft:

Procedure to don the crew oxygen masks:

a. **Remove the normal headset.**

b. **Put the oxygen mask on. Check 100%.**

c. **Put the smoke goggles on.**

d. **Put the normal headset back on.**

e. **Set MIC SELECT switch on the rear left panel to MASK.**

7.	**PASSENGER OXYGEN selector**	**ON. Check contents. Calculate Oxygen duration**
8.	**Systems MFD PAX OXY advisory**	**Confirm ON**
9.	**Passengers**	**Instruct to don masks**

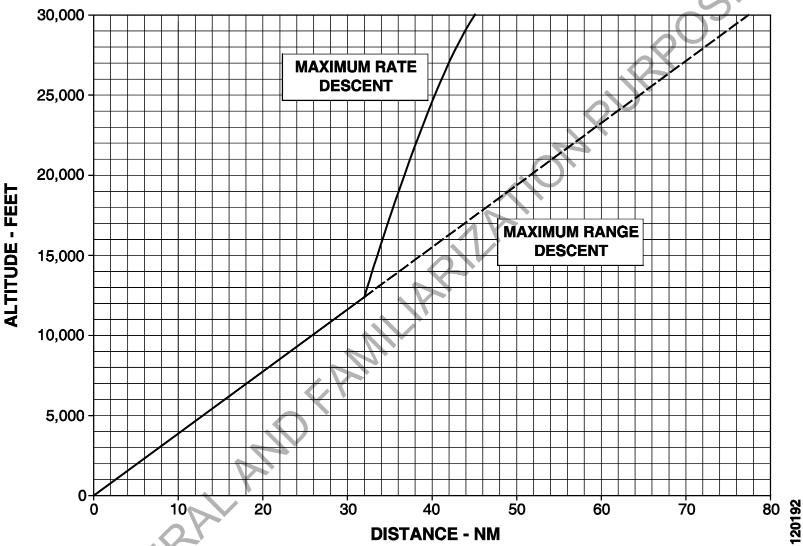
CAUTION

IN TURBULENCE REDUCE SPEED TO 170 KIAS

10.	**Left windshield heat**	**As required**

END

EMERGENCY DESCENT PROFILES



3.9 EMERGENCY LANDING

3.9.1 GLIDE DISTANCE AND SPEED

Configuration:

1.	**Landing gear**	**UP**
2.	**Flaps**	**0°**
3.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
4.	**Best glide speed**	**119 KIAS for 10450 lb (4740 kg)** **116 KIAS for 9920 lb (4500 kg)** **110 KIAS for 9040 lb (4100 kg)** **105 KIAS for 8160 lb (3700 kg)** **99 KIAS for 7280 lb (3300 kg)** **93 KIAS for 6400 lb (2900 kg)**

NOTE

Two fully charged batteries will last for 33 minutes with the Automatic Load Shedding.

END

3.9.2 FORCED LANDING (ENGINE CUT-OFF/FEATHER)

1.	**PCL**	**Idle**
2.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
3.	**FUEL EMERG shut off**	**Pull**
4.	**CABIN PRESSURE switch**	**DUMP**
5.	**Best glide speed**	**119 KIAS for 10450 lb (4740 kg)** **116 KIAS for 9920 lb (4500 kg)** **110 KIAS for 9040 lb (4100 kg)** **105 KIAS for 8160 lb (3700 kg)** **99 KIAS for 7280 lb (3300 kg)** **93 KIAS for 6400 lb (2900 kg)**
6.	**Seat backs**	**Upright**
7.	**Seat belts**	**Fastened. Tighten lap straps**
8.	**Passengers**	**Brief. Instruct to sit upright**
9.	**ELT**	**Set to ON**

If landing site allows:

a.	**Landing gear**	**DOWN**

If landing site not suitable for gear down landing:

	a. Landing gear	**Keep UP**
	b. Flaps	**40°**
10.	**Final approach speed**	**88 KIAS for 10450 lb (4740 kg). AOA centered**

After touch down:

11.	**MASTER POWER switch**	**EMERGENCY OFF**

After the aircraft has stopped:

12.	**Aircraft**	**Evacuate**

- - - - - - - - - - - - - - - - **END** - - - - - - - - - - - - - - - -

3.9.3 LANDING WITH MAIN LANDING GEAR UNLOCKED

1.	**Aircraft**	**Confirm landing gear position by control tower or other aircraft.**

NOTE

It is possible to verify the down position of the right main landing gear from the rear right cabin window.

CAUTION

IF ONE MAIN LANDING GEAR IS NOT DOWN, IT IS RECOMMENDED TO LAND WITH GEAR UP.

If failed gear is down but not locked:

2.	**Fuel weight**	**Reduce**
3.	**Passengers**	**Brief**
4.	**Flaps**	**40°**
5.	**Final approach speed**	**88 KIAS for 10450 lb (4740 kg). AOA centered**
6.	**Touchdown**	**Gently, avoid sideslip during touchdown**
7.	**Landing**	**Lower nose wheel immediately to maintain lateral control.**
8.	**Roll out**	**Use full aileron during roll-out to lift the wing with the failed landing gear**

9.	**PCL**	**Idle**
10.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
11.	**MASTER POWER switch**	**EMERGENCY OFF**

After the aircraft has stopped:

12.	**Aircraft**	**Evacuate**
13.	**Aircraft**	**Do not taxi the aircraft before deficiency is rectified.**

END

3.9.4 LANDING WITH NOSE LANDING GEAR UNLOCKED

1.	**Passengers**	**Brief**
2.	**Flaps**	**40°**
3.	**Final approach speed**	**88 KIAS for 10450 lb (4740 kg). AOA centered**
4.	**Landing**	**Land on main wheels, keep nose high**
5.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
6.	**MASTER POWER switch**	**EMERGENCY OFF**
7.	**Landing**	**Lower nose wheel slowly**
8.	**Aircraft**	**Avoid braking**

After the aircraft has stopped:

9.	**Aircraft**	**Evacuate**

END

3.9.5 LANDING WITH GEAR UP

1.	**Passengers**	**Brief**
2.	**Approach**	**Standard**
3.	**Flaps**	**40°**
4.	**Final approach speed**	**88 KIAS for 10450 lb (4740 kg). AOA centered**
5.	**CABIN PRESSURE Switch**	**DUMP**

When runway is assured:

6.	**PCL**	**Idle**
7.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
8.	**FUEL EMERG shut off**	**Pull**
9.	**Aircraft**	**Flare out**

After touch down:

10.	**MASTER POWER switch**	**EMERGENCY OFF**

After the aircraft has stopped:

11.	**Aircraft**	**Evacuate**

END

3.9.6 LANDING WITHOUT ELEVATOR CONTROL

1.	**Passengers**	**Brief**
2.	**Landing gear**	**Down**
3.	**Flaps**	**40°**
4.	**Final approach speed**	**90 KIAS**
5.	**Power**	**Set power as necessary to maintain speed and 300 to 500 ft/min rate of descent.**
6.	**Aircraft**	**Use stab trim to adjust pitch.**

When closing to ground:

7.	**Aircraft**	**Reduce Rate of Descent by increasing pitch and/or power.**
8.	**Power**	**Reduce power progressively.**

WARNING

STALLS ARE NOT PROTECTED WITH THE STICK PUSHER INOPERATIVE.

STALLS MUST BE AVOIDED WHEN THE STICK PUSHER IS INOPERATIVE. EXCESSIVE WING DROP AND ALTITUDE LOSS MAY RESULT DURING STALL WITH FLAPS DOWN AND/OR WHEN POWER IS APPLIED.

END

3.9.7 LANDING WITH IMMOBILIZED HORIZONTAL STABILIZER

1.	**Aircraft**	**Fly at indicated airspeed which reduces elevator forces to minimum.**
2.	**Flaps**	**At a safe altitude select flap required for landing**
3.	**Landing**	**Land using normal procedures holding elevator forces**

END

3.9.8 LANDING WITHOUT FLAPS

1.	**Aircraft**	**Proceed as for normal approach**
2.	**Landing gear**	**DOWN**
3.	**Final approach speed**	**122 KIAS for 10450 lb (4740 kg). AOA centered**
4.	**Landing**	**Normal**
5.	**Reverse**	**As required**
6.	**Braking**	**As required**

CAUTION

LANDING DISTANCE WILL INCREASE BY 80%.

MSN 1231 - 1942. IN THE CASE OF HEAVY BRAKE USAGE, SOFT BRAKE PEDALS AND/OR WHEEL FUSIBLE PLUGS RELEASE MAY OCCUR DURING A FOLLOWING TAXI. LIMITATION IN SECTION 2 APPLIES.

END

3.9.9 DITCHING

1.	**Landing gear**	**UP**

CAUTION

HEAVY SWELL WITH LIGHT WIND, DITCH PARALLEL TO THE SWELL. STRONG WIND, DITCH INTO THE WIND.

2.	**Passengers**	**Brief**
3.	**ELT**	**Set to ON**
4.	**Flaps**	**40°**
5.	**Final approach speed**	**88 KIAS for 10450 lb (4740 kg). AOA centered**
6.	**CABIN PRESSURE switch**	**DUMP**
7.	**PCL**	**Idle**
8.	**CONDITION LEVER**	**CUT-OFF/FEATHER**
9.	**If time permits, CPCS:**	
	a. CABIN PRESSURE switch	**AUTO**
	b. CPCS SYSTEM MODE switch	**MANUAL**
	c. MANUAL CONTROL switch	**Set and hold to DESCENT for 30 sec (to close OFV)**
10.	**FUEL EMERG shut off**	**Press latch down and pull lever up**
11.	**Ditching**	**Ditch with a low rate of descent.**
12.	**MASTER POWER switch**	**EMERGENCY OFF**
13.	**Aircraft**	**Evacuate through the overwing emergency exit only**

END

3.10 LANDING GEAR/HYDRAULIC SYSTEM FAILURE

3.10.1 LANDING GEAR FAILS TO RETRACT

Indication: All Landing Gear Indicator Lights do not change to UP.

If CAS warning - Essential Bus is on:

Condition: Essential Bus voltage is below 22 V.

1. **Aircraft** — **Refer to Electrical System Failures, Essential Bus (Sect. 3.15.2)**

If CAS caution Hydraulics is on:

2. **Aircraft** — **Refer to Emergency Extension (Sect. 3.10.3)**

END

3.10.2 HYDRAULIC SYSTEM FAILURE

Indication: CAS caution - Hydraulics

A. ON GROUND:

After landing: Hydraulic pump has operated more than six times in one hour during flight

1. **Aircraft** — **Maintenance required**

NOTE

If no maintenance facility is available:

The pilot shall visually check the areas around the nose and the two main landing gear actuators for signs of hydraulic fluid leakage. A visual check shall also be done along the belly of the aircraft and in the area of the left hand-hand wing to fuselage fairing. The preflight inspection of the hydraulic system per section 4 of the POH has to be carried out as well. If no irregularities are found and the hydraulic caution is not illuminated anymore after an electrical power cycle, further flight is possible without limitations.

B. IN FLIGHT:

Hydraulic pump has operated for more than 2½ minutes or system pressure has fallen below operational limits.

1. HYD CTL circuit breaker (Essential Bus $_L$C2)	**Pull**
2. Aircraft	**Reduce airspeed below 180 KIAS**

After 200 minutes (3 hrs, 20 mins), landing gear may start to extend.

Before landing:

3. Aircraft	**Refer to Emergency Extension procedure (Sect 3.10.3)**

END

3.10.3 EMERGENCY EXTENSION

Indication: Incorrect Indication on landing gear indicator lights and/or CAS caution - Hydraulics is on. Red unlocked lights on and/or green lights not illuminated.

1.	**Landing gear selector**	**DOWN**
2.	**Airspeed**	**110 KIAS (power idle momentarily)**

If 3 green lights not illuminated within 30 sec:

3.	**Hand pump**	**Activate. Use full strokes, pump until 3 green lights are illuminated. Complete lowering takes about 80 strokes**

If 3 green lights still not illuminated:

4.	**Aircraft**	**Yaw the aircraft left and right to lock the main landing gear.**
5.	**Airspeed**	**Reduce to minimum safe to improve nose gear locking.**

If 3 green lights illuminated:

6.	**Aircraft**	**Land**

If not successful:

7.	**Aircraft**	**Carry out Emergency Landing (Sect. 3.9.3 to 3.9.5)**

END

3.11 FLAPS FAILURE

A. FAILURE ON GROUND

Indication: CAS caution - Flaps

Condition: Flap system failed.

1.	**FLAP circuit breaker (LH Rear $_L$P4)**	**Check circuit breaker**

If tripped:

2.	**FLAP circuit breaker (LH Rear $_L$P4)**	**Wait 5 minutes, reset circuit breaker (max. 2 attempts) and continue normal operation if CAS caution goes off**

If not tripped:

3.	**FLAP RESET switch (on maintenance panel, right sidewall behind copilot seat)**	**Push (max. 1 attempt)**

If unsuccessful:

4.	**Aircraft**	**No flight permitted. Maintenance action required**

B. FAILURE IN FLIGHT

Indication: CAS caution - Flaps

Condition: Flap system failed.

1.	**FLAP circuit breaker (LH Rear $_L$P4)**	**Check circuit breaker**

If tripped:

2.	**FLAP circuit breaker (LH Rear $_L$P4)**	**Wait 5 minutes, reset circuit breaker (max. 2 attempts) and continue normal operation if CAS caution goes off**

If unsuccessful:

3.	**Aircraft**	**Land with flaps at the failed position**

C. FAILURE IN FLIGHT - WITH POTENTIAL FLAP ASYMMETRY

Indication: CAS cautions – “Flaps” shortly followed by “Pusher” and “Pusher Safe Mode” advisory illuminating.

Condition: Flap system failed asymmetrically and stick pusher remains available in “safe” mode.

CAUTION

THE APPROACH SPEED MUST BE INCREASED FOR INDICATED FLAP POSITION 12˚ OR GREATER. NO SPEED INCREASE IS NEEDED IF THE FLAP POSITION IS LESS THAN 12˚.

1.	**Airspeed**	**Reduce to below 121 KIAS for indicated flaps position 30° or greater**
2.	**Aircraft**	**Land as soon as practical - with flaps at the failed position.**
3	**Approach**	**For indicated flaps position 12˚ or greater:** **Build 6 and 7** **Approach using PFD Angle of Attack display at the fast diamond.** **Build 8 and higher** **Approach at approximately 10 knots above AOA based Dynamic Speed Bug in PFD (1.3 V_{STALL}).**

CAUTION

LANDING DISTANCE WILL INCREASE.

MSN 1231 - 1942. WHEELS AND BRAKES MAY OVERHEAT. LIMITATION IN SECTION 2 APPLIES.

END

3.12 STICK PUSHER FAILURE

Indication: CAS caution - Pusher

A. ON GROUND

1.	**Pusher Test**	**Carry out**

If PUSHER caution persists:

2.	**Aircraft**	**No flight permitted, maintenance required.**

B. IN FLIGHT

1.	**Pusher Test**	**Carry out**

If Shaker 1 and 2 active and PUSHER caution extinguished:

2.	**Aircraft**	**No further action required**

If Shaker 1 or 2 not active or PUSHER caution persists:

WARNING

THE AIRCRAFT IS NOT STALL PROTECTED

3.	**Airspeed not below 1.3 Vs for 10450 lb (4740 kg)**	**Flaps 0°**	**120 KIAS**
		Flaps 15°	**101 KIAS**
		Flaps 30°	**90 KIAS**
		Flaps 40°	**88 KIAS**

WARNING

STALLS MUST BE AVOIDED WHEN THE STICK PUSHER IS INOPERATIVE. EXCESSIVE WING DROP AND ALTITUDE LOSS MAY RESULT DURING STALL WITH FLAPS DOWN AND/OR WHEN POWER IS APPLIED.

CAUTION

STALL SPEEDS IN TURNS ARE HIGHER.

AOA MAY NOT BE RELIABLE.

If in icing conditions:

4.	**Aircraft**	**Carry out Pusher Ice Mode Failure in Icing Conditions (Sect. 3.18.9)**

END

3.13 INADVERTENT PUSHER/SHAKER OPERATION

3.13.1 PUSHER

Indication: Non-commanded pusher operation, rapid nose pitch-down motion.

NOTE

Control wheel force to stop pusher operation is 60 to 65 pounds.

1.	**Control wheel**	**Hold against pusher action**
2.	**PUSHER INTR switch**	**Press and hold**
3.	**PUSHER SYS GND circuit breaker (RH Rear $_R$P3)**	**Pull**
	and	
4.	**PUSHER SYS circuit breaker (Essential Bus $_L$L3)**	**Pull**
5.	**If shaker continues to operate**	**Carry out the Inadvertent Shaker Operation procedure (Sect. 3.13.2)**

WARNING

THE AIRCRAFT IS NOT STALL PROTECTED.

6.	**Airspeed not below 1.3 Vs for 10450 lb (4740 kg)**	**Flaps 0°**	**120 KIAS**
		Flaps 15°	**101 KIAS**
		Flaps 30°	**90 KIAS**
		Flaps 40°	**88 KIAS**

WARNING

NATURAL STALLS ARE NOT PREVENTED WITH THE STICK PUSHER INOPERATIVE.

STALLS MUST BE AVOIDED WHEN THE STICK PUSHER IS INOPERATIVE. EXCESSIVE WING DROP AND ALTITUDE LOSS MAY RESULT DURING STALL WITH FLAPS DOWN AND/OR WHEN POWER IS APPLIED.

CAUTION

STALL SPEEDS IN TURNS ARE HIGHER.

AOA MAY NOT BE RELIABLE.

7.	**Pusher test**	**Carry out to check shaker availability.**

If Shaker 1 or 2 not active:

WARNING

APPROACHES TO STALLS ARE NOT WARNED AND NATURAL STALLS ARE NOT PREVENTED WITH THE STICK SHAKER INOPERATIVE.

END

3.13.2 SHAKER

Indication: Non-commanded shaker operation.

1.	**AOA**	**Decrease**
2.	**IAS**	**Increase**

If shaker continues to operate:

3.	**STALL WARN 1 circuit breaker (Essential Bus $_{L}$K3)**	**Pull**
4.	**STALL WARN 2 circuit breaker (Main Bus $_{R}$H3)**	**Pull**

WARNING

THE AIRCRAFT IS NOT STALL PROTECTED.

5.	**Airspeed not below 1.3 Vs for 10450 lb (4740 kg)**	**Flaps 0°**	**120 KIAS**
		Flaps 15°	**101 KIAS**
		Flaps 30°	**90 KIAS**
		Flaps 40°	**88 KIAS**

WARNING

APPROACHES TO STALLS ARE NOT WARNED AND NATURAL STALLS ARE NOT PREVENTED WITH THE STICK SHAKER INOPERATIVE.

STALLS MUST BE AVOIDED WHEN THE STICK PUSHER IS INOPERATIVE. EXCESSIVE WING DROP AND ALTITUDE LOSS MAY RESULT DURING STALL WITH FLAPS DOWN AND/OR WHEN POWER IS APPLIED.

CAUTION

STALL SPEEDS IN TURNS ARE HIGHER.

AOA MAY NOT BE RELIABLE.

END

3.14 ELECTRICAL TRIM

3.14.1 PITCH TRIM RUNAWAY

Indications: CAS warning – "Pitch Trim Runaway" and voice callout "Trim Runaway"

1.	**TRIM INTERRUPT switch**	**INTR**
2.	**PITCH TRIM circuit breaker (Essential Bus $_L$A1)**	**Pull**
3.	**TRIM INTERRUPT switch**	**NORM**
	If trim runaway continues:	
4.	**TRIM INTERRUPT switch**	**INTR**
5.	**PITCH TRIM ALTN circuit breaker (Main Bus $_R$A1)**	**Pull**
6.	**PITCH TRIM circuit breaker (Essential Bus $_L$A1)**	**Close**
7.	**TRIM INTERRUPT switch**	**NORM**

NOTE

Reduce speed if control forces are high.

The autopilot will disconnect when Trim Interrupt is operated.
If the pitch trim has failed the autopilot is not operative.

If main stabilizer trim has failed:

8.	**Pitch trim**	**Use ALTERNATE STAB TRIM.**

END

3.14.2 TRIM RUNAWAY

Indication: Non-commanded trim operation, rapidly increasing out of trim forces.

1.	**TRIM INTERRUPT switch**	**INTR**
2.	**Circuit breaker of failed trim**	**Pull** **PITCH TRIM (Essential Bus $_L$A1)** **PITCH TRIM ALTN (Main Bus $_R$A1)** **AIL TRIM (Essential Bus $_L$C1)** **RUD TRIM (Essential Bus $_L$B1)**
3.	**TRIM INTERRUPT switch**	**NORM**

NOTE

Reduce speed if control forces are high.

NOTE

The autopilot will disconnect when TRIM INTERRUPT is operated.

END

3.14.3 NO MAIN STABILIZER TRIM

1.	**TRIM INTERRUPT**	**Check at NORM**
2.	**ALTERNATE STAB TRIM**	**Operate as required**

END

3.14.4 NO STABILIZER TRIM, MAIN OR ALTERNATE

1.	**Aircraft**	**Carry out Landing with Immobilized Horizontal Stabilizer (Sect. 3.9.7)**

END

3.15 ELECTRICAL SYSTEM FAILURES

3.15.1 ELECTRICAL POWER LOSS

Indication: loss of electrical power

1.	**MASTER POWER switch**	**Check ON and guarded**
2.	**BATT and GEN switches**	**Check ON**

If indication remains:

3.	**Aircraft**	**Land as soon as possible**

END

3.15.2 ESSENTIAL BUS

Indication: CAS warning – Essential Bus

Condition: Essential Bus voltage is below 22 V.

1.	**Overhead panel**	**Confirm EPS switch is in ARMED position and EPS ON caption is on**
2.	**Pitch Trim**	**Use ALTERNATE STAB TRIM.**
3.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as possible. Do not fly in icing conditions.**

CAUTION

THE SYSTEMS CONNECTED TO THE ESSENTIAL BUS, ON THE LEFT FORWARD CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

THERE WILL BE NO HYDRAULIC POWER PACK OPERATION. REFER TO SECT 3.10.3 GEAR EMERGENCY EXTENSION.

NOTE

It is possible to verify the down position of the right main landing gear from the rear right cabin window.

END

3.15.3 AVIONICS 1 BUS

Indication: CAS caution – Avionics 1 Bus

Condition: Avionics 1 Bus voltage below 22 V.

1.	**AV 1 BUS switch**	**Confirm set to ON**
2.	**AV 1 circuit breaker (LH Power Junction Box)**	**Confirm set**
3.	**STBY BUS switch**	**Confirm set to ON**

NOTE

The systems connected to the Standby bus on the left rear circuit breaker panel will be operative.

4.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as possible.**

CAUTION

THE SYSTEMS CONNECTED TO THE AVIONIC 1 BUS, ON THE LEFT REAR CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

END

3.15.4 MAIN BUS

Indication: CAS caution – Main Bus

Condition: Main Bus voltage below 22 V.

1.	**MAIN circuit breaker (RH Power Junction Box)**	**Confirm set**
2.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as practical.** **Depart icing conditions to positive SAT atmosphere, if possible.** **Do not fly in icing conditions.**

CAUTION

THE SYSTEMS CONNECTED TO THE MAIN BUS, ON THE RIGHT FORWARD CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

END

3.15.5 GENERATOR 1 BUS

Indication: CAS caution – Generator 1 Bus

Condition: Generator 1 bus voltage below 22 V.

1.	**GEN 1 circuit breaker (LH Power Junction Box)**	**Confirm set**
2.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as practical.**

CAUTION

THE SYSTEMS CONNECTED TO THE GENERATOR 1 BUS, ON THE LEFT REAR CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

END

3.15.6 GENERATOR 2 BUS

Indication: CAS caution – Generator 2 Bus

Condition: Generator 2 bus voltage below 22 V.

1.	**GEN 2 circuit breaker (RH Power Junction Box)**	**Confirm set**
2.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as practical.**

CAUTION

THE SYSTEMS CONNECTED TO THE GENERATOR 2 BUS, ON THE RIGHT REAR CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

END

3.15.7 AVIONICS 2 BUS

Indication: CAS caution – Avionics 2 Bus

Condition: Avionics 2 bus voltage below 22 V.

1.	**AV 2 BUS switch**	**Confirm set to ON**
2.	**AV 2 circuit breaker (RH Power Junction Box)**	**Confirm set**
3.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as practical.**

CAUTION

THE SYSTEMS CONNECTED TO THE AVIONICS 2 BUS, ON THE RIGHT REAR CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

END

3.15.8 STANDBY BUS

Indication: CAS caution – Standby Bus

Condition: Standby bus voltage below 22 V.

1.	**AV 1 BUS and STBY BUS switches**	**Confirm set to ON**
2.	**AV STBY PWR circuit breaker (LH Power Junction Box)**	**Confirm set**
3.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as practical.**

CAUTION

THE SYSTEMS CONNECTED TO THE STBY BUS, ON THE LEFT REAR CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

END

3.15.9 NON ESSENTIAL BUS

Indication: CAS caution – Non Essential Bus

Condition: Non-essential bus voltage below 22 V.

1.	**NON ESS circuit breaker (RH Power Junction Box)**	**Confirm set**
2.	**Aircraft**	**At pilots discretion, continue flight without services of failed bus or land as soon as practical.**

CAUTION

THE SYSTEMS CONNECTED TO THE NON ESSENTIAL BUS, ON THE RIGHT FORWARD CIRCUIT BREAKER PANEL, ARE INOPERATIVE.

END

3.15.10 BUS TIE

Indication: CAS caution – Bus Tie

Condition: BUS TIE in wrong state.

If GEN 1 and GEN 2 switches are ON and volts/amps normal:

1.	**BUS TIE circuit breaker (overhead panel)**	**Pull**

If a generator is off:

2.	**BUS TIE circuit breaker (overhead panel)**	**Check, if tripped**
3.	**BUS TIE circuit breaker (overhead panel)**	**Reset (max. 1 attempt only)**
4.	**Aircraft**	**Land as soon as possible.**

CAUTION

BUSES ARE BEING POWERED ONLY FROM A BATTERY. POSSIBLE BATTERY CURRENT CAUTION.

END

3.15.11 GENERATORS

Indication: CAS warning – Generators

Condition: GEN 1 and GEN 2 are off and engine running.

1.	**Systems MFD – ELECTRICAL window**	**Confirm the failures**
2.	**GEN 1 switch**	**RESET then ON**
3.	**GEN 2 switch**	**RESET then ON**

If generators do not reset (warning remains on):

4.	**Systems MFD – ELECTRICAL window**	**Monitor BAT 1 and BAT 2**
5.	**Aircraft**	**Land as soon as possible. Do not fly in icing conditions.**

NOTE

Two fully charged batteries will last for 33 minutes with the automatic load shedding.

CAUTION

The following buses are automatically load shed (no additional Cautions will be shown) and the systems connected to them will be inoperative:

- Generator 1 bus (Left rear CB panel)
- Main bus (Right forward CB panel)
- Avionic 2 bus (Right rear CB panel)
- Non Essential bus (Right front CB panel)
- Cabin bus (Right rear CB panel)
- Generator 2 bus (Right rear CB panel)

CAUTION

The following high current consumption systems are automatically load shed:

- Cabin Heater
- Under Floor Heater
- RH Windshield De-ice
- Propeller De-ice
- LH AOA Plate Heater
- RH AOA Plate Heater
- VCCS Compressor
- Footwarmer (optional system)
- Logo Lights (optional system)

NOTE

If further load reduction is desired to extend battery endurance beyond 33 minutes, consider manually switching off all exterior lights and if conditions allow all ice protection.

END

3.15.12 GENERATOR 1 OFF

Indication: CAS caution – Generator 1 Off

Condition: GEN 1 is OFF line and engine running.

1.	**Systems MFD – ELECTRICAL window**	**Confirm the failure**
2.	**GEN 1 switch**	**RESET then ON**

If GEN 1 does not reset:

3.	**Aircraft**	**At pilots discretion, continue flight without the services of the load shed systems and buses**

CAUTION

The following systems and buses are automatically load shed (no additional Cautions will be shown) and will not be available:

- Generator 1 bus (Left rear CB panel)
- Non Essential bus (Right front CB panel)
- Cabin bus (Right rear CB panel)

CAUTION

The following high current consumption systems are automatically load shed:

- Cabin Heater
- Under Floor Heater
- VCCS Compressor
- Footwarmer (optional system)
- Logo Lights (optional system)

END

3.15.13 GENERATOR 1 VOLTS

Indication: CAS caution – Generator 1 Volts

Condition: GEN 1 voltage is low or high.

1.	**Systems MFD – ELECTRICAL window**	**Confirm indications**
2.	**GEN 1 switch**	**RESET then ON**

If Generator 1 Volts caution remains

3.	**GEN 1 switch**	**OFF**
4.	**Aircraft**	**At pilots discretion, continue flight without the services of the load shed systems and buses**

CAUTION

The following systems and buses are automatically load shed (no additional Cautions will be shown) and will not be available:

- Generator 1 bus (Left rear CB panel)
- Non Essential bus (Right front CB panel)
- Cabin bus (Right rear CB panel)

CAUTION

The following high current consumption systems are automatically load shed:

- Cabin Heater
- Under Floor Heater
- VCCS Compressor
- Footwarmer (optional system)
- Logo Lights (optional system)

END

3.15.14 GENERATOR 2 OFF

Indication: CAS caution – Generator 2 Off

Condition: GEN 2 is OFF line and engine running.

1.	**Systems MFD – ELECTRICAL window**	**Confirm the failure**
2.	**GEN 2 switch**	**RESET then ON**

If GEN 2 does not reset:

3.	**Aircraft**	**At pilots discretion, continue flight without the services of the load shed systems and buses**

CAUTION

The following systems and buses are automatically load shed (no additional Cautions will be shown) and will not be available:

- Generator 2 bus (Right rear CB panel)
- Non Essential bus (Right front CB panel)
- Cabin bus (Right rear CB panel)

CAUTION

The following high current consumption systems are automatically load shed:

- Cabin Heater
- Under Floor Heater
- VCCS Compressor
- Footwarmer (optional system)
- Logo Lights (optional system)

END

3.15.15 GENERATOR 2 VOLTS

Indication: CAS caution – Generator 2 Volts

Condition: GEN 2 voltage is low or high.

1.	**Systems MFD – ELECTRICAL window**	**Confirm indications**
2.	**GEN 2 switch**	**RESET then ON**

If Generator 2 Volts caution remains on:

3.	**GEN 2 switch**	**OFF**
4.	**Aircraft**	**At pilots discretion, continue flight without the services of the load shed systems and buses**

CAUTION

The following systems and buses are automatically load shed (no additional Cautions will be shown) and will not be available:

- Generator 2 bus (Right rear CB panel)
- Non Essential bus (Right front CB panel)
- Cabin bus (Right rear CB panel)

CAUTION

The following high current consumption systems are automatically load shed:

- Cabin Heater
- Under Floor Heater
- VCCS Compressor
- Footwarmer (optional system)
- Logo Lights (optional system)

END

3.15.16 BATTERY 1 OR BATTERY 2 HOT OR BATTERY 1 + 2 HOT

Indication:	CAS warning – “Battery 1 Hot” or “Battery 2 Hot” or “Battery 1 + 2 Hot” and voice callout “Battery Hot”
Condition:	Battery temperature is excessive.

1. **Systems MFD – ELECTRICAL window** — **Check battery 1 and 2 charge current**

If charge current high:

2. **BAT 1 or BAT 2 switch** — **OFF (Do not select ON again)**

If charge current normal:

3. **BAT 1 or BAT 2 switch** — **OFF**

If battery hot warning extinguishes, wait 5 minutes then:

4. **BAT 1 or BAT 2 switch** — **ON (Once only)**

If Battery 1 and 2 Hot:

5. **BAT 1 and BAT 2 switches** — **OFF**
6. **Aircraft** — **Land as soon as possible**

NOTE

The Battery 1 Hot and Battery 2 Hot warnings are inoperative on aircraft with lead acid batteries installed.

END

3.15.17 BATTERY 1 OR 2

Indication: CAS caution – “Battery 1” or “Battery 2”

Condition: Battery discharge is above 60 Amps or battery voltage is below 22 V or above 30.1 V.

1.	**Systems MFD – ELECTRICAL window**	**Check GEN 1 or 2 and BAT 1 or 2 current and voltage**

If indications are normal:

2.	**BAT 1 or BAT 2 switch**	**OFF**

If indications are not normal:

3.	**Aircraft**	**Carry out Generator 1 or Generator 2 Volts procedure (Sect. 3.15.13 or 3.15.15)**

END

3.15.18 BATTERY 1 OR 2 OFF

Indication: CAS caution – “Battery 1 Off” or “Battery 2 Off”

1.	**BAT 1 or BAT 2 switch**	**Check ON. Reset**

END

3.15.19 EXTERNAL POWER

Indication: CAS caution – External Power

Condition: External power on with GEN 1 and GEN 2 and AV 1 BUS and AV 2 BUS on.

1.	**External power unit**	**Disconnect**

END

3.16 FUEL SYSTEM

3.16.1 FUEL PRESSURE LOW

Indication: - CAS CAUTION - Fuel Pressure Low, or

- MFD Fuel Window – Both green PUMP indications cycling on and off every 10 seconds

1.	**Power**	**Reduce to minimum to sustain flight**
2.	**FUEL PUMP switches**	**ON**
3.	**Fuel state**	**Monitor**

If there are 2 segments or more difference between the left and right:

4.	**FUEL PUMP switch (emptier side)**	**AUTO**
5.	**Fuel state**	**Monitor**

When fuel balanced:

6.	**FUEL PUMP switches**	**ON**
7.	**Aircraft**	**Descend to warmer air**

NOTE

A possible cause is the fuel filter blocked with ice crystals.

8.	**FUEL PUMP switches**	**AUTO**

If failure conditions remain:

9.	**FUEL PUMP switches**	**ON**
10.	**Aircraft**	**Land as soon as possible. If possible always retain glide capability, to the selected airfield in case of total engine failure**

END

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3.16.2 FUEL QUANTITY LOW

Indication: CAS caution – LH Fuel Low or RH Fuel Low or LH + RH Fuel Low

1.	**FUEL indications**	**Check**

If fuel leak from one wing is suspected:

2.	**Aircraft**	**Carry out suspected fuel leak procedure (Para 3.16.4)**

If no fuel leak is suspected and both fuel low quantity cautions are on:

3.	**FUEL PUMP switches**	**ON**
4.	**Power**	**Reduce to minimum to sustain flight**
5.	**Aircraft**	**Land as soon as possible. If possible always retain glide to the selected landing airfield, in case of total engine failure**

END

3.16.3 FUEL BALANCING

Indication: CAS caution – Fuel Balance Fault and/or Fuel Imbalance

A: ON GROUND

1.	**Fuel L and R indications**	**Check for difference**

WARNING

IF THERE ARE 4 SEGMENTS OR MORE DIFFERENCE BETWEEN LEFT AND RIGHT DO NOT TAKE OFF.

If Fuel pump on fuller side is not running:

2.	**FUEL PUMP switch (fuller side)**	**ON**
3.	**Fuel state**	**Monitor**

If difference cannot be balanced:

4.	**Aircraft**	**Do not take off**

When fuel balanced:

5.	**FUEL PUMP switch**	**AUTO**

B. IN FLIGHT

1.	**Fuel L and R indications**	**Check for difference**

CAUTION

IF THERE ARE 3 SEGMENTS OR MORE DIFFERENCE BETWEEN LEFT AND RIGHT, POSSIBLE AILERON DEFLECTION REQUIRED FOR WINGS LEVEL FLIGHT, ESPECIALLY AT LOW SPEED.

If fuel leak from one wing is suspected:

2.	**Aircraft**	**Carry out Suspected Fuel Leak procedure (Sect. 3.16.4)**

If no fuel leak is suspected:

3.	**FUEL PUMP circuit breaker (on fuller side) (Essential Bus $_L$J1 or $_L$H1)**	**Reset**
4.	**FUEL PUMP switch (fuller side)**	**ON**
5.	**FUEL PUMP circuit breaker (on emptier side) (Essential Bus $_L$J1 or $_L$H1)**	**Pull**
6.	**Fuel state**	**Monitor**

If difference cannot be balanced:

7.	**Aircraft**	**Land as soon as possible**

NOTE

If a prompt landing is not possible, keep high IAS to nearest airfield and consider burning off fuel until the fuel imbalance is not greater than 5 segments for landing. Use flaps up to keep approach speed high

If fuel is balanced:

8.	**FUEL PUMP circuit breakers (Essential Bus $_L$J1 and $_L$H1)**	**Reset**
9.	**FUEL PUMP switches**	**AUTO**

END

3.16.4 SUSPECTED FUEL LEAK

1.	**FUEL PUMP switch (on leaking side)**	**ON**
2.	**FUEL PUMP circuit breaker (on good side) (Essential Bus $_L$J1 or $_L$H1)**	**Pull**
3.	**Fuel state**	**Monitor**

If fuel imbalance:

4.	**Aircraft**	**Land as soon as possible**

NOTE

If a prompt landing is not possible, keep high IAS to nearest airfield and consider burning off fuel until the fuel imbalance is not greater than 5 segments for landing. Use flaps up to keep approach speed high.

END

3.16.5 LOSS OF ANALOGUE FUEL QUANTITY INDICATION

Indication: CAS caution – Fuel Quantity Fault and/or one or both MFD analogue displays go blank or indication amber crossed out.

CAUTION

THE AUTOMATIC FUEL BALANCING SYSTEM WILL NOT BE OPERATIVE.

FUEL RESET WILL NOT BE OPERATIVE.

“FUEL BALANCE FAULT” AND “FUEL IMBALANCE” AMBER CAUTIONS WILL NOT BE INDICATED.

1. **Fuel Quantity** **Monitor digital Fuel Quantity indication**

If fuel imbalance is suspected:

NOTE

To check fuel imbalance, disengage the autopilot regularly to check for roll trim changes.

2. **Aircraft** **Land as soon as possible**

END

3.16.6 LOSS OF DIGITAL FUEL QUANTITY INDICATION

Indication: Digital fuel quantity digits replaced by amber dashes.

If Fuel Flow digital indication is available, attempt to perform a fuel reset:

1.	**Aircraft**	**Make sure wings are level, pitch within ± 3°, with unaccelerated flight and no turbulence present**
2.	**Fuel Reset soft key**	**Press**

NOTE

The Fuel Used will be reset to zero with fuel reset.

If Fuel Flow digital indication is invalid:

3.	**Fuel state**	**Monitor analogue Fuel Quantity on Fuel window or the digital fuel indication on Systems Summary window**

NOTE

Continued flight is possible without digital Fuel Quantity (QTY) providing analogue fuel quantity is operating correctly.

END

3.16.7 FUEL PUMP FAILURE

Indication:
- Fuel pump(s) on for more than 10s with fuel balanced and no Fuel Pressure Low caution, or
- Both fuel pumps on for more than 10s with 2 or more segments difference between left and right and no Fuel Pressure Low caution, or
- Fuel pumps not running with green PUMP advisory on, or
- Fuel pressure low and Fuel pumps not running.

1.	**FUEL PUMP(S)**	**AUTO**
2.	**FUEL CTL circuit breaker (Essential Bus $_L$K1)**	**Reset**
3.	**LH FUEL PUMP circuit breaker (Essential Bus $_L$J1)**	**Reset**
4.	**RH FUEL PUMP circuit breaker (Essential Bus $_L$H1)**	**Reset**

If failure is still present

5.	**Fuel state**	**Monitor**

If fuel imbalance:

6.	**Aircraft**	**Carry out Fuel Balance procedure (Sect. 3.16.3)**

END

3.17 CABIN ENVIRONMENT FAILURES

3.17.1 CABIN PRESSURE WARNING

Indication: CAS warning - Cabin Pressure

Condition: Cabin pressure differential of less than -0.25 psi or greater than 6.35 psi is exceeded.

1. **Systems MFD ENVIRONMENT window** — **Check ΔP psi indication**

If ΔP less than - 0.25 psi:

a. **Aircraft** — **Reduce descent rate**
b. **CABIN PRESSURE switch** — **DUMP**

If ΔP more than 6.35 psi:

2. **CABIN PRESSURE switch** — **DUMP**
3. **ACS EMERG shut off** — **Pull**
4. **Main OXYGEN lever** — **Confirm ON**
5. **Crew oxygen masks** — **ON**

   Procedure to don the crew oxygen masks:

   a. **Remove the normal headset**
   b. **Put the oxygen mask on. Check 100%.**
   c. **Put the normal headset back on.**
   d. **Set MIC SELECT switch on the rear left panel to MASK.**
6. **PASSENGER OXYGEN selector** — **AUTO or ON**
7. **Systems MFD PAX OXY advisory** — **Confirm on**
8. **Passengers** — **Instruct to don masks**
9. **Aircraft** — **Carry out Emergency Descent procedure (Sect. 3.8)**

END

3.17.2 CABIN PRESSURE CAUTION

Indication: CAS caution - Cabin Pressure

Condition: For MSN 1001 - 1719:
Cabin pressure differential is less than -0.15 psi or greater than 6.0 psi.

For MSN 545, 1721 - 1942:
Cabin pressure differential is greater than 6.0 psi.

1. Systems MFD ENVIRONMENT window — Check ∆P psi indication

If ∆P less than - 0.15 psi:
(MSN 1001 - 1719)

- **a. Aircraft — Reduce descent rate**
- **b. CABIN PRESSURE switch — DUMP**

If ∆P more than 6.0 psi:

- **c. CPCS SYSTEM MODE switch — MANUAL**
- **d. MANUAL CONTROL switch — Push intermittently to CLIMB to reduce pressure differential to below 5.75 psi**

If unsuccessful:

2. CABIN PRESSURE switch — DUMP

3. ACS EMERG shut off — Pull

4. Main OXYGEN lever — Confirm ON

5. Crew oxygen masks — ON

Procedure to don the crew oxygen masks:

- **a. Remove the normal headset**
- **b. Put the oxygen mask on. Check 100%.**
- **c. Put the normal headset back on.**
- **d. Set MIC SELECT switch on the rear left panel to MASK.**

6. PASSENGER OXYGEN selector — AUTO or ON

7. Systems MFD PAX OXY advisory — Confirm on

8. Passengers — INSTRUCT to don masks

9. Aircraft — Carry out Emergency Descent procedure (Sect. 3.8)

Prior to landing:

10. CABIN PRESSURE switch — DUMP (if not selected earlier)

END

3.17.3 CABIN ALTITUDE

Indication: CAS warning - Cabin Altitude and voice callout "Cabin Altitude"

1.	**Main OXYGEN lever**	**Confirm ON**
2.	**Crew oxygen masks**	**ON**

Procedure to don the crew oxygen masks:

- a. **Remove the normal headset**
- b. **Put the oxygen mask on. Check 100%.**
- c. **Put the normal headset back on.**
- d. **Set MIC SELECT switch on the rear left panel to MASK.**

3.	**PASSENGER OXYGEN selector**	**AUTO or ON**
4.	**Systems MFD PAX OXY advisory**	**Confirm on**
5.	**Passengers**	**INSTRUCT to don masks**
6.	**CPCS MODE switch**	**MANUAL**
7.	**MANUAL CONTROL switch**	**Push DESCENT intermittently to reduce cabin altitude to required level**

If unsuccessful:

8.	**Aircraft**	**Limit flight altitude to maintain cabin altitude below 10,000 ft**

If necessary:

9.	**Aircraft**	**Carry out Emergency Descent (Sect. 3.8)**

Prior to landing:

10.	**CABIN PRESS switch**	**DUMP**

END

3.17.4 ACS LOW INFLOW

Indication: CAS caution – ACS Low Inflow

1.	**ACS BLEED AIR switch**	**INHIBIT**
2.	**ACS BLEED AIR switch**	**AUTO**

If unsuccessful:

3.	**ACS BLEED AIR SWITCH**	**INHIBIT**
4.	**ACS EMERG shut off**	**Pull**

If cabin altitude above 10,000 ft:

5.	**Main OXYGEN lever**	**Confirm ON**
6.	**Crew oxygen masks**	**ON**

Procedure to don the crew oxygen masks:

- **a. Remove the normal headset**
- **b. Put the oxygen mask on. Check 100%.**
- **c. Put the normal headset back on.**
- **d. Set MIC SELECT switch on the rear left panel to MASK.**

7.	**PASSENGER OXYGEN selector**	**AUTO or ON**
8.	**Systems MFD PAX OXY advisory**	**Confirm on**
9.	**Passengers**	**Instruct to don masks**
10.	**Emergency descent**	**Carry out Emergency Descent procedure (Sect. 3.8)**

When cabin altitude below 10,000 ft:

11.	**CABIN PRESS switch**	**DUMP (cabin ventilation)**

END

3.17.5 CPCS FAULT

Indication: CAS caution – CPCS Fault

A. ON GROUND

1.	**CPCS MODE switch**	**MANUAL for at least 1 sec then AUTO**
2.	**CAS**	**Check**

If CPCS fault caution remains:

3.	For MSN 1001 - 1719: **CPCS CH. 1 circuit breaker (EPS Bus $_L$R2) and CPCS CH. 2 circuit breaker (Main Bus $_R$L3)** For MSN 545, 1721 - 1942: **CPCS AUTO circuit breaker (ESS Bus $_L$E1) and CPCS MON circuit breaker (EPS Bus $_L$R2)**	**Open for 4 secs, then close**
4.	**CAS**	**Check**

5.	**CPCS MODE switch**	**MANUAL for at least 1 sec then AUTO**
6.	**CAS**	**Check**

B. IN FLIGHT

If ∆P and CAB ALT indications are available:

1.	**CPCS MODE switch**	**MANUAL for at least 1 sec then AUTO**
2.	**CAS**	**Check**

If CPCS fault caution remains:

3.	**CPCS MODE switch**	**MANUAL**
4.	**MANUAL CONTROL switch**	**Push intermittently to increase or reduce cabin altitude to required level**
5.	**Aircraft**	**Land as soon as practical.**

Prior to landing:

6.	**CABIN PRESSURE switch**	**DUMP**

C. IN FLIGHT

If ∆P not displayed (ADC A+B fail):

1.	**CPCS MODE switch**	**MANUAL**
2.	**MANUAL CONTROL switch**	**Press DESCENT for 30 seconds to close OFV**

If CAS warning “Cabin Altitude” comes on:

3.	**Main OXYGEN lever**	**Confirm ON**
4.	**Crew oxygen masks**	**ON**

Procedure to don the crew oxygen masks:

a. **Remove the normal headset**
b. **Put the oxygen mask on. Check 100%.**
c. **Put the normal headset back on.**
d. **Set MIC SELECT switch on the rear left panel to MASK.**

5.	**PASSENGER OXYGEN selector**	**AUTO or ON**
6.	**Systems MFD PAX OXY advisory**	**Confirm on**
7.	**Passengers**	**INSTRUCT to don masks**
8.	**CPCS MODE switch**	**MANUAL**
9.	**MANUAL CONTROL switch**	**Push intermittently to increase or reduce cabin altitude to required level**
10.	**Aircraft**	**Land as soon as practical**

Prior to landing:

11.	**CABIN PRESSURE switch**	**DUMP**

D. IN FLIGHT

If ∆P and CAB ALT not displayed:

1.	**Main OXYGEN lever**	**Confirm ON**
2.	**Crew oxygen masks**	**ON**

Procedure to don the crew oxygen masks:

- **a. Remove the normal headset**
- **b. Put the oxygen mask on. Check 100%.**
- **c. Put the normal headset back on.**
- **d. Set MIC SELECT switch on the rear left panel to MASK.**

3.	**PASSENGER OXYGEN selector**	**AUTO or ON**
4.	**Systems MFD PAX OXY advisory**	**Confirm on**
5.	**Passengers**	**INSTRUCT to don masks**
6.	**Aircraft**	**Descend below 10,000 ft or to minimum safe altitude if higher**
7.	**Aircraft**	**Land as soon as practical**

Prior to landing:

8.	**CABIN PRESSURE switch**	**DUMP**

END

3.17.6 ECS FAULT

Indication: CAS caution – ECS Fault

1.	**ECS circuit breaker (Essential Bus $_L$D2)**	**Reset**

If not successful:

2.	**ACS BLEED AIR switch**	**INHIBIT if cabin temperature is unacceptable**

NOTE

If ACS bleed air switch is set to inhibit, the aircraft will depressurize and ACS Low Inflow CAS Caution will come on.

If ACS bleed air switch is inhibited and aircraft altitude is > 10,000 ft:

3.	**ACS EMER shut off**	**Pull**
4.	**Aircraft**	**Carry out Emergency Descent procedure (Sect. 3.8)**
5.	**Aircraft**	**Land as soon as practical (depending on cabin/cockpit environment)**

END

3.17.7 UNCONTROLLED CABIN PRESSURE

Indication: Uncontrolled fluctuations of cabin pressure

1.	**CPCS MODE switch**	**MANUAL**
2.	**CPCS MANUAL CONTROL switch**	**Push intermittently to increase or reduce cabin altitude to required level**

If unsuccessful:

3.	**Main OXYGEN lever**	**Confirm ON**
4.	**Crew oxygen masks**	**ON**

Procedure to don the crew oxygen masks:

- **a. Remove the normal headset**
- **b. Put the oxygen mask on. Check 100%.**
- **c. Put the normal headset back on.**
- **d. Set MIC SELECT switch on the rear left panel to MASK.**

5.	**PASSENGER OXYGEN selector**	**AUTO or ON**
6.	**Systems MFD PAX OXY advisory**	**Confirm on**
7.	**Passengers**	**INSTRUCT to don masks**
8.	**CABIN PRESSURE switch**	**DUMP**
9.	**ACS EMERG shut off**	**PULL**
10.	**Aircraft**	**Descend below 10,000 ft or to minimum safe altitude if higher**
11.	**Aircraft**	**Land as soon as practical**

Prior to landing:

12.	**CPCS CABIN PRESSURE switch**	**DUMP (if not selected earlier)**

END

3.18 DEICE SYSTEMS

3.18.1 PROPELLER DEICE FAILURE IN ICING CONDITIONS

Indications: CAS caution - Propeller De Ice

WARNING

THE LOSS OF PROPELLER DEICE IN ICING CONDITIONS CAN CAUSE SEVERE DEGRADATION IN AIRCRAFT SPEED AND CLIMB PERFORMANCE.

1.	**PROPELLER switch**	**Set to OFF and wait 10 seconds**
2.	**PROPELLER switch**	**Set to ON**
3.	**PROP DE ICE circuit breaker (LH PJB)**	**Check. Do not reset unless tripped**

If captions go off after 5 seconds:

4.	**Aircraft**	**Continue flight and monitor system**

If captions remain on after 5 seconds:

5.	**PROPELLER switch**	**Maintain ON (together with INERT SEP OPEN) to maintain PUSHER ICE MODE**
6.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible.**

If propeller vibration occurs:

7.	**PCL**	**Increase or decrease power as required to minimize vibration and sustain level flight**
8.	**Aircraft**	**Avoid further icing conditions**

If propeller vibration continues or attained performance degrades

9.	**Aircraft**	**Land as soon as possible**

END

3.18.2 BOOT DEICE FAILURE IN ICING CONDITIONS

Indication: CAS caution - De Ice Boots with systems MFD BOOTS advisory off

WARNING

A BOOT DEICE FAILURE IN ICING CONDITIONS CAN CAUSE DEGRADATION OF AIRCRAFT SPEED AND CLIMB PERFORMANCE AND A PREMATURE STALL. FLAP POSITION IS LIMITED TO 0° WITH THIS FAILURE.

1.	**PCL**	**Increase power**
2.	**BOOTS switch**	**Set to OFF and wait until caution resets (1 min approx)**
3.	**BOOTS switch**	**Set to 3 MIN or 1 MIN and let run for at least one full cycle**
4.	**BOOTS DE-ICE circuit breaker (Main Bus $_R$H2)**	**Check. Do not reset unless tripped.**

If captions return to normal operation:

5.	**Aircraft**	**Continue flight and monitor system. Avoid low power settings if possible**

If captions stay in failure status:

6.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible**
7.	**BOOTS switch**	**Set to OFF**
8.	**Aircraft**	**Avoid large or sudden changes in aircraft directional, longitudinal and lateral control until airframe is judged to be free of residual ice.**
9.	**Aircraft**	**Avoid further icing conditions**

If airframe is free of ice accretion:

10.	**Landing approach**	**Flaps as required**

If airframe is not free of ice accretion:

11.	**Flap position**	**Limited to 0°**
12.	**Landing approach for 9921 lb (4500 kg) (MLW)**	**Keep minimum landing approach speed above 130 KIAS.**

CAUTION

ON LANDING APPROACH AFTER BOOT FAILURE (FLAPS 0°), THE PFD FAST SLOW POINTER OR DYNAMIC SPEED BUG WILL NOT BE CORRECT AND SHOULD NOT BE USED AS REFERENCE.

CAUTION

THE TOTAL LANDING DISTANCE WILL BE LONGER BY UP TO 160%. REFER TO SECTION 5, PERFORMANCE, FOR THE EXACT LANDING DISTANCE CALCULATION.

CAUTION

MSN 1231 - 1942. IN THE CASE OF HEAVY BRAKE USAGE, SOFT BRAKE PEDALS AND/OR WHEEL FUSIBLE PLUGS RELEASE MAY OCCUR DURING A FOLLOWING TAXI. LIMITATION IN SECTION 2 APPLIES.

END

3.18.3 INERTIAL SEPARATOR FAILURE

Indication: CAS caution - Inertial Separator

WARNING

AN INERTIAL SEPARATOR FAILURE IN ICING CONDITIONS CAN CAUSE DEGRADATION OF THE AIRCRAFT ENGINE PERFORMANCE (AN INCREASE IN ITT).

AN INERTIAL SEPARATOR FAILURE DURING OPERATIONS IN FOREIGN OBJECT DAMAGE ENVIRONMENTS (FOD) MAY CAUSE LONG TERM ENGINE DETERIORATION AND SHOULD BE REPORTED FOR POST FLIGHT MAINTENANCE.

1.	**INERT SEP switch**	**Set to CLOSED and wait 30 seconds**
2.	**INERT SEP switch**	**Set to OPEN**
3.	**INERT SEP circuit breaker (Essential Bus $_L$F2)**	**Check. Do not reset unless tripped.**

If caption returns to normal operation after 45 seconds:

4.	**Aircraft**	**Continue flight and monitor system**

If caption stays in failure status after 45 seconds:

5.	**INERT SEP switch**	**Maintain OPEN (together with ICE PROP PROTECTION PROPELLER ON) to maintain PUSHER ICE MODE**
6.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible**
7.	**Aircraft**	**Avoid further icing conditions**

If any attained performance degradation continues:

8.	**Aircraft**	**Land as soon as possible.**

END

3.18.4 WINDSHIELD DEICE FAILURE IN ICING CONDITIONS

Indication: CAS caution - LH Windshield Heat or RH Windshield Heat or
LH + RH Windshield Heat

1.	**LH W/SHLD circuit breaker (LH PJB)**	**Check. Do not reset unless tripped**
2.	**LH WSHLD switch**	**Set to OFF then to LIGHT or HEAVY**
3.	**RH W/SHLD circuit breaker (RH PJB)**	**Check. Do not reset unless tripped**
4.	**RH WSHLD switch**	**Set to OFF then to LIGHT or HEAVY**

If caption returns to normal operation:

5.	**Aircraft**	**Continue flight and monitor system**

If caption stays in failure status and forward visibility through LH windshield is lost:

6.	**Windshield**	**Use RH windshield**

If total forward visibility is lost:

7.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible. Interior fogging can be cleared by hand.**
8.	**Aircraft**	**Avoid further icing conditions**

If windshield has not cleared by time of landing:

9.	**Cabin pressure**	**Make sure depressurized**
10.	**DV window**	**Use, if required.**

END

3.18.5 PROBES OFF

Indication: CAS caution – Probes Off

Condition: Probes not on with static air temperature below 10° C.

1.	**PROBES switch**	**Set to ON**

END

3.18.6 AOA PROBE DEICE FAILURE IN ICING CONDITIONS

Indication: CAS caution - AOA De Ice

WARNING

AN AOA PROBE DEICE FAILURE IN ICING CONDITIONS CAN CAUSE A FALSE ACTIVATION OF THE STALL PROTECTION SYSTEM.

1.	**PROBES switch**	**Set to OFF and wait 3 minutes**
2.	**PROBES switch**	**Set to ON**
3.	**LH AOA SENS DE-ICE circuit breaker (Essential Bus $_L$L2)**	**Check. Do not reset unless tripped**
4.	**LH AOA PLATE HEAT circuit breaker (Essential Bus $_L$K2)**	**Check. Do not reset unless tripped**
5.	**RH AOA SENS DE-ICE circuit breaker (Main Bus $_R$C2)**	**Check. Do not reset unless tripped**
6.	**RH AOA PLATE HEAT circuit breaker (Main Bus $_R$D2)**	**Check. Do not reset unless tripped**

If caption return to normal operation:

7.	**Aircraft**	**Continue flight and monitor system**

If caption stays in failure status:

8.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible**

CAUTION

STICK SHAKER MAY ACTIVATE AT HIGHER SPEEDS THAN NORMAL. IF THIS OCCURS, INCREASE SPEED UNTIL SHAKER STOPS.

9.	**Aircraft**	**Avoid further icing conditions**
10.	**Flap position**	**Limited to 15°**
11.	**Landing approach for 9921 lb (4500 kg) (MLW)**	**Keep minimum landing approach speed above 105 KIAS or shaker activation speed, whichever is highest**

CAUTION

ON LANDING APPROACH AFTER AOA DEICE FAILURE, THE PFD FAST SLOW POINTER OR DYNAMIC SPEED BUG WILL NOT BE CORRECT AND SHOULD NOT BE USED AS REFERENCE.

CAUTION

THE TOTAL LANDING DISTANCE WILL BE LONGER BY UP TO 71%. REFERER TO SECTION 5, PERFORMANCE, FOR THE EXACT LANDING DISTANCE CALCULATION.

END

3.18.7 PITOT PROBE DEICE FAILURE IN ICING CONDITIONS

Indication: CAS caution - Pitot 1 Heat or Pitot 2 Heat

WARNING

A PITOT AND STATIC DEICE FAILURE IN ICING CONDITIONS CAN CAUSE AN INCORRECT INDICATION ON THE ASI AND/OR ALTIMETER AND VSI.

1.	**PROBES switch**	**Set to OFF then ON again**
2.	**LH PITOT DE-ICE circuit breaker (Essential Bus $_L$J2)**	**Check. Do not reset unless tripped**
3.	**RH PITOT DE-ICE circuit breaker (Main Bus $_R$E2)**	**Check. Do not reset unless tripped**

If caption returns to normal operation:

4.	**Aircraft**	**Continue flight and monitor system**

If caption stays in failure status:

5.	**Autopilot**	**Disconnect**
6.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible**
7.	**Aircraft**	**Avoid further icing conditions**
8.	**Aircraft**	**Land as soon as possible**

9. **Landing approach** — **Center PFD AOA fast/slow pointer with PUSHER ICE MODE and flaps 15°**

CAUTION

THE TOTAL LANDING DISTANCE WILL BE LONGER BY UP TO 71%. REFER TO SECTION 5, PERFORMANCE, FOR THE EXACT LANDING DISTANCE CALCULATION.

END

3.18.8 STATIC PROBE DEICE FAILURE IN ICING CONDITIONS

Indication: CAS caution - Static Heat

WARNING

A PITOT AND STATIC DEICE FAILURE IN ICING CONDITIONS CAN CAUSE AN INCORRECT INDICATION ON THE ASI AND/OR ALTIMETER AND VSI.

1.	**PROBES switch**	**Set to OFF then ON again**
2.	**LH STATIC DE-ICE circuit breaker (Essential Bus $_L$H2)**	**Check. Do not reset unless tripped**
3.	**RH STATIC DE-ICE circuit breaker (Main Bus $_R$F2)**	**Check. Do not reset unless tripped**

If caption returns to normal operation:

4.	**Aircraft**	**Continue flight and monitor system**

If caption stays in failure status:

5.	**Autopilot**	**Disconnect**
6.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible**
7.	**Aircraft**	**Avoid further icing conditions**
8.	**Aircraft**	**Land as soon as possible**
9.	**Landing approach**	**Center PFD AOA fast/slow pointer with PUSHER ICE MODE and flaps 15°. Maintain speed above shaker activation**

CAUTION

THE TOTAL LANDING DISTANCE WILL BE LONGER BY UP TO 71%. REFER TO SECTION 5, PERFORMANCE, FOR THE EXACT LANDING DISTANCE CALCULATION.

END

3.18.9 PUSHER ICE MODE FAILURE IN ICING CONDITIONS

Indication: CAS caution – “Pusher”

WARNING

A FAILURE OF THE STALL WARNING/STICK PUSHER SYSTEM TO RE-DATUM TO ICE MODE WHEN IN ICING CONDITIONS CAN LEAVE THE AIRCRAFT UNPROTECTED AGAINST THE NATURAL STALL WITH RESIDUAL ICE ON THE AIRFRAME.

1.	**STICK PUSHER test switch**	**Press and hold for duration of Pusher test sequence (approx. 5 seconds) (this identifies Pusher ice mode computer or selection failure).**

If failure stays during test go to step 7

If failure disappears during test but returns after completion of test:

2.	**PROPELLER switch**	**Cycle from OFF to ON**
3.	**INERT SEP switch**	**Cycle from CLOSED to OPEN**
4.	**PROP DE-ICE circuit breaker (LH PJB)**	**Check. Do not reset unless tripped**
5.	**INERT SEP circuit breaker (Essential bus $_{L}$F2)**	**Check. Do not reset unless tripped**

If captions return to normal operation within 30 seconds:

6.	**Aircraft**	**Continue flight and monitor system**

If caption stays in failure status:

7.	**Aircraft**	**DEPART ICING CONDITIONS to positive SAT atmosphere, if possible**
8.	**Aircraft**	**Avoid further icing conditions**
9.	**Flap position**	**Limited to 15°**

10.	**Landing approach for 9921 lb (4500 kg) (MLW)**	**Keep minimum landing approach speed above 105 KIAS.**

CAUTION

THE TOTAL LANDING DISTANCE WILL BE LONGER BY UP TO 71%. REFER TO SECTION 5, PERFORMANCE, FOR THE EXACT LANDING DISTANCE CALCULATION.

CAUTION

ON LANDING APPROACH AFTER PUSHER ICE MODE FAILURE, THE PFD FAST SLOW POINTER OR DYNAMIC SPEED BUG WILL NOT BE CORRECT AND SHOULD NOT BE USED AS REFERENCE.

END

3.18.10 BOOTS TEMPERATURE LIMIT EXCEEDED

Indication: CAS caution –
Build 10 and higher

Boots TEMP Limit caution with systems MFD BOOTS green advisory on

Condition: Deice boots switch has been inadvertently left in the ON position during climb or descent through the boots temperature limit, or the boots switch has been inadvertently switched ON without observing the boots temperature limits.

CAUTION

OPERATION OF THE PNEUMATIC DEICE BOOT SYSTEM IN AMBIENT TEMPERATURES BELOW -40°C AND ABOVE +40˚C MAY CAUSE PERMANENT DAMAGE TO THE BOOTS.

1.	**BOOTS switch**	**Set to OFF**

NOTE

For MSN 1001 thru 1751 Post SB 30-013 and MSN 1752 - 1942: Initial boot inflation sequence begins 20 seconds after deice boots activation, the deice timer/controller allows deactivation of the deice boots in this initial 20 seconds dwell time before inflation sequence starts, this to prevent damage to the pneumatic de-ice boots due to inflation outside of their operating envelope (-40°C - +40°C).

END

3.18.11 FLAPS EXTENDED LIMIT EXCEEDED

Indication: CAS caution –
Build 10 and higher
Flaps EXT Limit caution

Condition: Flaps have been inadvertently extended more than 15° during de-ice boots operation or flaps have been inadvertently extended with failed boots.

1. **FLAPS** — **Retract to previous position**

END

3.19 PASSENGER AND CARGO DOOR

Indication: CAS warning - Passenger Door or Cargo Door or Pax + Cargo Door.

Condition: The passenger and/or cargo door is not correctly locked.

A. ON GROUND

1. **Passenger and/or Cargo Door** — **Visually check for the correct locking of the door latches (green indicators visible)**
2. **Passenger Door** — **Check the handle lock pin for freedom of movement**

B. IN FLIGHT

CAUTION

DO NOT ADJUST THE POSITION OF THE DOOR HANDLES IN FLIGHT.

1. **All occupants** — **Check seat lap and shoulder belts are fastened and the lap belt tightened.**

2.	**Airspeed**	**Reduce IAS to practical minimum**
3.	**Aircraft**	**Start a slow descent to 10,000 ft, or minimum safe altitude if higher**
4.	**CPCS SYSTEM MODE**	**AUTO**
5.	**Aircraft**	**Land as soon as possible**

END

3.20 CRACKED WINDOW IN FLIGHT

1.	**All occupants**	**Check seat lap and shoulder belts are fastened and the lap belt tightened.**
2.	**Airspeed**	**Reduce IAS to practical minimum**
3.	**Aircraft**	**Start a slow descent to 10,000 ft, or minimum safe altitude if higher.**
4.	**CPCS SYSTEM MODE**	**AUTO**
5.	**Aircraft**	**Land as soon as practical**

NOTE

When left hand front windshield is cracked and the visibility is impaired, use direct vision window for landing.

END

3.21 WHEEL BRAKE FAILURE

Indications: Wheel brakes ineffective and/or pedal excessively soft when pressed.

1.	**Landing + Taxi**	**Use reverse power, BETA and Nose wheel steering**

END

3.22 APEX FAILURES

3.22.1 DISPLAYS

A. Indication: All APEX display units indicate a red X or blank

1.	**Primary flight information**	**Use ESIS to control safe aircraft flight path continuation**
2.	**Autopilot**	**Use the autopilot (if available) with mode annunciations on the flight controller**

NOTES

Basic autopilot operation is independent of display unit availability.

If failure remains, wait 10 seconds before continuing with the procedure. This gives the system time to reconfigure.

If above 10,000 feet:

3.	**Main OXYGEN lever**	**Confirm ON**
4.	**Crew oxygen masks**	**ON**

Procedure to put on the crew oxygen masks:

a. **Remove the normal headset**

b. **Put the oxygen mask on. Check 100%.**

c. **Put the normal headset back on.**

d. **Set MIC SELECT switch on the rear left panel to MASK.**

5.	**PASSENGER OXYGEN selector**	**AUTO or ON**
6.	**Passengers**	**Instruct to don masks**
7.	**Aircraft**	**Descend below 10,000 ft or to minimum safe altitude if higher. If required, inform ATC, ask for assistance to maintain safe aircraft flight path and traffic separation**

If failure remains:

8.	**MAU CH A1 circuit breaker (Essential Bus $_L$B3) and MAU CH B1 circuit breaker (Standby Bus $_L$Z3)**	**Open, wait two seconds and close. Wait approximately 30 seconds for the system to reboot**

If DU 1 and DU 2 remain blank or indicate red X, but DU 3 and/or DU 4 have recovered:

9.	**Reversion Controller**	**Set PILOTS PFD control knob to AGM2**
10.	**Reversion Controller**	**Set UPPER MFD control knob to OFF/REV**
11.	**Aircraft**	**Refer to CAS captions to cross check that all issues are addressed**

If failure remains:

12.	**Aircraft**	**Land as soon as practical using minimum engine power to avoid exceeding engine limits**

Prior to landing:

13.	**CABIN PRESSURE switch**	**DUMP**

B. Indication: CAS caution – Check DU 1 or DU 2 or DU 3 or DU 4.
Check DU 1+2 or 1+3 or 1+4 or 2+3 or 2+4 or 3+4
Check DU 1+2+3 or 1+2+4 or 1+3+4 or 2+3+4

1. **Display** .... **Check relevant display**

NOTE

If two or more DU have failed (blank or red X), wait 10 seconds to allow the system to reconfigure before switching off DUs for display reversionary formatting.

If display unit indicates red X or blank:

2. **Reversion Controller** .... **Set DU control knob to OFF/REV**

NOTES

If the MFD swap button is used for DU 2 or 3, the optional single charts can only be accessed on DU 2 (not applicable if the Dual Charts option is installed).

Basic Autopilot operation is independent of DU availability. Use annunciations on the Flight Controller and attempt to continue using the Autopilot.

C. Indication: CAS caution – Check DU 1 with AGM 1 Fail advisory or
Check DU 4 with AGM 2 Fail advisory

1. **DU 1 or 4** .... **Check red X**

If red X on display:

2. **Reversion Controller** .... **For DU 1 set control knob to AGM 2**
For DU 4 set control knob to AGM 1

D. Indication: CAS caution – Check DU 1+2+3+4

Condition: Displays suspect

1.	**Aircraft**	**Use Electronic Standby Instrument System (ESIS)**

If above 10,000 ft:

2.	**Main OXYGEN lever**	**Confirm ON**
3.	**Crew oxygen masks**	**ON**

Procedure to put on the crew oxygen masks:

- **a. Remove the normal headset**
- **b. Put the oxygen mask on. Check 100%.**
- **c. Put the normal headset back on.**
- **d. Set MIC SELECT switch on the rear left panel to MASK.**

4.	**PASSENGER OXYGEN selector**	**AUTO or ON**
5.	**Systems MFD PAX OXY advisory**	**Confirm on**
6.	**Passengers**	**Instruct to don masks**
7.	**Aircraft**	**Descend below 10,000 ft or to minimum safe altitude if higher**
8.	**Aircraft**	**Land as soon as practical using minimum engine power, to avoid exceeding engine limits**

Prior to landing:

9.	**CABIN PRESSURE switch**	**DUMP**

E. Indication: CAS caution – DU 1 or DU 2 or DU 3 or DU 4 Overheat.
DU 1+2 or 1+3 or 1+4, 2+3 or 2+4 or 3+4 Overheat.
DU 1+2+3 or 1+2+4 or 1+3+4 or 2+3+4 Overheat

1.	**Displays**	**Check relevant display and treat as suspect**
2.	**Reversion Controller**	**Set DU control knob to OFF/REV**
3.	**Relevant PFD or MFD circuit breaker**	**Pull**
4.	**Displayed data**	**Cross check PFD with Electronic Standby Instrument System (ESIS)** **Check Engine Instruments** **Check Environment Window**

NOTE

If the MFD swap button is used for DU 2 or 3, the optional single charts can only be accessed on the upper DU2 (not applicable if the Dual Charts option is installed).

5.	**Displays**	**Monitor for remainder of flight**

F. Indication: CAS caution – DU 1+2+3+4 Overheat

Condition: Displays suspect

1.	**Aircraft**	**Use Electronic Standby Instrument System (ESIS)**
2.	**PFD and/or MFD circuit breakers**	**Pull**

If above 10,000 ft:

3.	**Main OXYGEN lever**	**Confirm ON**
4.	**Crew oxygen masks**	**On**

Procedure to don the crew oxygen masks:

a. **Remove the normal headset**
b. **Put the oxygen mask on. Check 100%.**
c. **Put the normal headset back on.**
d. **Set MIC SELECT switch on the rear left panel to MASK.**

5.	**PASSENGER OXYGEN selector**	**AUTO or ON**
6.	**Systems MFD PAX OXY advisory**	**Confirm on**
7.	**Passengers**	**Instruct to don masks**
8.	**Aircraft**	**Descend below 10,000 ft or to minimum safe altitude if higher**

9.	**Aircraft**	**Land as soon as practical using minimum engine power, to avoid exceeding engine limits**

Prior to landing:

10.	**CABIN PRESSURE switch**	**DUMP**

G. Indication: CAS caution – LH PFD CTLR Fail

1.	**RH PFD Controller**	**Push PFD button to operate LH PFD**

NOTE

X PFD CTLR ACTIVE annunciation will be displayed in amber along bottom right of the ADI on pilot PFD. PFD CTLR INACTIVE will be displayed on copilot PFD (if installed).

H. Indication: CAS caution – RH PFD CTLR Fail

1.	**LH PFD Controller**	**Push PFD button to operate RH PFD**

NOTE

X PFD CTLR ACTIVE annunciation will be displayed in amber along bottom right of the ADI on copilot PFD (if installed). PFD CTLR INACTIVE will be displayed on pilot PFD.

I. Indication: CAS caution – LH+RH PFD CTLR Fail

1.	**PFD controller functions**	**Cross check PFD data with Electronic Standby Instrument System (ESIS). Use MF Controller to operate Radio window**

J. Indication: CAS caution – Check Pilot PFD

Condition: Pilot PFD data suspect

1.	**Display**	**Cross check pilot PFD data with copilot PFD (if installed) data, or with Electronic Standby Instrument System (ESIS)**

If data confirmed to be suspect:

2.	**Reversion Controller**	**Set pilot PFD control knob to AGM2**

K. Indication: CAS caution – Check Copilot PFD (when installed)

Condition: Copilot PFD data suspect

1.	**Display**	**Cross check copilot PFD data with pilot PFD data**

If data confirmed to be suspect:

2.	**Reversion Controller**	**Set copilot PFD control knob to AGM1**

L. Indication: CAS caution – Check Engine Display

Condition: PFD engine data suspect

1.	**Display**	**Cross check pilot PFD data with copilot PFD (if installed) data**

If data confirmed to be suspect:

2.	**Reversion Controller**	**Set pilot PFD control knob to AGM2**

If data remains suspect:

3.	**Aircraft**	**Land as soon as practical using minimum engine power, to avoid exceeding engine limits**

END

3.22.2 PFD INVALID DATA ALERTS

A. Indication: ATT FAIL annunciation

1.	**PFD pitch and roll**	**Check**

If shading is all blue and red crosses are shown, data has become invalid:

2.	**Pitch and Roll data**	**Use Electronic Standby Instrument System (ESIS)**
3.	**ADHRS pushbutton on PFD Controller**	**Press to bring the other ADAHRS channel data onto PFD**

B. Indication: RAD annunciation

Condition: Radar Altimeter data has become invalid.

1.	**Altitude data**	**Use Altimeter Indicator**

C. Indication: HDG FAIL annunciation

Condition: Heading data has become invalid.

1.	**Heading data**	**Use Standby Magnetic Direction Indicator**
2.	**ADHRS pushbutton on PFD Controller**	**Press to bring the other ADAHRS channel Heading data onto PFD**

D. Indication: Airspeed display replaced with red X

Condition: Airspeed Tape data has become invalid.

1.	**Airspeed data**	**Use Electronic Standby Instrument System (ESIS)**
2.	**ADHRS pushbutton on PFD Controller**	**Press to bring the other ADAHRS channel Airspeed data onto PFD**

E. Indication: Altitude display replaced with red X

Condition: Altitude Tape data has become invalid.

1.	**Altitude data**	**Use Electronic Standby Instrument System (ESIS)**
2.	**ADHRS pushbutton on PFD Controller**	**Press to bring the other ADAHRS channel Altitude data onto PFD**

F. Indication: Vertical Speed replaced with red X

Condition: Vertical Speed Tape data has become invalid.

1.	**Vertical Speed**	**Monitor altitude**
2.	**ADHRS pushbutton on PFD Controller**	**Press to bring the other ADAHRS channel Vertical Speed data onto PFD**

END

3.22.3 PFD MISCOMPARISON ALERTS

A. Indication: IAS? and/or ALT? Annunciation

Condition: Airspeed and/or barometric Altitude miscompare between ADAHRS 1 and ADAHRS 2 by more than 10 KIAS / 200 feet.

NOTE

ADAHRS Channel A receives dynamic and static pressure information from the LH pitot static system, ADAHRS Channel B and the ESIS from the RH pitot static system.

NOTE

A failed pitot static system may cause erroneous Altitude and Airspeed indications.

1.	**Baro setting**	**Check correct setting on Electronic Standby Instrument System (ESIS), Pilot PFD and Copilot PFD**
2.	**Airspeed and Altitude**	**Crosscheck with Electronic Standby Instrument System (ESIS) and Copilot PFD**

If erroneous pitot / static system cannot be determined:

3.	**Pilot**	**Advise ATC that the aircraft could be somewhere between both altitudes and the transponder altitude may be wrong**
4.	**PCL**	**Set maximum cruise power torque and cross check resulting IAS from Max Cruise table (Section 5 page 42 onwards) against cockpit indications**

5.	**ADHRS pushbutton on PFD Controller**	**If determined which source is NOT correct press to bring the good ADAHRS channel Airspeed / Altitude data onto PFD**
6.	**L/R AFCS mode selector**	**Check coupled arrow pointing towards the selected PFD**
7.	**Aircraft**	**Land as soon as practical**

If erroneous system cannot be determined:

If Airspeed malfunctions:

8.	**Cruise and descent**	**Use only known power settings and aircraft attitudes**
9.	**Approach**	**Center PFD AOA fast/slow pointer with PUSHER ICE MODE and flaps 15°.**

CAUTION

THE TOTAL LANDING DISTANCE WILL BE LONGER BY UP TO 71%. REFER TO SECTION 5, PERFORMANCE, FOR THE EXACT LANDING DISTANCE CALCULATION.

10.	**Aircraft**	**Land as soon as practical**

If Altimeter malfunctions:

Below 10,000 feet

11.	**Depressurize aircraft**	**Select CPCS System Mode switch to MANUAL and Manual Control switch to CLIMB**

When cabin pressure differential approaches zero:

12.	**CABIN PRESS switch**	**DUMP**
13.	**Use cabin altimeter to give approximate aircraft altitude**	
14.	**Aircraft**	**Land as soon as practical**

B. Indication: HDG? annunciation

Condition: Heading data miscompares more than 6°.

1.	**Heading**	**Cross check with Standby Magnetic Direction Indicator**
2.	**ADHRS pushbutton on PFD Controller**	**If required press to bring the other ADAHRS channel Heading data onto Pilot PFD (confirm a similar reading to Standby Magnetic Direction Indicator)**

C. Indication: PITCH? Annunciation

Condition: Pitch angle miscompares more than 5°.

1.	**Pitch**	**Cross check with Electronic Standby Instrument System (ESIS), Copilot PFD and Pilot PFD**
2.	**ADHRS pushbutton on PFD Controller**	**If required press to bring the other ADAHRS channel Pitch data onto PFD**

D. Indication: ROLL? annunciation

Condition: Roll angle miscompares more than 6°.

1.	**Roll**	**Cross check with Electronic Standby Instrument System (ESIS), Copilot PFD and Pilot PFD**
2.	**ADHRS pushbutton on PFD Controller**	**If required press to bring the other ADAHRS channel Roll data onto PFD**

E. Indication: BARO? annunciation

Condition: Pilot and Copilot PFD Altimeter settings are not synchronized.

1.	**Baro**	**Cross check with Electronic Standby Instrument System (ESIS), Copilot PFD and Pilot PFD**
2.	**ADHRS pushbutton on PFD Controller**	**If required press to bring the other ADAHRS Baro data onto PFD**

END

3.22.4 APEX MISCELLANEOUS - ON GROUND ONLY

Indication: CAS caution - APM 1 or 2 or 1 + 2 Fail
CMS 1 + 2 Fail
System Config Fail
Validate Config
APM Miscompare
Gear Actuator Cntl

1.	**Aircraft**	**Terminate procedure for flight and inform maintenance**

END

3.22.5 MAU FAILURES

A. Indication: CAS caution - MAU A Fail

1.	**MAU CH. A1 circuit breaker (Essential Bus $_L$B3)**	**Open, wait 2 seconds and close**

If failure remains, to access serviceable FMS1:

2.	**Co-pilot PFD controller**	**Set NAV SEL to FMS 1**

NOTE

For dual FMS installations, selecting NAV SEL to FMS 1 ensures that FMS 1 remains available on INAV after AGM2 reversion of the pilot PFD.

During LP approach, VDI will be unavailable.

3.	**Display Reversion Control Panel**	**Set UPPER MFD control knob to OFF/REV**
4.	**Display Reversion Control Panel**	**Set PILOTS PFD control knob to AGM2**
5.	**PFD Radio window XPDR detail**	**Select XPDR 2**

NOTE

If MAU Channel A cannot be reset, Autopilot, Flight Director and XPDR 1 are not available for remainder of the flight.

B. Indication: CAS caution - MAU B Fail

1. **MAU CH. B1 circuit breaker (Standby Bus $_L$Z3)** — **Open, wait 2 seconds and close**

If failure remains:

2. **Display Reversion Control Panel** — **Set LOWER MFD control knob to OFF/REV**
3. **Display Reversion Control Panel** — **Set Co-PILOTS PFD control knob to AGM1**

If dual FMS installed and access to FMS is desired:

4. **Pilot PFD controller** — **Set NAV SEL to FMS 2**

NOTE

If MAU Channel B cannot be reset: Autopilot, Flight Director, Yaw Damper and XPDR 2 are not available for remainder of the flight.

For single FMS installations: FMS is not available for the remainder of the flight.

END

3.22.6 AIR/GROUND FAILURE

Indication: CAS caution – Air/Ground Fail

A. ON GROUND:

1. **Do not fly – maintenance required.**

B. IN FLIGHT:

1. **All systems will default to “In Air”.**

END

3.22.7 AURAL WARNING FAILURE

Indication: CAS caution – Aural Warning Fail

NOTE

All aural warnings except TCAS and TAWS are inhibited, including FAS and CAS.

1.	**Aural Warning Inhibit switch (left rear panel)**	**Check in ON position**

END

3.22.8 DME FAILURE

Indication: CAS caution – DME 1 Fail

1.	**PFD Controller**	**Press DME button**

If DME HOLD is ON:

2.	**PFD DME window**	**Press soft key and set to OFF. Press DME PAIR soft key and change NAV association**

If unsuccessful:

3.	**DME circuit breaker (Avionic 1 bus LU1)**	**Reset**

CAUTION

AUTOPILOT PERFORMANCE ON COUPLED APPROACHES WILL BE REDUCED. FOR AUTOPILOT LIMITATIONS REFER TO SECTION 2, PRIMUS APEX – AUTOMATIC FLIGHT CONTROL SYSTEM

END

3.22.9 RAD ALT FAILURE

Indication: CAS caution – Rad Alt 1 Fail

1.	**PFD's**	**Confirm red RAD annunciations are on.**

CAUTION

RAD ALT DATA HAS BECOME INVALID.

2.	**Altimeter**	**Use Altimeter Indicator**

END

3.22.10 ADC FAILURES

A. Indication: CAS caution – ADC A Fail

1.	**Pilot PFD Controller**	**Press ADHRS button to select ADAHRS B**
2.	**Pilots PFD window**	**Confirm ADAHRS 2 flag which indicates attitude, heading and air data same source as copilot PFD. Compare with Electronic Standby Instrument System (ESIS)**

CAUTION

THE AUTOPILOT WILL DISENGAGE (ABNORMAL).

DO NOT USE VNAV FUNCTION OF THE FMS

3.	**Autopilot**	**Re-engage, after PFD data displayed**

B. Indication: CAS caution – ADC B Fail

1.	**Copilot PFD Controller**	**Press ADHRS button to select ADAHRS A**
2.	**Copilot PFD window**	**Confirm ADAHRS 1 flag which indicates attitude, heading and air data same source as pilot PFD. Compare with Electronic Standby Instrument System (ESIS)**

CAUTION

THE AUTOPILOT WILL DISENGAGE (ABNORMAL).

DO NOT USE VNAV FUNCTION OF THE FMS

3.	**Autopilot**	**Re-engage, after PFD data displayed**

C. Indication: CAS caution – ADC A+B Fail

Loss of primary altitude and airspeed data:

1.	**Aircraft**	**Use Electronic Standby Instrument System (ESIS)**

If loss of cabin pressure automatic control and ∆P display:

2.	**CPCS MODE switch**	**MANUAL**
3.	**MANUAL CONTROL switch**	**Press DESCENT for 30 seconds to close OFV**

CAUTION

THE FOLLOWING SERVICES WILL BE INOPERATIVE.

- Autopilot (abnormal disengage)
- Overspeed warning
- Altitude Alert Monitor
- Air data to other systems

DO NOT USE VNAV FUNCTION OF THE FMS

If CAS warning - Cabin Altitude comes on:

4.	**Main OXYGEN lever**	**Confirm ON**
5.	**Crew oxygen masks**	**ON**

Procedure to don the crew oxygen masks:

a. **Remove the normal headset**

b. **Put the oxygen mask on. Check 100%.**

c. **Put the normal headset back on.**

d. **Set MIC SELECT switch on the rear left panel to MASK.**

6.	**PASSENGER OXYGEN selector**	**AUTO or ON**
7.	**Systems MFD PAX OXY advisory**	**Confirm on**
8.	**Passengers**	**Instruct to don masks**
9.	**CPCS MODE switch**	**Confirm MANUAL**
10.	**MANUAL CONTROL switch**	**Push intermittently to DESCENT to reduce cabin altitude below 10,000 ft**

If unsuccessful:

11.	**Aircraft**	**Limit flight altitude to maintain cabin altitude below 10,000 ft**

If necessary:

12.	**Aircraft**	**Carry out emergency descent**
13.	**Aircraft**	**Land as soon as practical**

Prior to landing:

14.	**CABIN PRESSURE switch**	**DUMP**

END

3.22.11 AHRS FAILURES

A. Indication: CAS caution – AHRS A Fail

1.	**Pilot PFD Controller**	**Press ADHRS button to select ADAHRS B**
2.	**Pilots PFD window**	**Confirm ADAHRS 2 flag which indicates attitude, heading and air data same source as copilot PFD. Compare with Standby Instrument System**

CAUTION

THE AUTOPILOT WILL REVERT TO ROLL AND PITCH MODE

3.	**Autopilot**	**Re-select as required after PFD data displayed**

B. Indication: CAS caution – AHRS B Fail

1.	**Copilot PFD Controller**	**Press ADHRS button to select ADAHRS A**
2.	**Copilot PFD window**	**Confirm ADAHRS 1 flag which indicates attitude, heading and air data same source as pilot PFD. Compare with Standby Instrument System**

CAUTION

THE AUTOPILOT WILL REVERT TO ROLL AND PITCH MODE

3.	**Autopilot**	**Re-select as required after PFD data displayed**

C. Indication: CAS caution – AHRS A+B Fail

Loss of primary attitude and heading data:

1.	**Aircraft**	**Use Standby Instrument System**

CAUTION

THE FOLLOWING SERVICES WILL BE INOPERATIVE.

- Autopilot (abnormal disengage)
- INAV Map

DO NOT USE VNAV FUNCTION OF THE FMS

If flight conditions and pilot workload permits, attempt to realign AHRS 1 and/or AHRS 2:

2.	**ADHRS CH. A circuit breaker (Essential Bus $_L$D3)**	**Open, wait 5 seconds, then close**

If unsuccessful

3.	**ADHRS CH. B circuit breaker (Main Bus $_R$M1)**	**Open, wait 5 seconds, then close**
4.	**Aircraft**	**Fly strictly wings level and do not change pitch attitude for 1 minute**

If realignment is successful:

5.	**PFD Controller**	**Push ADHRS button to select required ADHRS**

If realignment is not successful:

6.	**Aircraft**	**Land as soon as practical using Standby Instrument System**

END

3.22.12 FLT CTLR

NOTE

FLT CTLR CAS messages are amber on the ground, but cyan in the air.

A. Indication: CAS caution – FLT CTLR Ch A Fail

Condition: Loss of Flight Controller channel redundancy.

NOTE

No loss of functionality. No pilot action.

B. Indication: CAS caution – FLT CTLR Ch B Fail

Condition: Loss of Flight Controller channel redundancy.

NOTE

No loss of functionality. No pilot action.

C. Indication: CAS caution – FLT CTLR Ch A+B Fail

Condition: Loss of both Flight Controller channels.

CAUTION

Loss of Autopilot.
Loss of Flight Director.
Loss of Yaw Damper.
Loss of Minimums Selection/Reporting.
Loss of Heading/Track Selection

END

3.22.13 FMS-GPS

A. Indication: CAS caution –
Build 6
FMS-GPS1 Pos Misc or FMS-GPS2 Pos Misc

Build 7 and higher
Any combination of FMS1-and/or FMS2 with GPS1 Pos Misc or GPS2 Pos Misc

1.	**GPS vs FMS position**	**Check manually**
2.	**GPS**	**Confirm alternate GPS (if second GPS installed) is selected on SENSORS GPS page**
3.	**Aircraft**	**Inform ATC of any loss of RNAV capability**

NOTE

For dual GPS with a single GPS failure – no loss of position will occur. With single GPS sensor failed system goes to DEGRADE and then Dead Reckoning (DR) mode. DEGRADE and DR modes will be annunciated on the PFD HSI.

B. Indication: CAS caution –
Build 6 – FMS-GPS1+2 Pos Misc

Build 7 and higher -
FMS1-GPS1+2 Pos Misc or FMS2-GPS1+2 Pos Misc

Condition FMS PPOS position invalid, GPS position valid.

1.	**Display**	**Monitor position on Map and on SENSORS GPS page**
2.	**Aircraft**	**Inform ATC of any loss of RNAV capability**

CAUTION

- Loss of GPS or FMS navigation
- RAIM unavailable

NOTE

With dual FMS, if only one FMS shows a position miscompare, select the other FMS to avoid loss of navigation and RAIM functionality.

NOTE

With both GPS sensors failed system goes to DEGRADE and then Dead Reckoning (DR) mode. DEGRADE and DR modes will be annunciated on the PFD HSI.

END

3.22.14 UNABLE FMS-GPS MONITOR

Indication:	CAS caution – Unable FMS-GPS Mon
Condition :	Monitor Warning System continuously compares the positions between each FMS and each GPS and annunciates miscompares between any if the threshold is exceeded.

A.

1.	**SENSORS GPS page**	**Check GPS navigation mode**
2.	**If FMS or GPS has failed**	**Use other means of navigation**

If aircraft is SBAS capable and the GPS shows problems with the GPS (GNSS) reception:

3.	**SBAS sensor page**	**Swap to systems. Select sensor pages on multi-purpose window and select GPS. On drop-down menu, select SBAS tab and switch “Enroute SBAS” from Enable to Disable**

NOTE

Disabling Enroute SBAS does not disable using SBAS for LPV approaches. If Enroute SBAS has been disabled due to SBAS problems, LPV approach capability may be affected. Plan an alternative IFR approach for the destination and alternate airports.

4.	**GPS 1 Circuit Breaker (Standby Bus $_L$V3)**	**Open, wait 2 seconds and close**

If GPS 2 is installed:

5.	**GPS 2 Circuit Breaker (Avionic 2 Bus $_R$X1)**	**Open, wait 2 seconds and close**

If caution remains and the DR flag is shown on the PFD:

6.	**Aircraft (If in flight)**	**Inform ATC of any loss of required navigation performance and use other means of navigation.**

CAUTION

RAIM unavailable

NOTE

In the case of an FMS failure the CPCS will default to 10,000 ft Landing Field Elevation (LFE). Manually re-select the LFE to prevent over or under pressurization.

B. IN FLIGHT (while conducting an FMS based approach)

1.	**Aircraft**	**Terminate approach and execute a missed approach if required**

C. IN FLIGHT (during RNP operation)

1.	**Aircraft**	**Terminate and revert to other means of navigation**

D. IN FLIGHT (during RNAV operation)

1.	**FMS information**	**Cross check with VOR, DME and/or NDB information**

If FMS shows an acceptable level of navigation performance:

2.	**Aircraft**	**Navigation may continue using the FMS**

If FMS does not show an acceptable level of navigation performance:

3.	**Aircraft**	**Revert to alternative navigation as required**

END

3.22.15 MULTI MODE RADIO TRANSCEIVER FAILURES

A. Indication: CAS caution – MMDR 1 Fail

1.	**MMDR 1 circuit breaker (Avionic 1 Bus $_{L}$P1)**	**Reset**

If COM 1, NAV 1 and ADF remain not available:

2.	**COM and NAV**	**Use COM 2 and NAV 2**

B. Indication: CAS caution – MMDR 2 Fail

1.	**MMDR 2 PRI circuit breaker (Main Bus $_{R}$H1)**	**Reset**

If COM 2 and NAV 2 remain not available:

2.	**COM and NAV**	**Use COM 1 and NAV 1**

C. Indication: CAS caution – MMDR 1+2 Fail

1.	**MMDR 1 circuit breaker (Avionic 1 Bus $_{L}$P1)**	**Reset**
2.	**MMDR 2 PRI circuit breaker (Main Bus $_{R}$H1)**	**Reset**

If all COM, NAV and ADF radios are not available and communication is required:

3.	**EMERG COM 1 switch**	**Set to 121.5 MHz**

NOTE

If both MMDR’s are not completely unserviceable, communication should be possible 121.5 MHz only.

4.	**Aircraft**	**Proceed to next suitable airfield or continue to destination according to ATC restrictions using 121.5 MHz.**

END

3.22.16 MULTI MODE RADIO TRANSCEIVER OVERHEAT

A. Indication: CAS caution – MMDR 1 Overheat

NOTE

MMDR 1 transmit capability is reduced because internal temperature of unit is too high. MMDR 1 may become operative again after a period of time.

1.	**COM and NAV**	**Use COM 2 and NAV 2**

B. Indication: CAS caution – MMDR 2 Overheat

NOTE

MMDR 2 transmit capability is reduced because internal temperature of unit is too high. MMDR 2 may become operative again after a period of time.

1.	**COM and NAV**	**Use COM 1, NAV 1 and ADF**

C. Indication: CAS caution – MMDR 1+2 Overheat

NOTE

MMDR 1 and 2 transmit capabilities are reduced because internal temperature of units is too high. MMDR 1 and 2 may become operative again after a period of time.

If communication is lost, attempt communication with:

1.	**EMERG COM 1 switch**	**Set to 121.5 MHz**

If communication not successful:

2.	**XPDR**	**Set to 7600 and follow national communication loss procedures**

If all VHF and ADF navigation capabilities are lost:

3.	**Aircraft**	**Continue flight with FMS/GPS**

END

.

3.22.17 TRANSPONDER FAILURES

A. Single Transponder Installation

Indication: CAS Caution – XPDR Fail

1.	**XPNDR 1 circuit breaker (Avionic 1 Bus $_L$V1)**	**Reset**

If caution remains:

2.	**Aircraft**	**Proceed according to ATC instructions, expect descent below controlled airspace or diversion to next suitable airfield**

B. Dual Transponder Installation

Indication: CAS caution – XPDR 1 Fail

1.	**PFD radio window**	**Press bezel button adjacent to XPDR1**
2.	**PFD Controller**	**Press DETAIL button**
3.	**XPDR detail page**	**Press XPDR SEL bezel button to change to XPDR 2**

Indication: CAS caution – XPDR 2 Fail

1.	**PFD radio window**	**Press bezel button adjacent to XPDR2**
2.	**PFD Controller**	**Press DETAIL button**
3.	**XPDR detail page**	**Press XPDR SEL bezel button to change to XPDR 1**

Indication: CAS caution – XPDR 1+2 Fail

1.	**XPNDR 1 circuit breaker (Avionic 1 Bus $_L$V1)**	**Reset**
2.	**XPNDR 2 circuit breaker (Avionic 2 Bus $_R$U1)**	**Reset**

If caution remains:

3.	**Aircraft**	**Proceed according to ATC instructions, expect descent below controlled airspace or diversion to next suitable airfield**

END

3.22.18 AVIONICS STANDARD COMMUNICATIONS BUS FAILURE

Indication: CAS caution – ASCB Fail

By checking available data the crew can determine if the caution is for a single or dual ASCB bus failure.

A. Single ASCB Failure

1.	**Cockpit data**	**Continues to be displayed (Flight data looks normal)**
2.	**Displayed data**	**Cross check PFD with Electronic Standby Instrument System (ESIS)** **Check Engine Instruments** **Check Environment Window**
3.	**Displays**	**Monitor for remainder of flight**

B. Dual ASCB Failure

1.	**Displays suspect (Loss of displayed data)**	**Use Electronic Standby System (ESIS)**

If above 10,000 ft and ∆P and CAB ALT indications are suspect or lost:

2.	**Main OXYGEN lever**	**Confirm ON**
3.	**Crew oxygen masks**	**On**

Procedure to don the crew oxygen masks:

- **a. Remove the normal headset**
- **b. Put the oxygen mask on. Check 100%.**
- **c. Put the normal headset back on.**
- **d. Set MIC SELECT switch on the rear left panel to MASK.**

4.	**PASSENGER OXYGEN selector**	**AUTO or ON**
5.	**Systems MFD PAX OXY advisory**	**Confirm ON**
6.	**Passengers**	**Instruct to don masks**
7.	**Aircraft**	**Descend below 10,000 ft or to minimum safe altitude if higher**
8.	**Aircraft**	**Land as soon as practical using minimum engine power, to avoid exceeding engine limits**

Prior to landing:

9.	**CABIN PRESSURE switch**	**DUMP**

END

3.22.19 AUTOMATIC FLIGHT CONTROL SYSTEM FAILURES

The four step procedure that follows should be among the basic aircraft emergency procedures that are committed to memory. It is important that the pilot be proficient in accomplishing all four steps without reference to this manual.

A. AFCS UNCOMMANDED DEVIATION FROM FLIGHT PATH

Indication: Abrupt control and/or airplane motion.

Accomplish Items 1 and 2 simultaneously.

1.	**Airplane Control Wheel**	**GRASP FIRMLY and regain aircraft control**
2.	**Autopilot Disengage Switch**	**PRESS to disengage the autopilot (pilot or co-pilot wheel)**
3.	**Aircraft**	**RETRIM manually as necessary**
4.	**A/P SERVO circuit breaker (Avionic 1 Bus ⌊Z2)**	**PULL**

WARNING

DO NOT ATTEMPT TO RE-ENGAGE THE AUTOPILOT FOLLOWING AN AUTOPILOT OR AUTOTRIM MALFUNCTION.

B. ABNORMAL DISCONNECT

Indication: Flashing red AP on PFD and continuous “Cavalry Charge” aural warning.

1.	**Airplane Control Wheel**	**GRASP FIRMLY and regain aircraft control**
2.	**Autopilot Disengage Switch**	**PRESS to cancel aural warning (pilot or co-pilot wheel)**
3.	**Aircraft**	**RETRIM manually as necessary**
4.	**Aircraft**	**If no AFCS associated CAS messages attempt to re-engage autopilot once**

C. CAS CAUTION MESSAGES

Indication: CAS caution – AP HOLD LH (RH) WING DN or
AP HOLD NOSE UP (DN) or
YD HOLD NOSE LEFT (RIGHT)

1.	**Airplane Control Wheel and rudder pedals**	**Grasp and position feet to gain aircraft control**
2.	**Autopilot Disengage Switch**	**PRESS to disengage the autopilot (pilot or co-pilot wheel)**
3.	**Aircraft**	**RETRIM manually as necessary**

NOTE

When the AFCS is manually disengaged, an aural warning is given and the PFD AP flashes red for 2.5 seconds.

If no AFCS associated CAS messages:

4.	**Aircraft**	**Attempt to re-engage autopilot once**

NOTE

Maximum Altitude losses due to autopilot malfunction:

Configuration	Alt Loss
Cruise, Climb, Descent	480 ft
APR 3°	90 ft

END

3.22.20 HSI TRK

A. Indication: CAS caution – Build 6 -
HSI is MAG TRK

Build 7 and higher -
HSI1 is MAG TRK or HSI2 is MAG TRK or HIS 1+2 is MAG TRK

Condition: The Primus Apex system has switched the long term reference source for the HSI heading from a gyro based magnetically corrected heading output to a magnetically compensated Track based display.

NOTE

The main difference is that the drift angle, i.e. difference between aircraft heading and track is not shown. The card shows actual track (related to Magnetic North) being made.

1.	**Flight Guidance Control Panel Heading/Track selector**	**Switch to Track**

B. Indication: CAS caution – Build 6 –
HSI is TRU TRK

Build 7 and higher -
HSI1 is TRU TRK or HSI2 is TRU TRK or
HSI1+2 is TRU TRK.

Condition: The Primus Apex system has switched the long term reference source for the HSI heading from a gyro based magnetically corrected heading output to a Track based display.

NOTE

The main difference is that the drift angle, i.e. difference between aircraft heading and track is not shown. The card shows actual track (related to True North) being made.

The autopilot will switch to ROL/PIT modes when the system switches to TRUE automatically. Other AFCS modes can be re-engaged as required.

1. Flight Guidance Control Panel Heading/Track selector — Switch to Track

END

3.22.21 CAS MISCOMPARE

Indication: MW caution on left side of CAS window

Condition: Monitor Warning Function Channels A and B miscompare.

1. CAS Window — Toggle MW soft key to see alternatively Channel A or B of the MWF to find out which message is triggering the MW miscompare condition

2. Aircraft — Ascertain the reason for the miscompare flag and take appropriate action, using the affected CAS message and Abnormal Procedures

END

3.22.22 STUCK MIC

Indication: Continuous transmit indication on one of the MMDRs and/or a “Stuck Mic” indication on the Radio Window

If “Stuck Mic is annunciated on the radio window:

1.	**Affected MMDR**	**Check “T” is removed by the “Stuck Mic” detection**

If “T” is not removed and affected MMDR continues to transmit

2.	**Affected audio panel**	**Select PA to disconnect PTT to MMDR**
3.	**Other audio panel**	**Use 2nd audio panel, 2nd headset, and 2nd PTT to re-establish ATC communication**

END

INTENTIONALLY BLANK

ABNORMAL PROCEDURES

3A.1 GENERAL

This section provides a description and any actions that can be taken for the Crew Alerting system (CAS) cyan advisory and white status messages. These are failures of system module or element parts that are not of an emergency nature. The information is given in the form of a list of all the cyan advisory and white status messages and their meaning, any effect on flight and where possible any actions that can be taken, they are not readily adaptable to a checklist format.

* These cyan advisory and white status messages require maintenance action if they cannot be cleared before flight, or dispatch the aircraft under the provisos of an approved and permissible PC-12 aircraft MEL.
During flight, continue with remaining operational equipment and report on landing.

3A.2 CAS ADVISORIES

CAS ADVISORY MESSAGE	MEANING, EFFECTS AND POSSIBLE ACTIONS
* 1: MWF A Fail * 2: MWF B Fail	A failure has been detected in either Monitor Warning Function A or B. No effect on flight. An amber "MW" miscompare annunciation will be displayed on the left of the CAS window, in the event of the MWF determining a miscompare of MW lists in the two MWF Channels. Pressing the MW bezel button allows toggle between the MWF source. The displayed source is shown below the CAS annunciation in larger white font. The pilot should select the source determined to be correct.
* 1: AIOP A Module Fail * 2: AIOP B Module Fail	Actuator I/O Processor module A or B has failed. The AFCS monitoring function between modules is inoperative. Effect on flight, loss of AFCS, FD and YD. Loss of corresponding MWF Channel.
* 1: CSIO A Fail * 2: CSIO B Fail * 3: CSIO A+B Fail	Custom I/O module A or B or A and B failed. A single A or B failure will have no effect on flight, an A and B failure will result in some invalid data on PFD/MFD windows.

CAS ADVISORY MESSAGE	MEANING, EFFECTS AND POSSIBLE ACTIONS
* 1: MAU A Overheat * 2: MAU B Overheat * 3: MAU A+B Overheat	An overheat condition has been detected for MAU CH A and/or B. Auto-shutdown of the MAU is possible if temperature continues to rise. When temperature returns to a safe level, the MAU will reset automatically. Effect on flight, loss of MAU CH A or B.
MAU Fan Fail	No flight crew action required. Corresponding MAU Overheat advisory may occur.
* 1: GIO A Fail * 2: GIO B Fail * 3: GIO A+B Fail	Generic I/O module A or B or A and B failed. A single A or B failure will have no effect on flight, an A and B failure will result in some invalid data on PFD/MFD windows.
* 1: AGM 1 Fail * 2: AGM 2 Fail	Advanced Graphics Module 1 or 2 failed. AGM 1 (MAU Ch. A) drives the Pilot PFD and upper MFD. AGM 2 (MAU Ch. B) drives the Copilot (when installed) and lower MFD. Refer to APEX Failures - Displays for more information.
1: CMS 1 Fail 2: CMS 2 Fail	Configuration Management System has detected a failure in the monitoring software of CMS 1 or 2. No effect on flight.
Yaw Damper Fail	Maintain the aircraft in balanced flight using rudder pedals and manual rudder trim. Above FL200 fly smoothly, do not make abrupt or large rudder or aileron control deflections. Keep the slip ball centered to +/- 1 ball. Reset the AFCS as follows: Open the A/P SERVO (Avionic 1 Bus $_{L}$Z2) and A/P SERVO ENABLE (Avionic 1 Bus $_{L}$Y2) circuit breakers for 2 secs, then close. Check CAS. Only one reset attempt per flight
Autopilot Fail	Autopilot is not available. Reset the AFCS as follows: Open the A/P SERVO (Avionic 1 Bus $_{L}$Z2) and A/P SERVO ENABLE (Avionic 1 Bus $_{L}$Y2) circuit breakers for 2 secs, then close. Check CAS. Only one reset attempt per

CAS ADVISORY MESSAGE	MEANING, EFFECTS AND POSSIBLE ACTIONS
Flight Director Fail	Flight Director is not available Reset the AFCS as follows: Open the A/P SERVO (Avionic 1 Bus $_L$Z2) and A/P SERVO ENABLE (Avionic 1 Bus $_L$Y2) circuit breakers for 2 secs, then close. Check CAS. Only one reset attempt per flight
AFCS Fault (Build 7 and higher)	Fault detected in the AFCS system. Reset the AFCS as follows: Open the A/P SERVO (Avionic 1 Bus $_L$Z2) and A/P SERVO ENABLE (Avionic 1 Bus $_L$Y2) circuit breakers for 2 secs, then close. Check CAS. Only one reset attempt per flight
All on together: Flight Director Fail, Autopilot Fail, Yaw Damper Fail	Reset the AFCS as follows: Trim the aircraft straight and level. Wait two minutes. If the CAS messages go off, re-engage autopilot. ADAHRS reset can only be achieved in stable pitch and no bank condition, also only light turbulence. Only one reset attempt per flight. If the CAS messages stay on or recur, trim the aircraft straight and level with autopilot and yaw damper disengaged. Open the ADAHRS CH B circuit breaker (Main Bus $_R$M1), wait 5 seconds then close the circuit breaker. Wait two minutes. If the CAS messages go off, engage the autopilot. If the CAS messages reoccur, and autopilot is required for continued safe flight, open the ADAHRS CH B circuit breaker (Main Bus $_R$M1) and leave open for the rest of the flight.
* FMS Fail or *FMS1+2 Fail (if dual FMS installed)	Flight management System is not available, use remaining operational navigation equipment as required. The CPCS will use the default Landing Field Elevation (LFE) of 10,000 ft to determine the target cabin altitude. Therefore, the flight crew must manually re-select the LFE early enough to prevent over or under pressurization. Alternatively, the CPCS SYSTEM MODE switch may be selected to MANUAL for manual control of the cabin altitude.
FMS1 Fail or FMS2 Fail	If required use the NAV source select button on the PFD Controller to select the cross-side FMS for navigation.

CAS ADVISORY MESSAGE	MEANING, EFFECTS AND POSSIBLE ACTIONS
FMS Synch Error	FMS1 and FMS2 are operating independently (not synchronized). Non-coupled FMS will not receive any changes made to the flight plan. See section 7-33 for a description of how to synchronize FMS1 and FMS2.
Takeoff Config	Takeoff configuration incorrect. Correct prior to takeoff.
* Pusher Safe Mode	Stick pusher computer has gone into pusher safe mode. Stall warning trigger thresholds operate at the 0° flap position settings irrespective of the flap position.
* 1: LH OAT Fail * 2: RH OAT Fail * 3: LH+RH OAT Fail	Loss of total and static air temperature from ADAHRS Channel A or B or A and B. Refer to AHRS Failures for more information.
* MF CTLR Fail	Multi function controller has failed. Open and close the MULTI FUNCT CONT circuit breaker (Standby Bus $_L$R3). If reset unsuccessful, use remaining operational navigation equipment as required. If joystick has failed, use the Direct To button on MF controller and enter waypoints to operate the FMS from point to point or use CCD (if installed) to operate joystick functions
* 1: LH PFD CTLR Fail * 2: RH PFD CTLR Fail * 3: LH+RH PFD CTLR Fail	Cross check PFD data with Electronic Standby Instrument System (ESIS). Use MF Controller to operate Radio window. Use PFD knob on serviceable PFD Controller to set up both Pilot and Copilot PFD
(In Flight Only) 1: FLT CTLR Ch A Fail 2: FLT CTLR Ch B Fail 3: FLT CTLR Ch A+B Fail	Single channel failure has no effect. Dual channel failure results in loss of AP/FD/YD.

CAS ADVISORY MESSAGE	MEANING, EFFECTS AND POSSIBLE ACTIONS
* 1: GPS 1 Fail * 2: GPS 2 Fail * 3: GPS 1+2 Fail	GPS has no satellite signal reception or GPS unit failed. If CAS message does not clear after approx. 2 mins: For Single GPS installation: Use remaining operational navigation equipment as required. For Dual GPS installation: If single GPS fail, the FMS will automatically select the alternate GPS. If needed, select alternate GPS on Sensors page. For Dual GPS installation: If dual GPS fail: Use remaining operational navigation equipment as required. Open the circuit breaker of the failed GPS (GPS 1 Standby Bus $_{L}$V3 and/or GPS 2 Avionic 2 Bus $_{R}$X1), wait 5 seconds then close the circuit breaker. NOTE: The FMS will use ADAHRS data to dead reckon, based on the previously known GPS position prior to the failure.
Traffic Fail	Loss of TCAS
TAWS Fail	Loss of TAWS
Terr Inhib Active	Terrain alerting Inhibit selected
Terr Inhib not Avail	Terrain alerting visual and aural inhibit is not available
No Altitude Reporting (Primus APEX Build 6)	XPDR not transmitting altitude. Select TA on Radio window or ALT if no TCAS system is installed.

ON GROUND CAS ADVISORIES	MEANING
Maintenance Fail	The Aircraft Diagnostic and Maintenance System (ADMS) has failed. Does not prevent the aircraft from dispatching, may impact mechanic's ability to diagnose and repair the aircraft in a timely manner.
ACMF Logs Full	One or more of the Aircraft Condition Monitoring Function – Aircraft, Navigation or Engine data logs are full. Data will be lost if not transferred.
ACMF Logs >80% Full	One or more of the Aircraft Condition Monitoring Function – Aircraft, Navigation or Engine data logs are more than 80% full. Data may be lost if not transferred.
Engine Log Full	The Engine Trend Recording Stable Cruise data log is full. Data will be lost if not transferred.
Engine Log >80% Full	Engine Trend Recording Stable Cruise data log is more than 80% full. Data may be lost if not transferred.
* Aural Warning Fault (Build 8.5 and higher)	One of the two aural drivers is inhibited or has failed. There is a loss of redundancy in the aural warning system. No effect on flight.

3A.3 CAS STATUS

AIRBORNE CAS STATUS MESSAGE	MEANING
Event	A 5 second airborne indication, to show that a crew initiated event, by pressing the EVENT button on the MF controller, has been recorded.
Function Unavailable	Indicates that an unavailable function has been selected by the crew

ON GROUND CAS STATUS MESSAGE	MEANING
* Check Oil Debris	The particle count 30 second threshold limit has been exceeded
* CPCS Fault	One of the channels in the Cabin Pressure Control computer has a fault condition. Reset the CPCS as follows: 1. CPCS MODE switch, set MANUAL for min. 1 sec then AUTO. Check CAS. 2. For MSN 1001 - 1719: CPCS Ch. 1 and CPCS Ch. 2 circuit breakers, open for 4 secs, then close. Check CAS. For MSN 545, 1721 - 1942: CPCS AUTO and CPCS MON circuit breakers, open for 4 secs, then close. Check CAS. 3. CPCS MODE switch, set MANUAL for min. 1 sec then AUTO. Check CAS.
* FCMU Fault	The Fuel Control and Monitoring computer has a fault condition. Automatic fuel balancing, analog fuel quantity and low level indication may be suspect.
* Low Lvl Sense Fault	The fuel low level sensing part of the Fuel Control and Monitoring computer has a fault condition. Fuel low level CAS cautions may be inoperative.
Maint Memory Full	The Fault History Database for the aircraft member systems has become full. Fault History will be lost if not transferred.
No Engine Trend Store	Indicates that a Stable Cruise flight data store condition was not achieved. Will remain on until a Stable Cruise flight data store is successful.

ON GROUND CAS STATUS MESSAGES	MEANING AND POSSIBLE ACTIONS
Engine Exceedance	Reminds on the ground that during flight a WARNING was displayed for an exceedance of one or more of the following engine parameters: Oil Pressure Oil Temperature ITT TORQUE NG NP If no exceedances were noted by the pilot, continue flight and report to maintenance personnel. If an exceedance was noted, maintenance action may be required before continued flight, depending on the extent of the exceeded parameter. The CAS message will always be displayed on the ground as a reminder. **Build 6** – The CAS message can only be cleared by maintenance action. Further exceedance (if any) will not be displayed. **Build 7 or higher** - The message is cleared by the next power cycle. The exceedance is permanently recorded on the ACMS file for periodic maintenance analysis.
Aircraft Exceedance	Reminds on the ground that during flight an Airspeed WARNING was displayed or, an acceleration parameter (g limit) was exceeded. If no exceedances were noted by the pilot, continue flight and report to maintenance personnel. If an exceedance was noted, maintenance action may be required before continued flight, depending on the extent of the exceeded parameter. The CAS message will always be displayed on the ground as a reminder. **Build 6** – The CAS message can only be cleared by maintenance action. Further exceedance (if any) will not be displayed. **Build 7 or higher** - The message is cleared by the next power cycle. The exceedance is permanently recorded on the ACMS file for periodic maintenance analysis.

ON GROUND CAS STATUS MESSAGES	MEANING AND POSSIBLE ACTIONS
Crew Event Store	Indicates that a crew initiated event has been recorded
* 1: LH WOW Fault * 2: RH WOW Fault * 3: LH+RH WOW Fault	Indicates that the Modular Avionics Unit (MAU) has determined that either of the main landing gear proximity switches is in disagreement with the aircraft Air/Ground determination.
* AGM 2/FMS1 GFP inop	Indicates graphical Flight Planning function failed in Aircraft Graphics Module.
* 1: AGM 1 DB Error * 2: AGM 2 DB Error * 3: AGM 1+2 DB Error	Indicates an error has been detected in the navigation or charts database on one or both Advanced Graphics Module (AGM).
* 1: AGM 1 DB Old * 2: AGM 2 DB Old * 3: AGM 1+2 DB Old	Indicates the navigation or charts database in one or both Advanced Graphics Module (AGM) is out of date.

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SECTION 4

NORMAL OPERATING PROCEDURES

CONTENTS

NORMAL OPERATING PROCEDURES

4.1 GENERAL

This section provides the normal operating procedures. All of the procedures required by regulation as well as those procedures which have been determined as necessary for the operation of this airplane are provided.

Normal operating procedures associated with optional systems or equipment which require supplements are contained in Section 9, Supplements.

Pilots must familiarize themselves with these procedures to become proficient in the normal operation of the airplane.

It is recommended that these procedures be followed for the normal operation of the aircraft. When the aircraft has been in extended storage, had recent major maintenance or been operated from prepared unpaved surfaces the full preflight inspection procedure given in this section is recommended.

4.2 AIRSPEEDS FOR NORMAL OPERATIONS

Airspeeds for normal operations are listed below. Unless otherwise noted, all airspeeds are based on a maximum takeoff weight of 10,450 lb (4,740 kg) at sea level under ISA standard day conditions.

Takeoff (V_R):

Flaps 15°	82 KIAS
Flaps 30°	76 KIAS

Maximum Climb:

Best Angle (V_X)	120 KIAS

Best Rate (V_Y) Flaps 0°:

Sea level	130 KIAS
5,000 ft	125 KIAS
10,000 ft	125 KIAS
15,000 ft	125 KIAS
20,000 ft and above	120 KIAS

Recommended Climb Speed with Flaps retracted and Pusher Ice Mode	135 KIAS
Maximum Operating Maneuvering Speed (V_O) (10,450 lb/ 4,740 kg)	166 KIAS

Maximum Flaps Extended (V_{FE}):

Flaps 15°	(≤ = 15°)	165 KIAS
Flaps 30° / 40°	(>15°)	130 KIAS

Maximum Landing Gear:

Extension (V_{LO})	180 KIAS
Retraction (V_{LO})	180 KIAS
Extended (V_{LE})	240 KIAS

Landing Approach Speed
(based on Maximum Landing Weight of 9,921 lb/ 4,500 kg):

Flaps 0°	120 KIAS
Flaps 15°	99 KIAS
Flaps 30°	89 KIAS
Flaps 40°	85 KIAS
with residual ice on the airframe	
Flaps 15°, Pusher Ice Mode	105 KIAS

Balked Landing (Go-Around):

TO/Pwr, Flaps 15°, LG down	98 KIAS
TO/Pwr, Flaps 30°, LG down	89 KIAS
TO/Pwr, Flaps 40°, LG down	85 KIAS
TO/Pwr, Flaps 15°, LG down, Pusher Ice Mode	105 KIAS

Maximum Demonstrated Crosswind for Takeoff and Landing (not a limitation):

Flaps 0°	30 kts
Flaps 15°	25 kts
Flaps 30°	20 kts
Flaps 40° (landing only)	15 kts

For APEX software Build 8 and higher, the Angle of Attack Fast/Slow indicator is replaced by the Dynamic Speed Bug on the Airspeed Tape. Therefore the term “AOA centered” used in this chapter refers to the speed represented by the Dynamic Speed Bug (1.3 V_{STALL}).

4.3 PREFLIGHT INSPECTION

4.3.1 EMPENNAGE

1.	Luggage	CHECKED and SECURED
2.	Cargo (Combi Interior)	CHECK that cargo is located against retainer angles installed on seat rails.
3.	Tie Down Straps (Combi interior)	CHECK fittings properly inserted into seat rails and that the straps are tight.
4.	Cargo Door	After cargo loading / unloading: CHECK lower attachment lugs for condition.
5.	Hydraulic system	Make sure nitrogen pressure is in the colored sector and the level indicator shows full.
6.	Cargo Door	CLOSED and LOCKED (check for green flags)
7.	Static ports	CHECK CLEAR of OBSTRUCTIONS
8.	Tail tie-down	DISCONNECTED
9.	External Power Door	CLOSED/AS REQUIRED
10.	Oxygen rupture disc	INTACT if a larger capacity oxygen system is installed in the rear fuselage
11.	Rudder and trim tab	CHECK VISUALLY
12.	Vertical stabilizer	CHECK VISUALLY
13.	Elevator assembly	CHECK VISUALLY
14.	Horizontal stabilizer	CHECK VISUALLY, Stabilizer Trim Mark within green range.
15.	Deicing Boots	CHECK VISUALLY
16.	Static discharge wicks	CHECK
17.	Dorsal and ventral fairings	CHECK
18.	General condition	CHECK

19. Battery compartment

a.	LDR Circuit breaker	CHECK IN
b.	ELT	CHECK CONDITION
c.	Autopilot servos and cables	CHECK CONDITION
d.	Power junction box circuit breakers	CHECK IN
e.	Steering bar	STOWED and SECURED
f.	Battery	CONNECTED
g.	Battery compartment	CHECK CLOSED

4.3.2 RIGHT WING TRAILING EDGE

1.	Flaps	CHECK CONDITION
2.	Aileron	CHECK CONDITION
3.	Static discharge wicks	CHECK
4.	General condition	CHECK

4.3.3 RIGHT WING LEADING EDGE

1.	Nav/Strobe light	CHECK CONDITION
2.	Fuel tank vent	CLEAR of OBSTRUCTIONS
3.	Fuel quantity and filler cap	CHECK and SECURE
4.	Pitot probe	COVER REMOVED and CHECKED
5.	AOA probe	COVER REMOVED CHECK FREE MOVEMENT
6.	Wing tie-down/wheel chocks	DISCONNECTED and REMOVED
7.	De-Icing boot	CHECK GENERAL CONDITION
8.	Right main landing gear	CHECK
9.	Right brake assembly	CHECK
10.	Two fuel drains	SAMPLE and SECURE
11.	General condition	CHECK

4.3.4 NOSE SECTION

A. SERVICE BAY (RIGHT) (If a standard oxygen system is installed):

1.	Oxygen Press	CHECK
2.	Oxygen and ECS Doors	CLOSED
3.	Oxygen rupture disc	INTACT

B. Engine Area

1.	Cowling RH	CHECK and SECURE
2.	Propeller	
a	Blade Anchor	REMOVED and STOWED
b	Blade	CHECK

NOTE

For 5-blade propeller: It is recommended to keep a copy of Hartzell Service Letter 61-360 (latest issue) in the aircraft for reference and damage assessment recording during the blade check.

c	De-Icing Boots	CHECK GENERAL CONDITION
d	Spinner	CHECK
3.	Air Inlet and Exhaust Covers	REMOVED and STOWED
4.	Air Inlets	CHECK ENGINE AIR INTAKE, OIL COOLER, ECS and GENERATOR for OBSTRUCTIONS
5.	Exhaust System	CHECK
6.	Nose Gear and Doors	CHECK
7.	Wheel Chocks	REMOVED
8.	Engine drain mast (LH)	CHECK. No leaks permitted
9.	Engine drain (LH)	SAMPLE and SECURE

WARNING

DO NOT TOUCH OUTPUT CONNECTORS OR COUPLING NUTS OF IGNITION EXCITER WITH BARE HANDS.

10.	Oil Quantity	CHECK SIGHT GLASS AND DIPSTICK FOR SECURITY (green markings aligned)

Check oil level in green range of sight glass within 10 to 20 minutes after engine shut down. If engine has been shut down for more than 30 minutes, check dipstick indication and if it indicates that oil is needed, check for oil leaks in the engine bay, start the engine and run at ground idle for 5 minutes. Recheck oil level using dipstick and refill if necessary. For a better view, the check of the dipstick security may be conducted from the RH cowling.

11.	General Condition	CHECK
12.	Cowling LH	CHECK and SECURE
13.	Windshield	CHECK CLEAN

C. SERVICE BAY (LEFT)

1.	Fuel Filter	SECURE, INDICATOR FLUSH
2.	Fuel Filter drain	SAMPLE AND SECURE
3.	Fuel Compartment Doors	CLOSED
4.	Air Separator drain	SAMPLE AND SECURE

4.3.5 LEFT WING LEADING EDGE

1.	Two fuel drains	SAMPLE and SECURE
2.	Left main landing gear	CHECK
3.	Left brake assembly	CHECK
4.	De Icing boot	CHECK GENERAL CONDITION
5.	Pitot probe	COVER REMOVED and CHECKED
6.	AOA Probe	COVER REMOVED and CHECK FREE MOVEMENT
7.	Wing tie-down/wheel chocks	DISCONNECTED and REMOVED
8.	Fuel quantity and filler cap	CHECK and SECURE
9.	Fuel tank vent	CLEAR of OBSTRUCTIONS
10.	Nav/Strobe light	CHECK CONDITION
11.	General condition	CHECK

4.3.6 LEFT WING TRAILING EDGE

1.	Static discharge wicks	CHECK SECURITY and CONDITION
2.	Aileron and trim tab	CHECK CONDITION
3.	Flaps	CHECK CONDITION
4.	General condition	CHECK

4.3.7 CABIN

1.	Passenger Door	CLOSED and LOCKED (check for 6 green flags)
2.	Hand luggage	SECURED/STOWED
3.	Passenger Seat	CHECK Backrests in upright position (for takeoff and landing)
4.	Passenger Seat Belts	FASTENED
5.	Overwing emergency exit	LOCK PIN REMOVED, EXIT CHECKED and LOCKED
6.	Fire Extinguisher	CHECK ATTACHMENT and PRESSURE

For flights above 10,000 ft altitude:

7.	Passenger oxygen masks	CONNECTED AND STOWED (for each passenger)

4.3.8 COCKPIT

1.	Flight Control Lock	REMOVED and placed in STOWAGE
2.	EMERG COM 1 switch	NORM
3.	Aural Warning Inhibit switch	ON
4*.	LH MASK/MIC switch	CHECK MIC
5.	LH Circuit breakers	CHECK IN
6.	Parking Brake Handle	SET/PUSH BRAKE PEDALS
7.	ICE PROTECTION switches INERT SEP switch	OFF AS REQUIRED
8.	Landing Gear Handle	DN
9.	Environmental (ACS, ELECTRICAL, FANS) and CPCS switches	AUTO
10*.	RH MASK/MIC switch	CHECK MIC
11.	RH Circuit breakers	CHECK IN
12.	Main OXYGEN lever	ON
13*.	Crew oxygen masks	CHECK 100%
14.	WX radar	STBY
15.	ELT	ARMED/GUARDED

Items marked thus:* only necessary on first flight of the day.

16.	TRIM INTERRUPT switch	NORM/GUARDED
17.	FLAP INTERRUPT switch	NORM/GUARDED
18.	Manual Override Lever	OFF and stowed properly

CAUTION

TO PREVENT DAMAGE TO ENGINE CONTROLS, DO NOT MOVE THE POWER CONTROL LEVER AFT OF THE IDLE DETENT WITH ENGINE NOT RUNNING.

19.	POWER CONTROL LEVER	IDLE DETENT
20.	CONDITION LEVER	CUT-OFF/FEATHER
21.	Flap Lever	0°
22.	Cockpit/Instrument/ Cabin Light switches	OFF
23.	Fuel Firewall Shut-off lever	FULLY IN
24.	Hydraulic hand pump handle	STOWED
25.	ACS Firewall Shut-off lever	FULLY IN
26.	FUEL PUMPS switches	AUTO
27.	IGNITION switch	AUTO
28.	EXTERNAL LIGHTS switches	OFF
29.	PASSENGER WARNING switches	OFF
30.	EPS switch	OFF
31.	MASTER POWER switch	ON and Guarded. Check condition of guard
32.	BAT 1, BAT 2, STBY BUS	CHECK OFF
33.	EXT PWR	CHECK CENTER
34.	AV 2 BUS, CABIN BUS, AV 1 BUS, GEN 1, GEN 2	CHECK ON

4.4 BEFORE STARTING ENGINE

1.	Preflight inspection		COMPLETE
2.	STBY BUS switch		ON wait until MFD powers up (30 secs) prior to switching batteries on
3.	Display reversion control panel		Pilots PFD AGM NORM, Copilots PFD AGM NORM (if installed) Adjust lower MFD brightness and set other DU's brightness control similarly
4.	ATIS and start up clearance		RECEIVED
5.	FMS programming		COMPLETED
6.	Seats		ADJUSTED and LOCKED
7.	Seat belts		FASTENED
8.	EPS switch		TEST (minimum 5 secs)
	a	Green TEST indicator	ON during test
	b	EPS switch	ARMED
	c	Red EPS ON indicator	ON
	d	ESIS	ALIGNING
9.	BAT 1 and BAT 2 switches		ON
10.	Red EPS ON indicator		Check OFF
11.	BAT 1 and BAT 2 indicators		CHECK 24 VDC min
12.	External power (if available)		
	a	External power unit	On, check 28 VDC
	b	External power unit	Connect, check OHP AVAIL is on
	c	EXT PWR switch	ON
	d	BAT 1 and BAT 2 indicators	CHECK 28 VDC

NOTE

The external power control unit on the aircraft will disconnect the EPU if the output voltage is above 29.5 or below 22 VDC.

13.	Landing Gear 3 greens	CHECK
14.	FUEL quantity	SUFFICIENT for flight, balanced within 3 segments for departure

15.	FIRE WARN test switch	PUSH. (CAS Engine Fire and Fire Detector annunciations on while switch is pushed, callout heard if powered from GPU)
16.	LAMP test switch	PUSH. (Master Warning and Caution lights on while switch is pushed)
17*.	FUEL PUMP LH switch	ON, check CAS Fuel Pressure Low caution goes off, then set AUTO
18*.	FUEL PUMP RH switch	ON, check CAS Fuel Pressure Low caution goes off, then set AUTO
19.	Oxygen pressure gage	CHECK 1,850 psi MAX
20.	PASSENGER OXYGEN selector	AUTO. SET switch to OFF if no passengers on board.
21.	Direct Vision window	CLOSED and LOCKED
22.	Radios/Avionics	SET as required, ESIS aligned

* only necessary on the first flight of the day.

4.5 ENGINE STARTING

4.5.1 WITH OR WITHOUT EXTERNAL POWER

1. External lights — AS REQUIRED

NOTE

Avoid prolonged use of the beacon and logo lights (if installed), as this can cause a decrease in battery power and affect the engine starting.

2. Propeller area — CLEAR, Confirm CLEAR of obstructions
3. CAS window — CHECK no door warnings, no oil temperature warning and no cyan autopilot messages

NOTE

It is essential that the autopilot pre-start servo calibration is not affected by any control inputs or an engine start before the CAS cyan autopilot messages are extinguished. Failure to follow this procedure will possibly affect the autopilot system availability in the air.

4. STARTER switch — PUSH momentarily
   a Oil pressure — CHECK rising
   b Ng — 13%
5. Condition Lever — GROUND IDLE

NOTES

COLD START - (oil temp below 5° C). Set FLIGHT IDLE as soon as Ng is above 13%. Set GROUND IDLE when Ng is above 50%.

WARM START - (ITT above 150° C). After Ng has stabilized wait until ITT approaches 150° C before GROUND IDLE is set.

6.	ITT		MONITOR. MAXIMUM 1000°C limited to 5 sec. 850° - 870°C limited to 20 sec.

If there is a rapid increase in ITT towards 1000°C, then:

a	CONDITION LEVER	CUT-OFF/FEATHER, refer to DRY MOTORING RUN.

7.	Ng	STABLE above 50%

If Ng stays below 50% then:

a	CONDITION LEVER	FLIGHT IDLE
b	ITT	MONITOR

If there is no increase in ITT or Ng within 10 sec of moving Condition Lever to GROUND OR FLIGHT IDLE, then:

c	CONDITION LEVER	CUT-OFF/FEATHER
d	STARTER INTERRUPT switch	Push
e	Allow min 30 sec draining period, then refer to DRY MOTORING RUN.	

8.	Starter sequence	COMPLETED
9.	Engine instruments	STABLE in green range
10.	GEN 1 and GEN 2	Check volts and amps

NOTE

If the propeller rpm after engine start-up is below 950 rpm, refer to Para. 3.6.2 in the Emergency Procedures section. If NG is below 60% after start-up, refer to Para. 3.6.3 in the Emergency Procedures section.

11.	FUEL RESET soft key	Push to reset
12.	External Power Unit (if used)	Disconnect

4.5.2 DRY MOTORING RUN

NOTE

This procedure is used to remove internally trapped fuel and vapor or if there is evidence of fire within the engine gas path.

Allow min 30 sec draining period, then:

1.	CONDITION LEVER	CUT-OFF/FEATHER
2.	POWER CONTROL LEVER	IDLE DETENT
3.	IGNITION circuit breaker (LH Blue ESSENTIAL BUS)	PULL
4.	BAT 1 and BAT 2 switches	ON
5.	EXT PWR switch	ON
6.	FUEL PUMPS switches	ON
7.	STARTER switch	PUSH momentarily
	After 15 seconds	Should a fire persist, as indicated by sustained ITT, CLOSE the Fuel Emerg Shut-off valve at this point and continue motoring for another 15 sec.
8.	START INTERRUPT switch	PUSH
9.	FUEL PUMPS switches	AUTO
10.	IGNITION circuit breaker (LH Blue ESSENTIAL BUS)	RESET
11.	EXT PWR switch	OFF
12.	BAT 1 and BAT 2 switches	OFF

Observe starter cooling off limits, then initiate applicable engine start procedure.

4.6 BEFORE TAXIING

1.	Flaps Lever	15°
IF ICING CONDITIONS EXPECTED OR FIRST FLIGHT OF THE DAY:		
2.	ICE PROTECTION switches	Set all on for 1 minute, (windshield heavy)
3.	CAS window	No cautions. Check PROPELLER, INERT SEP and BOOTS advisories are on
4.	ICE PROTECTION switches	Set as required
5.	Inertial Separator	OPEN, if operating on unprepared surface or for bird strike protection
6.	Stick Pusher Test:	
a	PCL	SET 5 - 10 psi
b	STICK PUSHER test switch (Overhead Panel)	PUSH AND HOLD
c	PCL	Set to idle.
d	Elevator Control	PULL
e	Shaker for 2 sec Break for 1 sec Shaker for 2 sec Break for 1 sec Pusher, Shaker	CHECK correct operation. Post SB 45-003. The “Stall” aural callout is inhibited on the ground
f	ICE PROTECTION PUSHER ICE MODE advisory	CHECK ON
	When pusher operates:	
g	PUSHER INTR switch (Control Wheel)	PRESS and HOLD, check pusher interrupts
h	STICK PUSHER test switch	RELEASE
i	CAS PUSHER caution	CHECK OFF
j	CAS PUSHER caution	CHECK ON (visual and aural) after 3 sec
k	PUSHER INTR switch	RELEASE
l	CAS PUSHER caution	CHECK OFF (visual and aural)
m	Elevator Control	CHECK FULL and FREE movement
7.	PFD, MFD CAS, ESIS	No flags or red warning captions, all aligned

4.7 TAXIING

1.	EXTERNAL LIGHTS switches	AS REQUIRED
2.	PASSENGER WARNING switches (if installed)	ON
3.	Parking Brake	RELEASE
4.	Brakes	CHECK
5.	PCL	CHECK beta is available, return to IDLE
6.	Display units	Compare ADI's, speeds, Altitude, Heading and check no flags

CAUTION

TO AVOID POSSIBLE PROPELLER DAMAGE, DO NOT ALLOW STABILIZED PROPELLER OPERATION BETWEEN 350 AND 950 RPM (PROPELLER NOT FEATHERED).

NOTE

If operating conditions allow, use the beta range (aft of the idle detent) to control taxi speed and reduce wear on brakes.

For the periodical brake conditioning procedure, refer to the Brake Care Paragraph in Section 8.

4.8 BEFORE TAKEOFF

4.8.1 BEFORE DEPARTURE

1.	Takeoff power setting	CALCULATED
2.	Fuel quantity	CHECK
3.	Engine instruments	CHECK
4.	Trim If CG is 236 inches (6 meters) or further aft of datum	SET GREEN range SET GREEN DIAMOND
5.	Flaps	15° (for reduced take-off distance flap 30° may be used)
6.	Flight controls	FULL, FREE and CORRECT
7.	CPCS	Check FMS identifier and ELEV, if no FMS ELEV adjust landing ELEV, check mode. Check no CPCS faults. If identifier and ELEV miscompare, select and deselect DEST ELEV
8.	DC Amps Batteries	CHECK both BAT 1 and BAT 2 indicate less than 30 amps. If greater than 30 amps is indicated, delay takeoff until indications are at or below 30 amps
9.	Radios/Navigation/FD/ clearance	SET and checked
10.	Departure and emergency briefing	COMPLETED

4.8.2 LINE UP CHECK

1.	PROBES switch	ON
2.	Windshield Heat	AS REQUIRED
3.	INERT SEP	AS REQUIRED
4.	External light switches	AS REQUIRED
5.	Transponder	AS REQUIRED
6.	Runway	IDENTIFIED, Heading verified and Heading Bug synchronized
7.	CONDITION LEVER	FLIGHT IDLE
8.	CAS window	CHECK

4.9 TAKEOFF

1.	ACS BLEED AIR switch	INHIBIT (If torque as per Static Takeoff Torque chart in Section 5 is below flat rating and/or if the given maximum torque cannot be achieved)
2.	POWER CONTROL LEVER	SET (Under certain hot and/or high airfield altitude the engine power is below the torque limiter setting and manual power setting is required according to Static Takeoff Torque chart in Section 5)

CAUTION

THE TORQUE LIMITER ASSISTS THE PILOT IN SETTING THE ENGINE POWER. THE PILOT IS RESPONSIBLE TO RESPECT ALL ENGINE OPERATING LIMITS.

NOTE

Increasing airspeed might cause torque and ITT to increase. If torque increases above 44.3 psi (CAS caution), reduce power to avoid a CAS warning.

3. Engine instruments:

a	Torque	MONITOR
b	ITT	MONITOR
c	Ng	MONITOR
d	Oil Temp/Pressure	MONITOR

4. Rotate at V_R,
initial climb at V_X or V_Y, as required

After lift-off and positive rate of climb:

5.	Brakes	PRESS to stop wheel rotation
6.	Landing Gear Handle	UP
7.	Yaw Damper	ON
8.	Flaps	0° above 100 KIAS
9.	Taxi and Landing Lights	OFF

4.10 FLIGHT INTO KNOWN ICING CONDITIONS

Icing conditions are defined in Section 1.

WARNING

FLIGHT IN ICING CONDITIONS IS PROHIBITED IF THERE IS A KNOWN FAILURE OF ANY OF THE ICE PROTECTION SYSTEMS.

WARNING

DURING FLIGHT IN ICING CONDITIONS OR FLIGHT WITH ANY VISIBLE ICE ACCRETION ON THE AIRFRAME, THE FOLLOWING FLAP EXTENSION LIMITS APPLY:
- WITH OPERATIONAL AIRFRAME PNEUMATIC DEICE BOOTS = 15° FLAP.
- AFTER FAILURE OF THE AIRFRAME PNEUMATIC DEICE BOOTS = 0° FLAP.

NOTE

Flight in icing conditions is only permitted with full operational status of all aircraft deicing systems. The deicing systems may be activated before takeoff.

BEFORE ENTERING ICING CONDITIONS SET THE DE ICING SWITCHES AS FOLLOWS:

1.	PROP	ON
2.	INERT SEP	OPEN
3.	BOOTS	ON and 3 MIN or 1 MIN as required

NOTE

A de-ice boots failure indication can occur at low power settings while in high pressure altitudes. Refer to the Emergency Procedures 3.18.2 for system reset.

4.	LH and RH WSHLD switches	ON and LIGHT or HEAVY as required

NOTE

When DE ICING switch PROP is set to ON and INERT SEP is set to OPEN, the stick shaker/pusher system is automatically reset to provide stall protection at lower angles of attack. The ICE PROTECTION advisory caption PUSHER ICE MODE comes on to inform the aircrew of this mode change. In this mode the shaker and pusher are activated at higher airspeeds.

DURING ICING CONDITIONS:

5.	Wing leading edge	MONITOR for continual shedding of ice
6.	MFD ICE PROTECTION window	MONITOR for correct function of ice protection systems

WARNING

IF ANY OF THE AIRCRAFT ICE PROTECTION SYSTEMS FAIL DURING FLIGHT IN ICING CONDITIONS, EXIT ICING CONDITIONS. CONTACT ATC FOR PRIORITY ASSISTANCE IF REQUIRED.

WARNING

IF SEVERE ICING CONDITIONS ARE ENCOUNTERED, REQUEST PRIORITY HANDLING FROM AIR TRAFFIC CONTROL TO FACILITATE A ROUTE OR AN ALTITUDE CHANGE TO EXIT THE ICING CONDITIONS.

AFTER DEPARTURE OF ICING CONDITIONS WITH RESIDUAL AIRFRAME ICE

7.	PROP	Maintain ON
8.	INERT SEP	Maintain OPEN

This ensures that the stick shaker/pusher system is maintained in PUSHER ICE MODE.

9.	BOOTS	ON and 3 MIN or 1 MIN as required
10.	LH and RH WSHLD	ON and LIGHT or HEAVY as required
11.	Flaps	Do not extend beyond 15° or if extended do not retract to 0°

AFTER REMOVAL OF RESIDUAL AIRFRAME ICE

12.	PROP	OFF
13.	INERT SEP	CLOSED
14.	BOOTS	OFF
15.	LH or RH WSHLD	LIGHT or HEAVY as required
16.	Flaps	AS REQUIRED

4.11 CLIMB

1.	Ice Protection system	AS REQUIRED
2.	Autopilot	AS REQUIRED
3.	POWER CONTROL LEVER	SET (According to Climb Torque chart for best performance or 780°C ITT recommended)
4.	ACS BLEED AIR switch	AUTO (if selected INHIBIT for takeoff)
5.	Cabin pressure	Monitor
6.	Engine instruments:	
	a Torque	MONITOR (max. 44.3)
	b ITT	MONITOR (max. 820) 780 recommended
	c Ng	MONITOR (max. 104)
7.	Baro	SET and cross check

4.12 CRUISE

1.	Cabin Pressurization	Monitor
2.	POWER CONTROL LEVER	SET (According to Cruise Torque table)
3.	Engine Instruments	MONITOR
4.	Fuel state	MONITOR

NOTE

On longer flights the digital fuel quantity value can be updated to the actual fuel content by pressing the FUEL RESET soft key, on Systems MFD FUEL window. Reset only when wings are level, pitch within ±3°, with unaccelerated flight and no turbulence present.

5.	Ice Protection system	AS REQUIRED

4.13 DESCENT

1.	ATIS/briefing	RECEIVED/PERFORMED
2.	Ice Protection system	AS REQUIRED
3.	POWER CONTROL LEVER	SET to desired torque
4.	CPCS system window	CHECK landing field elevation set

4.14 BEFORE LANDING

4.14.1 APPROACH CHECK

1.	Altimeter	SET
2.	Ice Protection system	AS REQUIRED
3.	Inertial Separator	OPEN, if operating on unprepared surface or for birdstrike protection
4.	Fuel Quantity	CHECK
5.	Landing Gear	DOWN (below 180 KIAS)
6.	Taxi and Landing Lights	AS REQUIRED
7.	Flaps - With residual airframe ice - Boot failure	AS REQUIRED SET maximum 15° Maintain at 0°

NOTE

For flap settings for crosswind operation, icing conditions and associated landing performance refer to 4.2 and Section 5.

8.	Speed	MINIMUM AOA CENTERED
9.	Passengers	Brief
10.	Passenger Warning switches (if installed)	ON

4.14.2 FINAL CHECK

1.	Landing Gear	3 Green Lights
2.	Flaps - With residual airframe ice - boot failure	40° or AS REQUIRED SET maximum 15° Maintain at 0°
3.	Speed	REDUCE TO AOA CENTERED AND STABILIZED
	Boot failure	130 KIAS
	AOA Deice or PUSHER ICE MODE failure	105 KIAS
4.	Cabin Pressurization	Diff Pressure below 0.7 psi decreasing
5.	Autopilot	DISENGAGED
6.	Yaw Damper (prior to landing)	DISENGAGED

NOTE

For minimum Autopilot heights, refer to Section 2 - Automatic Flight Control system.

For crosswind information, refer to para 4.2 and Section 5.

4.15 BALKED LANDING (GO-AROUND)

1.	Go Around switch (if Autopilot engaged)	PRESS
2.	POWER CONTROL LEVER	SET (According to the Balked Landing Torque chart in Section 5)
3.	Climb airspeed	85 KIAS
4.	Flaps	
	- Normal	SET 15° (max 165 KIAS)
	- With residual airframe ice	Maintain at 15°
	- Boot failure	Maintain at 0°
5.	Climb airspeed	
	- Pusher Normal Mode	95 KIAS
	- Pusher Ice Mode	105 KIAS
	- Boot failure	130 KIAS
6.	Landing Gear Handle	Up with positive rate-of-climb
7.	Flaps	
	- Normal	AS REQUIRED
	- With residual airframe ice	Maintain at 15°
	- Boot failure	Maintain 0°
8.	Ice Protection system	AS REQUIRED

CAUTION

IN THE EVENT OF A BALKED LANDING (GO-AROUND) WITH RESIDUAL ICE ON THE AIRFRAME, THE FLAPS SHOULD NOT BE RETRACTED. THE LANDING GEAR MAY NOT FULLY RETRACT AFTER SELECTION (REMAINING RED/WHITE HATCHED INDICATION).

4.16 LANDING

4.16.1 NORMAL

1.	TOUCH DOWN MAIN WHEELS FIRST.	
2.	DO NOT FLARE WITH HIGH PITCH ANGLE.	
3.	POWER CONTROL LEVER	IDLE
4.	CONDITION LEVER	GROUND IDLE
5.	Braking	AS REQUIRED

4.16.2 SHORT FIELD

1.	TOUCH DOWN MAIN WHEELS FIRST.	
2.	DO NOT FLARE WITH HIGH PITCH ANGLE.	
3.	POWER CONTROL LEVER	IDLE
4.	Reverse	SELECT MAX (if desired)
5.	Brake	FIRM
6.	CONDITION LEVER	GROUND IDLE
7.	POWER CONTROL LEVER	IDLE (before airplane stops)

4.17 AFTER LANDING

When runway vacated:

1.	Flaps	UP
2.	Trims	SET GREEN RANGE
3.	External Lights	AS REQUIRED
4.	Ice Protection switches	OFF or as required
5.	Transponder	STBY or check GND
6.	WX Radar	STBY

4.18 SHUTDOWN

WARNING

FOR ANY INDICATION OF ENGINE FIRE AFTER SHUTDOWN, IMMEDIATELY DO DRY MOTORING RUN PROCEDURE.

NOTE

Allow ITT to stabilize at least two minutes at ground idle.

Monitor compressor deceleration after shutdown for possible engine damage.

1.	POWER CONTROL LEVER	IDLE DETENT
2.	Parking Brake	SET/PEDALS PUSH
3.	ICE PROTECTION switches	OFF
4.	Inertial Separator	OPEN, if operating on unprepared surface
5.	CONDITION LEVER	CUT-OFF/FEATHER
6.	External Lights switches	OFF
7.	PASS-Warning switches (if installed)	OFF
8.	Main OXYGEN lever	OFF
9.	CAS Engine Oil Level warning (60 secs minimum after shutdown)	CHECK. Refill engine with an approved oil
10.	CPCS	CHECK cabin depressurized
11.	STBY BUS switch	OFF
12.	EPS switch	OFF
13.	Battery 1 and 2 switches	OFF
14.	Crew oxygen masks	CHECK 100% (if oxygen system is used)

4.19 PARKING

1.	Flight Control Lock	INSTALLED
2.	Wheel chocks	AS REQUIRED
3.	Tail stand	AS REQUIRED

NOTE

Install the tail stand when the aircraft is parked outside and wet snow fall is expected.

4.	Tie downs	AS REQUIRED

CAUTION

MAKE SURE PROPELLER ANCHOR IS PROPERLY INSTALLED TO PREVENT POSSIBLE ENGINE DAMAGE DUE TO WINDMILLING WITH ZERO OIL PRESSURE.

NOTE

Make sure that the rudder/nose wheel is centered.

5.	Propeller anchor	INSTALLED
6.	External covers	INSTALLED

4.20 OXYGEN SYSTEM

1. Oxygen Pressure Gauge — NOTE READING
2. Outside Air Temperature — NOTE READING
3. Percentage of Full Bottle — DETERMINE from the "Oxygen Available with Partially Full Bottle" graph, Figure 4-1.
4. COMPUTE — Oxygen Duration in minutes
   a Determine the Oxygen Duration in minutes for a full bottle for the number of connected passenger oxygen masks and pilots from the "Oxygen Duration with Full Bottle" graph, Figure 4-2.
   b Multiply the Full Bottle Duration by the percent of Usable Capacity to obtain the available oxygen duration in minutes
5. Turn the Oxygen shut-off lever and Passenger Oxygen control valve to ON. Insert the connector of each mask into an outlet and verify proper oxygen flow to the mask. For flights above 10,000 feet leave the masks connected to the outlets and turn the Oxygen Control Valve to AUTO.

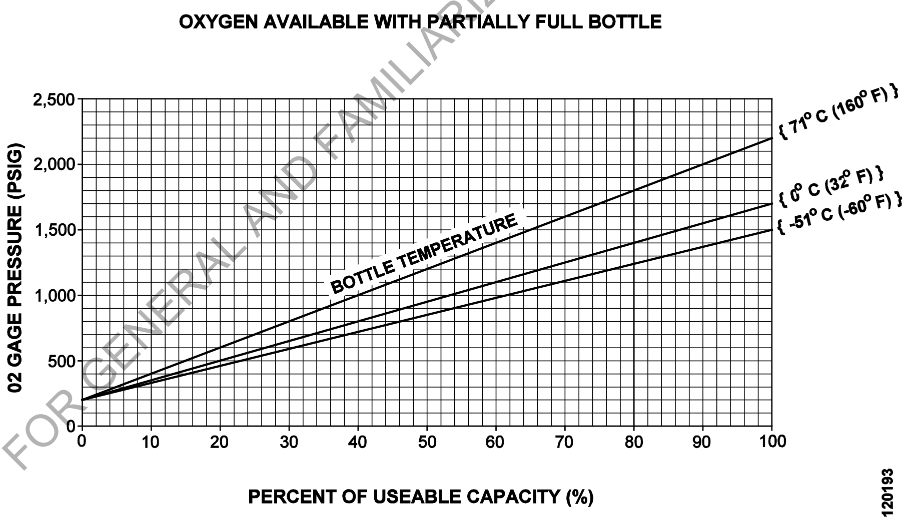

Figure 4-1. Oxygen Available with Partially Full Bottle

No. of Pax Oxygen Masks Connected	Oxygen Duration Pax plus 1 Crew Mask on		Oxygen Duration Pax plus 2 Crew Masks on	
	Diluter/ Demand (min)	100 % (min)	Diluter/ Demand (min)	100 % (min)
0	141	59	71	29
1	70	42	47	24
2	47	32	35	21
3	35	26	28	18
4	28	22	23	16
5	23	19	20	14
6	20	17	17	13
7	17	15	16	12
8	16	13	14	11
9	14	12	13	10

Figure 4-2. Oxygen Duration with Full Bottle (Standard Oxygen System)
(Sheet 1 of 2)

No. of Pax Oxygen Masks Connected	Oxygen Duration Pax plus 1 Crew Mask on		Oxygen Duration Pax plus 2 Crew Masks on	
	Diluter/ Demand (min)	100 % (min)	Diluter/ Demand (min)	100 % (min)
0	477	200	240	98
1	237	142	159	81
2	159	108	118	71
3	118	88	95	61
4	95	74	78	54
5	78	64	68	47
6	68	57	57	44
7	57	51	54	41
8	54	44	47	37
9	47	41	44	34

Figure 4-2. Oxygen Duration with a Full Bottle (Larger Capacity Oxygen System) (Sheet 2 of 2)

4.21 NOISE LEVEL

The noise levels stated below have been verified and approved by FOCA in noise level test flights conducted on the PC-12/47E. The PC-12/47E model is in compliance with all ICAO Annex 16 and Swiss VEL noise standards applicable to this type.

No determination has been made by EASA (FOCA) for the FAA that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

AIRCRAFT WITH 4-BLADED PROPELLER

ICAO Annex 16, Chapter 10	76.9 dB(A)
Swiss VEL	76.9 dB(A)
FAR Part 36, Appendix G	79.3 dB(A).

AIRCRAFT WITH 5-BLADED PROPELLER

ICAO Annex 16, Chapter 10	77.0 dB(A)
Swiss VEL	77.0 dB(A)
FAR Part 36, Appendix G	77.0 dB(A).

AMPLIFIED PROCEDURES

4.22 AUTOMATIC FLIGHT CONTROL SYSTEM OPERATION

The flight director uses the data displayed on either PFD for calculation of the guidance commands. The pilot may toggle his selection by pressing the L/R button on the flight controller. The AFCS transmits the pilots selection to the display. The display will indicate the PFD data selected for use, by displaying the couple arrow pointing toward the selected PFD (left/right). At power up, the default setting is L pilot side PFD.

A brief description of the AFCS is given in Section 7 of this POH. Refer to the Honeywell Primus Apex Integrated Avionics System for the PC-12E – Pilot Guide for complete information on the description and operation of the AFCS.

4.23 CROSSWIND OPERATION

The maximum demonstrated crosswind for takeoff and landing for all flap configurations is shown in para 4.2.

CAUTION

ON RUNWAYS WITH POOLS OF STANDING WATER AND/OR POOR BRAKING ACTION IT MAY NOT BE POSSIBLE TO MAINTAIN THE CENTERLINE AND/OR THE CORRECT ALIGNMENT OF THE AIRCRAFT ON THE RUNWAY IN CONDITIONS OF STRONG CROSSWIND.

For further information on crosswind operation refer to Section 10.

4.24 FLIGHT IN ICING CONDITIONS

Icing conditions can exist when:

The Outside Air Temperature (OAT) on the ground and for takeoff, or Static Air Temperature (SAT) in flight, is 10°C or colder, and visible moisture in any form is present (such as clouds, fog or mist with visibility of one mile or less, rain snow, sleet and ice crystals).

The OAT on the ground and for takeoff is 10°C or colder when operating on ramps, taxiways or runways, where surface snow, ice, standing water, or slush may be ingested by the engine, or freeze on the engine, or the engine nacelle.

There are visible signs of ice accretion on the aircraft.

Severe icing may result from environmental conditions during flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) which may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces.

Information on the removal of snow, ice and frost from the aircraft is provided in Section 10.

Freezing rain, freezing fog, freezing drizzle and mixed conditions and descent into icing clouds from above freezing temperatures can result in excessive accretion of ice on the protected surfaces. They may also result in runback ice forming beyond the protected surfaces over a large percentage of the chordwise extent of the lifting surfaces. This ice cannot be shed and it may seriously degrade performance and control of the aircraft.

Flight in severe icing conditions should be avoided, as this may exceed the capabilities of the aircraft ice protection systems. Severe icing conditions can be identified by excessive ice accretion on the visible parts of the airframe including the protected surfaces. This might affect the aircraft performance and handling qualities, and cause significant loss in powerplant performance. If this occurs request priority assistance from ATC to facilitate a route or an altitude change to exit the icing conditions.

Operation on deep slush or snow covered runways greater than 1 inch (2.5 cm) may result in contamination of the flap drive mechanism resulting in failure to retract. If possible operation on deep slush and snow compacted runways should be avoided.

For takeoff and landing on runways covered with surface snow, ice, standing water, or slush, the inertial separator must be open.

For flight in heavy precipitation the inertial separator must be open.

Detection of icing conditions and ice accretion on the aircraft is by pilot visual identification on the left hand wing leading edge. A wing inspection light is provided for night time operations.

Prior to entering icing conditions, activate all ice protection systems as required.

If not already activated, select all systems as required, immediately icing conditions are identified.

The procedures for selection of the ice protection systems are provided in Section 4.

During all icing encounters or times with visible ice accretion on any part of the airframe the flaps must not be extended beyond certain limits. These limits eliminate the possibility of tailplane stall which results in an uncontrolled aircraft pitch down moment.

- With operational airframe pneumatic deice boots 15° flap
- After failure of the airframe pneumatic deice boots 0° flap.

The minimum recommended speeds for icing encounters and with residual ice on the airframe are:

Climb, Flaps 0°, Pusher Ice Mode	= 135 KIAS
Holding Pattern, Flaps 0°	= 145 KIAS to 175 KIAS
Landing Approach, Flaps 15°, Pusher Ice Mode	= 105 KIAS
Landing Approach, Flaps 0°, Boot Failure Pusher Ice Mode	= 130 KIAS
Balked Landing (Go-Around) Flaps 15°, LG down Pusher Ice Mode	= 105 KIAS
Balked Landing (Go-Around) Boot failure Flaps 0°, LG down, Pusher Ice Mode	= 130 KIAS

Flight in icing conditions is only permitted with full operational status of all aircraft de-icing systems. This includes:

- Propeller Deice
- Wing and Horizontal Tail Deice Boots
- Inertial Separator
- Windshield Deice
- Probes Deice
- Stick Pusher Ice Mode

The propeller de-ice is activated from the ICE PROTECTION switch panel by the switch labeled PROPELLER being pushed to ON. In this mode the propeller de-ice system will be automatically selected to the correct cycle with reference to outside air temperature. No further aircrew input is required. The green ICE PROTECTION caption PROPELLER will be continuously illuminated. If a system failure occurs when activated, the green PROPELLER caption will go off and the amber CAS caption Propeller De Ice will be illuminated and an aural gong will sound.

The wing and horizontal tail de-ice boots are activated from the ICE PROTECTION switch panel by the switch labeled BOOTS being pushed to either 3MIN or 1MIN. 3MIN is to be selected in icing conditions with moderate ice accretion rates as judged by the aircrew. 1MIN is to be selected in icing conditions with high ice accretion rates. When activated in either 1MIN or 3MIN mode and operating correctly, the green ICE PROTECTION caption BOOTS will be continuously illuminated. If a system failure occurs when activated, the green BOOTS caption will go off and the amber CAS caption De Ice Boots will be illuminated and an aural gong will sound.

The engine inertial separator is activated to its open (icing encounter) position from the ICE PROTECTION switch panel by the switch labeled INERT SEP being pushed to OPEN. Once activated the inertial separator door will reach its fully open position in approximately 30 seconds and the green ICE PROTECTION caption INERT SEP will be continuously illuminated. If the door does not reach its fully open position or moves away from its fully open position when still selected, the green INERT SEP caption will go off and the amber CAS caption Inertial Separator will be illuminated and an aural gong will sound.

The LH side and RH side windshield deice is activated from the ICE PROTECTION switch panel by two switches labeled LH WSHLD and RH WSHLD respectively, being pushed to either LIGHT or HEAVY depending on the severity of the icing encounter.

Deicing of all probes, AOA (vane and mounting plate), pitot and static, is activated from the ICE PROTECTION switch panel by a switch labeled PROBES being pushed to ON. If deicing of the left pitot or right pitot probes fails when selected, then either the amber CAS caption Pitot 1 Heat or Pitot 2 Heat will be illuminated and an aural gong will sound. If the static ports fail a CAS caution Static Heat will be illuminated and an aural gong will sound. If deicing of the AOA probes fails when selected, then the amber CAS caption AOA De Ice will be illuminated and an aural gong will sound.

When the propeller de-ice is selected to ON and the inertial separator selected to OPEN, the stall protection system, stick pusher/shaker system is re-datumed to provide both shake and push functions at lower angles of attack and higher speeds. This is to protect against the natural stall through the effects of residual ice on the protected surfaces of the airfoil leading edges. When the system is in the re-datum mode, the aircrew are alerted by illumination of the green ICE PROTECTION caption PUSHER ICE MODE. Failure of the system in ice mode will result in the caption being extinguished and the amber CAS caption Pusher will be illuminated and an aural gong will sound.

Night time flight in icing conditions is only authorized with full operational status of all the aircraft de-icing systems above, plus the wing inspection light.

The wing inspection light is activated from the overhead EXTERNAL LIGHTS switch panel by the switch labeled WING being moved to on. No functional or failure indications are provided.

A full description of all of the de-ice systems, their switch terminology and caution and warning logic is provided in Section 7.

The probes de-ice should be selected to on, prior to, and during all flights.

During the icing encounter the pneumatic de-ice boots will operate continuously in either 3min or 1min cycle mode as selected by the aircrew. During this time the aircrew should frequently monitor the continual shedding of ice from the wing leading edge and the airframe for ice accretion on all visible surfaces that could affect aircraft controllability. It should be noted that some residual ice will be maintained on the wing leading edge during cycling of the boots.

During the icing encounter continue to monitor the ICE PROTECTION window and the CAS for correct function of the ice protection systems.

During flight in icing conditions the aircraft may be subject to a slight degradation in aircraft performance and engine performance. This may be recognized by a required increase in engine power to maintain a constant indicated airspeed and an increased engine ITT to maintain a constant power respectively. If failure of any of the ice protection systems occurs this degradation may become more severe. After such failure the pilot should make immediate arrangements for departure of icing conditions as soon as practicable. If required ATC priority assistance should be requested.

The emergency procedures, concerning failure of the ice protection systems during flight in icing conditions, are provided in Section 3.

On departure from icing conditions the inertial separator (INERT SEP) and the propeller deice system (PROPELLER) should be kept OPEN and ON respectively until all visible and unprotected areas of the aircraft are observed as being free of ice. This protects the engine from possible ice ingestion and maintains the stick shaker/pusher computer in PUSHER ICE MODE therefore protecting the aircraft against the onset of natural stall. The flaps are not to be extended beyond 15° or in the case of deice boot failure, left at 0°. If the flaps are in an extended position, do not retract them until the airframe is clear of ice.

Primus APEX Build 10 or higher. If flaps are extended to positions that are not allowed, the CAS amber caution Flaps EXT Limit will be displayed and an aural gong will sound.

On departure of icing conditions the deice boots are to be selected OFF and the windshield heat is to be selected as required for good visibility, irrespective of the presence of residual ice.

Once all visible protected and unprotected areas are observed as being free of ice then the inertial separator and the propeller deice system can be selected CLOSED and OFF respectively. This will return the stick shaker/pusher computer to its normal mode. The flaps can be extended or retracted to any required position.

When performing a landing approach after an icing encounter and with residual ice on the airframe the minimum landing speeds defined above should be observed. This will prevent stick shaker activation in PUSHER ICE MODE.

When performing a landing approach after an icing encounter and with residual ice on the airframe the flap limitations defined above must be observed.

Of note, the tailplane may have residual ice that is not visible to the pilot. The speeds listed as minimum recommended speeds for icing encounters should be adhered to and recognized as MINIMUM recommended speeds following any icing encounter where there is even the slightest suspicion that the airframe may have residual ice. As additional operational guidance and, if possible, the pilot should maintain a minimum airspeed of 150 KIAS, in the clean configuration, throughout the IFR approach procedures, including initial and intermediate segments. It is also recommended to fly the approach segment clean as well as to establish the landing configuration with gear down and flaps 15° (pusher ice mode AOA or DSB centered) not later than passing through 1000 ft. AGL.

After you have encountered, or suspect you have encountered, severe icing, you should apply the procedures as given in para 4.25.

In case of a balked landing go around after an icing encounter, the climb speeds defined above should be maintained. This will prevent stick shaker activation in PUSHER ICE MODE.

In case of a balked landing go around after an icing encounter, the flap position should not be changed and should be maintained at the approach position.

The landing gear can be retracted but a locked indication may not be achieved due to ice contamination of the up position switch striker.

Use of **ICE X** (B.F. Goodrich Brand Name) improves the shedding capability of the pneumatic de-ice boots. Its use (see Aircraft Maintenance Manual) is recommended but not mandatory.

4.25 SEVERE ICING CONDITIONS

Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems, and may seriously degrade the performance and controllability of the airplane.

The following weather conditions may be conductive to severe in-flight icing:

- visible rain at temperatures below 0 degrees Celsius ambient air temperature
- droplets that splash or splatter on impact at temperatures below 0 degrees Celsius ambient air temperature

The following procedures are for exiting the severe icing environment and are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature. While severe icing may form at temperatures as cold as -18 degrees Celsius, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified in Section 2 for identifying severe icing conditions are observed, accomplish the following:

- report the weather conditions to Air Traffic Control
- immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the severe icing conditions in order to avoid extended exposure to flight conditions more severe than those for which the airplane has been certificated.

It should be recalled that flight in severe icing conditions may exceed the capabilities of the aircraft ice protection systems. If severe icing has been encountered or suspected, even after having exited icing conditions, the pilot should consider maintaining speeds higher than the minimum recommended speeds to account for the possibility if degraded flying qualities due to excessive residual ice.

4.26 CPCS LOW CAB MODE OPERATION

A semi-automatic mode called ‘Low Cabin’ is available, whereby the pilot can use Landing Field Elevation (LFE) as the target cabin altitude. The targeted cabin altitude can be the automatic LFE value from the FMS or the manually entered LFE. Low Cabin mode can be selected on the ENVIRONMENT window of the systems MFD. As soon as the LOW CAB annunciator comes on, the cabin altitude is controlled to maintain the LFE selected value, limited only by the maximum pressure differential of 5.75 psi (depending on cruise altitude). From this cruise altitude upwards, the cabin altitude will increase to maintain max Dp.

The following Table gives the aircraft altitude for a selected LFE from which upwards the maximum pressure differential of 5.75 psid will be reached and maintained.:

Selected LFE (ft)	Aircraft altitude with max Dp 5.75 psid
-2000	10000
-1500	10700
-1000	11400
-500	12100
SL	12900
500	13600
1000	14400
1500	15200
2000	16000
2500	16800
3000	17600
3500	18400
4000	19250
4500	20100
5000	20900
5500	21800
6000	22600
6500	23500
7000	24400
7500	25300
8000	26200
8500	27100
9000	28100
9500	29000
10000	30000

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SECTION 5

PERFORMANCE

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SECTION 5-1

STANDARD TABLES

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GENERAL

This section contains all of the required and complementary performance data for airplane operation. Aircraft performance associated with optional equipment and systems which require supplements is provided in Section 9, Supplements.

The performance information presented in this section is derived from actual flight test data corrected to standard day conditions and analytically expanded for the different parameters such as weight, altitude, and temperature, etc. This information does not account for many factors that the pilot must evaluate before each takeoff such as pilot proficiency, aircraft condition, runway surface and slope other than that specified, or the effect of winds aloft. When necessary, a performance chart (table) will specify the aircraft configuration and the procedure to achieve the published performance.

NOTE

The take-off, accelerate –stop and landing distance performance chart data is based on a **DRY TARMAC RUNWAY** surface. Runways that are wet, or contaminated with slush or snow will adversely affect the runway coefficient of friction and subsequently increase the take-off, accelerate-stop and landing distance.

A Flight Planning Example is provided to assist the pilot in the preflight performance calculations as required by the operating regulations. Each performance chart (table) has an example plotted to indicate the proper sequence in which to use the chart and determine accurate performance data.

All performance data is limited to between the -55° C (-67° F) and +50° C (122° F) outside air temperature limits. Some tables presented in this section show data for temperatures below -55° C (-67° F) which is purely for ease of interpolation between data points. These temperature areas in the tables are shaded.

Performance data regarding takeoff, landing and accelerate-stop distances is presented up to 14,000 ft. This does not, however, imply an operational limitation of the aircraft. Field performance data at higher altitudes can be supplied under special request.

The stall speeds shown in the performance charts are achieved at an entry rate of 1 knot/second. Maximum altitude loss observed during the stall was 300 feet. During an accelerated stall, a rapid pitch-down in excess of 30° may result with an altitude loss of up to 500 feet.

By setting the climb torque as defined in this section, the recommended ITT of 780° C (see Section 4 Climb) could be exceeded.

When landing with flaps set to less than 40°, the total landing distances will be increased by the following factors:

FLAP SETTING	FACTOR
0°	1.83
15°	1.31
30°	1.22

The ADAHRS removes most of the error due to static pressure source measurements. A small residual error exists; this error is typically no more than 1 knot on airspeed or 30 ft on altimeter readings for retracted flaps at all airspeeds and for extended flaps below 100 KIAS.

The ADAHRS SAT indication in the air may be treated as OAT for reading the performance graphs and/or table entries. SAT indication on the ground may not be accurate.

The formulas for the conversion of standard format to metric equivalent and vice versa are given in Section 1 – Conversion Information.

FAHRENHEIT TO CELSIUS CONVERSION

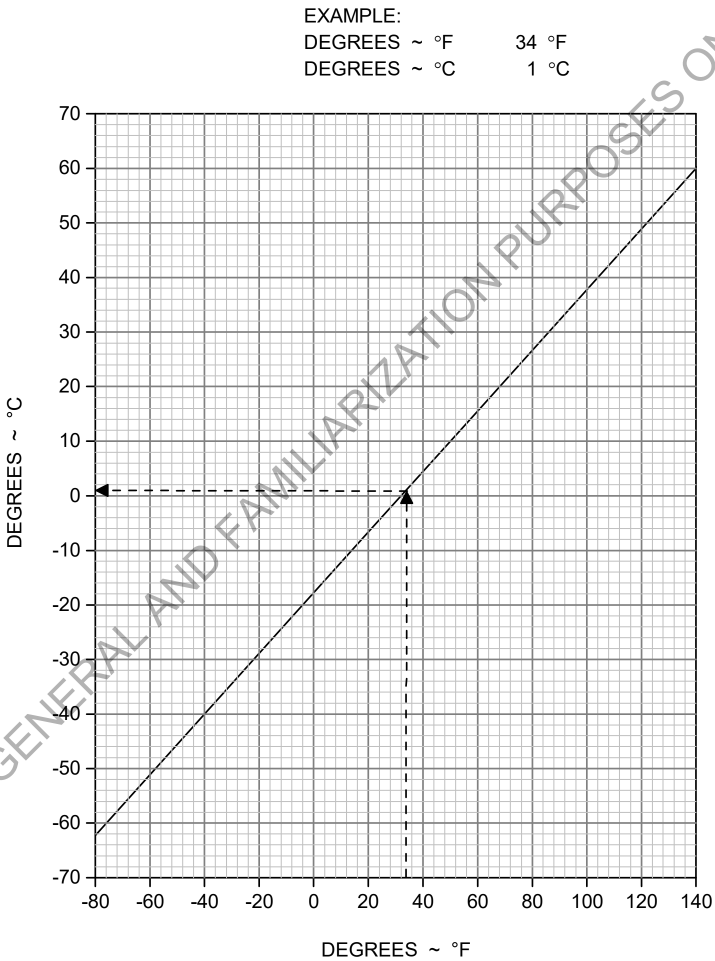

Figure 5-1-1. Fahrenheit to Celsius Conversion

ISA TEMPERATURE CONVERSION

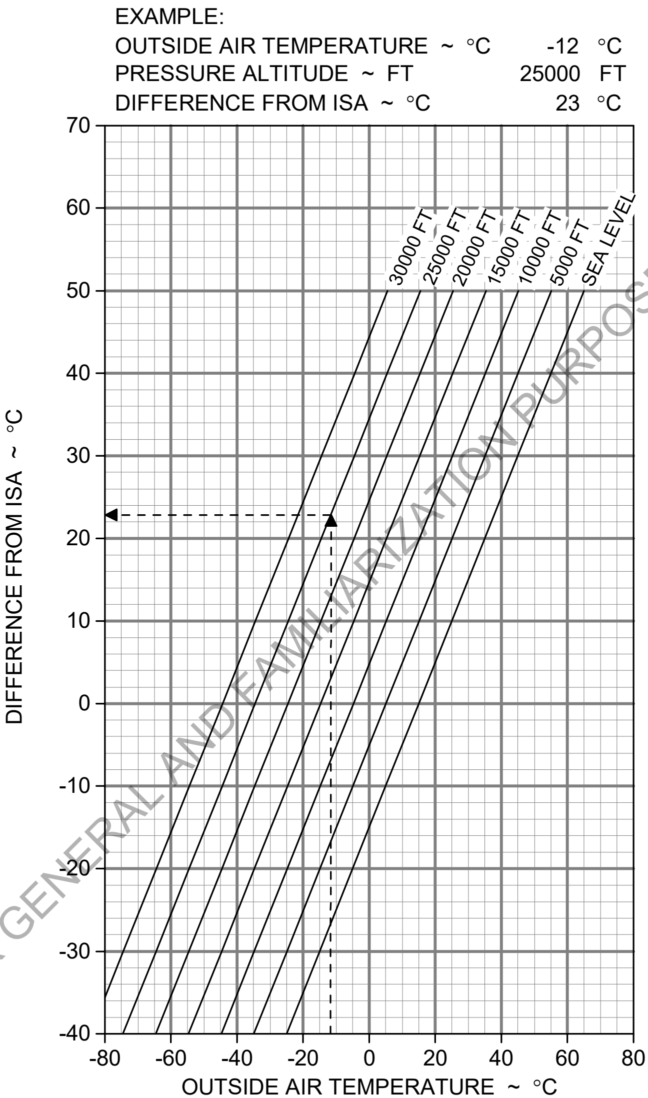

Figure 5-1-2. ISA Conversion

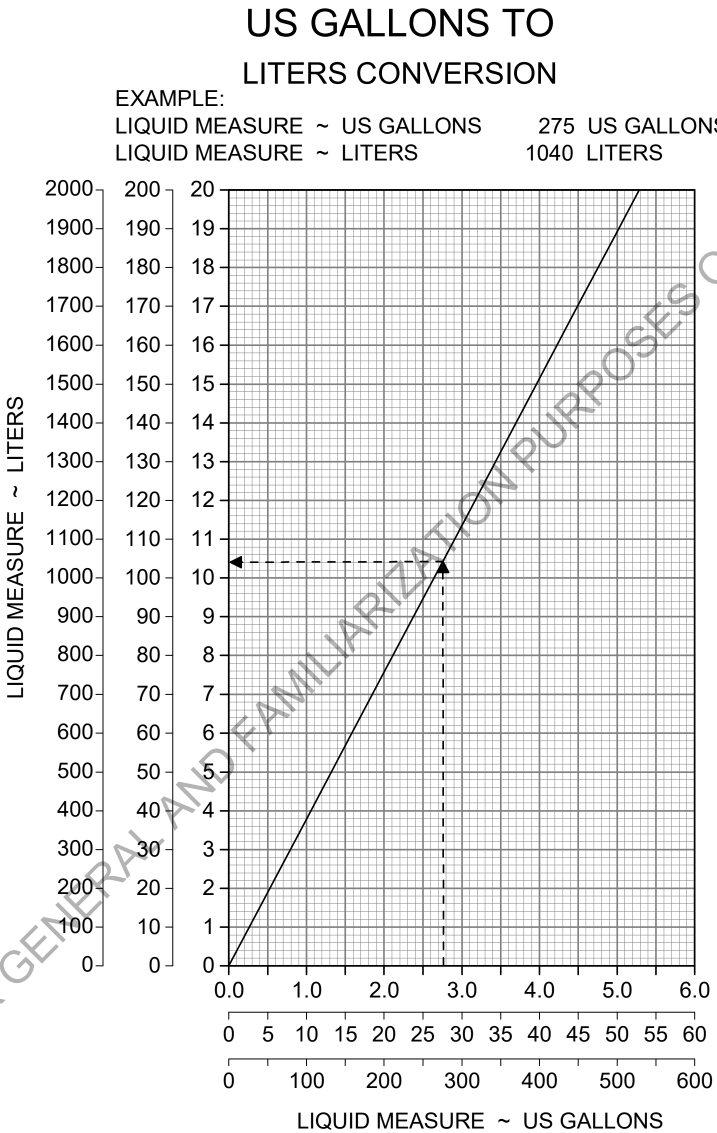

Figure 5-1-3. U.S. Gallons to Liters Conversion

FEET TO METERS CONVERSION

EXAMPLE:
DISTANCE ~ FEET 4400 FEET
DISTANCE ~ METERS 1350 METERS

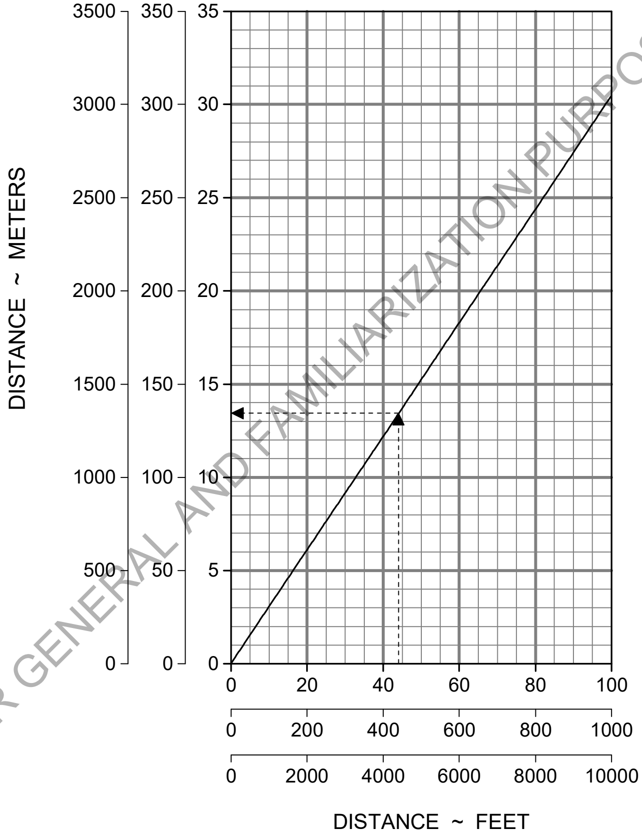

Figure 5-1-4. Feet to Meters Conversion

POUNDS TO KILOGRAMS CONVERSION

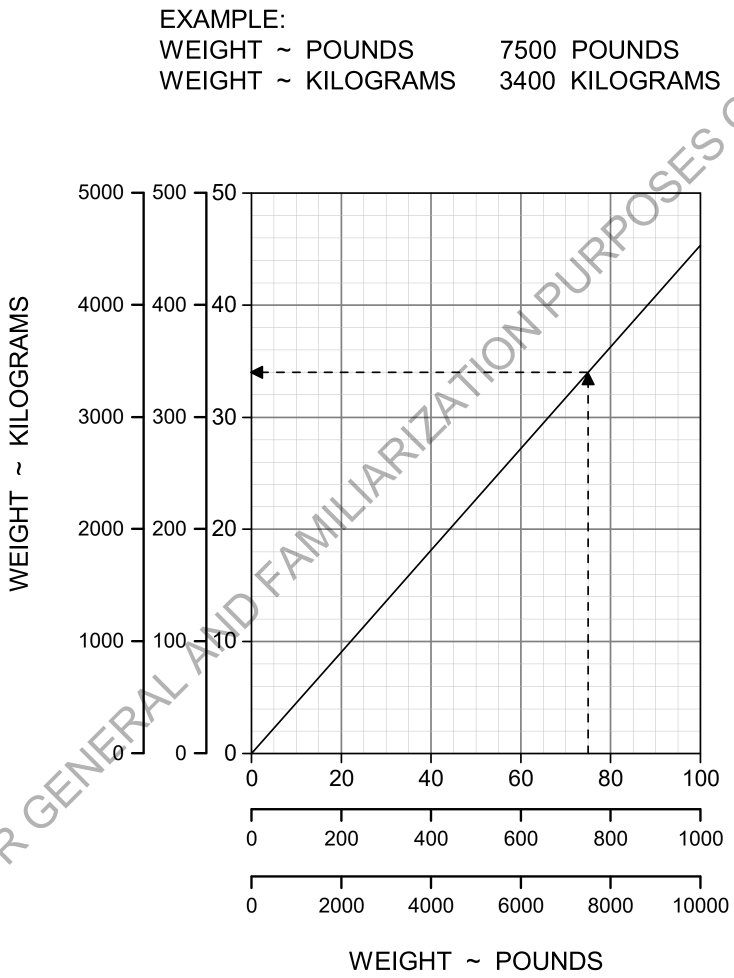

Figure 5-1-5. Pounds to Kilograms Conversion

INCHES TO MILLIMETERS CONVERSION

EXAMPLE:

DISTANCE ~ INCHES	65	INCHES
DISTANCE ~ MILLIMETERS	1650	MILLIMETERS

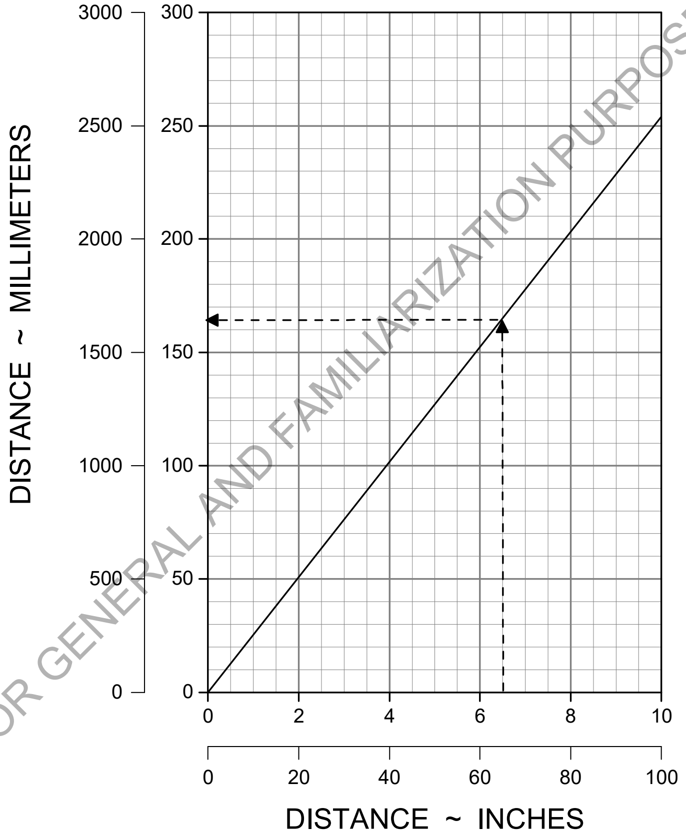

Figure 5-1-6. Inches to Millimeters Conversion

TAKEOFF AND LANDING

CROSSWIND COMPONENT

EXAMPLE	
WIND SPEED ~ KNOTS	31 KNOTS
WIND DIRECTION ~ °	34 °
CROSSWIND COMPONENT ~ KNOTS	17 KNOTS
HEADWIND COMPONENT ~ KNOTS	26 KNOTS

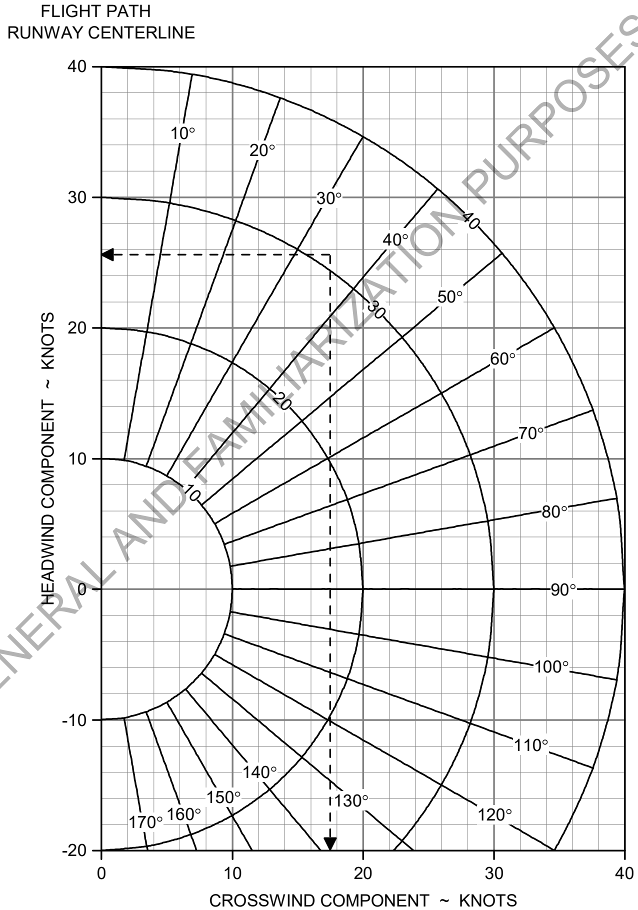

Figure 5-1-7. Wind Components

AIRSPEED CALIBRATION
(ALTITUDE 0 TO 10000 FEET)

WITH FLAPS RETRACTED
THE AIRSPEED ERROR
IS ZERO AT ALTITUDES
ABOVE 10000 FT

EXAMPLE:
IAS - INDICATED AIRSPEED 110 KT
FLAPS EXTENDED
CAS - CALIBRATED AIRSPEED 107 KT

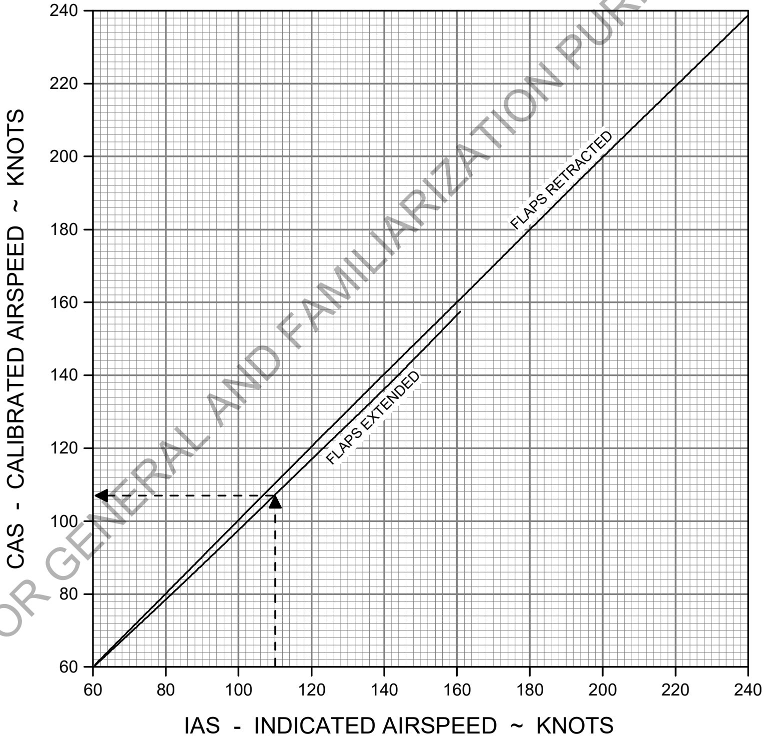

Figure 5-1-8. Airspeed Calibration

ALTIMETER CALIBRATION

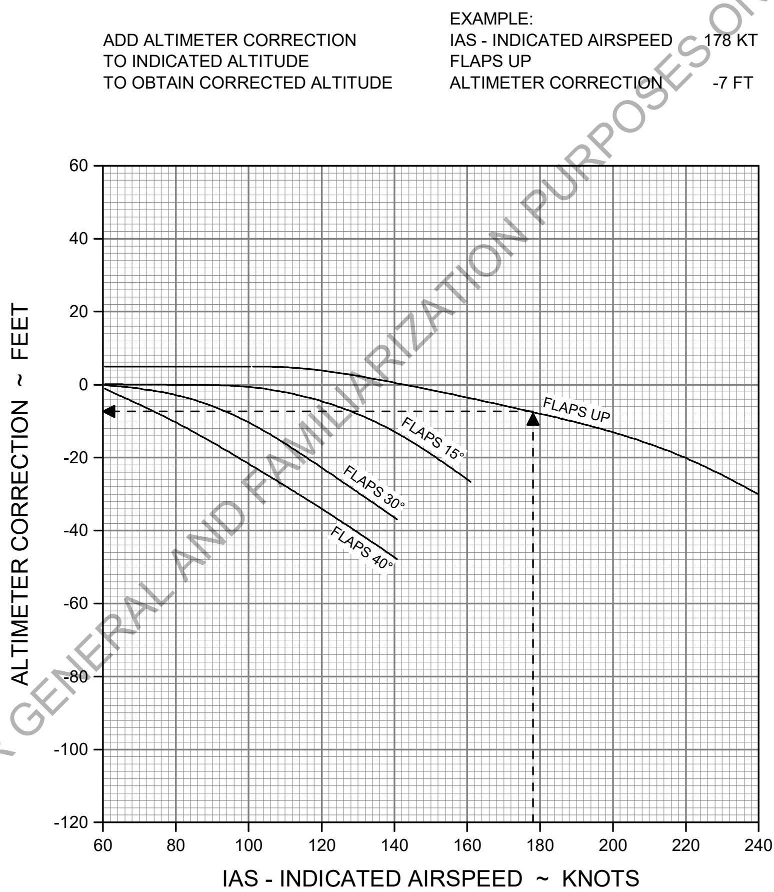

Figure 5-1-9. Altimeter Correction

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SECTION 5-2

PERFORMANCE DATA FOR MSN 1001 - 1942 WITH A 4-BLADED PROPELLER

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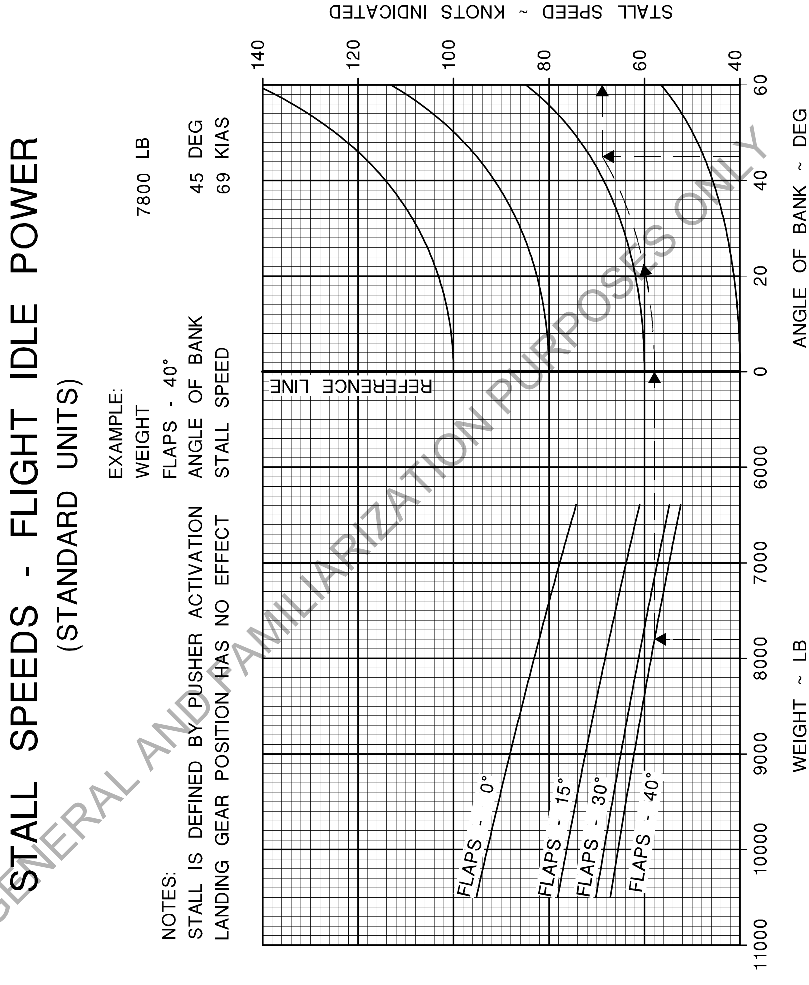
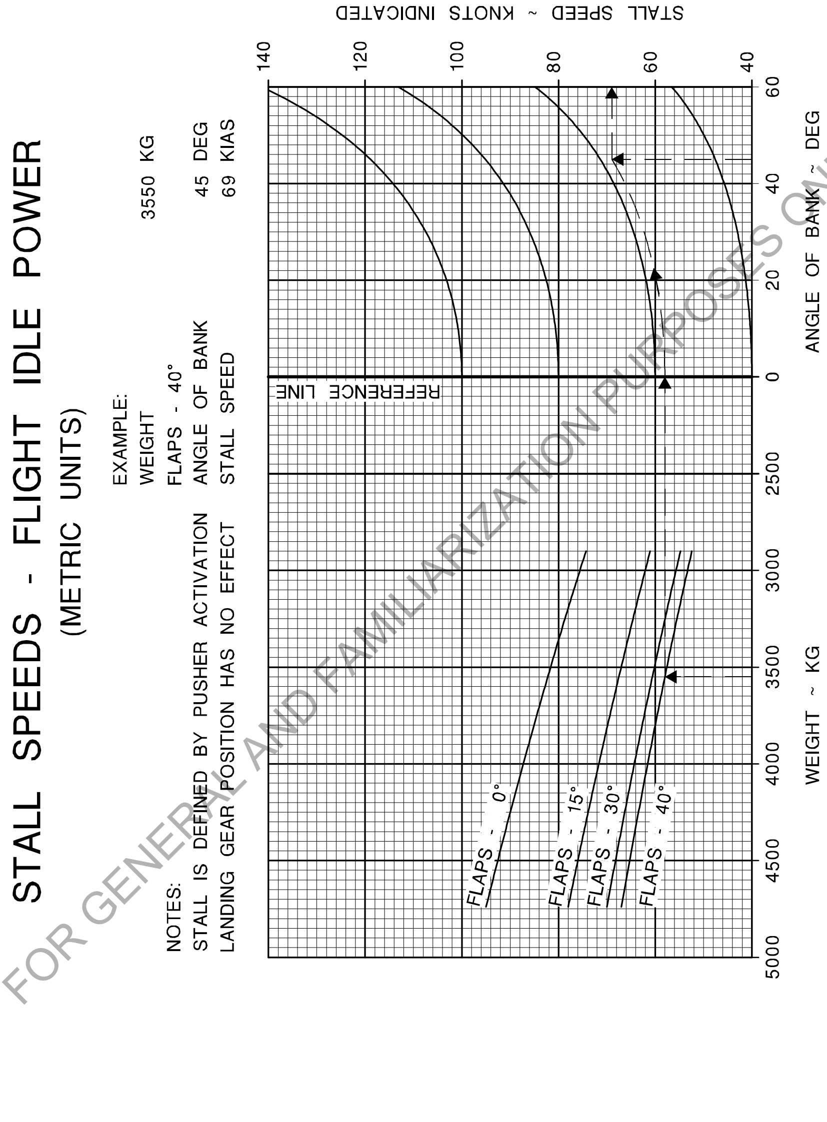


See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-1. Stall Speeds KIAS - Flight Idle Power (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-2. Stall Speeds KIAS - Flight Idle Power (metric units)

STATIC TAKEOFF TORQUE

PROPELLER SPEED 1700 RPM
ICE PROTECTION:
PROBES: ON
WINDSHIELD: ON
INERTIAL SEPARATOR OPERATION
HAS NO EFFECT ON TORQUE
DEICE/ANTICE SYSTEMS CAN REDUCE
TORQUE BY 0.1 PSI
IF ITT LIMIT IS REACHED SWITCH
ACS TO INHIBIT TO OBTAIN
REQUIRED TORQUE

EXAMPLE:

ALTITUDE	8000	FT
OAT	26	°C
ENGINE TORQUE	34.1	PSI

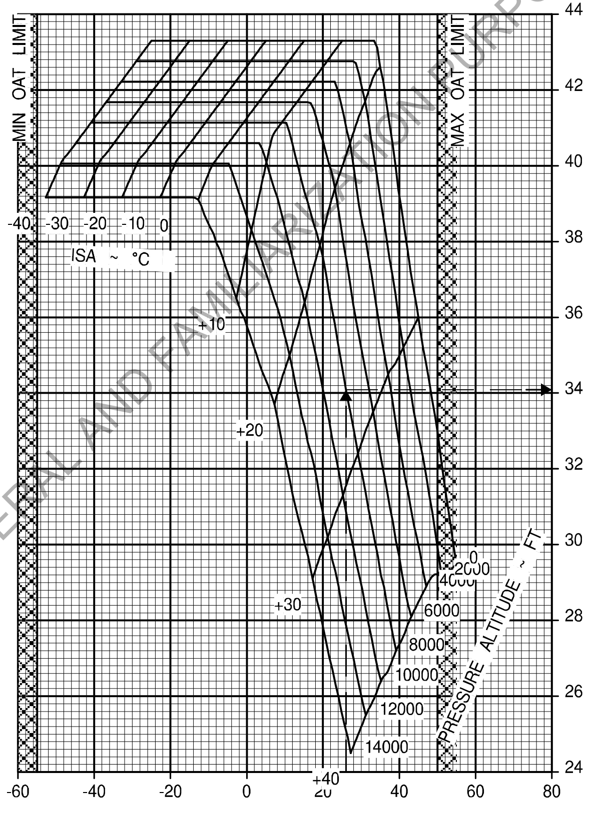


Figure 5-2-3. Static Takeoff Torque

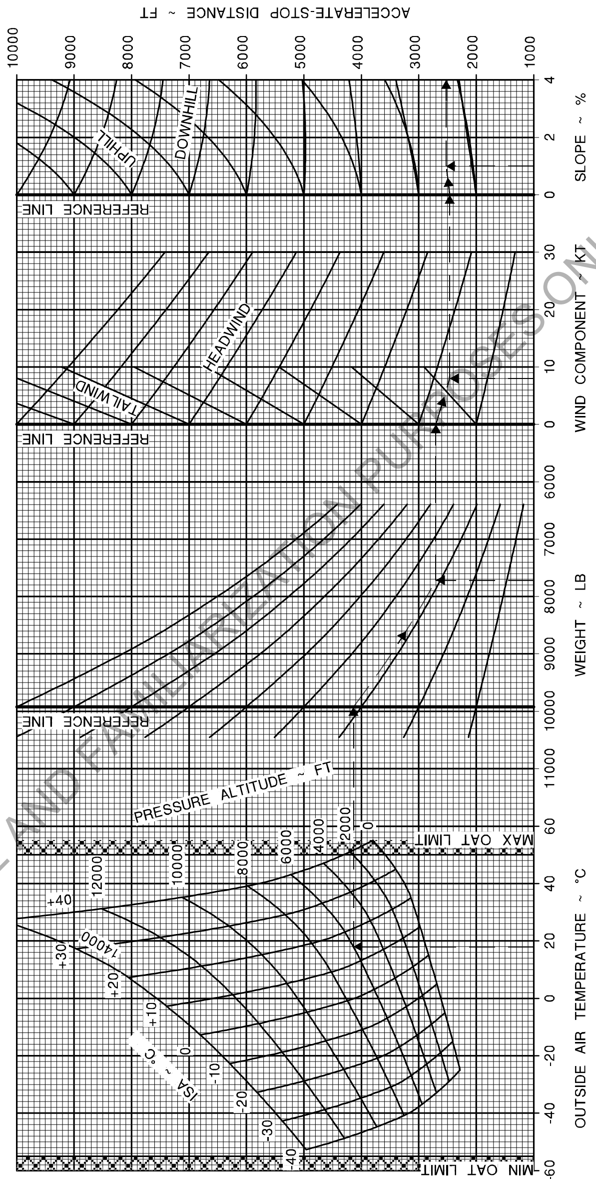
ACCELERATE-STOP DISTANCE - FLAPS 30°

(STANDARD UNITS)

WEIGHT ~ LB	1.1 V_{S1} ~ KIAS
6400	60
7300	64
8200	68
9100	72
10000	75
10450	77

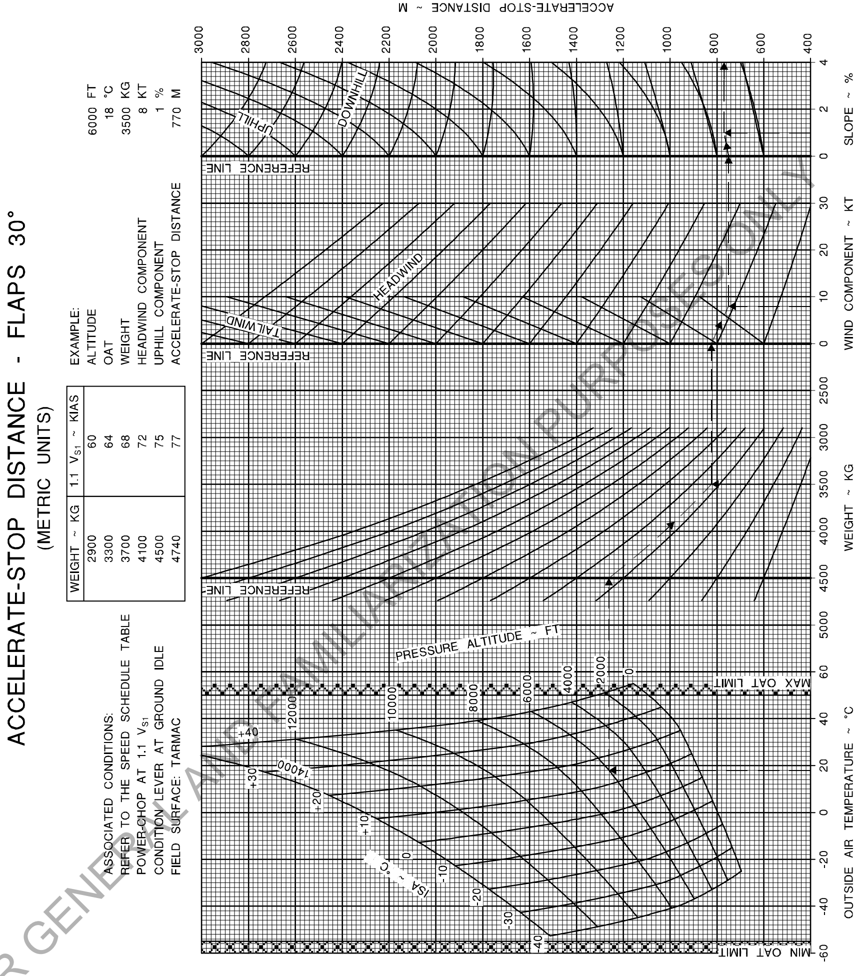
ASSOCIATED CONDITIONS:
REFER TO THE SPEED SCHEDULE TABLE
POWER-CHOP AT 1.1 V_{S1}
CONDITION LEVER AT GROUND IDLE
FIELD SURFACE: TARMAC

EXAMPLE:	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7716 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
ACCELERATE-STOP DISTANCE	2550 FT



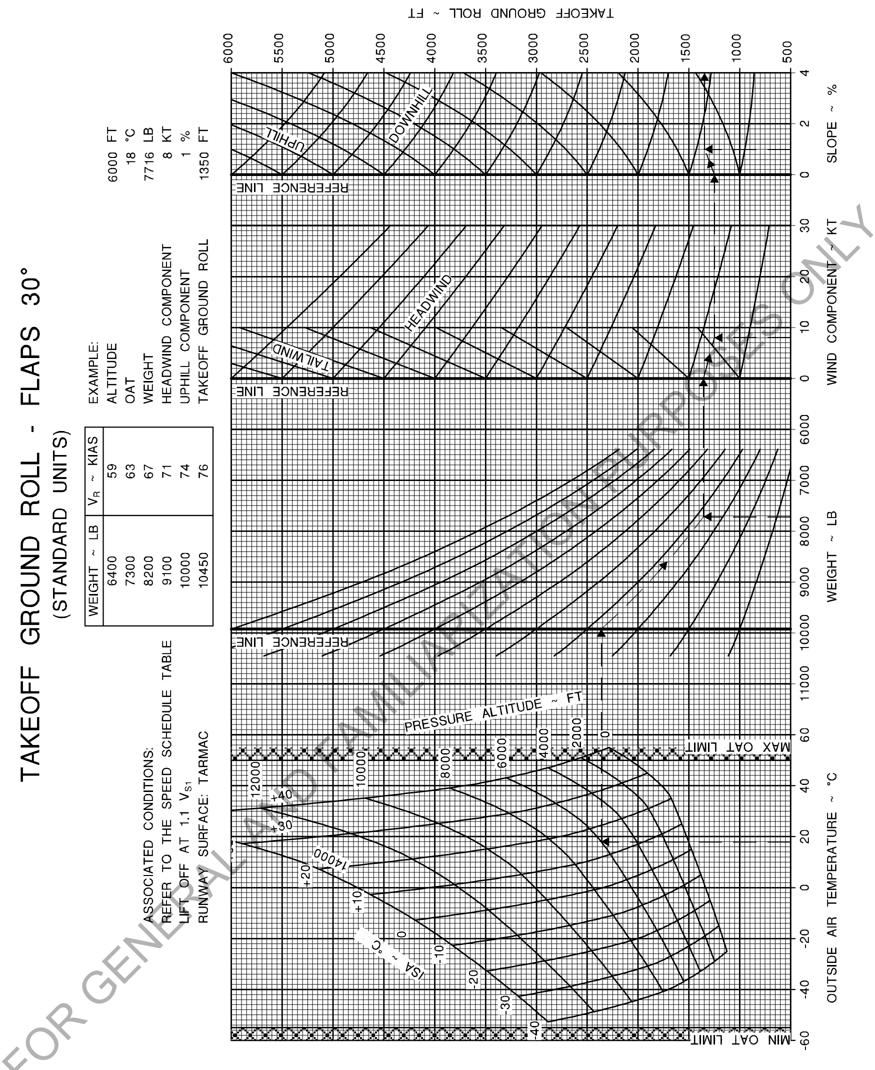
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-4. Accelerate - Stop Distance - Flaps 30° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-5. Accelerate - Stop Distance - Flaps 30° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-6. Takeoff Ground Roll - Flaps 30° (standard units)

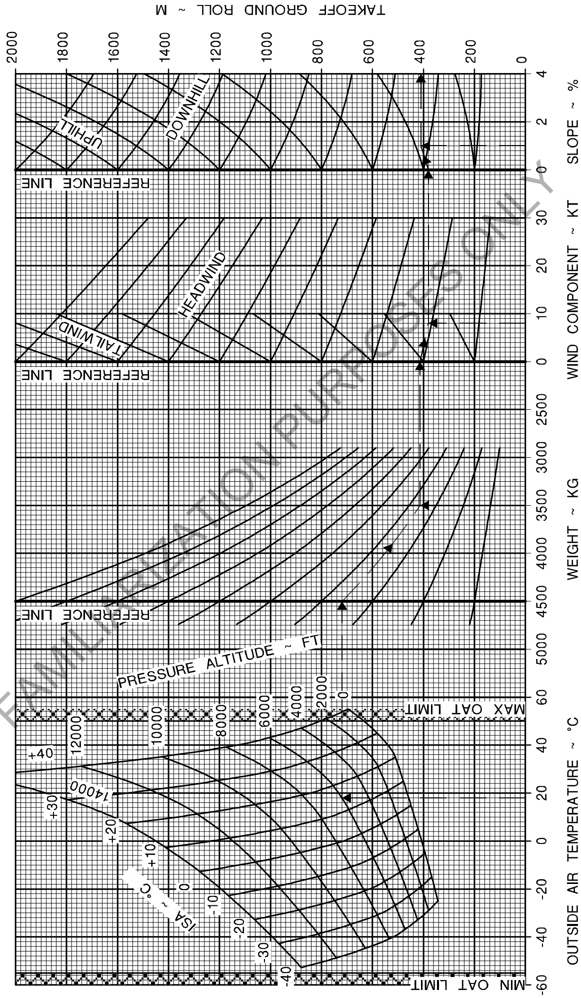
TAKEOFF GROUND ROLL - FLAPS 30°

(METRIC UNITS)

WEIGHT ~ KG	V_R ~ KIAS
2900	59
3300	63
3700	67
4100	71
4500	74
4740	76

EXAMPLE:	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	3500 KG
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF GROUND ROLL	410 M

ASSOCIATED CONDITIONS:
REFER TO THE SPEED SCHEDULE TABLE
LIFT OFF AT 1.1 V_{S1}
RUNWAY SURFACE: TARMAC



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-7. Takeoff Ground Roll - Flaps 30° (metric units)

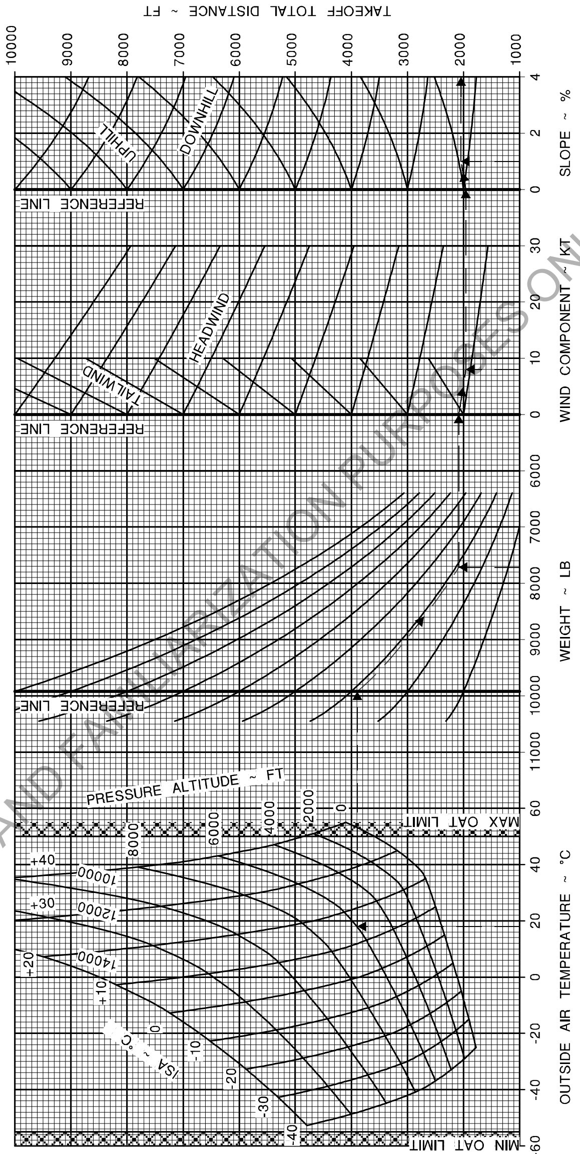
TAKEOFF TOTAL DISTANCE - FLAPS 30°

OVER 50 FT OBSTACLE; (STANDARD UNITS)

ASSOCIATED CONDITIONS:
LIFT OFF AT 1.1 V_{S1}
OBSTACLE AT 1.3 V_{S1}
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC

WEIGHT ~ LB	V_R ~ KIAS	V_{50FT} ~ KIAS
6400	59	71
7300	63	76
8200	67	81
9100	71	85
10000	74	89
10450	76	91

EXAMPLE:	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7716 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF TOTAL DISTANCE	2050 FT



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-8. Takeoff Total Distance - Flaps 30° (standard units)

TAKEOFF TOTAL DISTANCE - FLAPS 30°

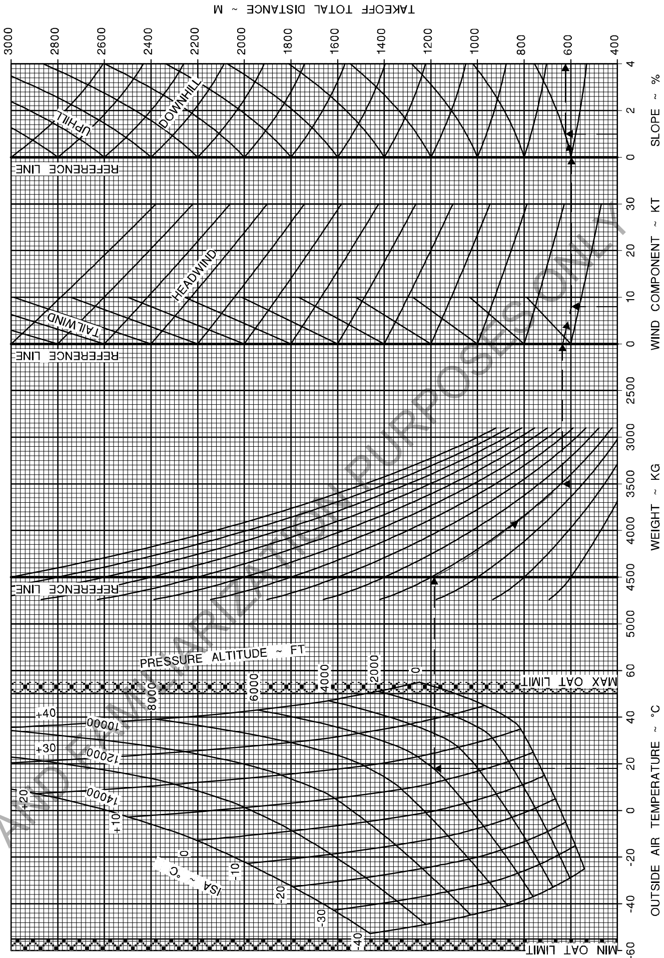
OVER 15 M OBSTACLE; (METRIC UNITS)

WEIGHT ~ KG	V_R ~ KIAS	V_{50FT} ~ KIAS
2900	59	71
3300	63	76
3700	67	81
4100	71	85
4500	74	89
4740	76	91

EXAMPLE:

ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	3500 KG
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF TOTAL DISTANCE	620 M

ASSOCIATED CONDITIONS:
LIFT OFF AT 1.1 V_{S1}
OBSTACLE AT 1.3 V_{S1}
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-9. Takeoff Total Distance - Flaps 30° (metric units)

ACCELERATE-STOP DISTANCE - FLAPS 15°

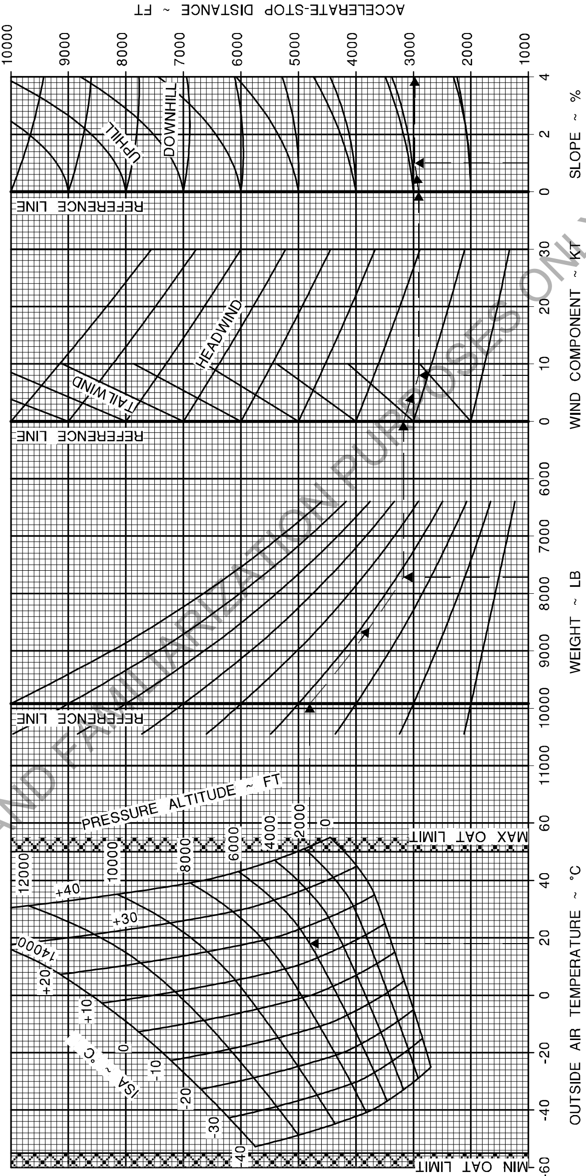
(STANDARD UNITS)

WEIGHT ~ LB	1.1 V_{S1} ~ KIAS
6400	67
7300	72
8200	76
9100	80
10000	84
10450	86

EXAMPLE:

ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7716 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
ACCELERATE-STOP DISTANCE	3000 FT

ASSOCIATED CONDITIONS:
REFER TO THE SPEED SCHEDULE TABLE
POWER-CHOP AT 1.1 V_{S1}
CONDITION LEVER AT GROUND IDLE
FIELD SURFACE: TARMAC



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-10. Accelerate - Stop Distance - Flaps 15° (standard units)

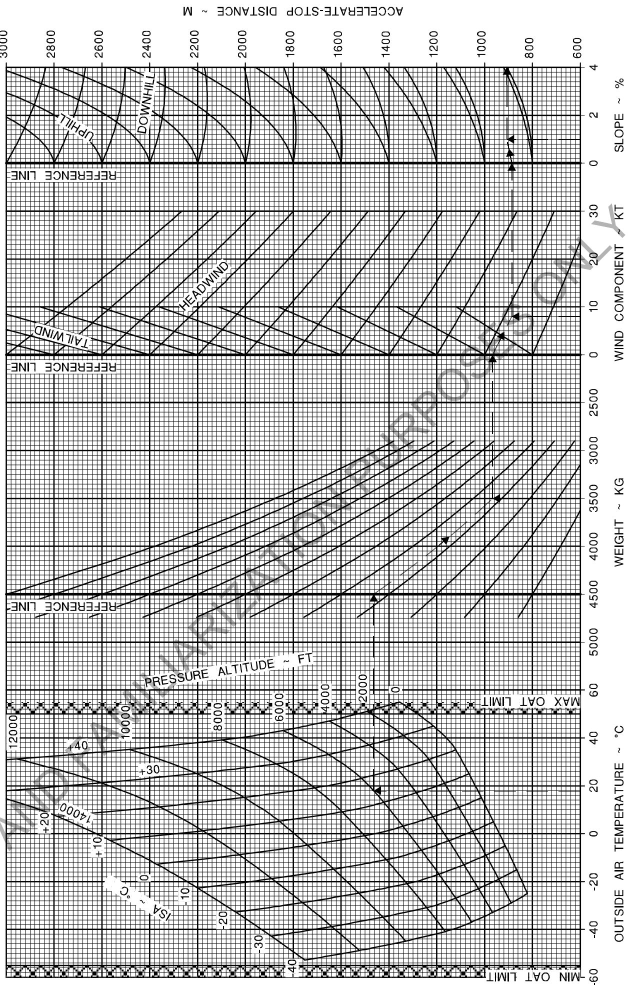
ACCELERATE-STOP DISTANCE - FLAPS 15°

(METRIC UNITS)

WEIGHT ~ KG	1.1 V_{S1} ~ KIAS
2900	67
3300	72
3700	76
4100	80
4500	84
4740	86

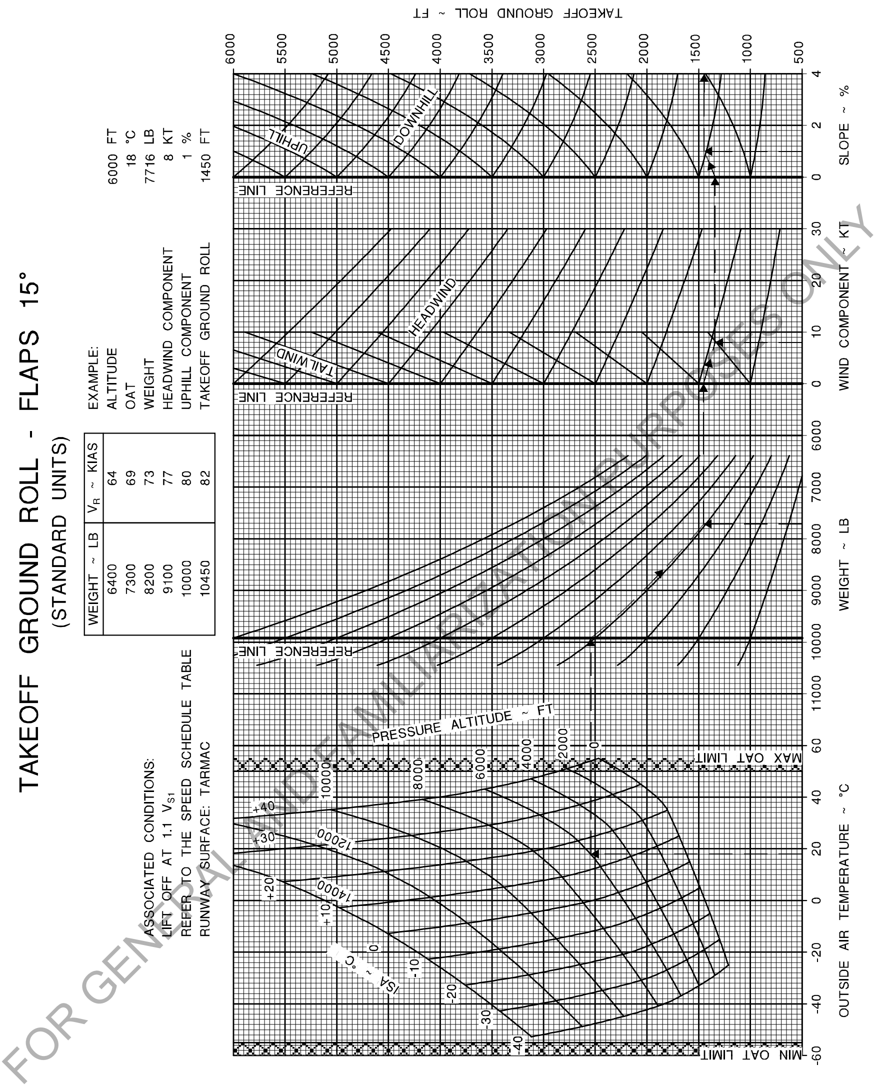
ASSOCIATED CONDITIONS:
REFER TO THE SPEED SCHEDULE TABLE
POWER-CHOP AT 1.1 V_{S1}
CONDITION LEVER AT GROUND IDLE
FIELD SURFACE: TARMAC

EXAMPLE:	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	3500 KG
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
ACCELERATE-STOP DISTANCE	910 M



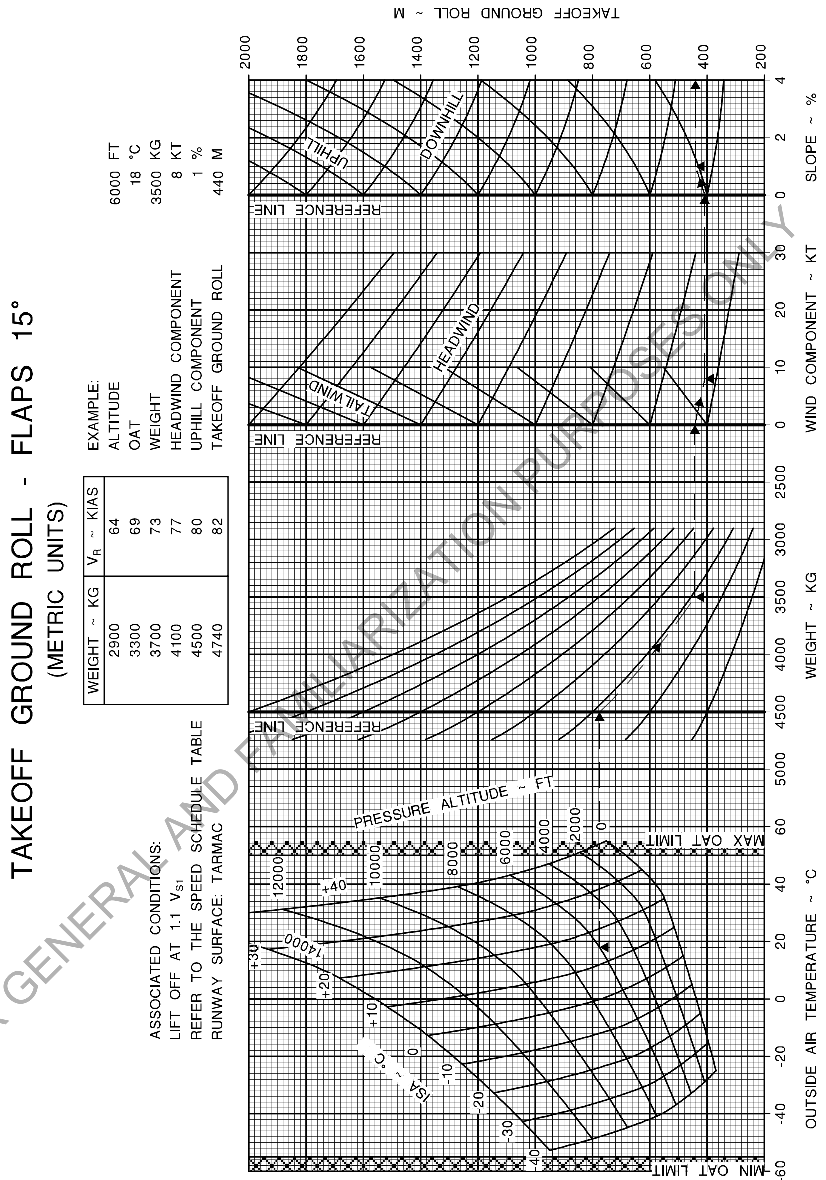
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-11. Accelerate - Stop Distance - Flaps 15° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-12. Takeoff Ground Roll - Flaps 15° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-13. Takeoff Ground Roll - Flaps 15° (metric units)

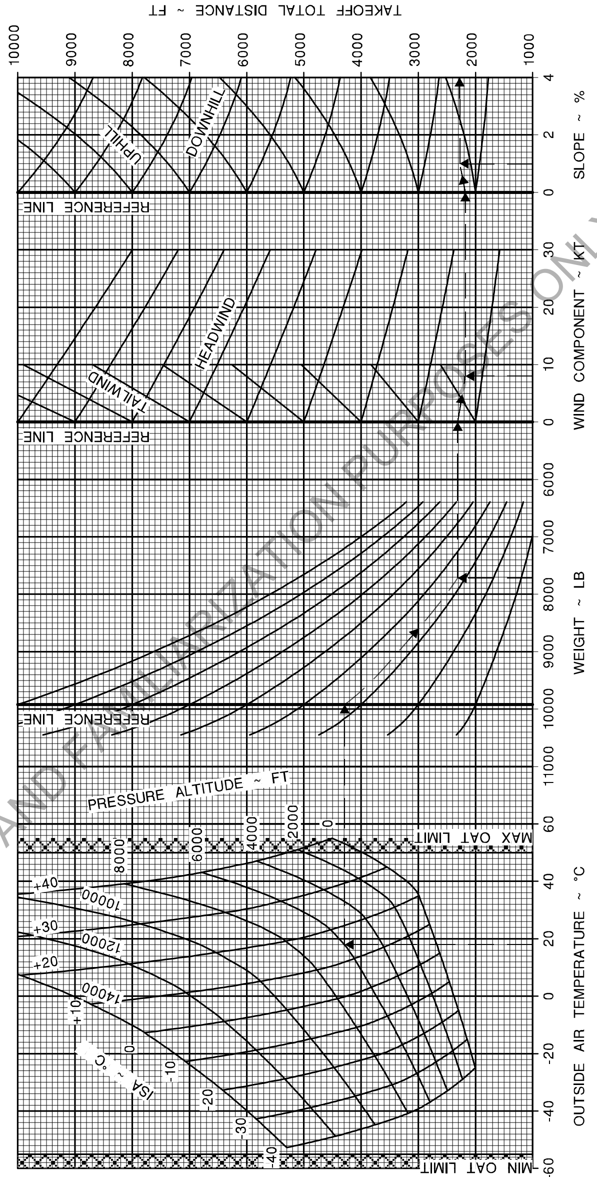
TAKEOFF TOTAL DISTANCE - FLAPS 15°

OVER 50 FT OBSTACLE; (STANDARD UNITS)

WEIGHT ~ LB	V_R ~ KIAS	V_{50FT} ~ KIAS
6400	64	79
7300	69	85
8200	73	90
9100	77	95
10000	80	99
10450	82	101

EXAMPLE:	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7716 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF TOTAL DISTANCE	2300 FT

ASSOCIATED CONDITIONS:
LIFT OFF AT 1.1 V_{S1}
OBSTACLE AT 1.3 V_{S1}
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-14. Takeoff Total Distance - Flaps 15° (standard units)

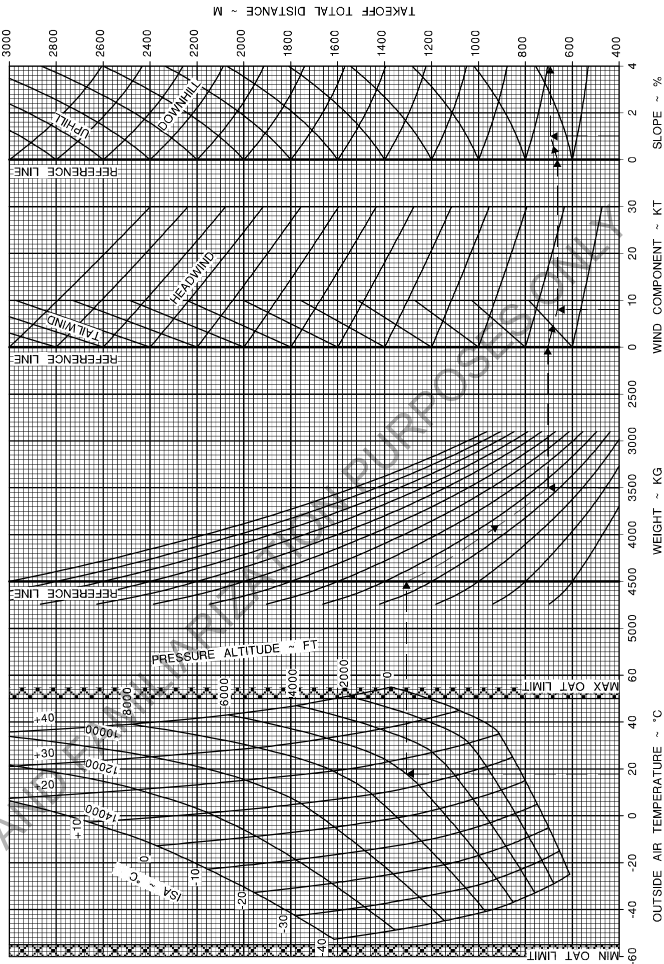
TAKEOFF TOTAL DISTANCE - FLAPS 15°
OVER 15 M OBSTACLE; (METRIC UNITS)

WEIGHT ~ KG	V_R ~ KIAS	V_{50FT} ~ KIAS
2900	64	79
3300	69	85
3700	73	90
4100	77	95
4500	80	99
4740	82	101

EXAMPLE:

ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	3500 KG
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF TOTAL DISTANCE	690 M

ASSOCIATED CONDITIONS:
LIFT OFF AT 1.1 V_{S1}
OBSTACLE AT 1.3 V_{S1}
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-15. Takeoff Total Distance - Flaps 15° (metric units)

MAXIMUM CLIMB TORQUE

PROPELLER SPEED 1700 RPM
ICE PROTECTION:
PROBES: ON
WINDSHIELD: ON
INERTIAL SEPARATOR OPERATION CAN REDUCE TORQUE BY 2.2 PSI
DEICE/ANTICE SYSTEMS CAN REDUCE TORQUE BY 3.0 PSI

EXAMPLE:
ALTITUDE 8000 FT
OAT 26 °C
ENGINE TORQUE 32.25 PSI

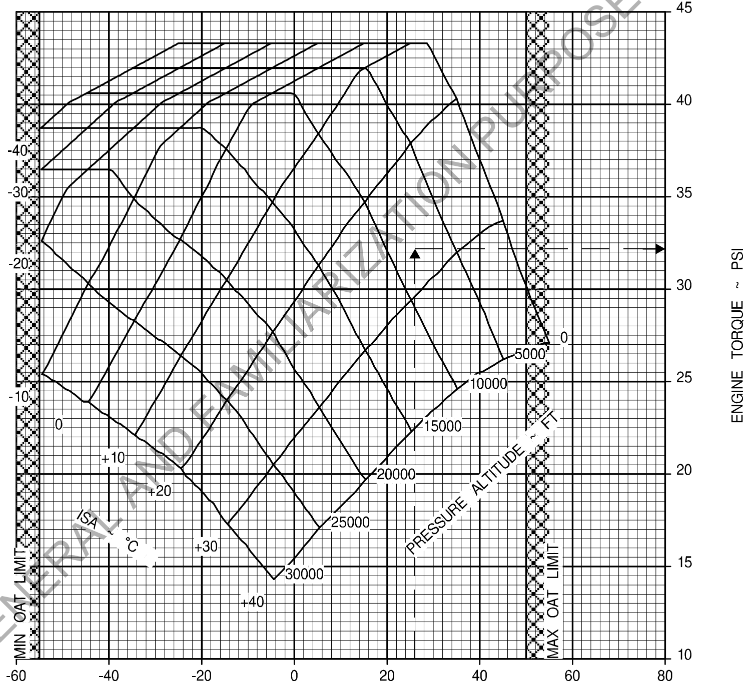
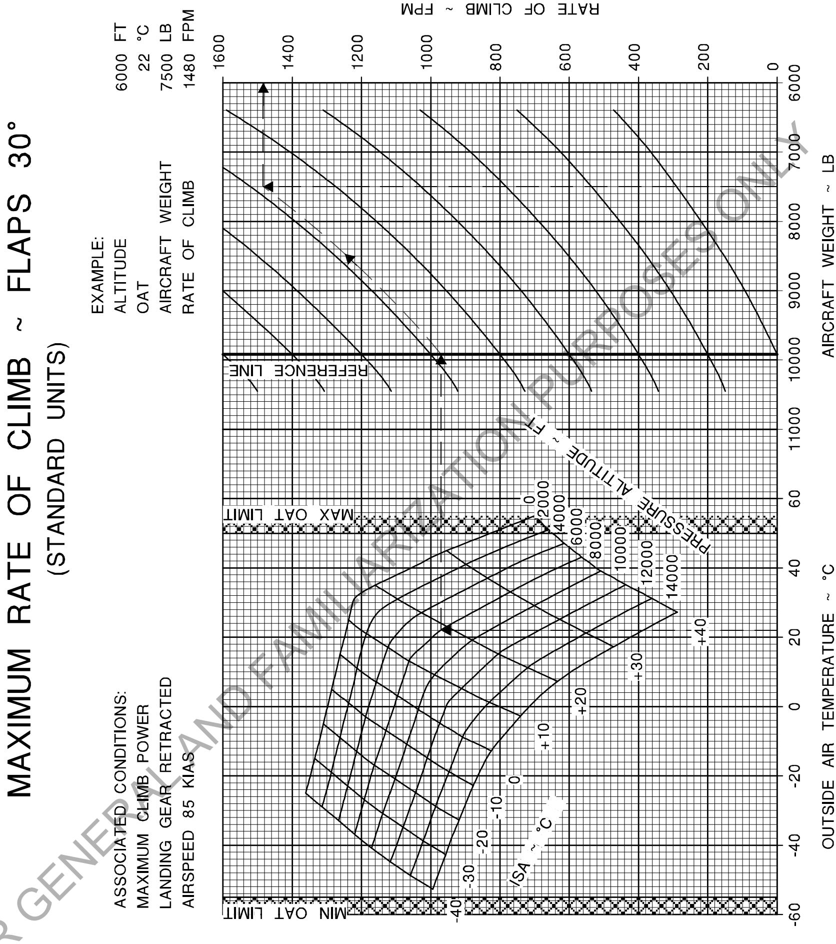
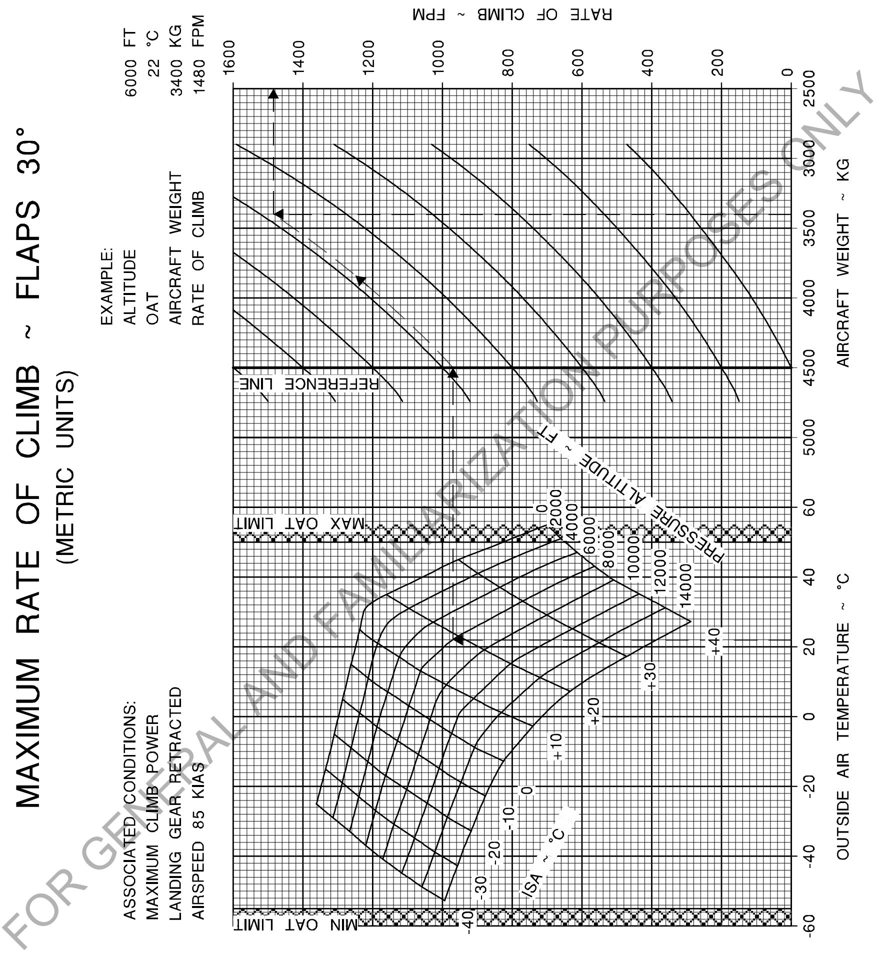


Figure 5-2-16. Maximum Climb Torque



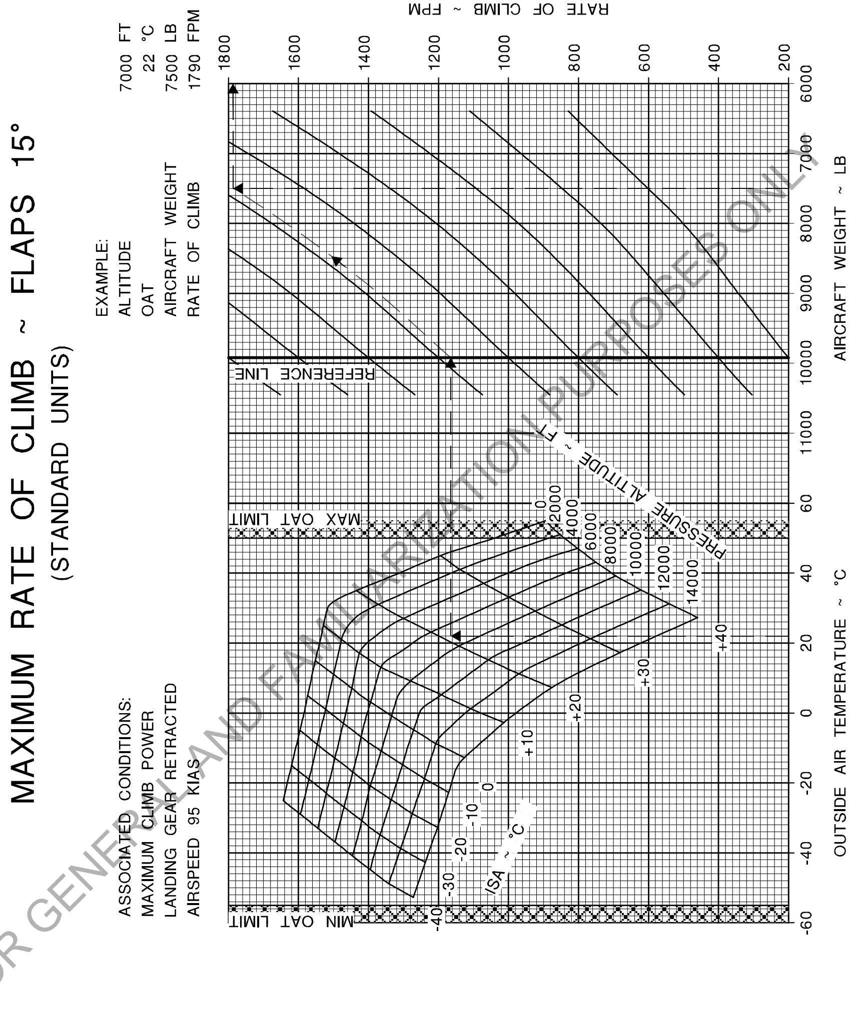
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-17. Maximum Rate of Climb - Flaps 30° (standard units)



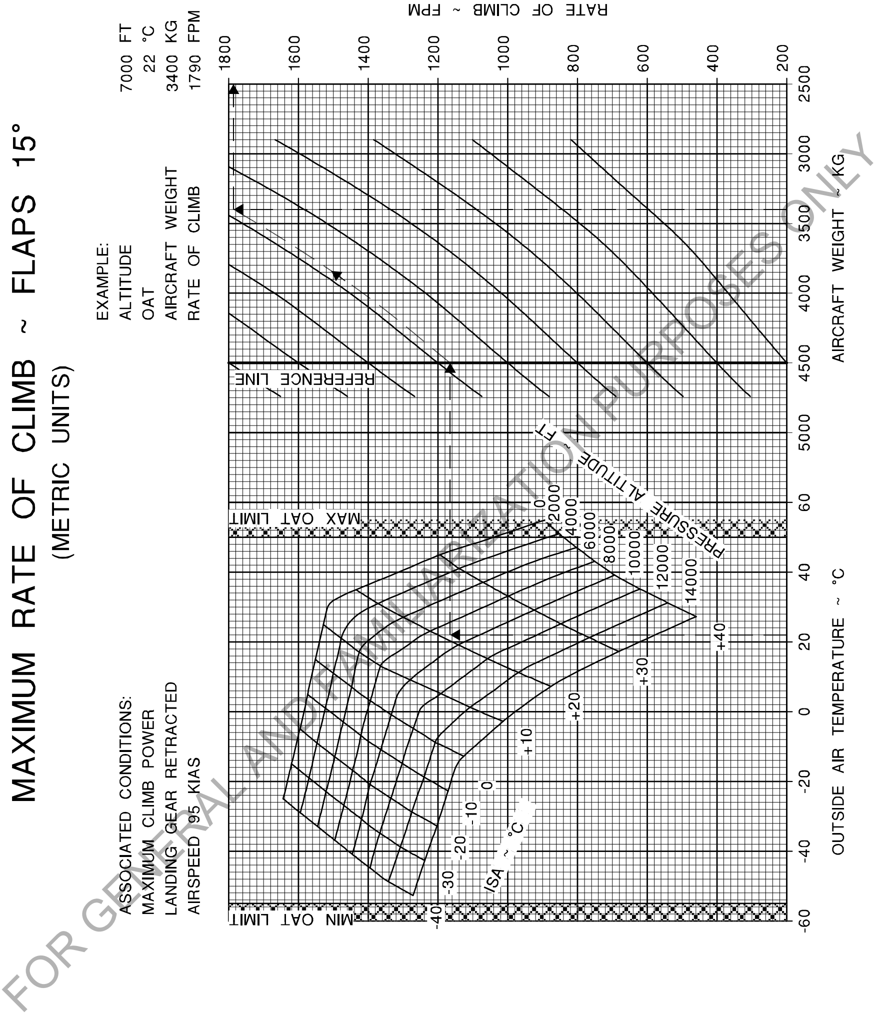
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-18. Maximum Rate of Climb - Flaps 30° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-19. Maximum Rate of Climb - Flaps 15° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-20. Maximum Rate of Climb - Flaps 15° (metric units)

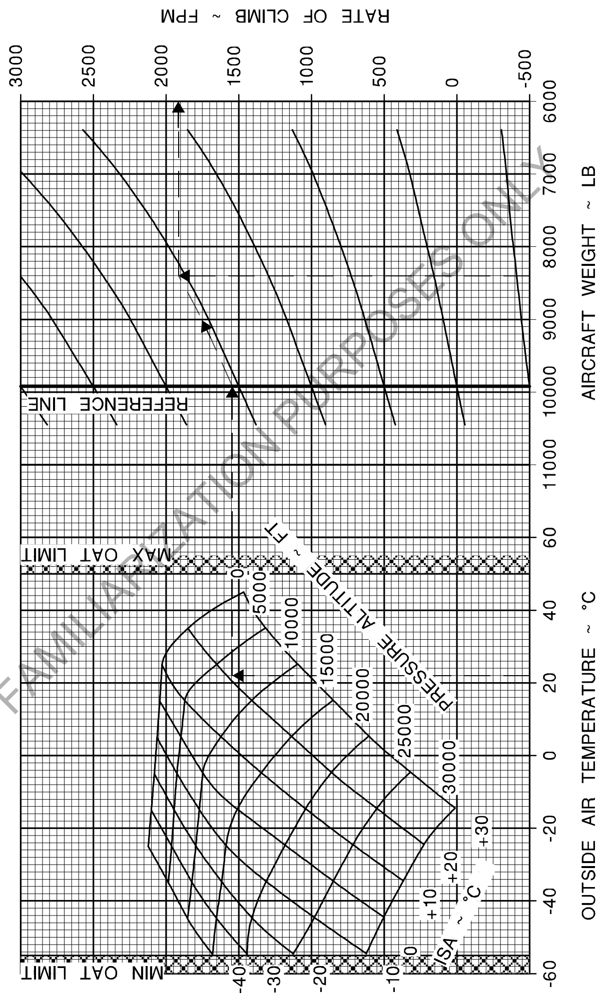
MAXIMUM RATE OF CLIMB ~ FLAPS 0°

(STANDARD UNITS)

Altitude~ft	Airspeed
0	130 KIAS
5000	125 KIAS
15000	125 KIAS
20000	120 KIAS
30000	120 KIAS

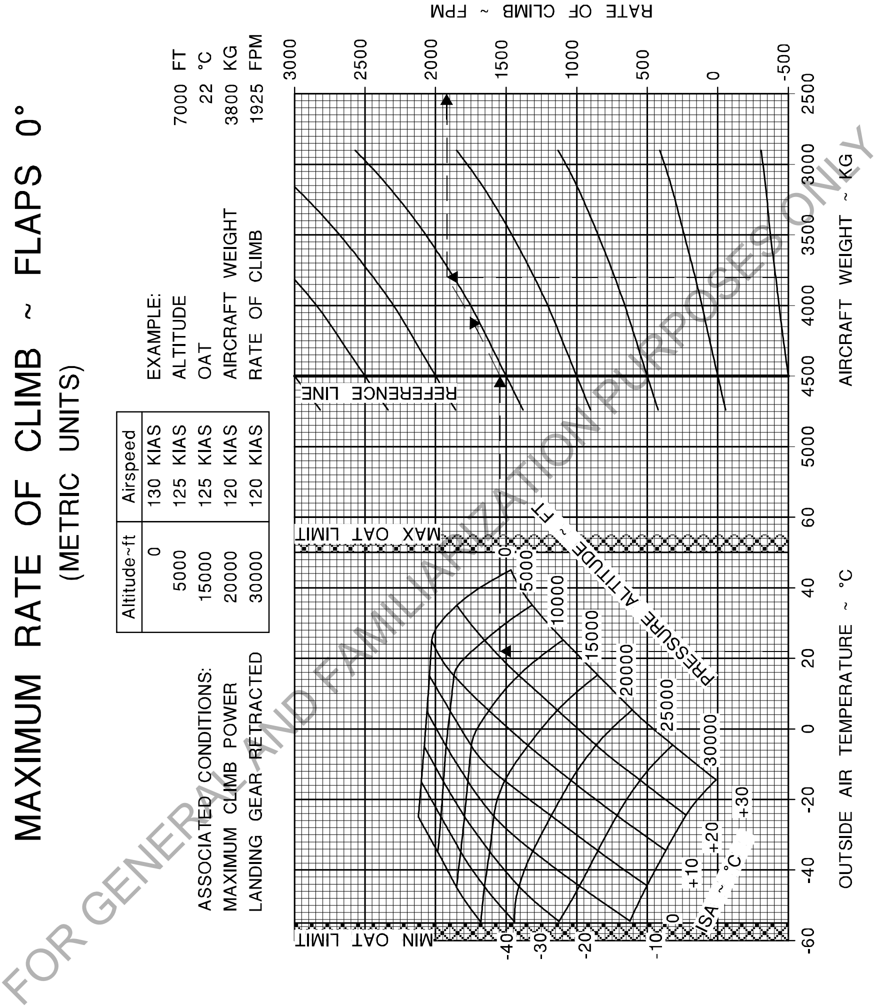
ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED

EXAMPLE:	
ALTITUDE	7000 FT
OAT	22 °C
AIRCRAFT WEIGHT	8400 LB
RATE OF CLIMB	1925 FPM



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-21. Maximum Rate of Climb - Flaps 0° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-22. Maximum Rate of Climb - Flaps 0° (metric units)

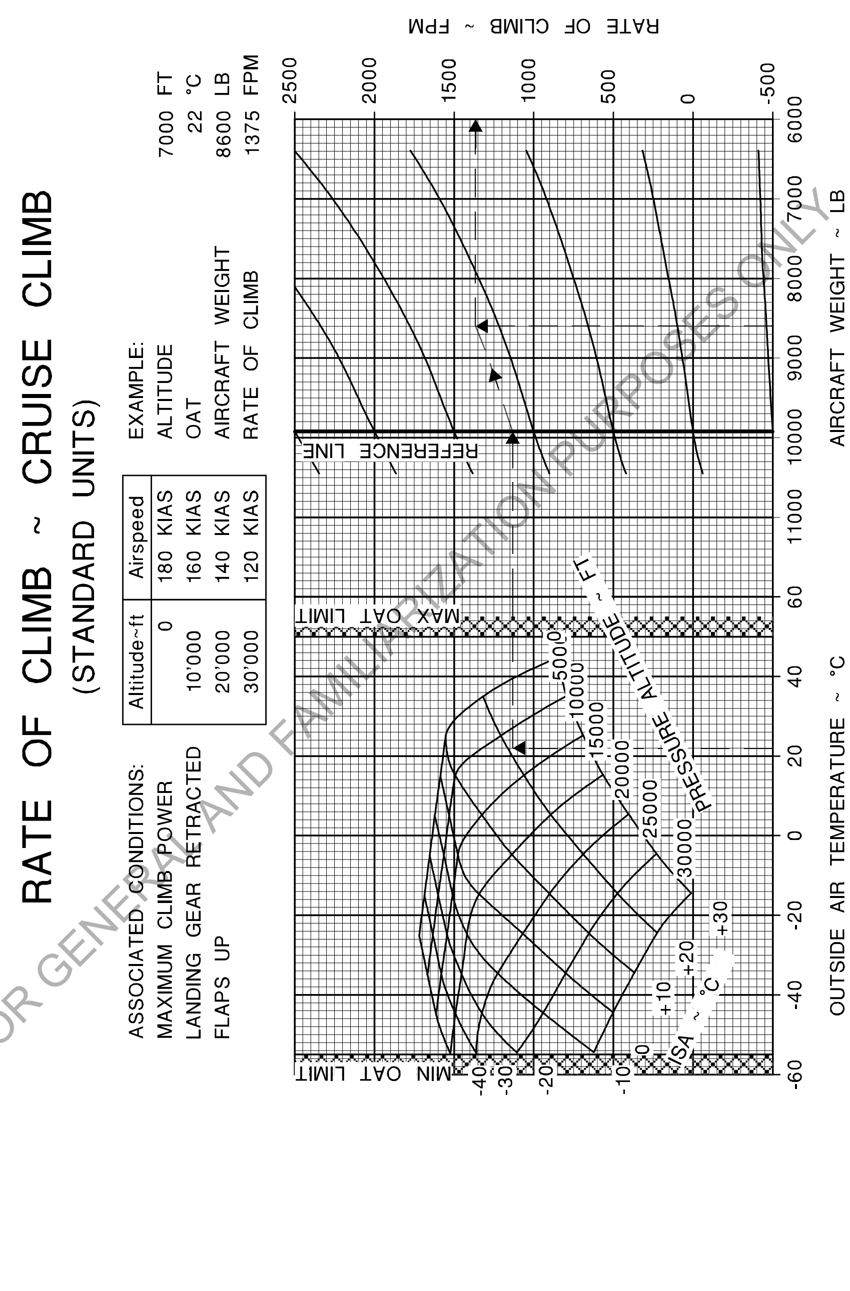


Figure 5-2-23. Rate of Climb - Cruise Climb (standard units)

RATE OF CLIMB ~ CRUISE CLIMB

(METRIC UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

Altitude~ft	Airspeed
0	180 KIAS
10'000	160 KIAS
20'000	140 KIAS
30'000	120 KIAS

EXAMPLE:	
ALTITUDE	7000 FT
OAT	22 °C
AIRCRAFT WEIGHT	3900 KG
RATE OF CLIMB	1375 FPM

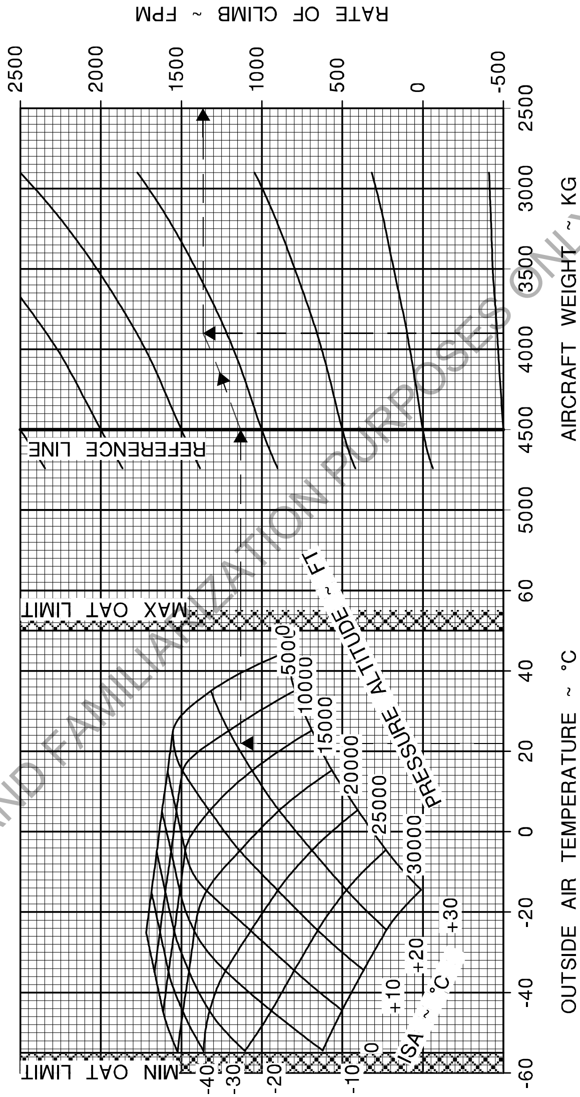


Figure 5-2-24. Rate of Climb - Cruise Climb (metric units)

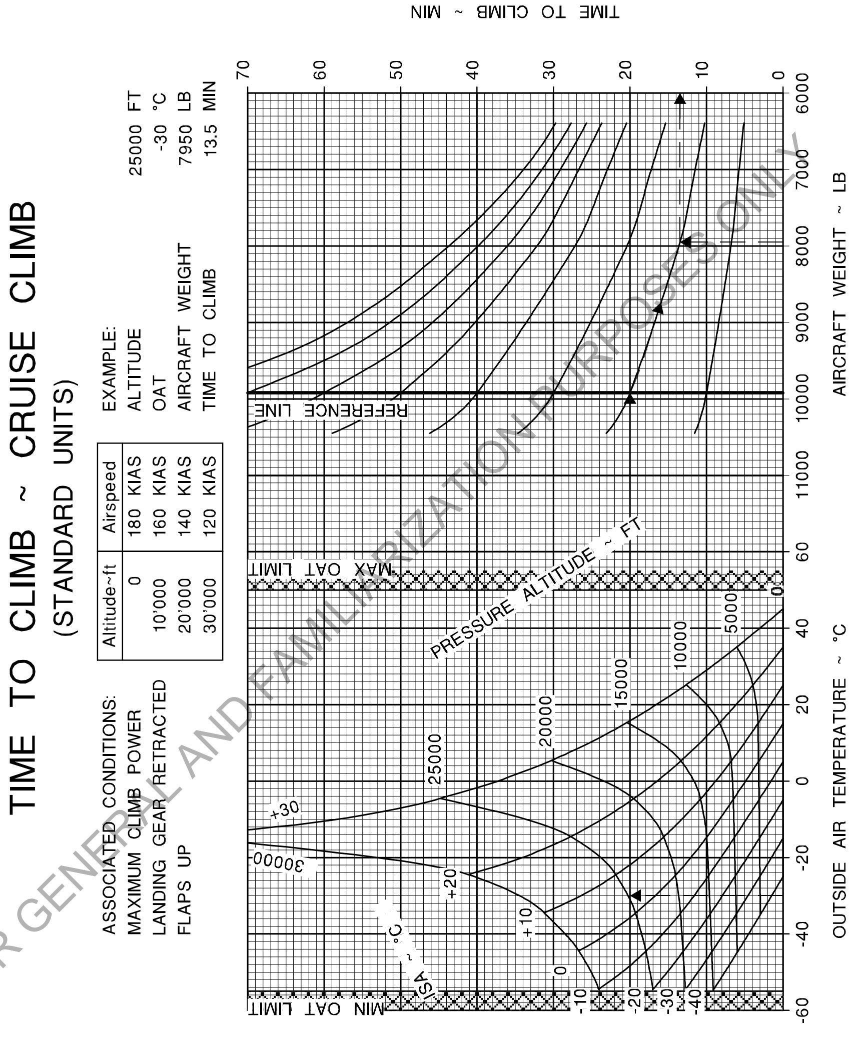


Figure 5-2-25. Time to Climb - Cruise Climb (standard units)

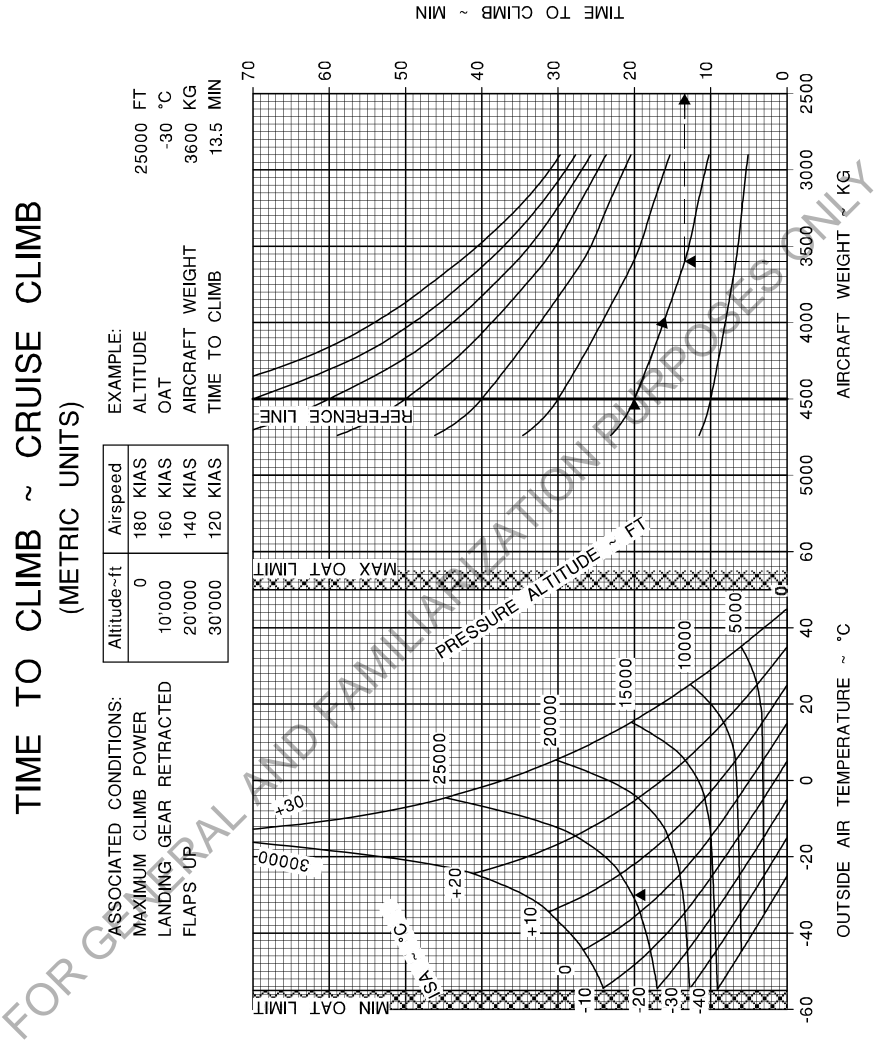


Figure 5-2-26. Time to Climb - Cruise Climb (metric units)

FUEL USED TO CLIMB ~ CRUISE CLIMB
(STANDARD UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

Altitude~ft	Airspeed
0	180 KIAS
10'000	160 KIAS
20'000	140 KIAS
30'000	120 KIAS

EXAMPLE:	
ALTITUDE	25000 FT
OAT	-30 °C
AIRCRAFT WEIGHT	7950 LB
FUEL USED	137.5 LB

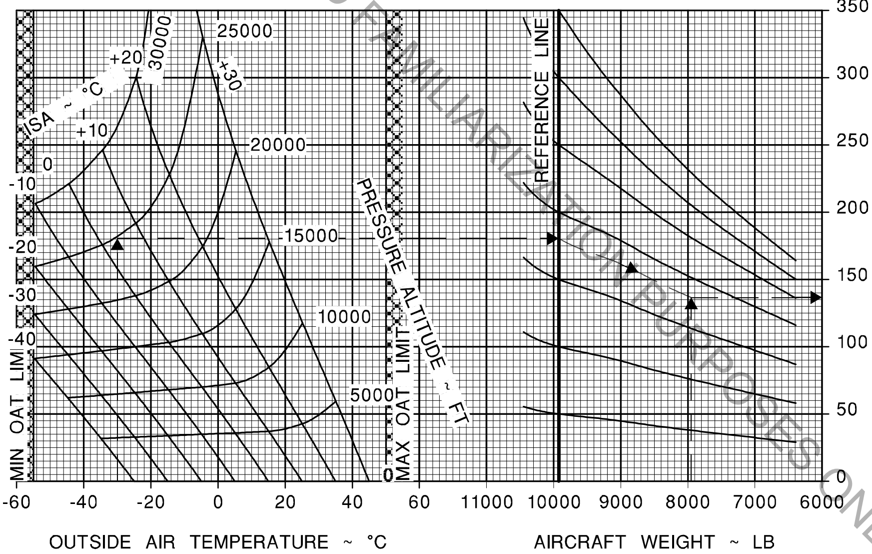


Figure 5-2-27. Fuel Used to Climb - Cruise Climb (standard units)

FUEL USED TO CLIMB ~ CRUISE CLIMB

(METRIC UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

Altitude~ft	Airspeed
0	180 KIAS
10'000	160 KIAS
20'000	140 KIAS
30'000	120 KIAS

EXAMPLE:

ALTITUDE	25000 FT
OAT	-30 °C
AIRCRAFT WEIGHT	3600 KG
FUEL USED	62 KG

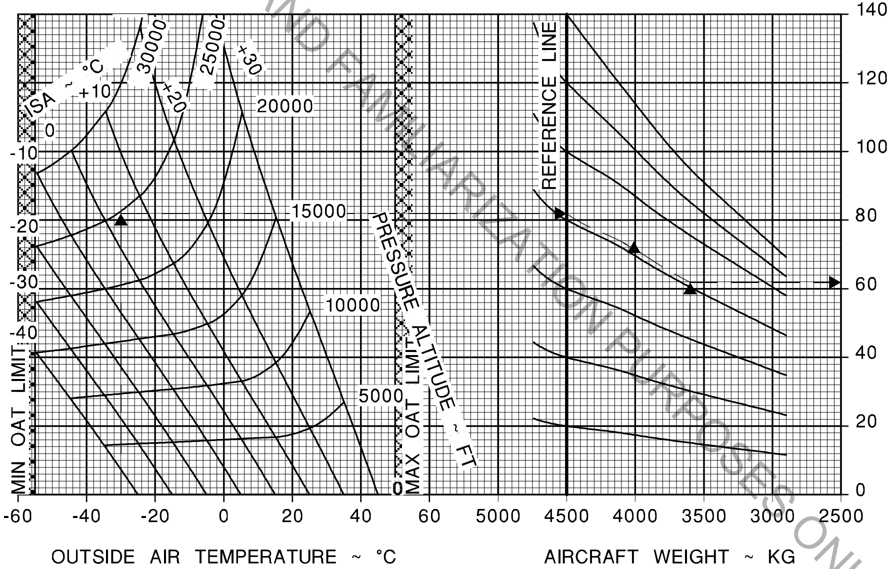


Figure 5-2-28. Fuel Used to Climb - Cruise Climb (metric units)

DISTANCE TO CLIMB ~ CRUISE CLIMB
(STANDARD UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

Altitude~ft	Airspeed
0	180 KIAS
10'000	160 KIAS
20'000	140 KIAS
30'000	120 KIAS

EXAMPLE:		
ALTITUDE	25000	FT
OAT	-30	°C
AIRCRAFT WEIGHT	7950	LB
DISTANCE TO CLIMB	40	NM

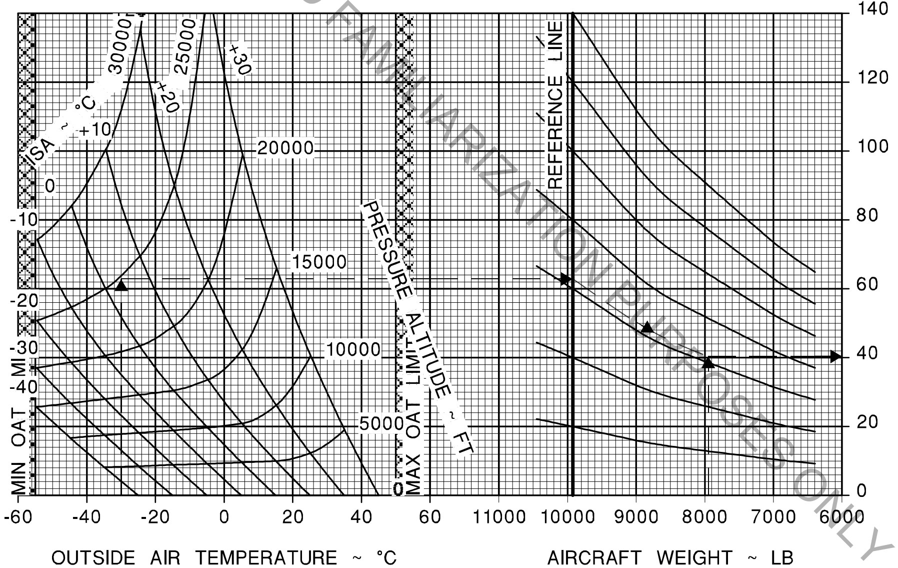


Figure 5-2-29. Distance to Climb - Cruise Climb (standard units)

DISTANCE TO CLIMB ~ CRUISE CLIMB
(METRIC UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

Altitude~ft	Airspeed
0	180 KIAS
10'000	160 KIAS
20'000	140 KIAS
30'000	120 KIAS

EXAMPLE:		
ALTITUDE	25000	FT
OAT	-30	°C
AIRCRAFT WEIGHT	3600	KG
DISTANCE TO CLIMB	41	NM

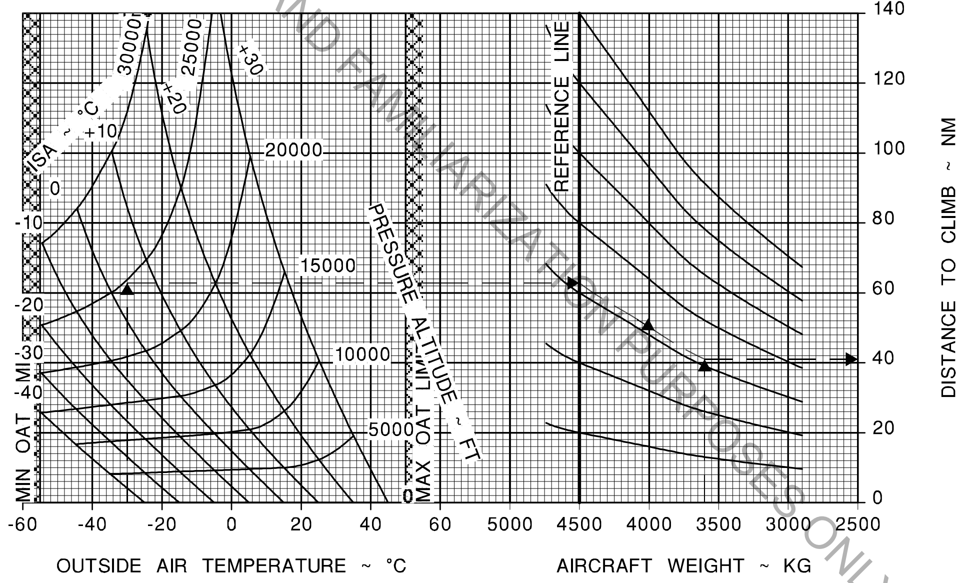


Figure 5-2-30. Distance to Climb - Cruise Climb (metric units)

MAXIMUM CRUISE POWER

NOTE: OAT, TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

						@ 7000 lb (3175 kg)		@ 8000 lb (3629 kg)		@ 9000 lb (4082 kg)		@ 10000 lb (4536 kg)		@ 10400 lb (4717 kg)	
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)
-40	0	-25	36.9	608	276	239	222	239	222	239	221	238	221	237	220
	2000	-29	36.9	591	268	238	227	237	226	237	226	236	225	235	224
	4000	-33	36.9	573	260	236	231	235	231	235	230	233	229	233	228
	6000	-37	36.9	557	253	234	236	233	235	233	234	231	233	231	232
	8000	-41	36.9	542	246	232	240	231	240	230	239	229	237	228	237
	10000	-45	36.9	529	240	230	245	229	244	228	243	227	242	226	241
	12000	-49	36.9	521	236	228	250	227	249	226	248	224	246	224	246
	14000	-53	36.9	513	233	226	255	225	254	224	253	222	251	222	251
	16000	-57	36.9	505	229	224	260	223	259	222	258	220	256	219	255
	18000	-61	36.9	496	225	222	266	221	265	219	263	218	261	217	260
	20000	-65	36.5	485	220	218	270	218	269	216	267	214	265	214	264
	22000	-69	34.0	451	205	209	267	209	267	209	267	209	267	209	267
	24000	-73	31.3	416	189	200	264	200	264	200	264	200	264	200	264
	26000	-77	29.2	387	175	192	262	192	262	192	262	192	262	192	262
	28000	-81	26.9	358	162	184	259	184	259	184	259	184	259	184	259
	30000	-84	24.9	331	150	176	256	176	256	176	256	176	256	176	256
-30	0	-15	36.9	615	279	238	225	237	225	237	224	236	223	235	222
	2000	-19	36.9	597	271	236	230	235	229	235	228	233	227	233	227
	4000	-23	36.9	579	263	234	234	233	233	232	233	231	231	231	231
	6000	-27	36.9	563	255	232	239	231	238	230	237	229	236	228	235
	8000	-31	36.9	548	249	230	243	229	242	228	241	227	240	226	239
	10000	-35	36.9	534	242	228	248	227	247	226	246	224	244	224	244
	12000	-39	36.9	526	239	226	253	225	252	224	251	222	249	221	249
	14000	-43	36.9	518	235	223	258	223	257	221	256	220	254	219	253
	16000	-47	36.9	510	231	221	264	220	263	219	261	217	259	217	258
	18000	-51	36.9	501	227	219	269	218	268	217	266	215	264	214	263
	20000	-55	36.5	489	222	216	273	215	272	213	270	212	268	211	267
	22000	-59	34.9	466	211	209	273	209	273	209	273	207	271	207	270
	24000	-63	32.5	433	196	201	271	201	271	201	271	201	271	201	271
	26000	-67	30.0	400	181	192	268	192	268	192	268	192	268	192	268
	28000	-71	27.9	373	169	184	266	184	266	184	266	184	266	184	266
	30000	-74	25.8	346	157	176	263	176	263	176	263	176	263	176	263

Values applicable with inertial separator closed

Figure 5-2-31. Maximum Cruise Power (Sheet 1 of 4)

MAXIMUM CRUISE POWER

NOTE: OAT, TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

						@ 7000 lb (3175 kg)		@ 8000 lb (3629 kg)		@ 9000 lb (4082 kg)		@ 10000 lb (4536 kg)		@ 10400 lb (4717 kg)	
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)
-20	0	-5	36.9	622	282	236	228	235	227	235	226	234	225	233	225
	2000	-9	36.9	603	274	234	232	233	231	233	231	231	229	231	229
	4000	-13	36.9	585	265	232	237	231	236	230	235	229	234	228	233
	6000	-17	36.9	568	258	230	241	229	240	228	239	227	238	226	237
	8000	-21	36.9	554	251	228	246	227	245	226	244	224	242	224	242
	10000	-25	36.9	540	245	225	251	225	250	224	249	222	247	221	246
	12000	-29	36.9	531	241	223	256	222	255	221	253	220	252	219	251
	14000	-33	36.9	523	237	221	261	220	260	219	258	217	257	217	256
	16000	-37	36.9	515	233	219	267	218	265	217	264	215	262	214	261
	18000	-41	36.9	506	229	217	272	216	271	214	269	213	267	212	266
	20000	-45	36.5	494	224	214	277	212	275	211	273	209	271	208	270
	22000	-49	35.6	478	217	209	280	208	278	206	276	205	274	204	273
	24000	-53	33.4	448	203	200	277	200	277	200	277	200	277	199	275
	26000	-57	31.1	417	189	192	275	192	275	192	275	192	275	192	275
	28000	-61	28.7	386	175	184	272	184	272	184	272	184	272	184	272
	30000	-64	26.8	361	164	176	270	176	270	176	270	176	270	176	270
-10	0	5	36.9	628	285	234	230	234	229	233	229	232	228	231	227
	2000	1	36.9	609	276	232	235	231	234	231	233	229	232	229	231
	4000	-3	36.9	592	268	230	239	229	238	228	237	227	236	226	235
	6000	-7	36.9	574	260	228	244	227	243	226	242	225	240	224	240
	8000	-11	36.9	559	254	226	249	225	248	224	246	222	245	222	244
	10000	-15	36.9	545	247	223	253	223	253	221	251	220	250	219	249
	12000	-19	36.9	536	243	221	259	220	258	219	256	217	254	217	254
	14000	-23	36.9	529	240	219	264	218	263	217	261	215	259	214	259
	16000	-27	36.9	520	236	217	269	216	268	214	266	213	264	212	264
	18000	-31	36.9	511	232	215	275	213	274	212	272	210	270	210	269
	20000	-35	36.5	498	226	211	280	210	278	208	276	207	274	206	273
	22000	-39	35.6	482	218	207	283	206	281	204	279	202	276	201	275
	24000	-43	33.7	455	206	201	283	199	281	197	278	195	275	194	274
	26000	-47	31.6	425	193	192	281	191	279	189	277	186	273	185	271
	28000	-51	29.4	397	180	184	279	183	278	181	274	178	269	177	268
	30000	-54	27.3	369	167	176	276	176	275	172	270	169	265	168	263

Values applicable with inertial separator closed

Figure 5-2-31. Maximum Cruise Power (Sheet 2 of 4)

MAXIMUM CRUISE POWER

NOTE: OAT, TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

						@ 7000 lb (3175 kg)		@ 8000 lb (3629 kg)		@ 9000 lb (4082 kg)		@ 10000 lb (4536 kg)		@ 10400 lb (4717 kg)	
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)
0	0	15	36.9	634	288	232	232	232	232	231	231	230	230	229	229
	2000	11	36.9	615	279	230	237	230	236	229	235	227	234	227	233
	4000	7	36.9	597	271	228	241	227	241	226	240	225	238	224	238
	6000	3	36.9	579	263	226	246	225	245	224	244	223	243	222	242
	8000	-1	36.9	564	256	224	251	223	250	222	249	220	247	220	247
	10000	-5	36.9	550	249	221	256	221	255	219	254	218	252	217	251
	12000	-9	36.9	541	245	219	261	218	260	217	259	215	257	215	256
	14000	-13	36.9	533	242	217	267	216	266	214	264	213	262	212	261
	16000	-17	36.9	524	238	215	272	214	271	212	269	210	267	210	266
	18000	-21	36.9	515	234	212	278	211	276	210	274	208	272	207	271
	20000	-25	35.5	491	223	207	280	205	278	204	275	202	273	201	272
	22000	-29	33.5	461	209	200	279	198	277	196	275	194	272	193	270
	24000	-33	31.5	432	196	193	279	191	276	189	273	186	270	185	268
	26000	-37	29.4	404	183	186	277	184	275	181	271	178	267	177	265
	28000	-41	27.4	376	171	178	275	176	272	173	268	169	263	168	261
	30000	-44	25.4	349	158	170	273	167	269	164	264	161	258	159	256
10	0	25	36.9	641	291	231	235	230	234	229	233	228	232	227	231
	2000	21	36.9	621	282	229	239	228	238	227	237	225	236	225	235
	4000	17	36.9	603	274	226	244	226	243	224	242	223	240	222	240
	6000	13	36.9	586	266	224	249	223	248	222	246	221	245	220	244
	8000	9	36.9	570	258	222	254	221	253	220	251	218	249	218	249
	10000	5	36.9	555	252	220	259	219	258	217	256	216	254	215	254
	12000	1	36.9	546	248	217	264	216	263	215	261	213	259	213	258
	14000	-3	36.9	539	244	215	269	214	268	212	266	211	264	210	263
	16000	-7	36.4	523	237	211	273	210	272	208	270	207	267	206	267
	18000	-11	34.6	493	224	205	274	203	272	202	270	200	267	199	266
	20000	-15	32.8	465	211	199	274	197	272	195	269	193	266	192	265
	22000	-19	31.0	437	198	192	274	190	271	188	269	186	265	184	263
	24000	-23	29.3	411	186	185	273	183	271	181	267	178	263	177	261
	26000	-27	27.3	383	174	178	272	176	269	173	264	170	260	168	258
	28000	-31	25.4	356	162	170	270	168	265	164	261	161	255	160	253
	30000	-34	23.5	330	150	162	267	159	262	156	256	152	250	150	247

Values applicable with inertial separator closed

Figure 5-2-31. Maximum Cruise Power (Sheet 3 of 4)

MAXIMUM CRUISE POWER

NOTE: OAT, TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

						@ 7000 lb (3175 kg)		@ 8000 lb (3629 kg)		@ 9000 lb (4082 kg)		@ 10000 lb (4536 kg)		@ 10400 lb (4717 kg)	
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)
20	0	35	36.9	648	294	229	237	228	236	227	235	226	234	225	233
	2000	31	36.9	628	285	227	241	226	241	225	240	224	238	223	237
	4000	27	36.9	609	276	225	246	224	245	223	244	221	242	221	242
	6000	23	36.9	592	269	222	251	222	250	220	249	219	247	218	246
	8000	19	36.9	576	261	220	256	219	255	218	253	216	252	216	251
	10000	15	36.8	559	254	217	261	216	260	215	258	213	256	213	255
	12000	11	35.5	537	244	212	263	211	261	209	259	208	257	207	256
	14000	7	34.2	515	233	207	264	206	262	204	260	202	258	202	258
	16000	3	32.6	488	221	201	265	199	263	198	260	196	258	195	257
	18000	-1	30.9	460	208	194	265	193	263	191	260	189	257	188	256
	20000	-5	29.3	432	196	188	265	186	262	184	260	182	256	181	254
	22000	-9	27.9	408	185	182	265	180	263	178	259	175	255	174	253
	24000	-13	26.4	383	174	176	265	174	262	171	257	167	253	166	251
	26000	-17	24.7	358	162	169	263	166	259	163	255	159	249	158	247
	28000	-21	22.9	333	151	161	261	158	256	155	250	151	245	149	242
	30000	-24	21.3	309	140	153	258	150	252	146	246	142	239	140	235
30	0	45	35.0	636	289	223	234	222	233	221	232	219	231	219	230
	2000	41	34.8	613	278	220	238	219	237	218	236	217	234	216	234
	4000	37	34.2	587	266	217	241	216	240	214	239	213	237	212	236
	6000	33	33.2	560	254	212	243	211	242	209	240	208	239	207	238
	8000	29	32.1	533	242	207	245	206	244	204	242	203	240	202	239
	10000	25	31.1	507	230	202	247	201	245	199	243	197	241	196	240
	12000	21	30.1	487	221	198	249	196	247	194	245	192	242	191	241
	14000	17	29.0	465	211	192	250	191	248	189	246	186	242	185	241
	16000	13	27.7	442	200	187	251	185	249	183	246	180	242	179	241
	18000	9	26.4	416	189	181	251	179	249	177	245	174	241	172	240
	20000	5	25.1	392	178	175	251	173	248	170	244	167	240	166	238
	22000	1	23.8	368	167	169	251	166	247	163	243	160	238	159	236
	24000	-3	22.5	345	157	163	250	160	246	156	241	153	236	151	233
	26000	-7	21.0	322	146	156	248	152	243	149	237	144	231	143	228
	28000	-11	19.5	300	136	148	245	145	239	141	233	135	224	133	220
	30000	-14	18.1	278	126	141	242	137	235	132	227	125	215	120	208

Values applicable with inertial separator closed

Figure 5-2-31. Maximum Cruise Power (Sheet 4 of 4)

LONG RANGE CRUISE

NOTE: OAT BASED ON 8000 lb (3629 kg)

			@ 7000 lb (3175 kg)					@ 8000 lb (3629 kg)					@ 9000 lb (4082 kg)					@ 10000 lb (4536 kg)					@ 10400 lb (4717 kg)				
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
-40	0	-25	20.0	443	201	188	175	20.0	443	201	186	173	20.0	443	201	185	171	20.0	443	201	182	169	20.0	443	201	181	168
	2000	-29	19.5	420	191	184	176	19.6	422	191	183	175	19.7	424	192	182	174	19.9	425	193	180	172	19.9	426	193	179	171
	4000	-33	18.9	399	181	181	177	19.2	401	182	180	177	19.5	404	183	179	176	19.7	407	185	178	174	19.9	409	185	177	174
	6000	-37	18.4	378	171	177	179	18.8	382	173	177	179	19.2	386	175	176	178	19.6	390	177	176	177	19.8	392	178	176	177
	8000	-41	17.9	358	162	173	180	18.4	363	165	174	180	18.9	369	167	174	180	19.5	374	170	173	180	19.7	377	171	173	180
	10000	-45	17.3	339	154	170	181	18.0	346	157	170	182	18.7	353	160	171	182	19.3	359	163	171	183	19.7	363	164	171	183
	12000	-49	16.8	325	147	166	183	17.6	333	151	167	184	18.4	340	154	168	185	19.2	348	158	168	185	19.6	352	160	169	186
	14000	-53	16.3	310	141	162	184	17.2	319	145	163	185	18.1	329	149	165	187	19.1	338	153	166	188	19.5	342	155	167	189
	16000	-57	15.7	295	134	158	184	16.8	306	139	160	187	17.9	316	143	162	189	18.9	326	148	163	191	19.5	332	150	164	192
	18000	-61	15.2	280	127	153	185	16.4	292	132	156	188	17.6	303	137	158	191	18.8	315	143	160	194	19.4	321	145	162	195
	20000	-65	14.7	265	120	149	186	16.0	278	126	152	190	17.3	291	132	155	193	18.7	304	138	158	196	19.3	310	141	159	198
	22000	-69	14.1	250	114	145	186	15.6	265	120	149	191	17.1	279	127	152	195	18.5	293	133	155	199	19.3	300	136	157	201
	24000	-73	13.6	236	107	140	186	15.2	252	114	145	192	16.8	267	121	149	197	18.4	283	128	152	202	19.2	291	132	154	205
	26000	-77	13.1	223	101	136	186	14.8	240	109	141	193	16.5	257	117	145	199	18.3	274	124	149	205	19.1	283	128	151	207
	28000	-81	12.5	211	96	131	186	14.4	229	104	137	194	16.3	248	112	142	201	18.1	266	121	146	207	19.1	275	125	148	210
	30000	-84	12.0	200	90	126	185	14.0	219	99	133	195	16.0	239	108	138	203	18.0	258	117	143	209	19.0	269	122	146	213
-30	0	-15	20.0	448	203	187	177	20.0	448	203	185	175	20.0	448	203	183	173	20.0	448	203	181	171	20.0	448	203	180	170
	2000	-19	19.5	425	193	183	178	19.6	427	193	182	177	19.7	428	194	180	176	19.9	430	195	179	174	19.9	431	195	178	173
	4000	-23	18.9	403	183	179	179	19.2	406	184	179	179	19.5	409	185	178	178	19.7	412	187	176	177	19.9	413	187	176	176
	6000	-27	18.4	382	173	176	181	18.8	386	175	176	181	19.2	391	177	175	180	19.6	395	179	174	179	19.8	397	180	174	179
	8000	-31	17.9	362	164	172	182	18.4	368	167	172	183	18.9	373	169	172	182	19.5	379	172	172	182	19.7	381	173	172	182
	10000	-35	17.3	343	156	168	184	18.0	350	159	169	184	18.7	357	162	169	185	19.3	363	165	169	185	19.7	367	166	169	185
	12000	-39	16.8	328	149	164	185	17.6	336	152	165	186	18.4	344	156	166	187	19.2	352	160	166	187	19.6	356	162	167	188
	14000	-43	16.3	314	142	160	186	17.2	323	147	161	187	18.1	332	151	163	189	19.1	342	155	164	190	19.5	346	157	165	191
	16000	-47	15.7	299	135	156	187	16.8	309	140	158	189	17.9	320	145	160	191	18.9	330	150	161	193	19.5	335	152	162	194
	18000	-51	15.2	283	128	152	187	16.4	295	134	154	190	17.6	307	139	156	193	18.8	318	144	158	195	19.4	324	147	160	197
	20000	-55	14.7	268	122	147	188	16.0	281	127	150	192	17.3	294	133	153	195	18.7	307	139	156	198	19.3	313	142	157	200
	22000	-59	14.1	254	115	143	188	15.6	268	121	147	193	17.1	282	128	150	197	18.5	296	134	153	201	19.3	303	138	155	203
	24000	-63	13.6	239	108	138	188	15.2	255	116	143	194	16.8	270	123	147	199	18.4	286	130	150	204	19.2	294	133	152	206
	26000	-67	13.1	226	103	134	188	14.8	243	110	139	195	16.5	260	118	143	201	18.3	277	126	147	206	19.1	285	129	149	209
	28000	-71	12.5	214	97	129	188	14.4	232	105	135	196	16.3	250	114	139	203	18.1	269	122	144	209	19.1	278	126	146	212
	30000	-74	12.0	202	92	124	187	14.0	222	100	130	196	16.0	241	109	136	204	18.0	261	118	140	211	19.0	272	123	143	215

Figure 5-2-32. Long Range Cruise (Sheet 1 of 4)

LONG RANGE CRUISE

NOTE: OAT BASED ON 8000 lb (3629 kg)

			@ 7000 lb (3175 kg)					@ 8000 lb (3629 kg)					@ 9000 lb (4082 kg)					@ 10000 lb (4536 kg)					@ 10400 lb (4717 kg)				
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
-20	0	-5	20.0	453	205	185	179	20.0	453	205	184	177	20.0	453	205	182	175	20.0	453	205	179	173	20.0	453	205	178	172
	2000	-9	19.5	430	195	182	180	19.6	431	196	180	179	19.7	433	196	179	178	19.9	434	197	177	176	19.9	435	197	176	175
	4000	-13	18.9	407	185	178	182	19.2	410	186	177	181	19.5	413	187	176	180	19.7	416	189	175	178	19.9	418	190	174	178
	6000	-17	18.4	386	175	174	183	18.8	391	177	174	183	19.2	395	179	173	182	19.6	399	181	172	181	19.8	402	182	172	181
	8000	-21	17.9	366	166	170	184	18.4	372	169	170	185	18.9	377	171	170	184	19.5	383	174	170	184	19.7	386	175	170	184
	10000	-25	17.3	347	157	167	186	18.0	354	160	167	186	18.7	361	164	167	186	19.3	367	167	167	186	19.7	371	168	167	187
	12000	-29	16.8	332	151	163	187	17.6	340	154	163	188	18.4	348	158	164	189	19.2	356	161	165	189	19.6	360	163	165	190
	14000	-33	16.3	317	144	158	188	17.2	327	148	160	189	18.1	336	152	161	191	19.1	345	157	162	192	19.5	350	159	163	193
	16000	-37	15.7	302	137	154	189	16.8	313	142	156	191	17.9	323	147	158	193	18.9	334	151	159	195	19.5	339	154	160	196
	18000	-41	15.2	286	130	150	189	16.4	298	135	152	192	17.6	310	141	154	195	18.8	322	146	156	197	19.4	328	149	158	199
	20000	-45	14.7	271	123	146	190	16.0	284	129	149	194	17.3	297	135	151	197	18.7	310	141	154	200	19.3	317	144	155	202
	22000	-49	14.1	257	116	141	190	15.6	271	123	145	195	17.1	285	129	148	199	18.5	299	136	151	203	19.3	307	139	152	205
	24000	-53	13.6	242	110	137	190	15.2	258	117	141	196	16.8	274	124	145	201	18.4	289	131	148	205	19.2	297	135	149	208
	26000	-57	13.1	229	104	132	190	14.8	246	112	137	197	16.5	263	119	141	203	18.3	280	127	144	208	19.1	288	131	146	211
	28000	-61	12.5	217	98	127	190	14.4	235	106	133	198	16.3	253	115	137	204	18.1	271	123	141	210	19.1	281	127	143	214
	30000	-64	12.0	205	93	122	189	14.0	224	102	128	198	16.0	244	110	133	206	18.0	264	120	138	212	19.0	275	125	140	216
-10	0	5	20.0	457	207	184	181	20.0	457	207	182	179	20.0	458	208	180	177	20.0	458	208	178	175	20.0	458	208	177	174
	2000	1	19.5	434	197	180	182	19.6	436	198	179	181	19.7	437	198	178	179	19.9	439	199	176	178	19.9	440	199	175	177
	4000	-3	18.9	412	187	177	184	19.2	415	188	176	183	19.5	418	190	175	182	19.7	421	191	173	180	19.9	423	192	173	180
	6000	-7	18.4	391	177	173	185	18.8	395	179	172	185	19.2	399	181	172	184	19.6	404	183	171	183	19.8	406	184	170	183
	8000	-11	17.9	370	168	169	187	18.4	376	171	169	187	18.9	382	173	169	186	19.5	387	176	168	186	19.7	390	177	168	185
	10000	-15	17.3	351	159	165	188	18.0	358	162	165	188	18.7	365	165	165	188	19.3	372	169	165	188	19.7	375	170	166	188
	12000	-19	16.8	336	152	161	189	17.6	344	156	162	190	18.4	352	160	162	190	19.2	360	163	163	191	19.6	364	165	163	191
	14000	-23	16.3	321	146	157	190	17.2	330	150	158	191	18.1	340	154	159	193	19.1	349	158	160	194	19.5	354	161	161	194
	16000	-27	15.7	306	139	153	191	16.8	316	143	154	193	17.9	327	148	156	195	18.9	338	153	157	196	19.5	343	156	158	198
	18000	-31	15.2	290	131	148	191	16.4	302	137	151	194	17.6	313	142	153	197	18.8	325	148	154	199	19.4	331	150	156	201
	20000	-35	14.7	274	124	144	192	16.0	287	130	147	196	17.3	301	136	149	199	18.7	314	142	152	202	19.3	320	145	153	204
	22000	-39	14.1	259	118	139	192	15.6	274	124	143	197	17.1	288	131	146	201	18.5	303	137	148	204	19.3	310	140	150	207
	24000	-43	13.6	245	111	135	192	15.2	261	118	139	198	16.8	276	125	142	203	18.4	292	132	145	207	19.2	300	136	147	209
	26000	-47	13.1	232	105	130	192	14.8	249	113	135	199	16.5	265	120	139	204	18.3	282	128	142	209	19.1	291	132	144	212
	28000	-51	12.5	219	99	125	192	14.4	237	108	130	199	16.3	255	116	135	206	18.1	274	124	139	212	19.1	284	129	141	215
	30000	-54	12.0	207	94	120	190	14.0	226	103	126	199	16.0	246	112	131	207	18.0	267	121	135	213	19.0	277	126	138	217

Figure 5-2-32. Long Range Cruise (Sheet 2 of 4)

LONG RANGE CRUISE

NOTE: OAT BASED ON 8000 lb (3629 kg)

			@ 7000 lb (3175 kg)					@ 8000 lb (3629 kg)					@ 9000 lb (4082 kg)					@ 10000 lb (4536 kg)					@ 10400 lb (4717 kg)				
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
0	0	15	20.0	461	209	183	183	20.0	461	209	181	181	20.0	461	209	179	179	20.0	462	209	177	177	20.0	462	209	176	176
	2000	11	19.5	438	199	179	184	19.6	439	199	178	183	19.7	441	200	176	181	19.9	443	201	174	179	19.9	443	201	173	178
	4000	7	18.9	416	188	175	186	19.2	419	190	174	185	19.5	422	191	173	183	19.7	425	193	172	182	19.9	426	193	171	181
	6000	3	18.4	394	179	171	187	18.8	398	181	171	187	19.2	403	183	170	186	19.6	407	185	169	185	19.8	410	186	169	184
	8000	-1	17.9	373	169	168	189	18.4	379	172	167	188	18.9	385	175	167	188	19.5	391	177	166	187	19.7	394	179	166	187
	10000	-5	17.3	354	161	164	190	18.0	361	164	164	190	18.7	368	167	164	190	19.3	375	170	164	190	19.7	378	172	164	190
	12000	-9	16.8	338	153	160	191	17.6	346	157	160	192	18.4	355	161	161	192	19.2	363	165	161	193	19.6	367	166	161	193
	14000	-13	16.3	324	147	155	192	17.2	333	151	157	193	18.1	343	155	158	194	19.1	352	160	158	195	19.5	357	162	159	196
	16000	-17	15.7	308	140	151	193	16.8	319	145	153	195	17.9	330	150	154	197	18.9	340	154	155	198	19.5	346	157	156	199
	18000	-21	15.2	292	132	147	193	16.4	304	138	149	196	17.6	316	143	151	199	18.8	328	149	153	201	19.4	334	151	154	202
	20000	-25	14.7	276	125	142	194	16.0	289	131	145	197	17.3	303	137	148	201	18.7	316	143	150	203	19.3	322	146	151	205
	22000	-29	14.1	261	118	138	194	15.6	276	125	141	199	17.1	290	132	144	203	18.5	304	138	146	206	19.3	312	141	148	208
	24000	-33	13.6	247	112	133	194	15.2	262	119	137	200	16.8	278	126	140	204	18.4	294	133	143	208	19.2	302	137	145	211
	26000	-37	13.1	233	106	129	194	14.8	250	114	133	200	16.5	267	121	137	206	18.3	285	129	140	211	19.1	294	133	142	213
	28000	-41	12.5	221	100	124	193	14.4	239	108	128	201	16.3	257	117	133	207	18.1	276	125	136	213	19.1	286	130	138	216
	30000	-44	12.0	208	94	118	192	14.0	228	103	124	201	16.0	248	113	129	208	18.0	269	122	133	214	19.0	279	127	135	218
10	0	25	20.0	466	211	181	185	20.0	466	212	180	183	20.0	466	212	178	181	20.0	467	212	175	178	20.0	467	212	174	177
	2000	21	19.5	443	201	178	186	19.6	444	201	176	185	19.7	446	202	175	183	19.9	448	203	173	181	19.9	448	203	172	180
	4000	17	18.9	420	190	174	188	19.2	423	192	173	187	19.5	426	193	172	185	19.7	429	195	170	183	19.9	431	195	170	183
	6000	13	18.4	398	181	170	189	18.8	403	183	170	188	19.2	408	185	169	187	19.6	412	187	168	186	19.8	414	188	167	186
	8000	9	17.9	378	171	166	190	18.4	383	174	166	190	18.9	389	177	165	190	19.5	395	179	165	189	19.7	398	181	165	189
	10000	5	17.3	358	162	162	192	18.0	365	166	162	192	18.7	372	169	162	192	19.3	379	172	162	192	19.7	383	174	162	192
	12000	1	16.8	342	155	158	193	17.6	350	159	159	193	18.4	359	163	159	194	19.2	367	166	159	194	19.6	371	168	160	195
	14000	-3	16.3	327	148	154	194	17.2	337	153	155	195	18.1	346	157	156	196	19.1	356	161	157	197	19.5	361	164	157	198
	16000	-7	15.7	311	141	150	194	16.8	322	146	151	196	17.9	333	151	153	198	18.9	344	156	154	200	19.5	350	159	155	201
	18000	-11	15.2	295	134	145	195	16.4	307	139	147	198	17.6	319	145	149	200	18.8	331	150	151	202	19.4	337	153	152	204
	20000	-15	14.7	279	127	141	195	16.0	292	133	143	199	17.3	306	139	146	202	18.7	319	145	148	205	19.3	326	148	149	206
	22000	-19	14.1	264	120	136	196	15.6	278	126	139	200	17.1	293	133	142	204	18.5	308	140	144	207	19.3	315	143	146	209
	24000	-23	13.6	249	113	132	196	15.2	265	120	135	201	16.8	281	127	138	206	18.4	297	135	141	209	19.2	305	139	143	212
	26000	-27	13.1	236	107	127	196	14.8	253	115	131	202	16.5	270	122	135	207	18.3	288	131	138	212	19.1	297	135	139	214
	28000	-31	12.5	223	101	122	195	14.4	241	109	127	202	16.3	260	118	131	208	18.1	279	127	134	213	19.1	289	131	136	217
	30000	-34	12.0	211	95	117	193	14.0	230	104	122	202	16.0	251	114	126	209	18.0	271	123	130	215	19.0	282	128	133	219

Figure 5-2-32. Long Range Cruise (Sheet 3 of 4)

LONG RANGE CRUISE

NOTE: OAT BASED ON 8000 lb (3629 kg)

			@ 7000 lb (3175 kg)					@ 8000 lb (3629 kg)					@ 9000 lb (4082 kg)					@ 10000 lb (4536 kg)					@ 10400 lb (4717 kg)				
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
20	0	35	20.0	471	214	180	186	20.0	471	214	179	185	20.0	471	214	176	182	20.0	472	214	174	180	20.0	472	214	173	179
	2000	31	19.5	447	203	176	188	19.6	449	204	175	187	19.7	451	204	173	185	19.9	452	205	171	182	19.9	453	206	170	182
	4000	27	18.9	425	193	173	189	19.2	428	194	172	188	19.5	431	195	170	187	19.7	434	197	169	185	19.9	436	198	168	184
	6000	23	18.4	403	183	169	191	18.8	407	185	168	190	19.2	412	187	167	189	19.6	417	189	166	188	19.8	419	190	166	187
	8000	19	17.9	382	173	165	192	18.4	388	176	165	192	18.9	394	179	164	191	19.5	400	181	163	190	19.7	403	183	163	190
	10000	15	17.3	362	164	161	193	18.0	369	168	161	193	18.7	377	171	161	193	19.3	384	174	161	193	19.7	388	176	161	193
	12000	11	16.8	346	157	157	194	17.6	355	161	157	195	18.4	363	165	158	196	19.2	372	169	158	196	19.6	376	171	158	196
	14000	7	16.3	331	150	152	195	17.2	341	154	153	197	18.1	351	159	154	198	19.1	361	164	155	198	19.5	366	166	156	199
	16000	3	15.7	314	143	148	196	16.8	326	148	150	198	17.9	337	153	151	200	18.9	348	158	152	201	19.5	354	160	153	202
	18000	-1	15.2	298	135	144	197	16.4	310	141	146	199	17.6	323	146	148	202	18.8	335	152	149	204	19.4	341	155	150	205
	20000	-5	14.7	282	128	139	197	16.0	296	134	142	201	17.3	309	140	144	204	18.7	323	146	146	206	19.3	330	150	147	208
	22000	-9	14.1	267	121	135	197	15.6	282	128	138	202	17.1	296	134	140	205	18.5	311	141	142	208	19.3	319	145	144	210
	24000	-13	13.6	252	114	130	197	15.2	268	122	134	203	16.8	284	129	137	207	18.4	301	136	139	211	19.2	309	140	141	213
	26000	-17	13.1	238	108	125	197	14.8	256	116	129	203	16.5	273	124	133	208	18.3	291	132	135	213	19.1	300	136	137	215
	28000	-21	12.5	225	102	120	196	14.4	244	111	125	203	16.3	263	119	129	209	18.1	282	128	132	214	19.1	292	132	134	217
	30000	-24	12.0	213	96	115	194	14.0	233	106	120	203	16.0	254	115	124	210	18.0	275	125	128	216	19.0	285	129	130	219
30	0	45	20.0	478	217	179	188	20.0	478	217	177	186	20.0	478	217	175	184	20.0	478	217	172	181	20.0	478	217	171	180
	2000	41	19.5	454	206	175	190	19.6	455	206	174	188	19.7	457	207	172	186	19.9	459	208	170	184	19.9	460	208	169	183
	4000	37	18.9	431	195	171	191	19.2	434	197	170	190	19.5	437	198	169	188	19.7	441	200	167	187	19.9	442	201	167	186
	6000	33	18.4	409	186	168	193	18.8	414	188	167	192	19.2	419	190	166	191	19.6	424	192	165	189	19.8	426	193	164	189
	8000	29	17.9	388	176	164	194	18.4	395	179	163	193	18.9	401	182	163	193	19.5	407	184	162	192	19.7	409	186	162	192
	10000	25	17.3	369	167	160	195	18.0	377	171	159	195	18.7	384	174	159	195	19.3	390	177	159	195	19.7	394	179	159	195
	12000	21	16.8	352	160	155	196	17.6	362	164	156	197	18.4	370	168	156	197	19.2	378	171	156	197	19.6	382	173	157	198
	14000	17	16.3	337	153	151	197	17.2	347	157	152	198	18.1	356	162	153	199	19.1	366	166	153	200	19.5	370	168	154	201
	16000	13	15.7	320	145	147	198	16.8	331	150	148	200	17.9	342	155	149	201	18.9	353	160	150	203	19.5	358	162	151	203
	18000	9	15.2	303	137	142	198	16.4	315	143	144	201	17.6	327	148	146	203	18.8	339	154	147	205	19.4	345	157	148	206
	20000	5	14.7	286	130	138	199	16.0	300	136	140	202	17.3	313	142	142	205	18.7	327	148	144	207	19.3	333	151	145	209
	22000	1	14.1	270	123	133	199	15.6	285	129	136	203	17.1	300	136	139	207	18.5	315	143	141	210	19.3	322	146	142	212
	24000	-3	13.6	255	116	129	199	15.2	271	123	132	204	16.8	287	130	135	208	18.4	304	138	137	212	19.2	312	142	139	214
	26000	-7	13.1	241	109	124	198	14.8	258	117	128	204	16.5	276	125	131	209	18.3	294	133	133	213	19.1	303	137	135	216
	28000	-11	12.5	228	103	119	197	14.4	247	112	123	204	16.3	266	121	127	210	18.1	285	129	130	215	19.1	295	134	132	218
	30000	-14	12.0	215	98	113	195	14.0	236	107	118	203	16.0	256	116	122	210	18.0	277	126	125	215	19.0	288	131	127	218

Figure 5-2-32. Long Range Cruise (Sheet 4 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

				@ 7000 lb (3175 kg)			@ 8000 lb (3629 kg)			@ 9000 lb (4082 kg)			@ 10000 lb (4536 kg)			@ 10400 lb (4717 kg)		
ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)
-40	0	-25	107.0	8.95	320.2	145.2	9.43	325.6	147.7	9.98	331.8	150.5	10.51	337.8	153.2	10.70	339.9	154.2
	2000	-29	110.0	8.93	306.3	138.9	9.40	311.3	141.2	9.93	317.2	143.9	10.49	323.4	146.7	10.71	325.8	147.8
	4000	-33	113.2	8.89	292.9	132.9	9.34	297.7	135.0	9.91	303.7	137.8	10.52	310.2	140.7	10.73	312.6	141.8
	6000	-37	116.5	8.83	280.1	127.1	9.30	285.0	129.3	9.94	291.6	132.3	10.54	297.9	135.1	10.76	300.2	136.2
	8000	-41	119.9	8.78	268.2	121.7	9.32	273.6	124.1	9.94	279.9	127.0	10.58	286.2	129.8	10.82	288.7	131.0
	10000	-45	123.5	8.79	256.4	116.3	9.31	261.6	118.7	9.96	268.0	121.6	10.64	274.8	124.6	10.89	277.2	125.7
	12000	-49	127.3	8.78	246.8	111.9	9.32	252.2	114.4	10.03	259.2	117.6	10.72	266.0	120.7	11.01	268.9	122.0
	14000	-53	131.2	8.79	237.7	107.8	9.39	243.7	110.5	10.12	250.9	113.8	10.91	258.7	117.3	11.20	261.5	118.6
	16000	-57	135.3	8.89	229.3	104.0	9.51	235.4	106.8	10.31	243.3	110.4	11.12	251.3	114.0	11.44	254.4	115.4
	18000	-61	139.6	9.01	220.3	99.9	9.68	226.9	102.9	10.52	235.1	106.6	11.39	243.6	110.5	11.71	246.8	111.9
	20000	-65	144.0	9.16	211.7	96.0	9.86	218.6	99.2	10.76	227.5	103.2	11.65	236.2	107.1	11.98	239.5	108.6
	22000	-69	148.7	9.34	203.9	92.5	10.09	211.3	95.8	11.01	220.3	99.9	11.95	229.6	104.1	12.30	233.0	105.7
	24000	-73	153.6	9.56	196.8	89.3	10.31	204.3	92.7	11.30	214.1	97.1	12.29	223.8	101.5	12.66	227.5	103.2
	26000	-77	158.7	9.75	191.0	86.6	10.57	199.1	90.3	11.62	209.5	95.0	12.63	219.5	99.6	13.02	223.4	101.3
	28000	-81	164.1	10.00	186.5	84.6	10.86	195.1	88.5	11.94	205.8	93.4	13.02	216.4	98.2	13.43	220.5	100.0
	30000	-84	169.7	10.27	182.8	82.9	11.17	191.7	87.0	12.32	203.0	92.1	13.44	214.0	97.1	13.87	218.3	99.0
-30	0	-15	109.1	8.96	323.0	146.5	9.42	328.4	149.0	9.96	334.6	151.8	10.50	340.7	154.5	10.72	343.2	155.7
	2000	-19	112.2	8.93	308.7	140.0	9.38	313.8	142.3	9.92	319.8	145.1	10.53	326.7	148.2	10.75	329.1	149.3
	4000	-23	115.5	8.87	295.2	133.9	9.31	300.0	136.1	9.95	306.9	139.2	10.56	313.6	142.2	10.78	315.9	143.3
	6000	-27	118.9	8.80	282.3	128.1	9.34	288.0	130.6	9.97	294.6	133.6	10.58	301.1	136.6	10.82	303.7	137.8
	8000	-31	122.5	8.81	271.0	122.9	9.34	276.4	125.4	9.97	282.9	128.3	10.65	289.8	131.5	10.89	292.3	132.6
	10000	-35	126.2	8.81	259.6	117.8	9.33	264.8	120.1	10.04	271.9	123.3	10.72	278.7	126.4	10.98	281.4	127.6
	12000	-39	130.1	8.80	249.9	113.4	9.40	255.9	116.1	10.11	263.0	119.3	10.89	270.8	122.8	11.18	273.7	124.1
	14000	-43	134.1	8.89	241.7	109.6	9.49	247.7	112.4	10.29	255.7	116.0	11.09	263.6	119.6	11.40	266.7	121.0
	16000	-47	138.4	9.00	233.4	105.9	9.67	240.0	108.9	10.49	248.1	112.5	11.35	256.7	116.4	11.67	259.8	117.8
	18000	-51	142.8	9.16	224.8	102.0	9.84	231.5	105.0	10.74	240.4	109.0	11.62	249.1	113.0	11.95	252.3	114.4
	20000	-55	147.4	9.32	216.3	98.1	10.07	223.7	101.5	10.98	232.7	105.6	11.91	241.8	109.7	12.26	245.2	111.2
	22000	-59	152.3	9.54	208.8	94.7	10.30	216.3	98.1	11.28	225.9	102.5	12.25	235.5	106.8	12.62	239.2	108.5
	24000	-63	157.4	9.75	201.8	91.5	10.56	209.8	95.2	11.59	220.0	99.8	12.61	230.0	104.3	12.99	233.7	106.0
	26000	-67	162.7	9.99	196.1	89.0	10.85	204.6	92.8	11.92	215.2	97.6	12.98	225.7	102.4	13.39	229.7	104.2
	28000	-71	168.3	10.27	191.8	87.0	11.16	200.5	90.9	12.30	211.8	96.1	13.41	222.8	101.1	13.83	227.0	103.0
	30000	-74	174.1	10.56	187.9	85.2	11.50	197.3	89.5	12.69	209.1	94.8	13.85	220.6	100.1	14.30	225.0	102.1

Figure 5-2-33. Maximum Endurance Cruise (Sheet 1 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

				@ 7000 lb (3175 kg)			@ 8000 lb (3629 kg)			@ 9000 lb (4082 kg)			@ 10000 lb (4536 kg)			@ 10400 lb (4717 kg)		
ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)
-20	0	-5	111.2	8.96	325.9	147.8	9.41	331.2	150.2	9.94	337.4	153.0	10.54	344.3	156.2	10.76	346.9	157.4
	2000	-9	114.4	8.91	311.2	141.2	9.34	316.2	143.4	9.95	323.1	146.6	10.57	330.1	149.7	10.79	332.6	150.9
	4000	-13	117.8	8.83	297.4	134.9	9.35	303.1	137.5	9.99	310.1	140.7	10.60	316.9	143.7	10.83	319.4	144.9
	6000	-17	121.3	8.83	285.2	129.4	9.36	290.9	132.0	9.98	297.5	134.9	10.65	304.7	138.2	10.89	307.3	139.4
	8000	-21	125.0	8.83	273.7	124.2	9.35	279.1	126.6	10.04	286.3	129.9	10.72	293.4	133.1	10.96	295.9	134.2
	10000	-25	128.8	8.82	262.5	119.1	9.40	268.4	121.7	10.11	275.6	125.0	10.86	283.2	128.5	11.15	286.1	129.8
	12000	-29	132.8	8.88	253.7	115.1	9.49	259.8	117.8	10.26	267.6	121.4	11.05	275.5	125.0	11.35	278.6	126.4
	14000	-33	137.0	9.00	245.7	111.4	9.65	252.3	114.4	10.45	260.3	118.1	11.31	268.9	122.0	11.62	272.1	123.4
	16000	-37	141.4	9.15	237.6	107.8	9.81	244.2	110.8	10.70	253.1	114.8	11.58	261.9	118.8	11.91	265.1	120.2
	18000	-41	146.0	9.29	228.9	103.8	10.03	236.3	107.2	10.95	245.3	111.3	11.85	254.3	115.3	12.20	257.8	116.9
	20000	-45	150.8	9.52	221.1	100.3	10.27	228.6	103.7	11.22	238.0	108.0	12.19	247.5	112.3	12.55	251.2	113.9
	22000	-49	155.8	9.74	213.6	96.9	10.53	221.5	100.5	11.54	231.5	105.0	12.55	241.5	109.5	12.93	245.2	111.2
	24000	-53	161.1	9.97	206.9	93.8	10.81	215.2	97.6	11.87	225.7	102.4	12.92	236.1	107.1	13.32	240.0	108.9
	26000	-57	166.6	10.24	201.5	91.4	11.12	210.2	95.3	12.24	221.2	100.3	13.35	232.2	105.3	13.77	236.3	107.2
	28000	-61	172.4	10.53	197.0	89.4	11.46	206.2	93.5	12.64	217.8	98.8	13.79	229.2	104.0	14.23	233.5	105.9
	30000	-64	178.5	10.85	193.4	87.7	11.82	202.9	92.0	13.06	215.1	97.6	14.27	227.0	103.0	14.73	231.5	105.0
-10	0	5	113.3	8.94	328.5	149.0	9.39	333.7	151.4	9.96	340.6	154.5	10.57	347.8	157.8	10.79	350.4	158.9
	2000	1	116.6	8.88	313.5	142.2	9.37	319.1	144.7	10.00	326.4	148.1	10.61	333.5	151.3	10.82	336.0	152.4
	4000	-3	120.0	8.85	300.0	136.1	9.38	306.0	138.8	10.01	313.1	142.0	10.64	320.3	145.3	10.89	323.0	146.5
	6000	-7	123.7	8.85	287.9	130.6	9.38	293.7	133.2	10.03	300.8	136.4	10.72	308.3	139.8	10.96	310.9	141.0
	8000	-11	127.4	8.85	276.3	125.3	9.40	282.1	128.0	10.11	289.6	131.4	10.82	297.1	134.8	11.10	300.2	136.2
	10000	-15	131.4	8.87	265.7	120.5	9.48	271.9	123.3	10.22	279.5	126.8	11.01	287.6	130.5	11.30	290.5	131.8
	12000	-19	135.5	8.98	257.6	116.8	9.61	263.9	119.7	10.41	272.1	123.4	11.24	280.6	127.3	11.56	283.8	128.7
	14000	-23	139.8	9.12	249.9	113.4	9.79	256.6	116.4	10.64	265.3	120.3	11.51	274.1	124.3	11.84	277.5	125.9
	16000	-27	144.4	9.27	241.7	109.6	9.98	248.9	112.9	10.89	258.0	117.0	11.78	267.0	121.1	12.13	270.5	122.7
	18000	-31	149.1	9.47	233.5	105.9	10.23	241.1	109.4	11.15	250.3	113.5	12.11	259.8	117.8	12.47	263.4	119.5
	20000	-35	154.0	9.70	225.8	102.4	10.47	233.5	105.9	11.46	243.3	110.4	12.47	253.3	114.9	12.85	257.1	116.6
	22000	-39	159.2	9.92	218.3	99.0	10.74	226.4	102.7	11.80	236.9	107.5	12.83	247.1	112.1	13.23	251.1	113.9
	24000	-43	164.7	10.19	211.9	96.1	11.06	220.6	100.1	12.16	231.3	104.9	13.26	242.2	109.9	13.67	246.3	111.7
	26000	-47	170.4	10.48	206.6	93.7	11.40	215.6	97.8	12.56	227.0	103.0	13.70	238.3	108.1	14.14	242.5	110.0
	28000	-51	176.4	10.80	202.2	91.7	11.76	211.6	96.0	12.98	223.6	101.4	14.18	235.4	106.8	14.63	239.9	108.8
	30000	-54	182.7	11.15	198.7	90.1	12.16	208.7	94.7	13.45	221.3	100.4	14.69	233.5	105.9	15.17	238.3	108.1

Figure 5-2-33. Maximum Endurance Cruise (Sheet 2 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

				@ 7000 lb (3175 kg)			@ 8000 lb (3629 kg)			@ 9000 lb (4082 kg)			@ 10000 lb (4536 kg)			@ 10400 lb (4717 kg)		
ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)
0	0	15	115.3	8.92	330.2	149.8	9.37	335.5	152.2	10.00	343.1	155.6	10.61	350.5	159.0	10.83	353.1	160.2
	2000	11	118.7	8.86	315.3	143.0	9.40	321.6	145.9	10.02	328.9	149.2	10.64	336.2	152.5	10.88	339.0	153.8
	4000	7	122.2	8.87	302.0	137.0	9.40	308.1	139.8	10.03	315.3	143.0	10.71	323.0	146.5	10.95	325.8	147.8
	6000	3	126.0	8.87	289.8	131.5	9.40	295.6	134.1	10.10	303.4	137.6	10.78	311.0	141.1	11.05	314.0	142.4
	8000	-1	129.9	8.87	278.1	126.1	9.47	284.6	129.1	10.18	292.2	132.5	10.96	300.6	136.3	11.25	303.7	137.8
	10000	-5	133.9	8.96	268.2	121.7	9.57	274.4	124.5	10.37	282.8	128.3	11.17	291.1	132.0	11.48	294.4	133.5
	12000	-9	138.2	9.08	260.5	118.2	9.75	267.4	121.3	10.58	275.9	125.1	11.44	284.8	129.2	11.76	288.0	130.6
	14000	-13	142.6	9.25	253.1	114.8	9.93	260.1	118.0	10.82	269.2	122.1	11.72	278.4	126.3	12.04	281.7	127.8
	16000	-17	147.3	9.41	245.0	111.1	10.16	252.6	114.6	11.08	261.9	118.8	12.02	271.4	123.1	12.37	275.0	124.7
	18000	-21	152.1	9.65	236.6	107.3	10.41	244.3	110.8	11.38	254.1	115.3	12.37	264.1	119.8	12.74	267.8	121.5
	20000	-25	157.2	9.86	228.7	103.7	10.68	236.9	107.5	11.71	247.2	112.1	12.74	257.5	116.8	13.12	261.4	118.6
	22000	-29	162.6	10.12	221.7	100.6	10.98	230.3	104.5	12.05	241.0	109.3	13.13	251.7	114.2	13.55	255.9	116.1
	24000	-33	168.2	10.42	215.7	97.8	11.31	224.5	101.8	12.46	235.9	107.0	13.58	247.1	112.1	14.01	251.3	114.0
	26000	-37	174.1	10.73	210.5	95.5	11.68	219.9	99.7	12.87	231.7	105.1	14.06	243.4	110.4	14.51	247.9	112.4
	28000	-41	180.3	11.07	206.3	93.6	12.07	216.1	98.0	13.33	228.6	103.7	14.56	240.7	109.2	15.03	245.4	111.3
	30000	-44	186.8	11.44	202.9	92.0	12.49	213.2	96.7	13.81	226.2	102.6	15.11	239.3	108.5	15.60	244.4	110.9
10	0	25	117.3	8.89	332.8	151.0	9.41	339.0	153.8	10.04	346.7	157.3	10.65	354.2	160.7	10.87	357.0	161.9
	2000	21	120.8	8.89	318.2	144.3	9.42	324.6	147.2	10.04	332.0	150.6	10.70	339.9	154.2	10.94	342.8	155.5
	4000	17	124.4	8.89	305.0	138.3	9.41	311.0	141.1	10.09	318.9	144.7	10.77	326.8	148.2	11.02	329.7	149.5
	6000	13	128.2	8.88	292.4	132.6	9.46	298.9	135.6	10.17	306.9	139.2	10.91	315.2	143.0	11.20	318.5	144.5
	8000	9	132.2	8.93	281.3	127.6	9.54	287.9	130.6	10.31	296.3	134.4	11.09	304.9	138.3	11.39	308.1	139.8
	10000	5	136.4	9.06	271.6	123.2	9.70	278.5	126.3	10.50	287.0	130.2	11.36	296.0	134.3	11.68	299.4	135.8
	12000	1	140.7	9.21	264.7	120.1	9.87	271.5	123.2	10.75	280.7	127.3	11.64	289.9	131.5	11.96	293.3	133.0
	14000	-3	145.3	9.35	256.8	116.5	10.10	264.4	119.9	11.01	273.9	124.2	11.92	283.3	128.5	12.27	287.0	130.2
	16000	-7	150.1	9.58	248.8	112.9	10.34	256.6	116.4	11.28	266.4	120.8	12.25	276.4	125.4	12.62	280.2	127.1
	18000	-11	155.1	9.81	240.4	109.0	10.60	248.4	112.7	11.60	258.8	117.4	12.62	269.2	122.1	13.01	273.1	123.9
	20000	-15	160.4	10.05	232.6	105.5	10.89	241.1	109.4	11.95	251.9	114.3	13.01	262.7	119.2	13.40	266.7	121.0
	22000	-19	165.9	10.34	226.0	102.5	11.22	234.9	106.6	12.33	246.1	111.6	13.45	257.4	116.8	13.87	261.6	118.7
	24000	-23	171.7	10.64	220.0	99.8	11.57	229.3	104.0	12.75	241.1	109.4	13.91	252.7	114.6	14.36	257.2	116.7
	26000	-27	177.7	10.98	215.1	97.6	11.95	224.7	101.9	13.19	237.1	107.5	14.41	249.3	113.1	14.88	253.9	115.2
	28000	-31	184.1	11.34	211.1	95.8	12.38	221.4	100.4	13.68	234.4	106.3	14.95	247.1	112.1	15.44	252.1	114.4
	30000	-34	190.9	11.74	208.0	94.3	12.82	218.6	99.2	14.19	232.5	105.5	15.51	246.1	111.6	16.02	251.4	114.0

Figure 5-2-33. Maximum Endurance Cruise (Sheet 3 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

				@ 7000 lb (3175 kg)			@ 8000 lb (3629 kg)			@ 9000 lb (4082 kg)			@ 10000 lb (4536 kg)			@ 10400 lb (4717 kg)		
ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)
20	0	35	119.2	8.90	336.0	152.4	9.43	342.6	155.4	10.06	350.3	158.9	10.69	358.1	162.4	10.93	361.1	163.8
	2000	31	122.8	8.91	321.6	145.9	9.43	327.9	148.7	10.08	335.7	152.3	10.76	343.9	156.0	11.00	346.9	157.4
	4000	27	126.5	8.91	307.9	139.7	9.45	314.3	142.6	10.15	322.6	146.3	10.84	330.7	150.0	11.13	334.1	151.5
	6000	23	130.4	8.92	295.6	134.1	9.52	302.5	137.2	10.25	310.7	140.9	11.04	319.8	145.1	11.33	323.1	146.6
	8000	19	134.5	9.03	284.6	129.1	9.64	291.4	132.2	10.44	300.4	136.3	11.26	309.5	140.4	11.58	313.1	142.0
	10000	15	138.8	9.16	274.1	124.3	9.82	281.4	127.6	10.66	290.5	131.8	11.54	300.1	136.1	11.86	303.7	137.8
	12000	11	143.3	9.32	266.4	120.8	10.02	274.1	124.3	10.92	283.8	128.7	11.81	293.5	133.1	12.15	297.1	134.8
	14000	7	148.0	9.51	259.4	117.7	10.26	267.5	121.3	11.17	277.3	125.8	12.13	287.5	130.4	12.48	291.3	132.1
	16000	3	152.9	9.74	252.1	114.4	10.50	260.1	118.0	11.49	270.6	122.7	12.49	281.2	127.6	12.87	285.1	129.3
	18000	-1	158.0	9.97	243.9	110.6	10.79	252.5	114.5	11.83	263.4	119.5	12.87	274.2	124.4	13.27	278.4	126.3
	20000	-5	163.4	10.23	236.6	107.3	11.11	245.7	111.4	12.19	256.9	116.5	13.29	268.2	121.7	13.71	272.6	123.6
	22000	-9	169.1	10.55	230.2	104.4	11.45	239.6	108.7	12.61	251.4	114.0	13.75	263.2	119.4	14.19	267.7	121.4
	24000	-13	175.1	10.87	224.5	101.8	11.83	234.3	106.3	13.04	246.6	111.9	14.24	258.9	117.4	14.70	263.6	119.6
	26000	-17	181.3	11.24	219.8	99.7	12.24	230.1	104.4	13.52	243.0	110.2	14.77	255.7	116.0	15.25	260.6	118.2
	28000	-21	187.9	11.63	216.2	98.1	12.68	226.8	102.9	14.02	240.5	109.1	15.33	253.9	115.2	15.83	259.0	117.5
	30000	-24	194.8	12.05	213.2	96.7	13.16	224.6	101.9	14.57	239.1	108.5	15.94	253.2	114.8	16.47	258.6	117.3
30	0	45	121.1	8.92	338.1	153.4	9.45	344.9	156.4	10.07	352.9	160.1	10.74	361.5	164.0	10.98	364.7	165.4
	2000	41	124.8	8.92	323.2	146.6	9.44	329.7	149.6	10.13	338.4	153.5	10.81	347.0	157.4	11.06	350.1	158.8
	4000	37	128.6	8.91	309.0	140.2	9.50	316.3	143.5	10.21	325.0	147.4	10.96	334.4	151.7	11.26	338.0	153.3
	6000	33	132.6	8.99	296.5	134.5	9.59	303.8	137.8	10.36	313.3	142.1	11.16	323.0	146.5	11.47	326.7	148.2
	8000	29	136.8	9.10	285.3	129.4	9.76	293.2	133.0	10.56	302.8	137.4	11.43	313.2	142.1	11.75	317.0	143.8
	10000	25	141.2	9.27	275.2	124.8	9.93	283.1	128.4	10.82	293.6	133.2	11.71	304.1	137.9	12.04	308.0	139.7
	12000	21	145.8	9.42	267.8	121.5	10.17	276.5	125.4	11.08	287.2	130.3	12.00	297.9	135.1	12.36	302.0	137.0
	14000	17	150.6	9.66	261.6	118.7	10.42	270.4	122.7	11.37	281.4	127.6	12.35	292.7	132.8	12.72	296.9	134.7
	16000	13	155.6	9.89	254.6	115.5	10.69	263.7	119.6	11.70	275.2	124.8	12.73	286.9	130.1	13.12	291.2	132.1
	18000	9	160.9	10.14	247.1	112.1	10.99	256.6	116.4	12.05	268.5	121.8	13.13	280.4	127.2	13.54	285.0	129.3
	20000	5	166.4	10.44	240.6	109.1	11.33	250.3	113.5	12.46	262.6	119.1	13.59	275.0	124.7	14.01	279.6	126.8
	22000	1	172.3	10.76	234.5	106.4	11.70	244.6	111.0	12.89	257.4	116.8	14.06	269.8	122.4	14.51	274.4	124.5
	24000	-3	178.4	11.12	229.3	104.0	12.10	239.7	108.7	13.35	252.7	114.6	14.58	265.3	120.3	15.04	270.0	122.5
	26000	-7	184.8	11.50	224.8	102.0	12.54	235.5	106.8	13.85	249.0	112.9	15.14	262.2	118.9	15.63	267.3	121.2
	28000	-11	191.6	11.91	221.4	100.4	12.99	232.5	105.5	14.38	246.7	111.9	15.73	260.7	118.3	16.24	266.1	120.7
	30000	-14	198.7	12.36	218.9	99.3	13.50	230.6	104.6	14.96	245.7	111.4	16.37	260.6	118.2	16.91	266.3	120.8

Figure 5-2-33. Maximum Endurance Cruise (Sheet 4 of 4)

SPECIFIC AIR RANGE

WEIGHT 7000 lb (3175 kg) - ISA-20°

ASSOCIATED CONDITIONS:	EXAMPLE:	
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000 FEET
FLAPS UP	TORQUE	27 PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	234 KT
	SPECIFIC AIR RANGE	0.56 NM/lb

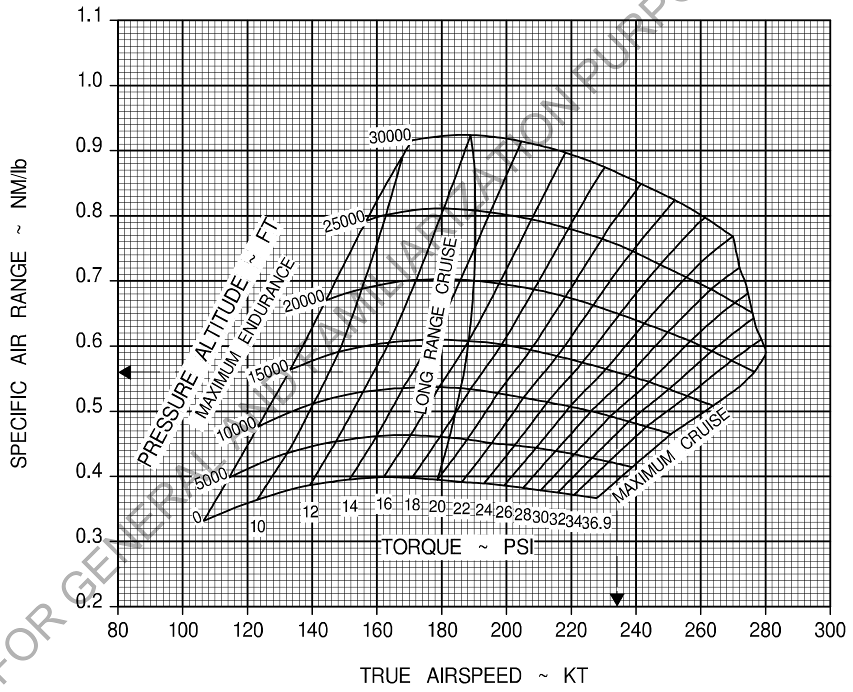


Figure 5-2-34. Specific Air Range - 7000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

WEIGHT 7000 lb (3175 kg) - ISA

ASSOCIATED CONDITIONS:	EXAMPLE:		
	PRESSURE ALTITUDE	15000	FEET
LANDING GEAR RETRACTED	TORQUE	27	PSI
FLAPS UP	TRUE AIRSPEED	239	KT
INERTIAL SEPARATOR CLOSED	SPECIFIC AIR RANGE	0.56	NM/lb

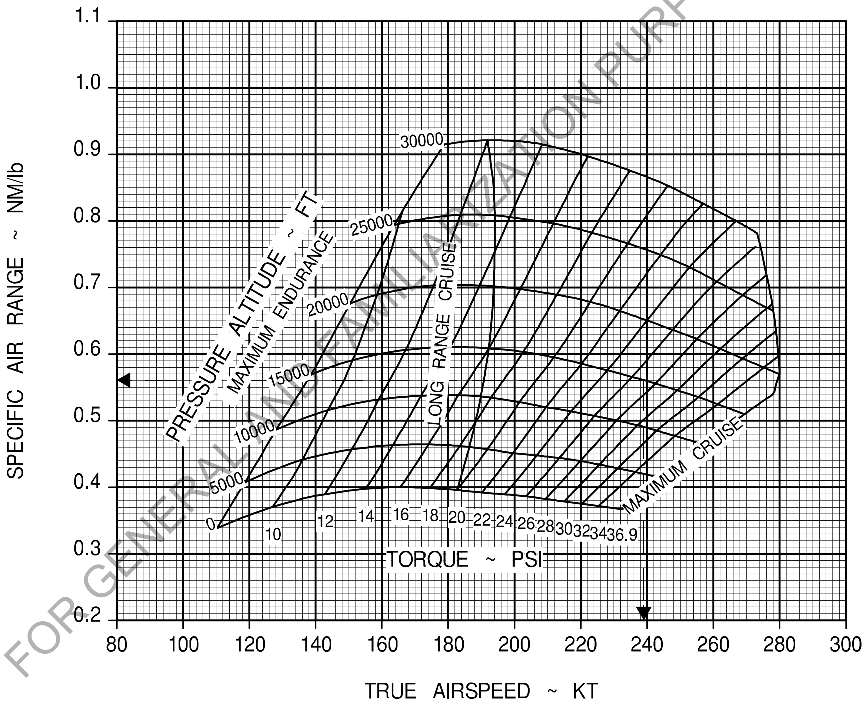


Figure 5-2-34. Specific Air Range - 7000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

WEIGHT 7000 lb (3175 kg) - ISA+20°

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	244	KT
	SPECIFIC AIR RANGE	0.56	NM/lb

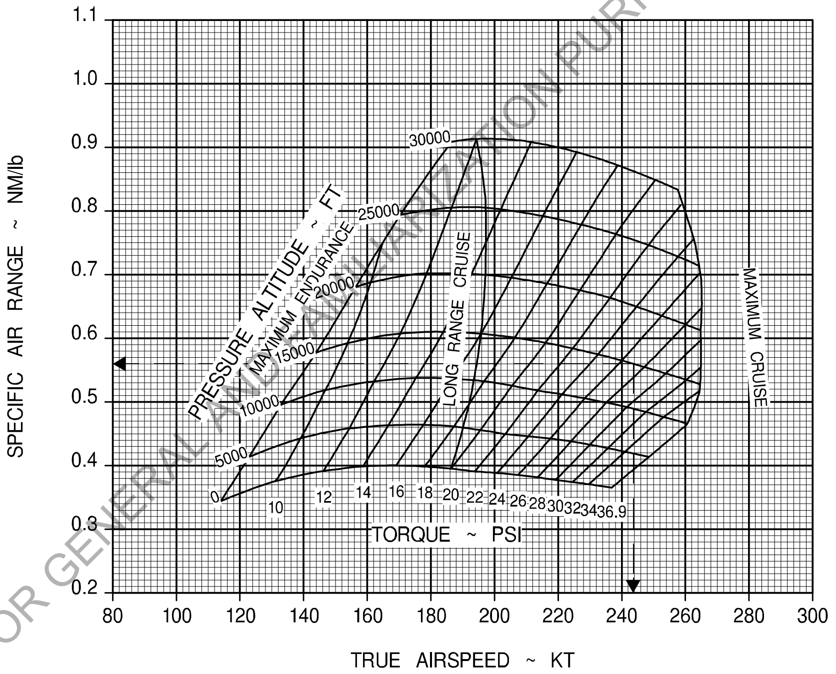


Figure 5-2-34. Specific Air Range - 7000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

WEIGHT 8000 lb (3629 kg) - ISA-20°

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	232	KT
	SPECIFIC AIR RANGE	0.56	NM/lb

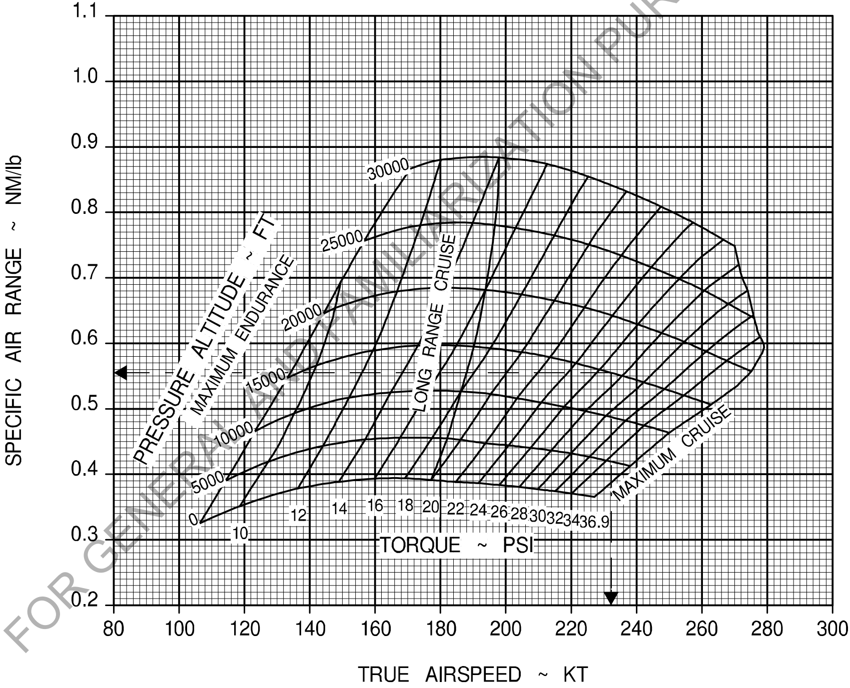


Figure 5-2-35. Specific Air Range - 8000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

WEIGHT 8000 lb (3629 kg) - ISA

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	237	KT
	SPECIFIC AIR RANGE	0.56	NM/lb

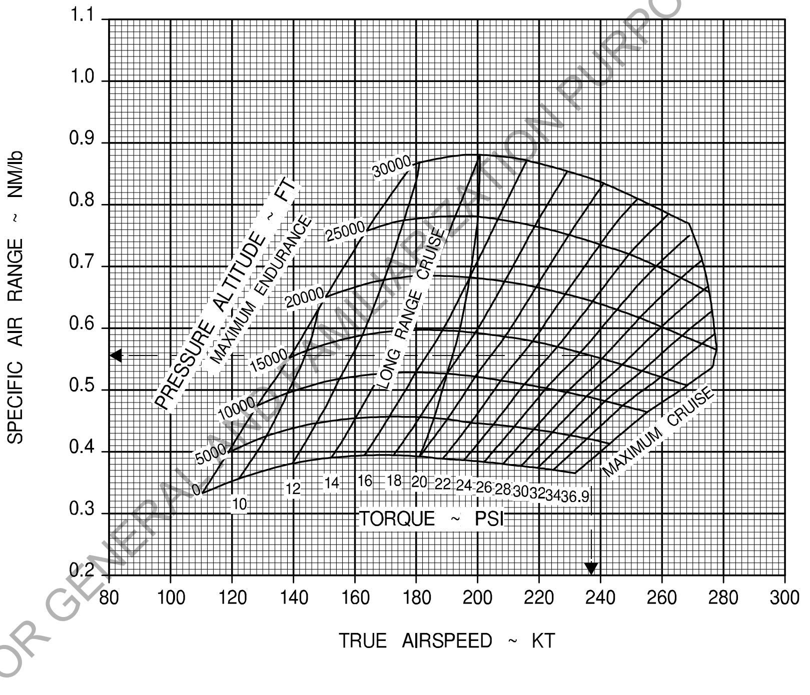


Figure 5-2-35. Specific Air Range - 8000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

WEIGHT 8000 lb (3629 kg) - ISA+20°

ASSOCIATED CONDITIONS:	EXAMPLE:	
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000 FEET
FLAPS UP	TORQUE	27 PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	241 KT
	SPECIFIC AIR RANGE	0.56 NM/lb

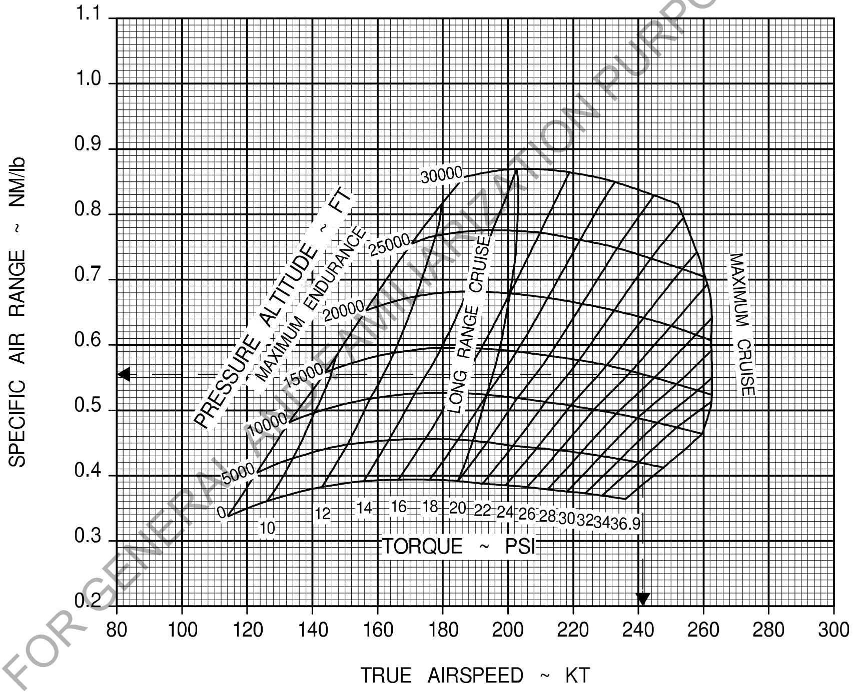


Figure 5-2-35. Specific Air Range - 8000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

WEIGHT 9000 lb (4082 kg) - ISA-20°

ASSOCIATED CONDITIONS:	EXAMPLE:		
	PRESSURE ALTITUDE	15000	FEET
LANDING GEAR RETRACTED	TORQUE	27	PSI
FLAPS UP	TRUE AIRSPEED	230	KT
INERTIAL SEPARATOR CLOSED	SPECIFIC AIR RANGE	0.55	NM/lb

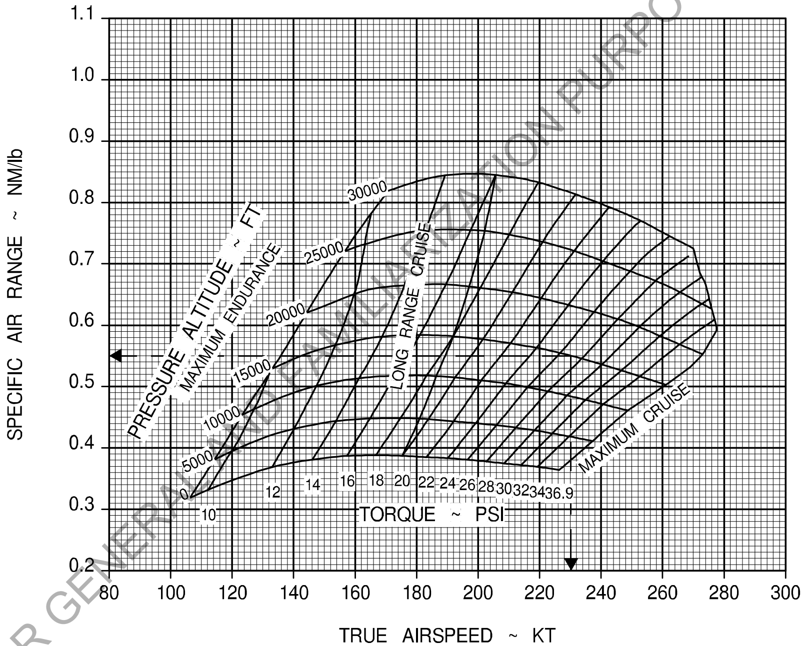


Figure 5-2-36. Specific Air Range - 9000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

WEIGHT 9000 lb (4082 kg) - ISA

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	235	KT
	SPECIFIC AIR RANGE	0.55	NM/lb

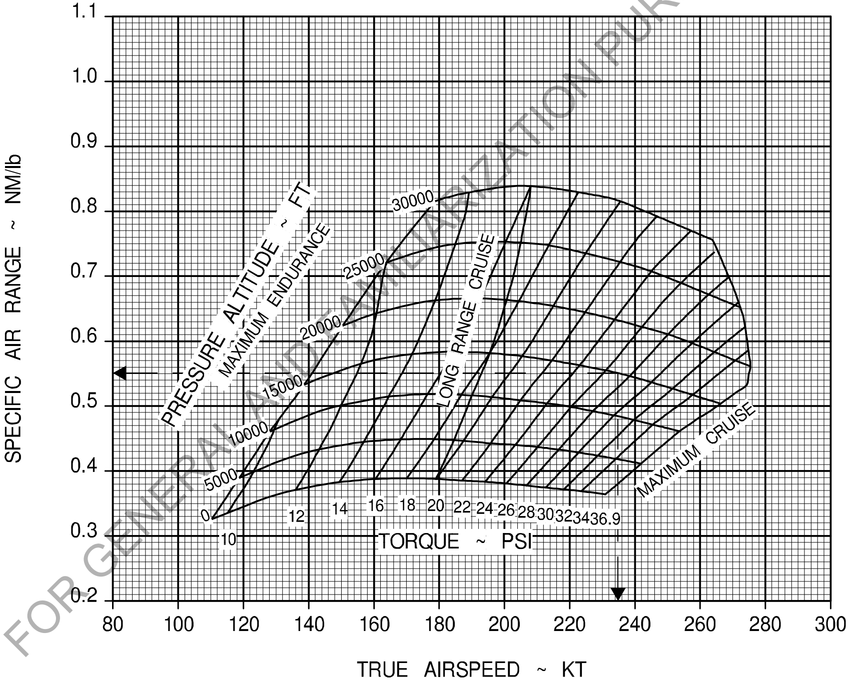


Figure 5-2-36. Specific Air Range - 9000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

WEIGHT 9000 lb (4082 kg) - ISA+20°

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	239	KT
	SPECIFIC AIR RANGE	0.55	NM/lb

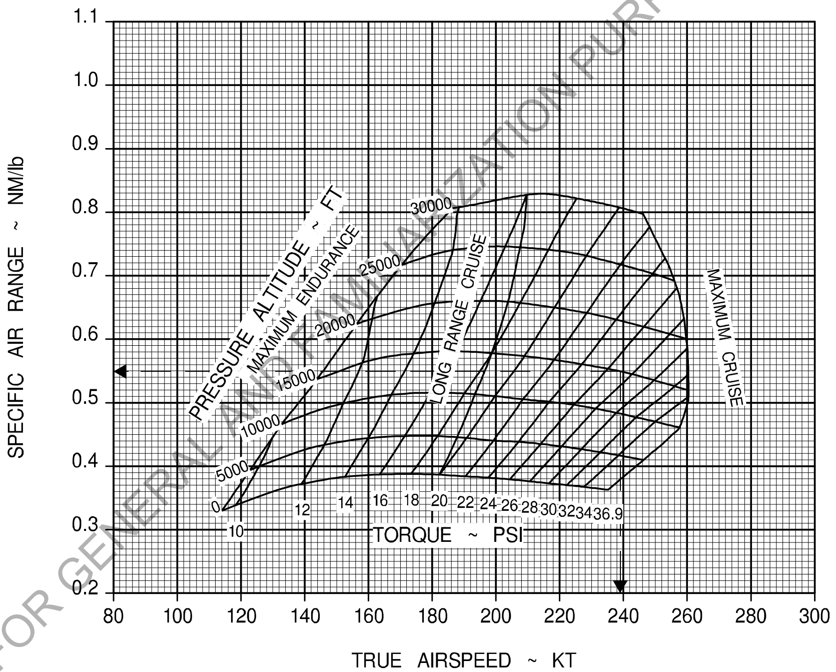


Figure 5-2-36. Specific Air Range - 9000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

WEIGHT 10000 lb (4536 kg) - ISA-20°

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	228	KT
	SPECIFIC AIR RANGE	0.54	NM/lb

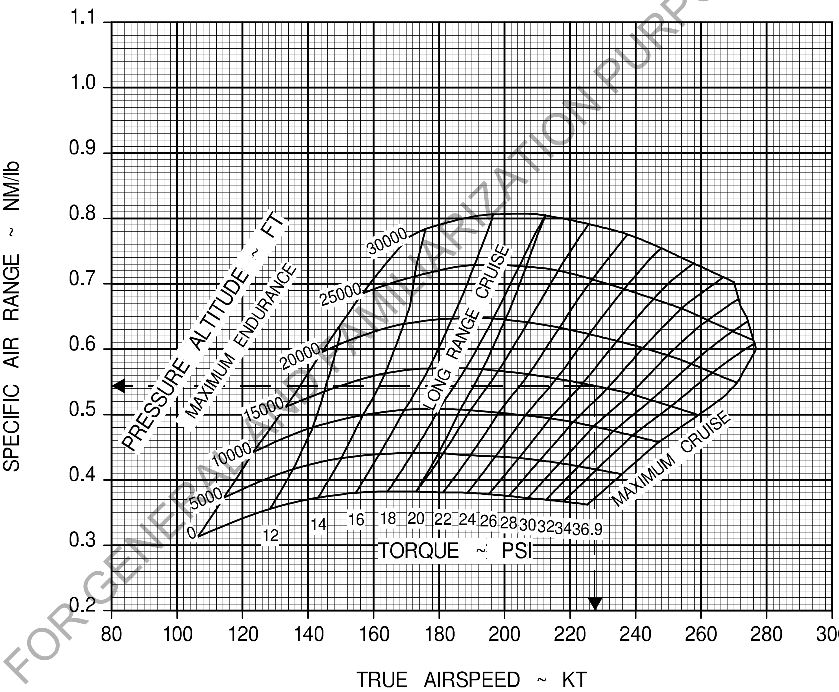


Figure 5-2-37. Specific Air Range - 10000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

WEIGHT 10000 lb (4536 kg) - ISA

ASSOCIATED CONDITIONS:	EXAMPLE:	
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000 FEET
FLAPS UP	TORQUE	27 PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	232 KT
	SPECIFIC AIR RANGE	0.54 NM/lb

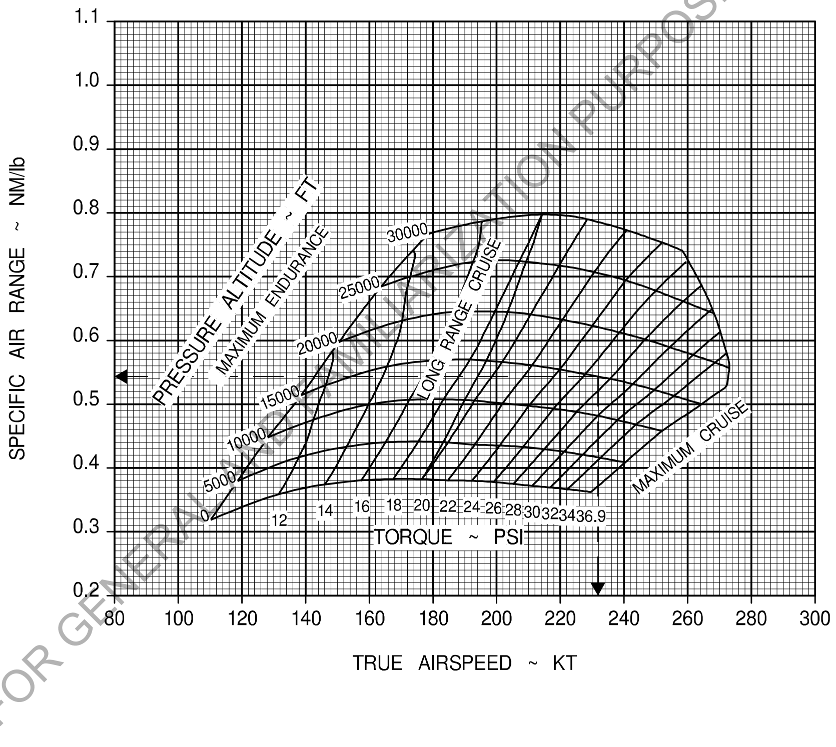


Figure 5-2-37. Specific Air Range - 10000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

WEIGHT 10000 lb (4536 kg) - ISA+20°

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	236	KT
	SPECIFIC AIR RANGE	0.54	NM/lb

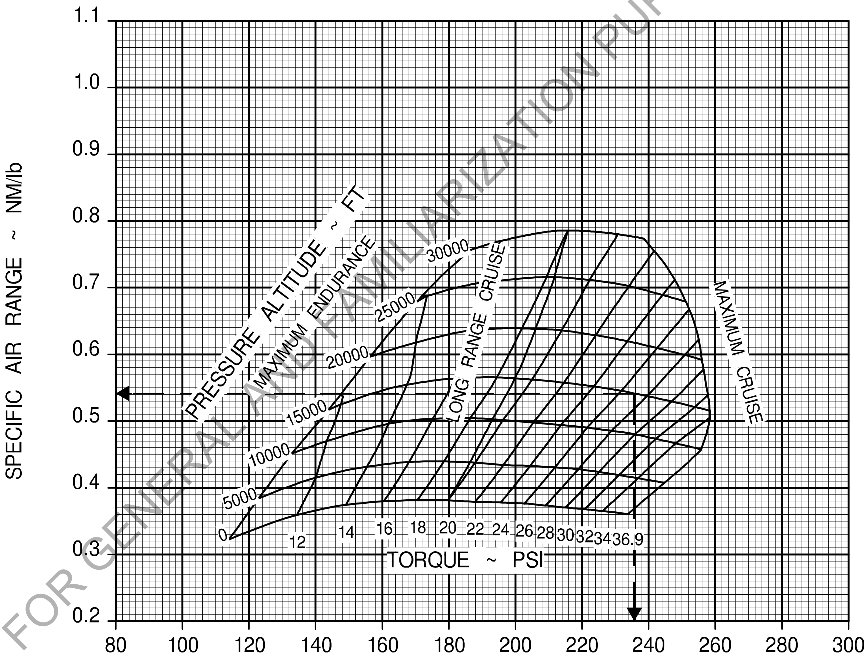


Figure 5-2-37. Specific Air Range - 10000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

WEIGHT 10400 lb (4717 kg) - ISA-20°

ASSOCIATED CONDITIONS:	EXAMPLE:	
	PRESSURE ALTITUDE	15000 FEET
LANDING GEAR RETRACTED	TORQUE	27 PSI
FLAPS UP	TRUE AIRSPEED	226 KT
INERTIAL SEPARATOR CLOSED	SPECIFIC AIR RANGE	0.54 NM/lb

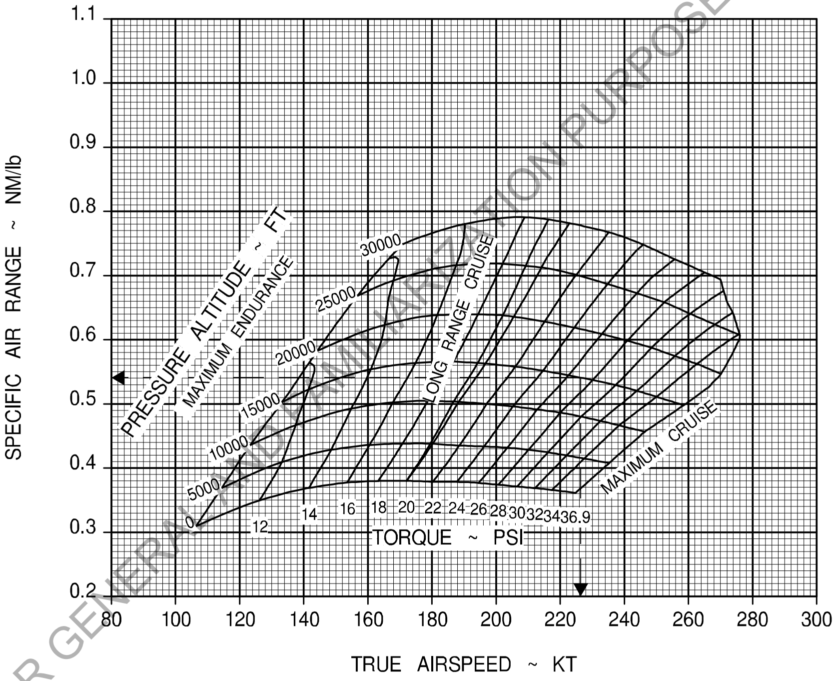


Figure 5-2-38. Specific Air Range - 10400 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

WEIGHT 10400 lb (4717 kg) - ISA

ASSOCIATED CONDITIONS:	EXAMPLE:		
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000	FEET
FLAPS UP	TORQUE	27	PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	231	KT
	SPECIFIC AIR RANGE	0.54	NM/lb

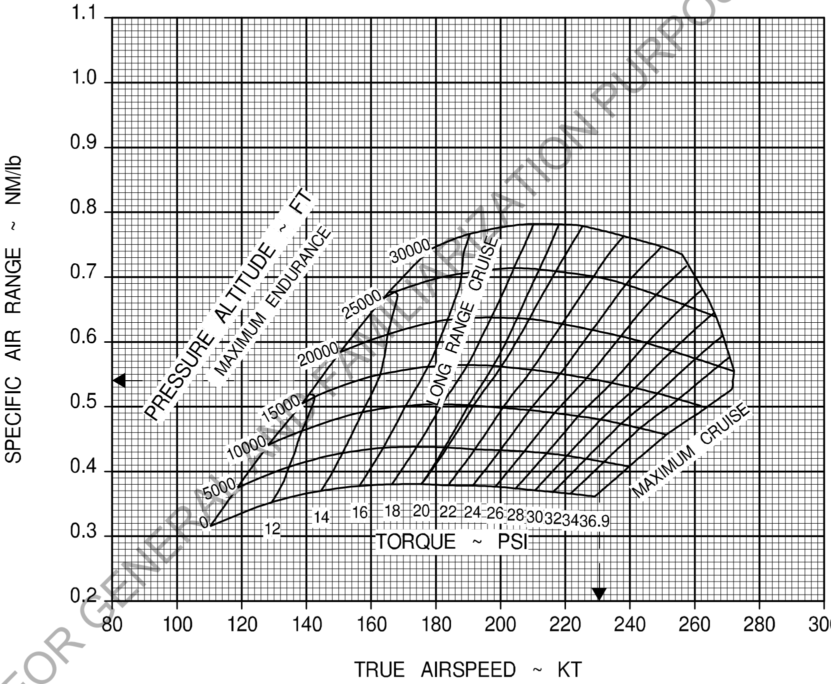


Figure 5-2-38. Specific Air Range - 10400 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

WEIGHT 10400 lb (4717 kg) - ISA+20°

ASSOCIATED CONDITIONS:	EXAMPLE:	
LANDING GEAR RETRACTED	PRESSURE ALTITUDE	15000 FEET
FLAPS UP	TORQUE	27 PSI
INERTIAL SEPARATOR CLOSED	TRUE AIRSPEED	234 KT
	SPECIFIC AIR RANGE	0.54 NM/lb

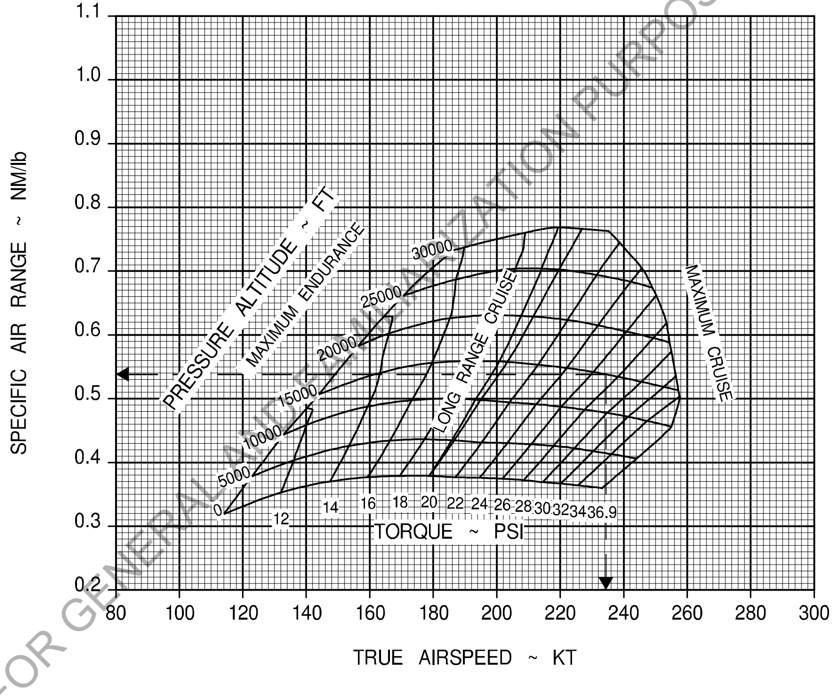
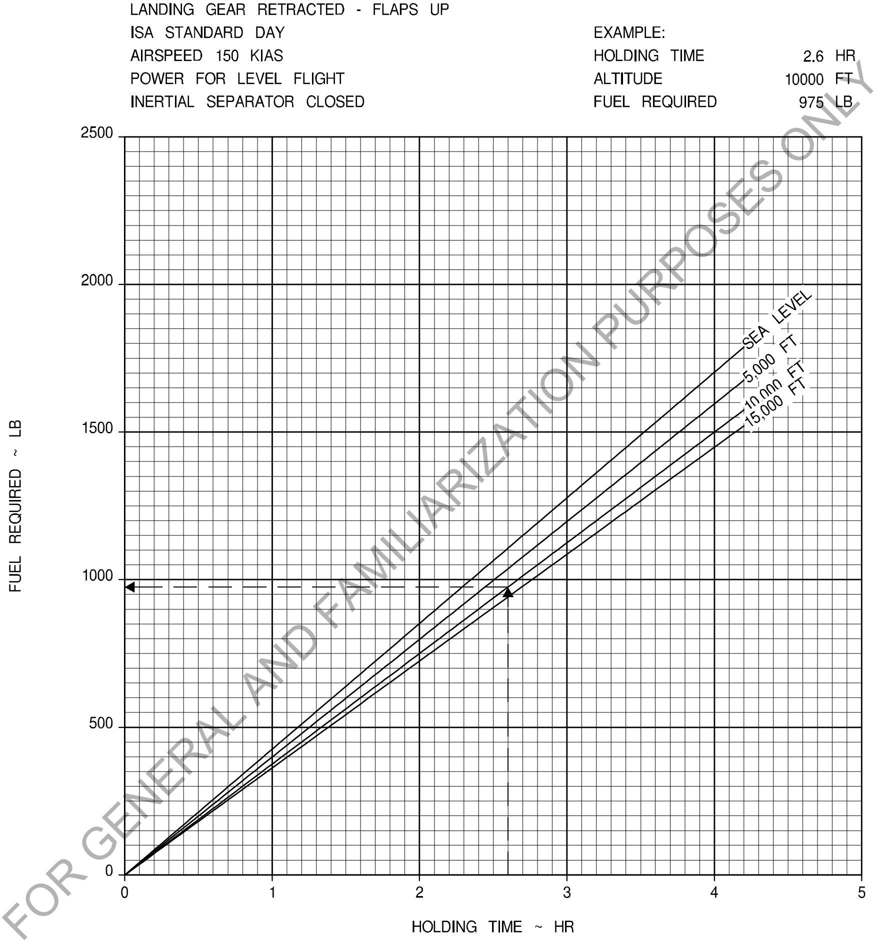


Figure 5-2-38. Specific Air Range - 10400 lb (Sheet 3 of 3)

HOLDING TIME AND FUEL



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-39. Holding Time and Fuel

TIME TO DESCEND

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED - FLAPS UP
POWER AS REQUIRED TO
DESCEND AT 2000 FPM
AIRSPEED: MACH 0.48 OR 236 KIAS,
WHICHEVER IS LOWER

EXAMPLE:
ALTITUDE 12000 FEET
TIME 6 MIN

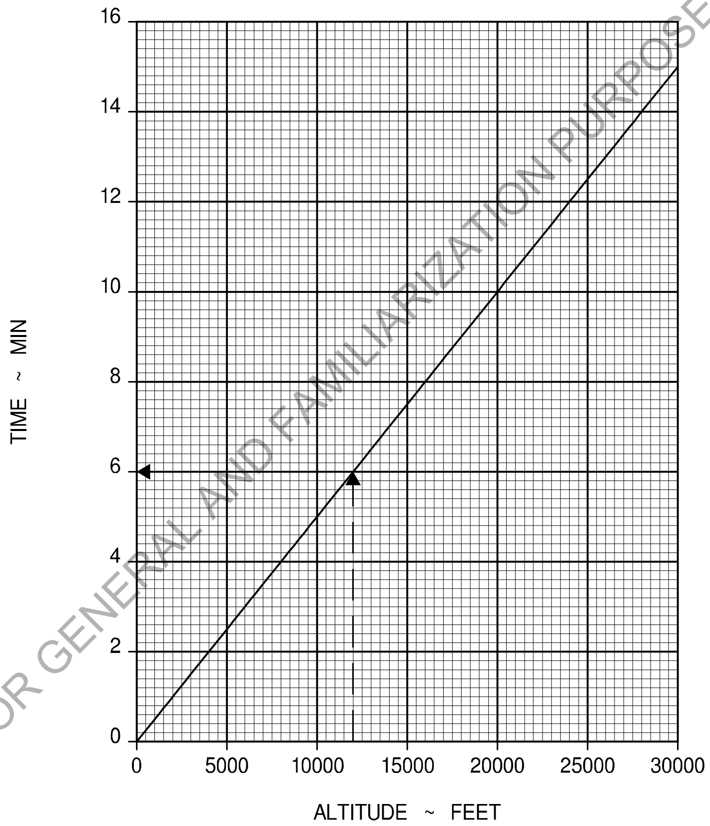


Figure 5-2-40. Time to Descend

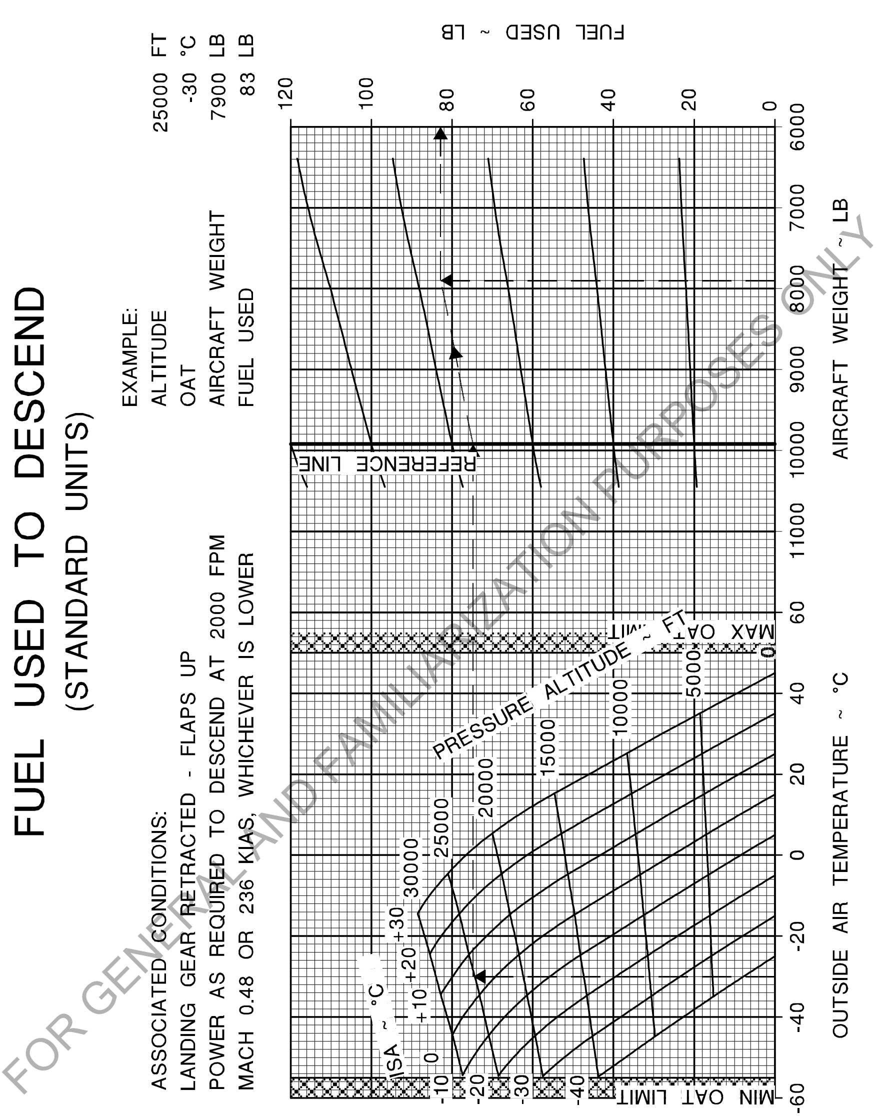


Figure 5-2-41. Fuel Used to Descend (standard units)

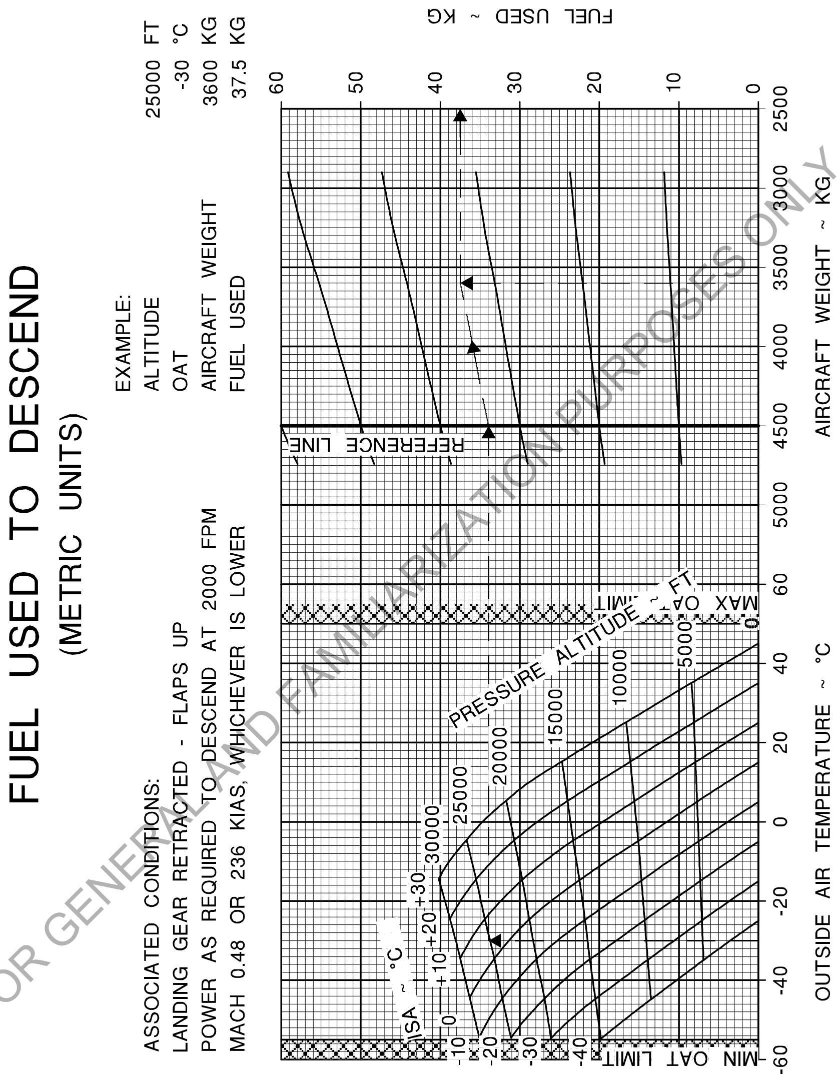


Figure 5-2-42. Fuel Used to Descend (metric units)

DISTANCE TO DESCEND

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED - FLAPS UP
POWER AS REQUIRED TO
DESCEND AT 2000 FPM
AIRSPEED: MACH 0.48 OR 236 KIAS,
WHICHEVER IS LOWER

EXAMPLE:
ALTITUDE 25000 FT
OAT -32 °C
DISTANCE 58 NM

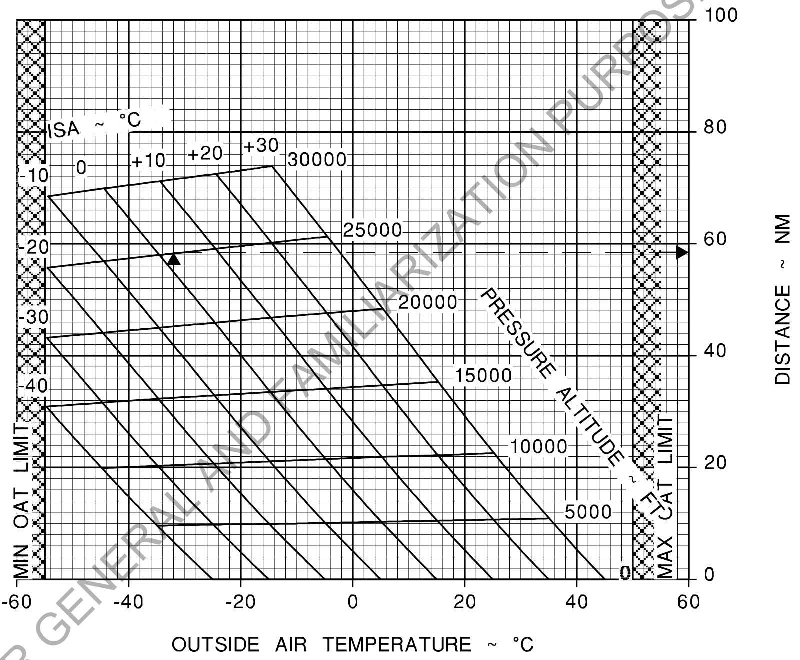


Figure 5-2-43. Distance to Descend

POWER-OFF GLIDE TIME
(STANDARD UNITS)

ASSOCIATED CONDITIONS:
POWER OFF
PROPELLER FEATHERED
LANDING GEAR RETRACTED
FLAPS UP

WEIGHT ~ LB	KIAS
10450	119
9920	116
9040	110
8160	105
7280	99
6400	93

EXAMPLE:		
ALTITUDE	25000	FT
OAT	-30	°C
AIRCRAFT WEIGHT	6950	LB
GLIDE TIME	32.5	MIN

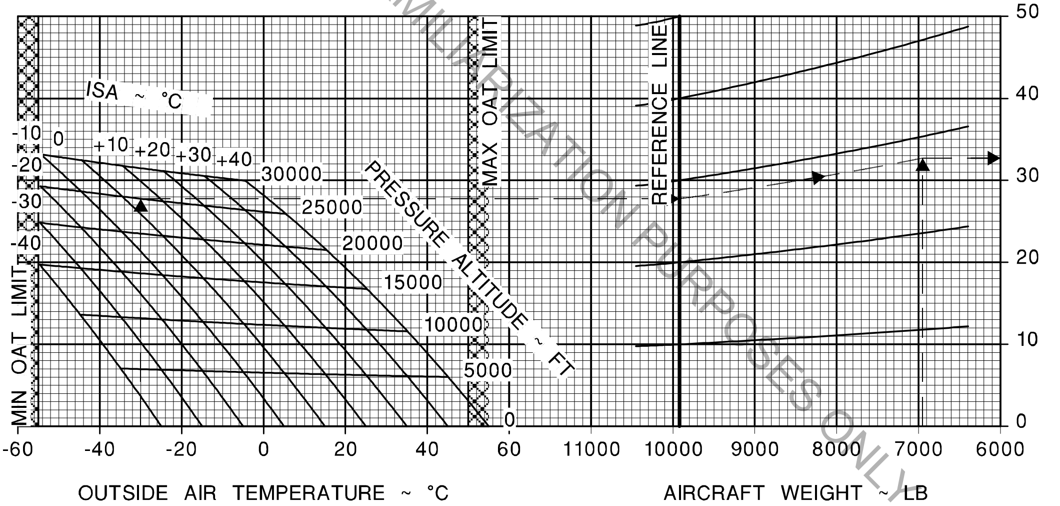


Figure 5-2-44. Power-off Glide Time (standard units)

POWER-OFF GLIDE TIME
(METRIC UNITS)

ASSOCIATED CONDITIONS:
POWER OFF
PROPELLER FEATHERED
LANDING GEAR RETRACTED
FLAPS UP

WEIGHT ~ KG	KIAS
4740	119
4500	116
4100	110
3700	105
3300	99
2900	93

EXAMPLE:

ALTITUDE	25000	FT
OAT	-30	°C
AIRCRAFT WEIGHT	3150	KG
GLIDE TIME	32.5	MIN

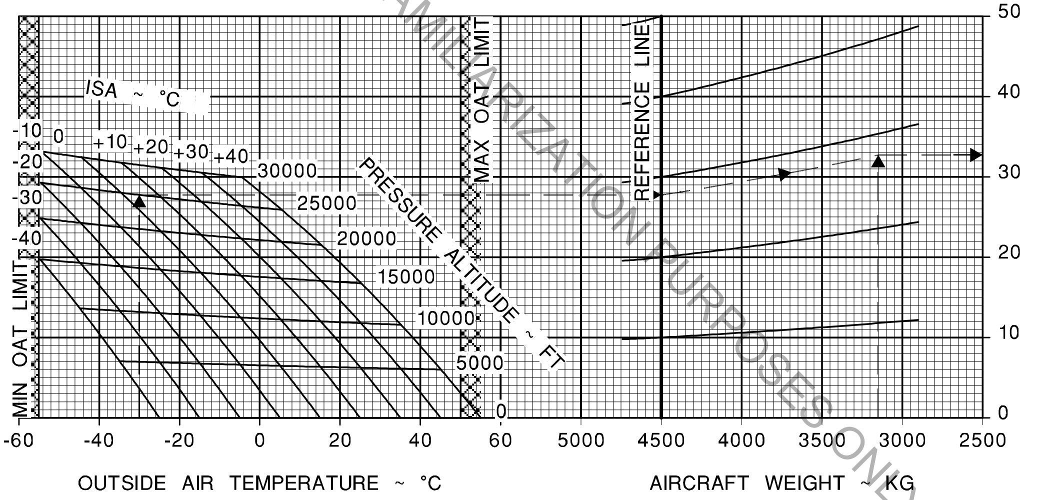


Figure 5-2-45. Power-off Glide Time (metric units)

POWER-OFF GLIDE DISTANCE

(VALID FOR ALL AIRCRAFT WEIGHTS)

ASSOCIATED CONDITIONS:
POWER OFF
PROPELLER FEATHERED
LANDING GEAR RETRACTED
FLAPS UP

WEIGHT ~ LB	WEIGHT ~ KG	KIAS
10450	4740	119
9920	4500	116
9040	4100	110
8160	3700	105
7280	3300	99
6400	2900	93

EXAMPLE:

ALTITUDE	25000	FT
OAT	-30	°C
GLIDE DISTANCE	65	NM

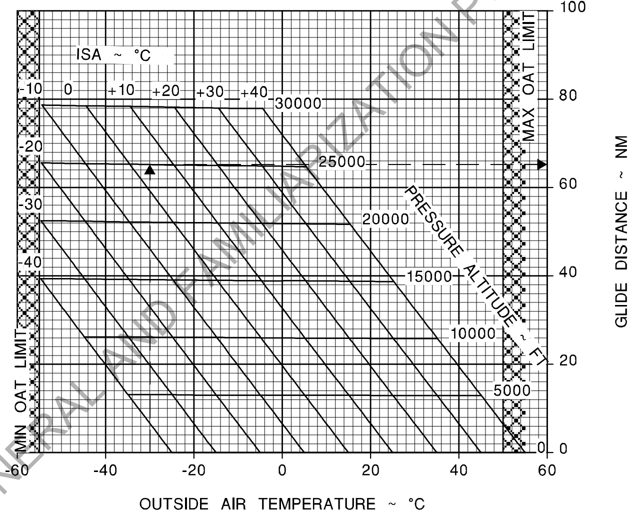


Figure 5-2-46. Power-off Glide Distance

BALKED LANDING TORQUE

PROPELLER SPEED 1700 RPM
ICE PROTECTION:
PROBES: ON
WINDSHIELD: ON
INERTIAL SEPARATOR OPERATION
HAS NO EFFECT
DEICE/ANTICE SYSTEMS CAN REDUCE
TORQUE BY 0.2 PSI

EXAMPLE:

ALTITUDE	8000	FT
OAT	26	°C
ENGINE TORQUE	34.6	PSI

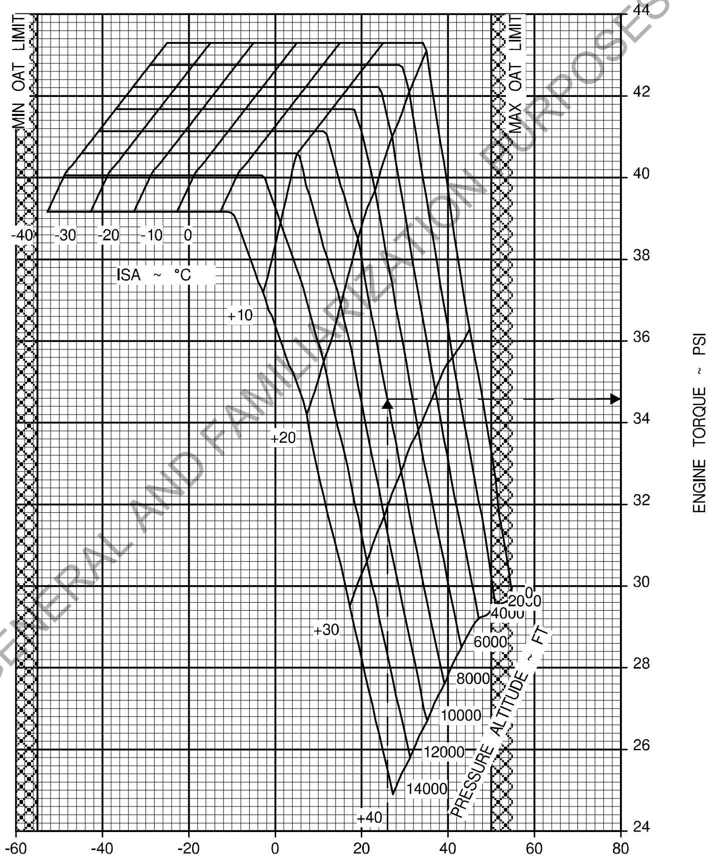
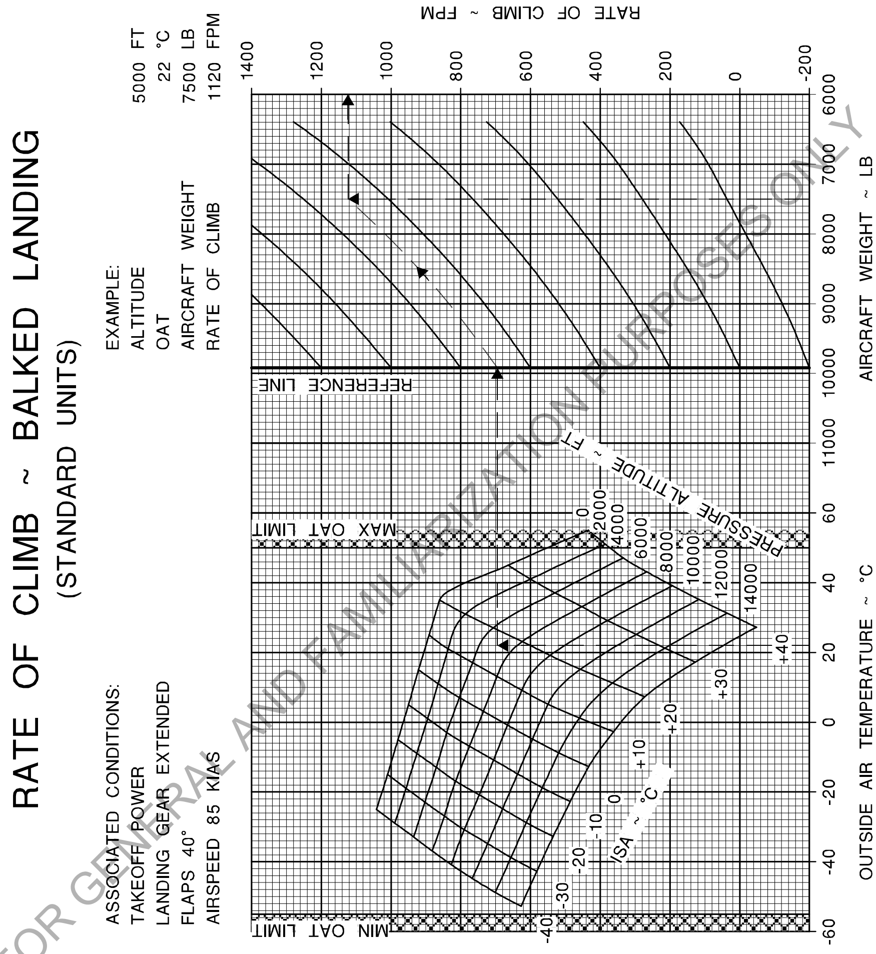
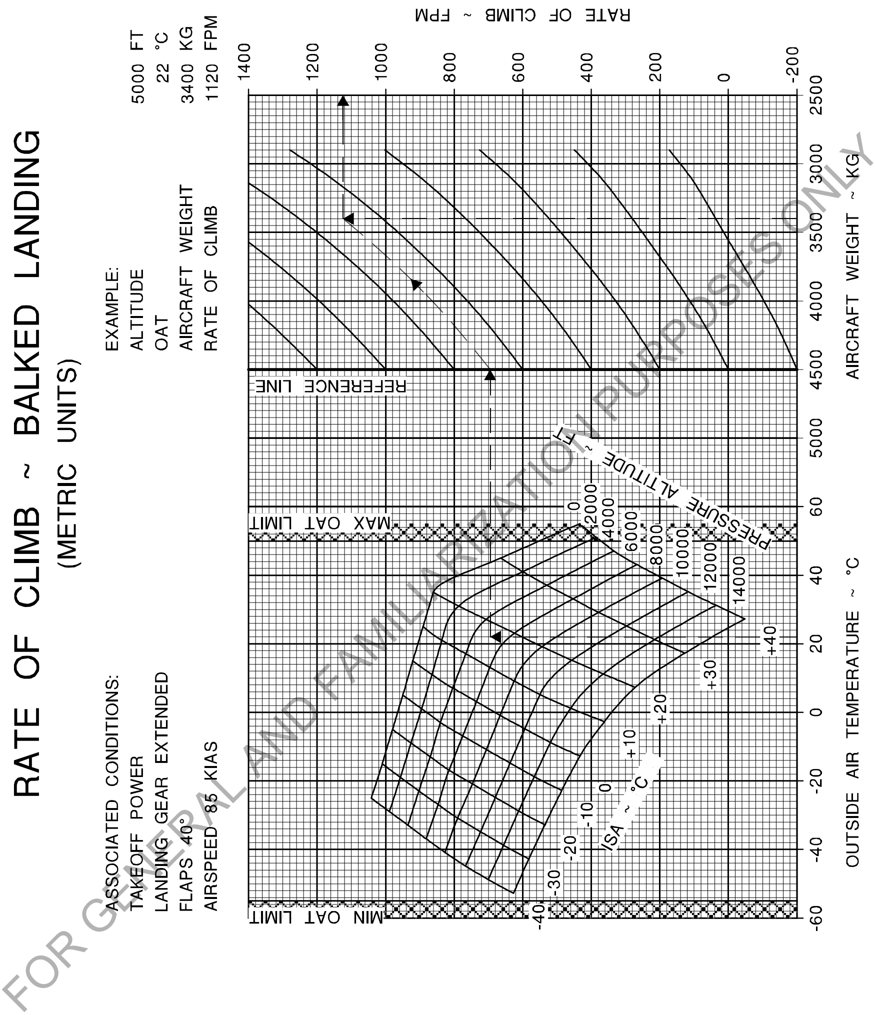


Figure 5-2-47. Balked Landing Torque



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-48. Rate of Climb - Balked Landing (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-49. Rate of Climb - Balked Landing (metric units)

LANDING TOTAL DISTANCE - FLAPS 40°

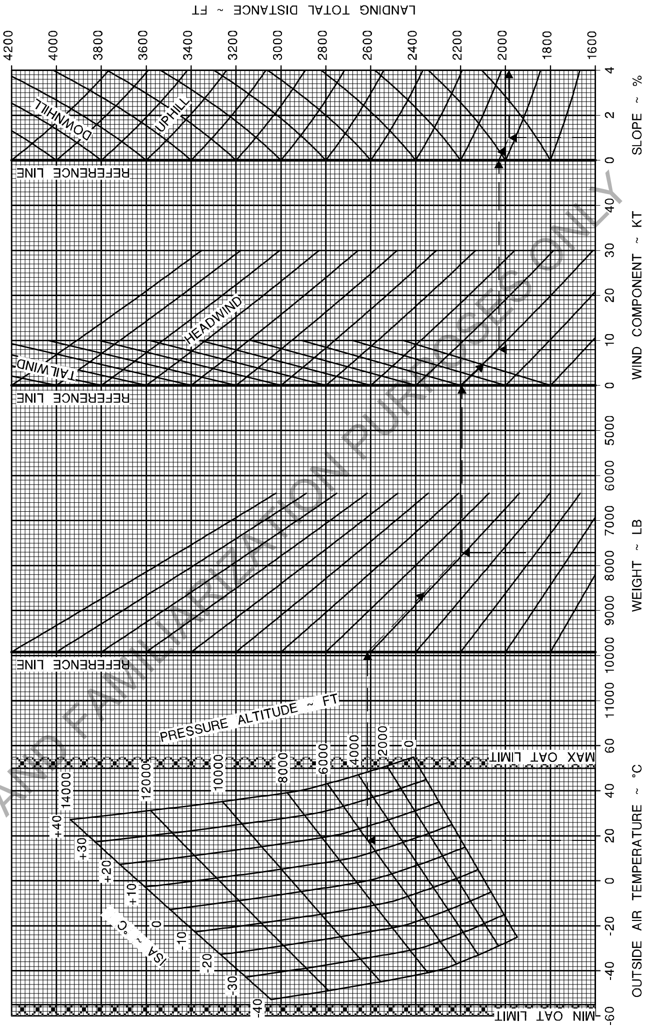
FROM 50 FT; (STANDARD UNITS)

ASSOCIATED CONDITIONS:
APPROACH AT 1.3 V_{S1}
REFER TO THE SPEED SCHEDULE TABLE
AVERAGE BRAKING TECHNIQUE
GROUND IDLE AFTER TOUCH DOWN

WEIGHT ~ LB	V_{APP} ~ KIAS
6400	68
7300	73
8200	77
9100	81
9920	85

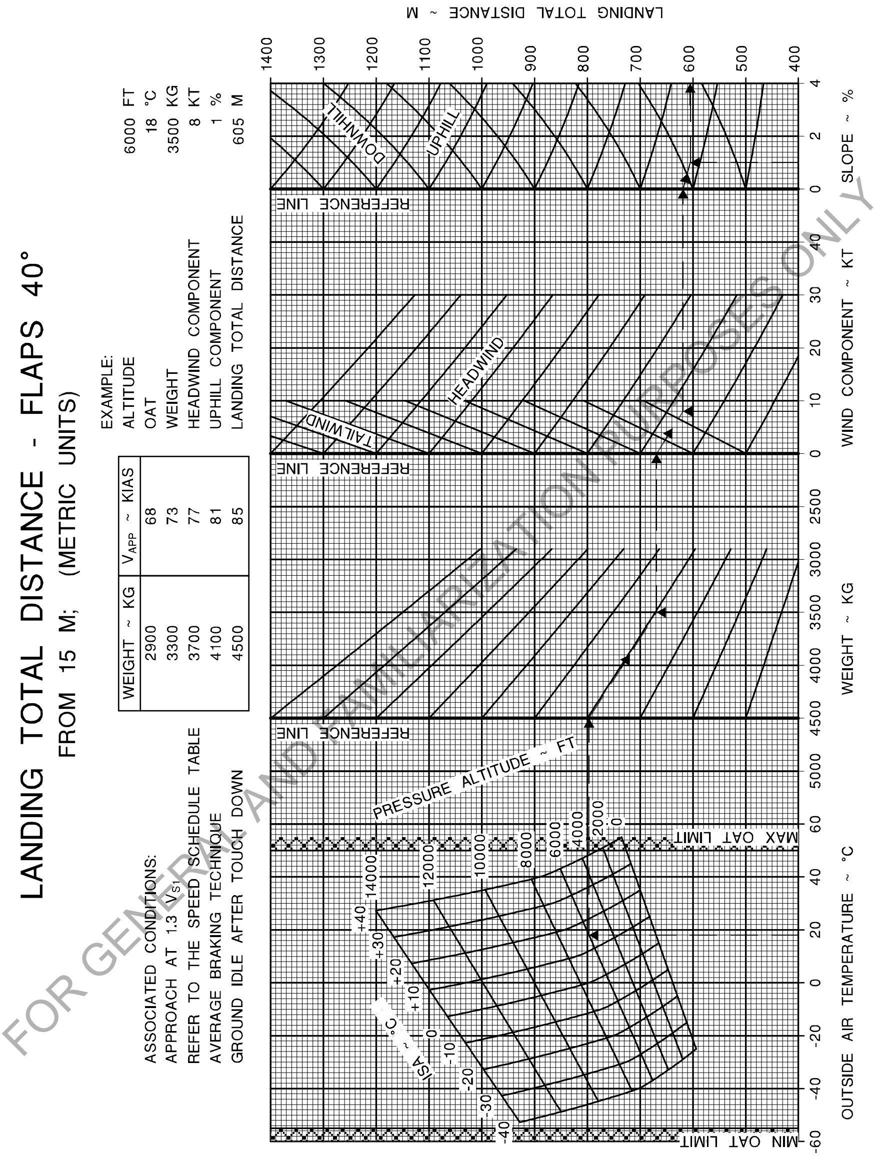
EXAMPLE:

ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7716 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
LANDING TOTAL DISTANCE	1990 FT



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

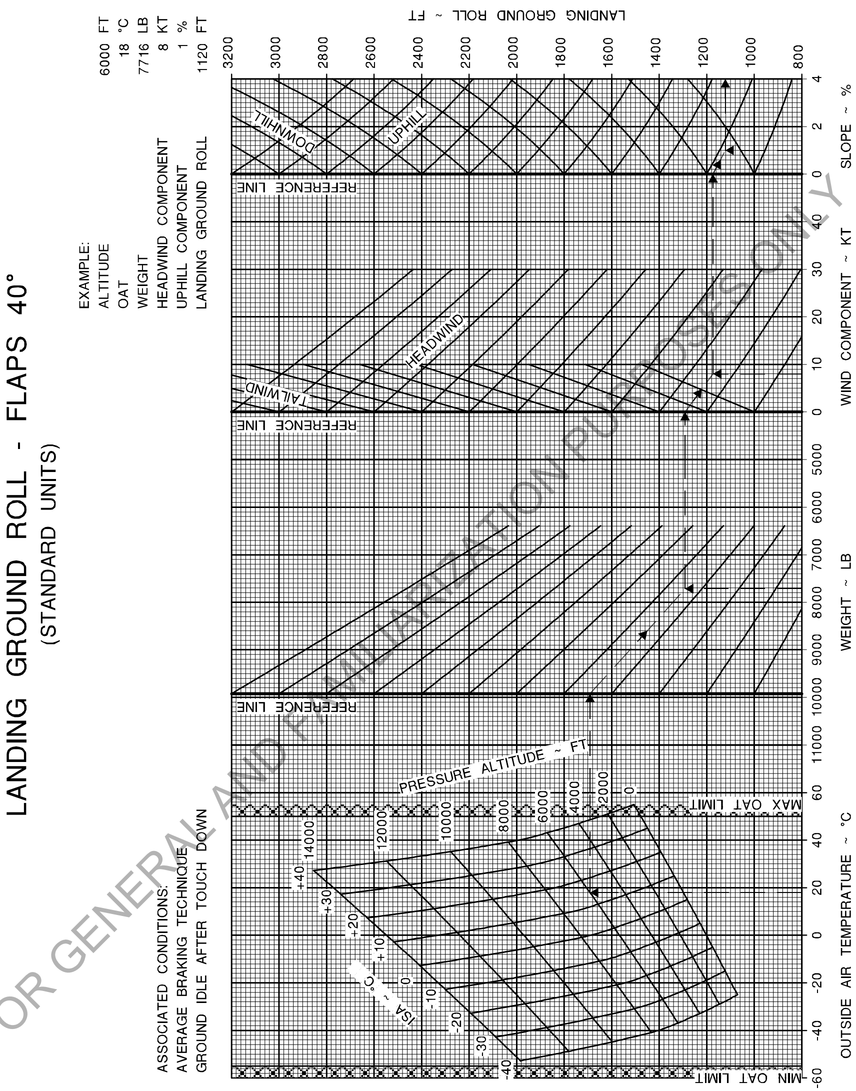
Figure 5-2-50. Landing Total Distance - Flaps 40° (standard units)



WEIGHT ~ KG	V_{APP} ~ KIAS
2900	68
3300	73
3700	77
4100	81
4500	85

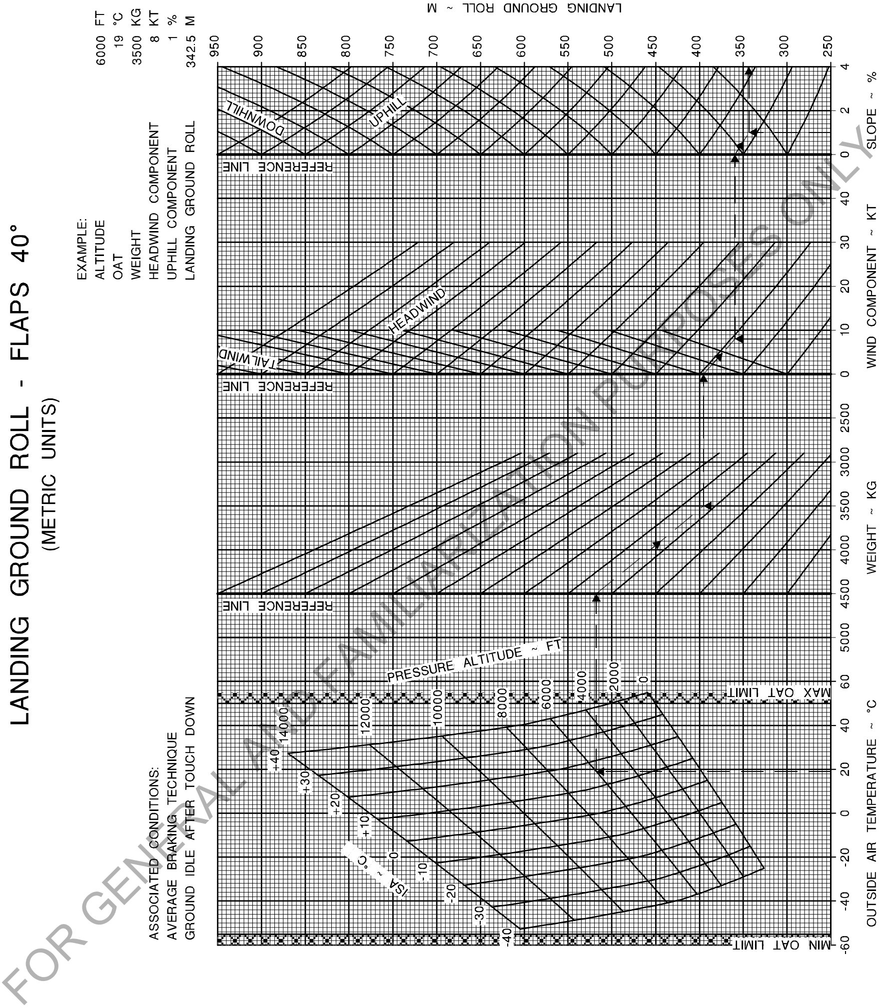
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-51. Landing Total Distance - Flaps 40° (metric units)



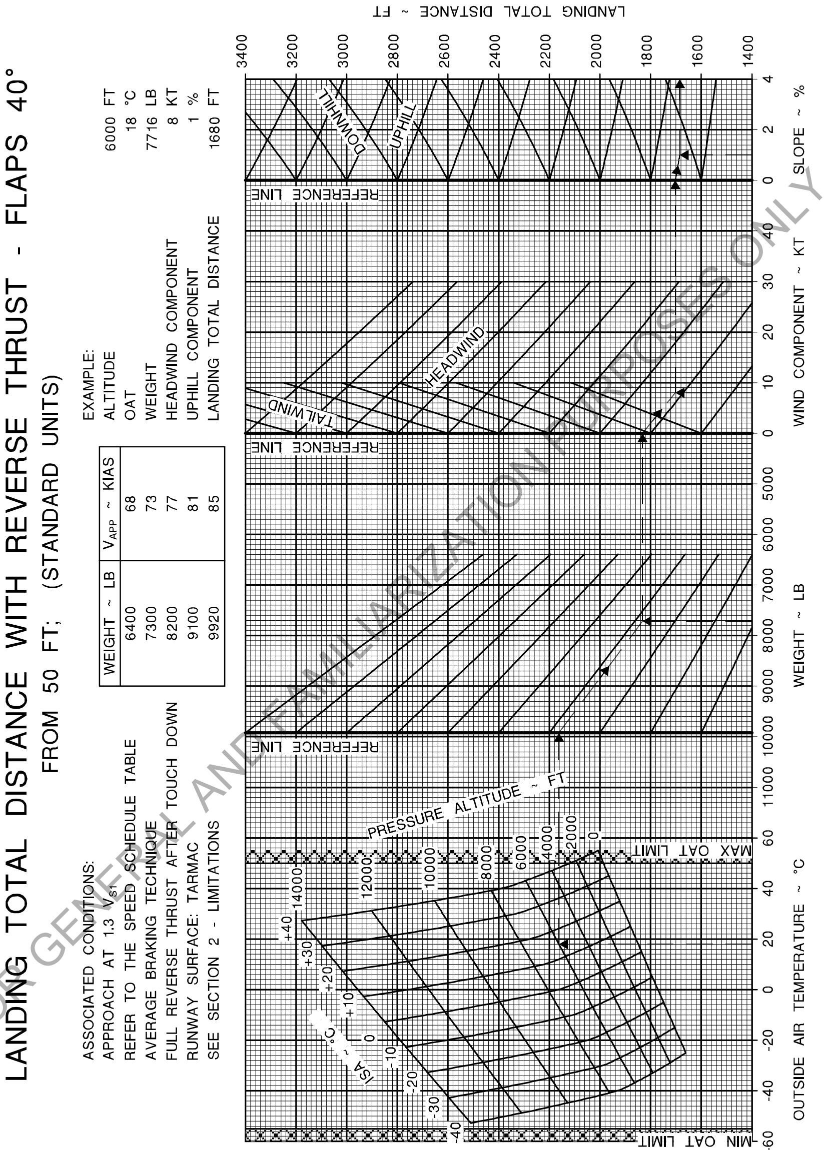
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-52. Landing Ground Roll - Flaps 40° (standard units)



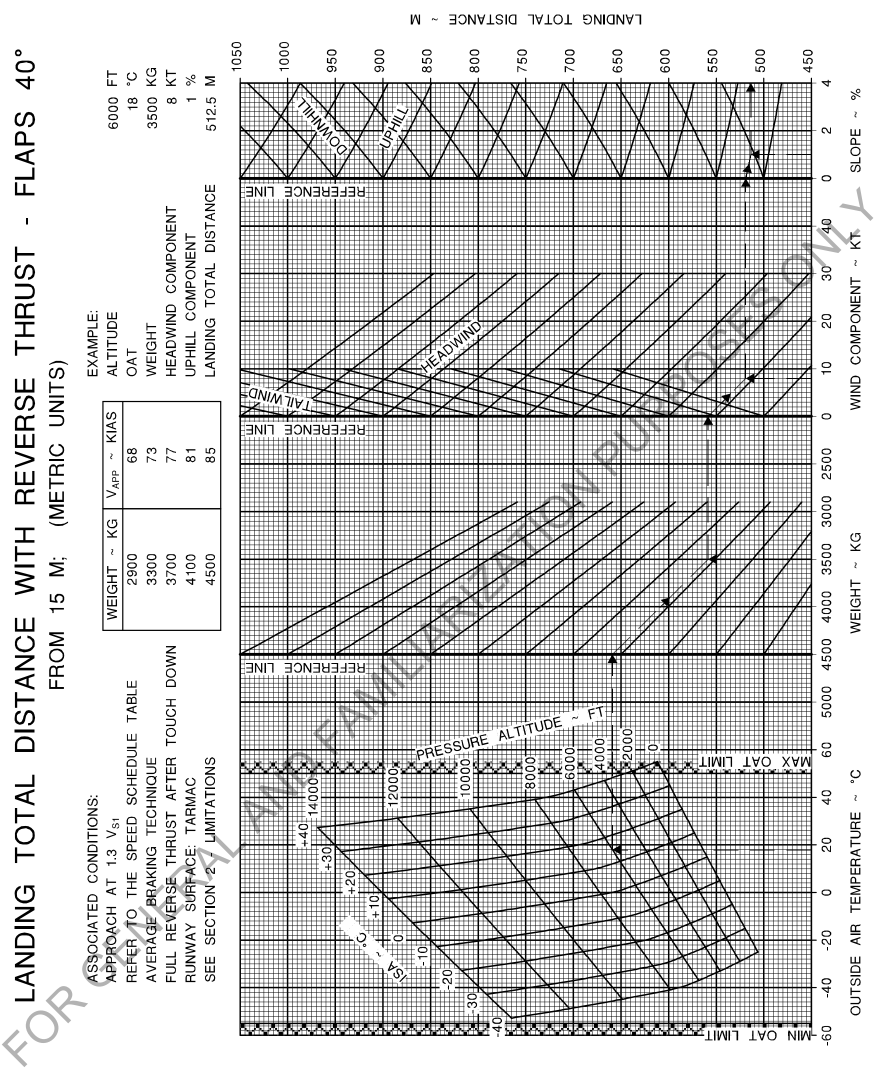
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-53. Landing Ground Roll - Flaps 40° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

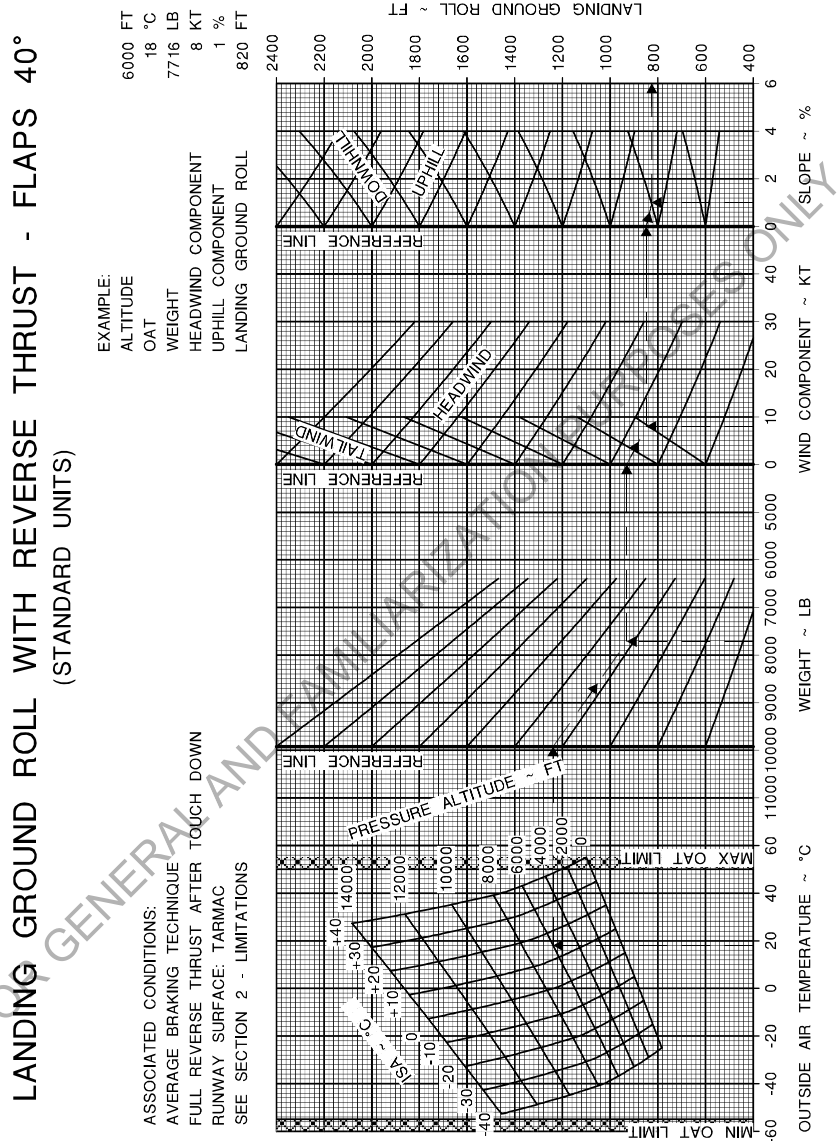
Figure 5-2-54. Landing Total Distance with the use of Reverse Thrust - Flaps 40° (standard units)



WEIGHT ~ KG	V_{APP} ~ KIAS
2900	68
3300	73
3700	77
4100	81
4500	85

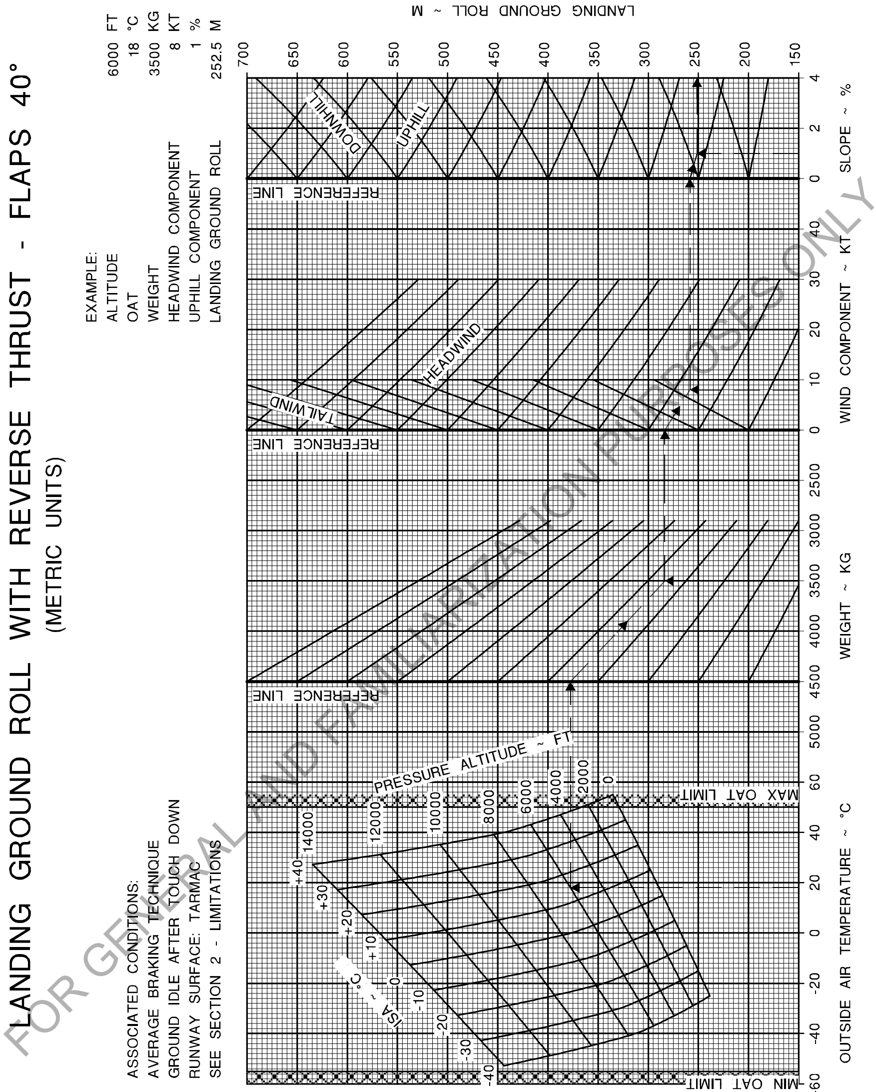
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-55. Landing Total Distance with the use of Reverse Thrust - Flaps 40° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-56. Landing Ground Roll with the use of Reverse Thrust - Flaps 40° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-2-57. Landing Ground Roll with the use of Reverse Thrust - Flaps 40° (metric units)

FLIGHT IN ICING CONDITIONS

The following section presents performance information related to the operation in or into known icing conditions. This information was derived analytically from actual wind tunnel tests with natural ice. The following cases are considered:

- 45 minutes holding in moderate icing conditions with fully operational pneumatic de-ice boots and substantial ice accretion on unprotected surfaces.
- 20 minutes holding in moderate icing conditions with ice accretion on the total airframe due to inoperative pneumatic de-ice boots.

Besides these aerodynamic degradations, performance losses to the aircraft's propulsive system have been considered (increased bleed air extraction, inertial separator open, less ram recovery, and ice-build up on unprotected parts of the propeller blades).

FLAPS

When operating in or into known icing conditions, the use of Flaps 30° or 40° is prohibited

When operating in or into known icing conditions with fully operational pneumatic de-ice boots, the flap position is limited to a maximum of 15°.

When operating in or into known icing conditions with failed operational pneumatic de-ice boots, the flap position is limited to a maximum of 0°.

STALL SPEEDS

When operating in STICK PUSHER ICE MODE the stick pusher computer automatically reduces the shaker and pusher settings, as measured by the angle of attack vanes, by 8°. With operational pneumatic de-ice boots, this results in an increase of the stall speed at the maximum takeoff weight of 12 kts with flaps set to 0° and 9 kts with flaps set to 15°.

The wings level stall speeds at the maximum takeoff weight of 10450 lb (4740 kg) and with flight idle power are summarized in Table 1.

Table 1 - Stall Speeds in accordance with ICE Mode Set

FLAPS	STALL SPEED (PUSHER ACTIVATION) AT MTOW - KIAS	
0°	Non icing	95
	Icing conditions (STICK PUSHER ICE MODE)	107
	Pneumatic de-ice boots failure (unprotected)	110
15°	Non icing	78
	Icing conditions (STICK PUSHER ICE MODE)	87

ENGINE TORQUE

When the engine inlet inertial separator is open and during flight, the maximum torque available can be reduced by up to 2.2 psi in non-icing conditions, and up to 3.0 psi in icing conditions.

TAKEOFF PERFORMANCE

The flaps must be set to 15° for takeoff. The use of flaps 30° for takeoff is prohibited.

When de-icing / anti-icing fluids are applied to the aircraft before departure, and/or when the stick pusher is in ICE mode: The takeoff reference speeds must be adjusted to the values indicated by the corresponding correction table.

The total takeoff distance is calculated by first computing the total takeoff distance in non-icing conditions from Figure 5-2-14 (standard units) or Figure 5-2-15 (metric units) and then correcting that distance for takeoff in or into known icing conditions by using the corrections in Table 2.

Table 2 - Icing Corrections to Takeoff Total Distance

TABLE A	**TAKEOFF WEIGHT - KG**					
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
V_R / V_{50ft} (KIAS)	**72 / 88**	**77 / 94**	**81 / 100**	**86 / 105**	**90 / 110**	**92 / 113**
0 FT	+18	+25	+25	+27	+28	+29
2000 FT	+21	+26	+26	+27	+28	+29
4000 FT	+25	+25	+26	+27	+29	+29
6000 FT	+24	+25	+26	+27	+29	+30
8000 FT	+25	+25	+26	+28	+29	+30
10000 FT	+25	+25	+26	+28	+29	+31
12000 FT	+24	+25	+27	+28	+30	+31
14000 FT	+25	+27	+29	+28	+30	+31
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE A	**TAKEOFF WEIGHT - LB**					

TABLE B	**TAKEOFF WEIGHT - KG**
WIND CORRECTION (%)	**2900 - 4740**
10 KTS TAILWIND	-2
NO WIND	0
10 KTS HEADWIND	+1
20 KTS HEADWIND	+3
30 KTS HEADWIND	+5
WIND CORRECTION (%)	**6393 - 10450**
TABLE B	**TAKEOFF WEIGHT - LB**

TABLE C	**TAKEOFF WEIGHT - KG**					
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
4% DOWN	+2	+2	+2	-1	-1	-2
2% DOWN	+2	+2	+1	-1	-1	-1
NO SLOPE	0	0	0	0	0	0
2% UP	+3	+4	+2	+2	+4	+4
4% UP	+7	+3	+4	+6	+8	+9
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE C	**TAKEOFF WEIGHT - LB**					

ICING CORRECTION (%) = A + B + C

Analogically, the takeoff ground roll is derived correcting the distances obtained from Figure 5-2-12 (standard units) or Figure 5-2-13 (metric units) by using Table 3.

Table 3 - Icing Corrections to Takeoff Ground Roll

TABLE A	**TAKEOFF WEIGHT - KG**					
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
V_R / V_{50ft} (KIAS)	**72 / 88**	**77 / 94**	**81 / 100**	**86 / 105**	**90 / 110**	**92 / 113**
0 FT	+27	+28	+28	+28	+29	+29
2000 FT	+27	+28	+28	+28	+29	+29
4000 FT	+27	+27	+28	+28	+29	+29
6000 FT	+27	+27	+28	+28	+28	+29
8000 FT	+27	+27	+28	+28	+28	+29
10000 FT	+27	+27	+28	+28	+28	+29
12000 FT	+27	+27	+28	+28	+28	+29
14000 FT	+27	+27	+28	+28	+29	+29
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE A	**TAKEOFF WEIGHT - LB**					

TABLE B	**TAKEOFF WEIGHT - KG**
WIND CORRECTION (%)	**2900 - 4740**
10 KTS TAILWIND	-4
NO WIND	0
10 KTS HEADWIND	+2
20 KTS HEADWIND	+5
30 KTS HEADWIND	+8
WIND CORRECTION (%)	**6393 - 10450**
TABLE B	**TAKEOFF WEIGHT - LB**

TABLE C	**TAKEOFF WEIGHT - KG**					
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
4% DOWN	0	0	0	-1	-1	-1
2% DOWN	0	0	0	0	0	0
NO SLOPE	0	0	0	0	0	0
2% UP	0	+1	+1	+1	+1	+1
4% UP	+1	+1	+1	+1	+2	+2
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE C	**TAKEOFF WEIGHT - LB**					

ICING CORRECTION (%) = A + B + C

Example:

- Pressure Altitude 6000 ft
- Outside Air Temperature 18°C
- Weight 3500 kg
- Headwind Component 8 kt
- Uphill Component 1%
- Takeoff Ground Roll 440 m (from Figure 5-2-13)
- Icing Correction (A + B +C) = 27.5% + 1.6% + 0.5% = 29.6%
- Takeoff Ground Roll in Icing Conditions = 440 m x 1.296 = 570 m.

ACCELERATE STOP PERFORMANCE

The flaps must be set to 15° for takeoff. The use of Flaps 30° for takeoff is prohibited.

The maximum speed for power chop is assumed to be 10 kts higher than that for non-icing conditions.

The total accelerate-stop distance is calculated by first computing the total accelerate-stop distance in non-icing conditions from Figure 5-2-10 (standard units) or Figure 5-2-11 (metric units) and then correcting that distance for takeoff in or into known icing conditions by using the corrections in Table 4.

Table 4 - Icing Corrections to Accelerate Stop Distance

TABLE A	**TAKEOFF WEIGHT - KG**					
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
POWER CHOP SPEED (KIAS)	**76**	**81**	**86**	**90**	**95**	**97**
0 FT	+25	+26	+26	+27	+28	+28
2000 FT	+25	+26	+27	+27	+28	+28
4000 FT	+26	+26	+27	+28	+28	+29
6000 FT	+26	+27	+27	+28	+28	+29
8000 FT	+26	+27	+28	+28	+29	+29
10000 FT	+27	+27	+28	+28	+29	+29
12000 FT	+27	+27	+28	+28	+29	+29
14000 FT	+27	+28	+29	+29	+30	+30
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE A	**TAKEOFF WEIGHT - LB**					

TABLE B	**TAKEOFF WEIGHT - KG**
WIND CORRECTION (%)	**2900 - 4740**
10 KTS TAILWIND	-3
NO WIND	0
10 KTS HEADWIND	+2
20 KTS HEADWIND	+3
30 KTS HEADWIND	+5
WIND CORRECTION (%)	**6400 - 10450**
TABLE B	**TAKEOFF WEIGHT - LB**

TABLE C	**TAKEOFF WEIGHT - KG**					
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
4% DOWN	+2	+2	+2	+3	+3	+3
2% DOWN	+1	+1	+1	+1	+1	+1
NO SLOPE	0	0	0	0	0	0
2% UP	0	0	0	0	+1	+1
4% UP	0	0	0	+1	+2	+3
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE C	**TAKEOFF WEIGHT - LB**					

ICING CORRECTION (%) = A + B + C

MAXIMUM RATE OF CLIMB

The use of Flaps 30° is prohibited in or into known icing conditions. After icing encounters, and with visible ice accretion on the airframe, a climb is performed with the flaps retracted and a climb speed based on the schedule below.

Table 5 - Climb Speed in Icing Conditions

FLAPS UP	NON-ICING	ICING	PNEUMATIC DE-ICE BOOT FAILURE
ALTITUDE	KIAS	KIAS	KIAS
0 FT	130	135	140
5000 FT	125		
10000 FT	125		
15000 FT	125		
20000 FT	120		
25000 FT	120		
30000 FT	120		

The total climb performance is calculated by first computing the Rate of Climb in non-icing conditions from Figure 5-2-21 (standard units) or Figure 5-2-22 (metric units) and then correcting the Rate of Climb in or into known icing conditions by using the corrections in Table 6 (with operational pneumatic de-ice boots) or Table 7 (with the pneumatic de-ice boots inoperative).

Table 6 - Icing Corrections to Maximum Rate of Climb with Operational Pneumatic De-ice Boots

RATE OF CLIMB CORRECTION (FEET PER MINUTE)				
ALTITUDE - FT	TAKEOFF WEIGHT - KG			
	2900	3500	4500	4740
0	-1240	-1030	-790	-750
5000	-1290	-1070	-810	-770
10000	-1510	-1250	-950	-900
15000	-1510	-1250	-960	-900
20000	-1610	-1330	-1000	-940
25000	-1630	-1350	-1020	-960
30000	-1650	-1360	-1020	-970
ALTITUDE - FT	6393	7716	9921	10450
	TAKEOFF WEIGHT - LB			

Table 7 - Icing Corrections to Maximum Rate of Climb with Pneumatic De-ice Boots Inoperative

RATE OF CLIMB CORRECTION (FEET PER MINUTE)				
ALTITUDE - FT	**TAKEOFF WEIGHT - KG**			
	2900	**3500**	**4500**	**4740**
0	-1530	-1280	-980	-920
5000	-1610	-1340	-1020	-960
10000	-1880	-1560	-1190	-1120
15000	-1920	-1600	-1220	-1150
20000	-2070	-1710	-1300	-1220
25000	-2140	-1770	-1340	-1270
30000	-2130	-1760	-1330	-1260
ALTITUDE - FT	**6393**	**7716**	**9921**	**10450**
	TAKEOFF WEIGHT - LB			

Example:

- Pressure Altitude 7000 ft
- Outside Air Temperature 22°C
- Aircraft Weight 3800 kg
- Rate of Climb (non-icing) 1925 fpm (from Figure 5-2-22)
- Icing Correction -1059 fpm (interpolated from Table 6)
- Max. Rate of Climb in Icing Conditions = 1925 fpm - 1059 fpm = 866 fpm.

HOLDING ENDURANCE

During holding flight in icing conditions, a higher engine torque is required to maintain level flight. Table 8 and Table 9 give the increases in fuel flow with respect to non-icing conditions. Refer to Figure 5-2-39.

Table 8 - Icing Corrections to Holding Fuel Flow with Operational Pneumatic De-ice Boots

FUEL FLOW CORRECTION (%)	
ALTITUDE - FT	**AIRCRAFT WEIGHT - KG**
	2900 - 4740
0 FT	+27
5000 FT	+31
10000 FT	+35
15000 FT	+41
ALTITUDE - FT	**6393 - 10450**
	AIRCRAFT WEIGHT - LB

Table 9 - Icing Corrections to Holding Fuel Flow with Pneumatic De-ice Boots Inoperative

FUEL FLOW CORRECTION (%)	
ALTITUDE - FT	AIRCRAFT WEIGHT - KG
	2900 - 4740
0 FT	+34
5000 FT	+40
10000 FT	+45
15000 FT	+54
ALTITUDE - FT	6393 - 10450
	AIRCRAFT WEIGHT - LB

BALKED RATE OF CLIMB

The use of Flaps 30° or Flaps 40° is prohibited in or into known icing conditions.

After icing encounters and with visible ice accretion on the airframe, a balked landing climb is performed with Flaps 15° and a climb speed of 105 KIAS. The total climb performance is calculated by first computing the Rate of Climb in non-icing conditions from Figure 5-2-48 (standard units) or Figure 5-2-49 (metric units) and then correcting the Rate of Climb in or into known icing conditions by using the corrections in Table 10.

Table 10 - Icing Corrections to Balked Landing Climb with Operational Pneumatic De-ice Boots

RATE OF CLIMB CORRECTION (FEET PER MINUTE)			
ALTITUDE - FT	LANDING WEIGHT - KG		
	2900	3500	4500
0	-100	-70	-60
2000	-90	-60	-50
4000	-100	-70	-50
6000	-110	-70	-60
8000	-110	-70	-60
10000	-110	-70	-60
12000	-100	-60	-50
14000	-100	-60	-50
ALTITUDE - FT	6393	7716	9921
	LANDING WEIGHT - LB		

After failure of the airframe pneumatic boots in icing conditions, a balked landing climb is performed with Flaps 0° and a climb speed of 130 KIAS. The total climb performance is calculated by first computing the Rate of Climb in non-icing conditions from Figure 5-2-48 (standard units) or Figure 5-2-49 (metric units) and then correcting the Rate of Climb in or into known icing conditions by using the corrections in the Table 11.

Table 11 - Icing Corrections to Balked Landing Climb with Pneumatic De-ice Boots inoperative

RATE OF CLIMB CORRECTION (FEET PER MINUTE)			
ALTITUDE - FT	**LANDING WEIGHT - KG**		
	2900	**3500**	**4500**
0	-510	-390	-270
2000	-540	-410	-290
4000	-590	-450	-310
6000	-610	-470	-320
8000	-640	-490	-330
10000	-670	-510	-350
12000	-690	-530	-360
14000	-880	-690	-480
ALTITUDE - FT	**6393**	**7716**	**9921**
	LANDING WEIGHT - LB		

LANDING PERFORMANCE

The flaps must be set to 15° for landing. The use of Flaps 30° or 40° for landing is prohibited. With pneumatic de-ice boots failed; a flaps-up-landing must be performed. For both flap configurations, the landing reference speed must be adjusted to the values indicated by the corresponding correction table.
The landing distance is calculated by first computing the landing distance in non-icing conditions and then correcting that distance for landing in or into known icing conditions by using the following correction tables:

Table 12 - Landing in Icing Conditions - Overview

Reverse Thrust	**Pneumatic De-ice Boots**	**Flap Setting**	**Landing Performance Information**	**Non-icing Figure No.**	**Icing Correction Table**
No	Operational	Flaps 15°	Landing Total Distance	Figure 5-2-50/51	Table 13
			Landing Ground Roll	Figure 5-2-52/53	Table 14
	Inoperative	Flaps 0°	Landing Total Distance	Figure 5-2-50/51	Table 15
			Landing Ground Roll	Figure 5-2-52/53	Table 16
Yes	Operational	Flaps 15°	Landing Total Distance	Figure 5-2-54/55	Table 17
			Landing Ground Roll	Figure 5-2-56/57	Table 18
	Inoperative	Flaps 0°	Landing Total Distance	Figure 5-2-54/55	Table 19
			Landing Ground Roll	Figure 5-2-56/57	Table 20

Table 13 - Icing Corrections to Landing Total Distance – Flaps 15° - No Reverse Thrust

TABLE A	**LANDING WEIGHT - KG**				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**84**	**90**	**95**	**100**	**105**
0 FT	+41	+45	+48	+50	+52
2000 FT	+44	+47	+49	+51	+53
4000 FT	+46	+49	+51	+53	+54
6000 FT	+47	+50	+52	+54	+56
8000 FT	+49	+52	+54	+56	+57
10000 FT	+51	+53	+55	+57	+58
12000 FT	+52	+54	+56	+58	+59
14000 FT	+53	+56	+58	+58	+58
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	**LANDING WEIGHT - KG**				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-6	-6	-6	-6	-6
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+3	+3	+3	+3	+3
20 KTS HEADWIND	+7	+7	+6	+6	+6
30 KTS HEADWIND	+11	+11	+11	+10	+10
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	**LANDING WEIGHT - KG**
SLOPE CORRECTION (%)	**2900 - 4500**
4% DOWN	+1
2% DOWN	0
NO SLOPE	0
2% UP	0
4% UP	0
SLOPE CORRECTION (%)	**6393 - 9921**
TABLE C	**LANDING WEIGHT - LB**

ICING CORRECTION (%) = A + B + C

Table 14- Icing Corrections to Landing Ground Roll – Flaps 15° - No Reverse Thrust

TABLE A	**LANDING WEIGHT - KG**				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**84**	**90**	**95**	**100**	**105**
0 FT	+54	+63	+64	+60	+59
2000 FT	+55	+64	+61	+58	+59
4000 FT	+64	+63	+59	+59	+60
6000 FT	+63	+60	+59	+60	+61
8000 FT	+62	+59	+60	+61	+62
10000 FT	+60	+59	+61	+62	+63
12000 FT	+59	+60	+62	+63	+64
14000 FT	+60	+61	+63	+65	+66
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	**LANDING WEIGHT - KG**				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-7	-7	-7	-6	-6
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+5	+5	+5	+4	+4
20 KTS HEADWIND	+12	+11	+11	+9	+8
30 KTS HEADWIND	+20	+19	+19	+16	+14
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	**LANDING WEIGHT - KG**
SLOPE CORRECTION (%)	**2900 - 4500**
4% DOWN	-3
2% DOWN	-1
NO SLOPE	0
2% UP	+2
4% UP	+4
SLOPE CORRECTION (%)	**6393 - 9921**
TABLE C	**LANDING WEIGHT - LB**

ICING CORRECTION (%) = A + B + C

Table 15 - Icing Corrections to Landing Total Distance – Flaps 0° - No Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**104**	**111**	**118**	**124**	**130**
0 FT	+90	+98	+103	+108	+111
2000 FT	+95	+101	+106	+110	+114
4000 FT	+99	+105	+110	+114	+118
6000 FT	+102	+108	+112	+117	+120
8000 FT	+106	+112	+117	+121	+125
10000 FT	+109	+114	+119	+124	+128
12000 FT	+111	+117	+122	+127	+130
14000 FT	+116	+122	+127	+129	+130
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-12	-12	-12	-12	-11
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+7	+7	+7	+7	+6
20 KTS HEADWIND	+15	+15	+15	+14	+14
30 KTS HEADWIND	+26	+25	+25	+24	+23
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	LANDING WEIGHT - KG				
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
4% DOWN	-3	-3	-3	-4	-3
2% DOWN	-1	-1	-1	-1	-1
NO SLOPE	0	0	0	0	0
2% UP	+2	+2	+2	+2	+2
4% UP	+3	+3	+4	+4	+4
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE C	**LANDING WEIGHT - LB**				

ICING CORRECTION (%) = A + B + C

Table 16 - Icing Corrections to Landing Ground Roll – Flaps 0° - No Reverse Thrust

TABLE A	**LANDING WEIGHT - KG**				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**104**	**111**	**118**	**124**	**130**
0 FT	+105	+119	+120	+115	+116
2000 FT	+107	+120	+117	+116	+118
4000 FT	+120	+119	+116	+119	+122
6000 FT	+119	+116	+118	+122	+125
8000 FT	+118	+118	+122	+126	+130
10000 FT	+116	+121	+125	+130	+132
12000 FT	+119	+123	+128	+129	+126
14000 FT	+123	+128	+126	+126	+126
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	**LANDING WEIGHT - KG**				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-14	-13	-13	-12	-12
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+10	+10	+10	+9	+8
20 KTS HEADWIND	+23	+22	+22	+19	+17
30 KTS HEADWIND	+39	+38	+37	+32	+29
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	**LANDING WEIGHT - KG**				
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
4% DOWN	-8	-7	-8	-7	-7
2% DOWN	-3	-3	-3	-3	-3
NO SLOPE	0	0	0	0	0
2% UP	+6	+6	+6	+6	+5
4% UP	+12	+11	+11	+10	+10
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE C	**LANDING WEIGHT - LB**				

ICING CORRECTION (%) = A + B + C

Table 17 - Icing Corrections to Landing Total Distance – Flaps 15° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500
V_{APP} (KIAS)	84	90	95	100	105
0 FT	+37	+40	+43	+45	+47
2000 FT	+40	+41	+44	+46	+47
4000 FT	+40	+44	+46	+47	+49
6000 FT	+42	+45	+47	+48	+49
8000 FT	+45	+46	+48	+49	+50
10000 FT	+45	+47	+49	+50	+50
12000 FT	+46	+48	+49	+50	+49
14000 FT	+48	+49	+49	+49	+49
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921
TABLE A	LANDING WEIGHT - LB				

TABLE B	LANDING WEIGHT - KG
WIND CORRECTION (%)	2900 - 4500
10 KTS TAILWIND	-6
NO WIND	0
10 KTS HEADWIND	+3
20 KTS HEADWIND	+7
30 KTS HEADWIND	+11
WIND CORRECTION (%)	6393 - 9921
TABLE B	LANDING WEIGHT - LB

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	2900 - 4500
4% DOWN	-1
2% DOWN	0
NO SLOPE	0
2% UP	+1
4% UP	+1
SLOPE CORRECTION (%)	6393 - 9921
TABLE C	LANDING WEIGHT - LB

ICING CORRECTION (%) = A + B + C

Table 18 - Icing Corrections to Landing Ground Roll – Flaps 15° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**84**	**90**	**95**	**100**	**105**
0 FT	+48	+55	+55	+52	+51
2000 FT	+49	+55	+53	+50	+51
4000 FT	+56	+55	+51	+51	+51
6000 FT	+55	+53	+51	+51	+51
8000 FT	+54	+51	+51	+51	+52
10000 FT	+52	+51	+51	+52	+52
12000 FT	+51	+51	+51	+52	+52
14000 FT	+51	+51	+52	+52	+53
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-8	-7	-7	-6	-6
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+5	+5	+5	+4	+4
20 KTS HEADWIND	+11	+11	+10	+9	+8
30 KTS HEADWIND	+18	+18	+17	+15	+13
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	**2900 - 4500**
4% DOWN	-2
2% DOWN	-1
NO SLOPE	0
2% UP	+2
4% UP	+3
SLOPE CORRECTION (%)	**6393 - 9921**
TABLE C	**LANDING WEIGHT - LB**

ICING CORRECTION (%) = A + B + C

Table 19 - Icing Corrections to Landing Total Distance – Flaps 0° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500
V_{APP} (KIAS)	104	111	118	124	130
0 FT	+83	+90	+95	+99	+101
2000 FT	+88	+92	+97	+100	+103
4000 FT	+90	+97	+100	+103	+106
6000 FT	+93	+98	+102	+105	+107
8000 FT	+97	+101	+104	+107	+109
10000 FT	+99	+103	+106	+109	+109
12000 FT	+101	+105	+108	+108	+107
14000 FT	+104	+107	+107	+107	+107
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921
TABLE A	LANDING WEIGHT - LB				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	2900	3300	3700	4100	4500
10 KTS TAILWIND	-14	-14	-14	-14	-14
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+7	+7	+7	+7	+6
20 KTS HEADWIND	+15	+15	+15	+14	+14
30 KTS HEADWIND	+25	+25	+24	+23	+23
WIND CORRECTION (%)	6393	7275	8157	9039	9921
TABLE B	LANDING WEIGHT - LB				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	2900 - 4500
4% DOWN	-3
2% DOWN	-1
NO SLOPE	0
2% UP	+2
4% UP	+4
SLOPE CORRECTION (%)	6393 - 9921
TABLE C	LANDING WEIGHT - LB

ICING CORRECTION (%) = A + B + C

Table 20 - Icing Corrections to Landing Ground Roll – Flaps 0° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500
V_{APP} (KIAS)	104	111	118	124	130
0 FT	+94	+103	+104	+100	+98
2000 FT	+95	+104	+101	+98	+99
4000 FT	+104	+103	+99	+99	+100
6000 FT	+104	+101	+99	+100	+101
8000 FT	+103	+99	+100	+102	+103
10000 FT	+100	+100	+101	+103	+104
12000 FT	+100	+101	+102	+104	+106
14000 FT	+101	+103	+105	+106	+106
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921
TABLE A	LANDING WEIGHT - LB				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	2900	3300	3700	4100	4500
10 KTS TAILWIND	-15	-14	-13	-13	-13
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+10	+9	+9	+8	+7
20 KTS HEADWIND	+21	+21	+21	+18	+16
30 KTS HEADWIND	+36	+35	+35	+30	+27
WIND CORRECTION (%)	6393	7275	8157	9039	9921
TABLE B	LANDING WEIGHT - LB				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	2900 - 4500
4% DOWN	-7
2% DOWN	-3
NO SLOPE	0
2% UP	+4
4% UP	+8
SLOPE CORRECTION (%)	6393 - 9921
TABLE C	LANDING WEIGHT - LB

ICING CORRECTION (%) = A + B + C

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SECTION 5-3

PERFORMANCE DATA FOR MSN 1576 - 1942 WITH A 5-BLADED PROPELLER

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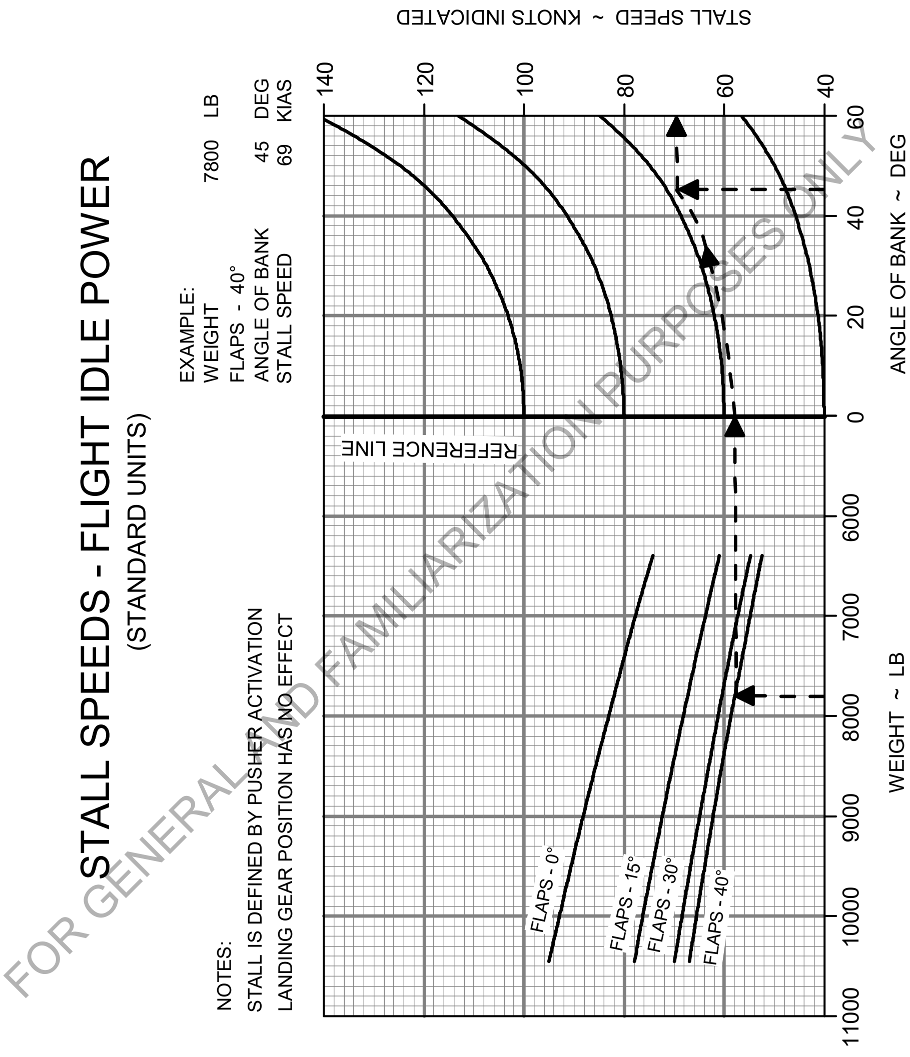
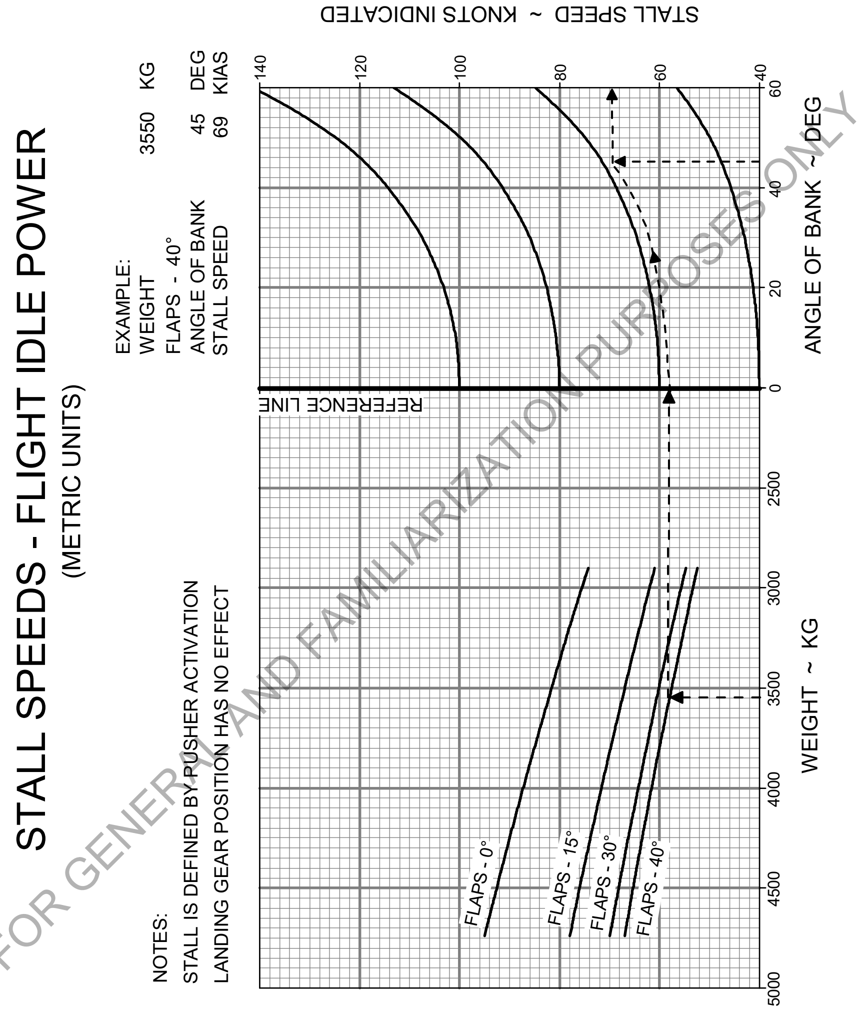


See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-1. Stall Speeds KIAS - Flight Idle Power (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-2. Stall Speeds KIAS - Flight Idle Power (metric units)

STATIC TAKEOFF TORQUE

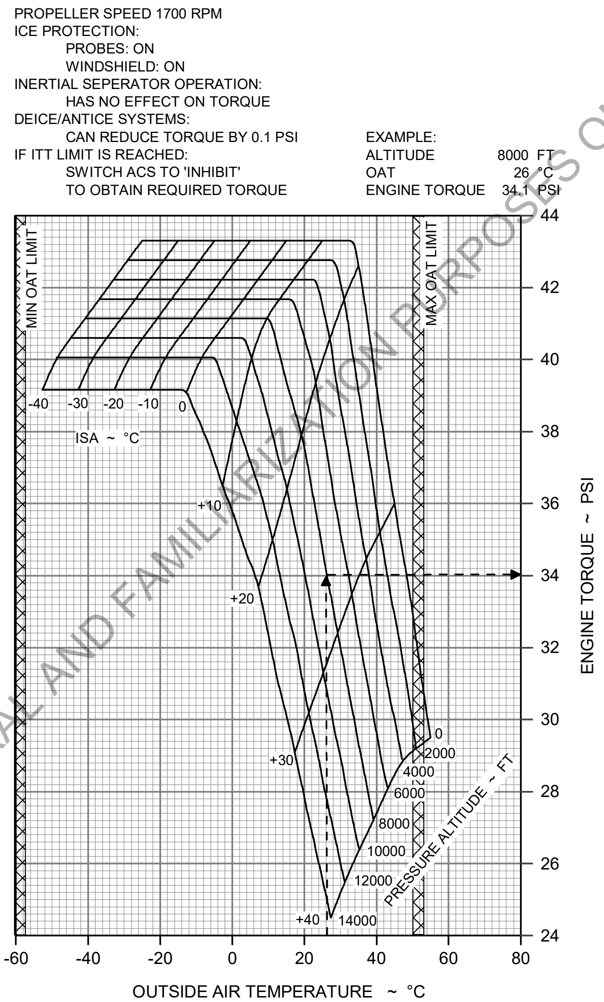
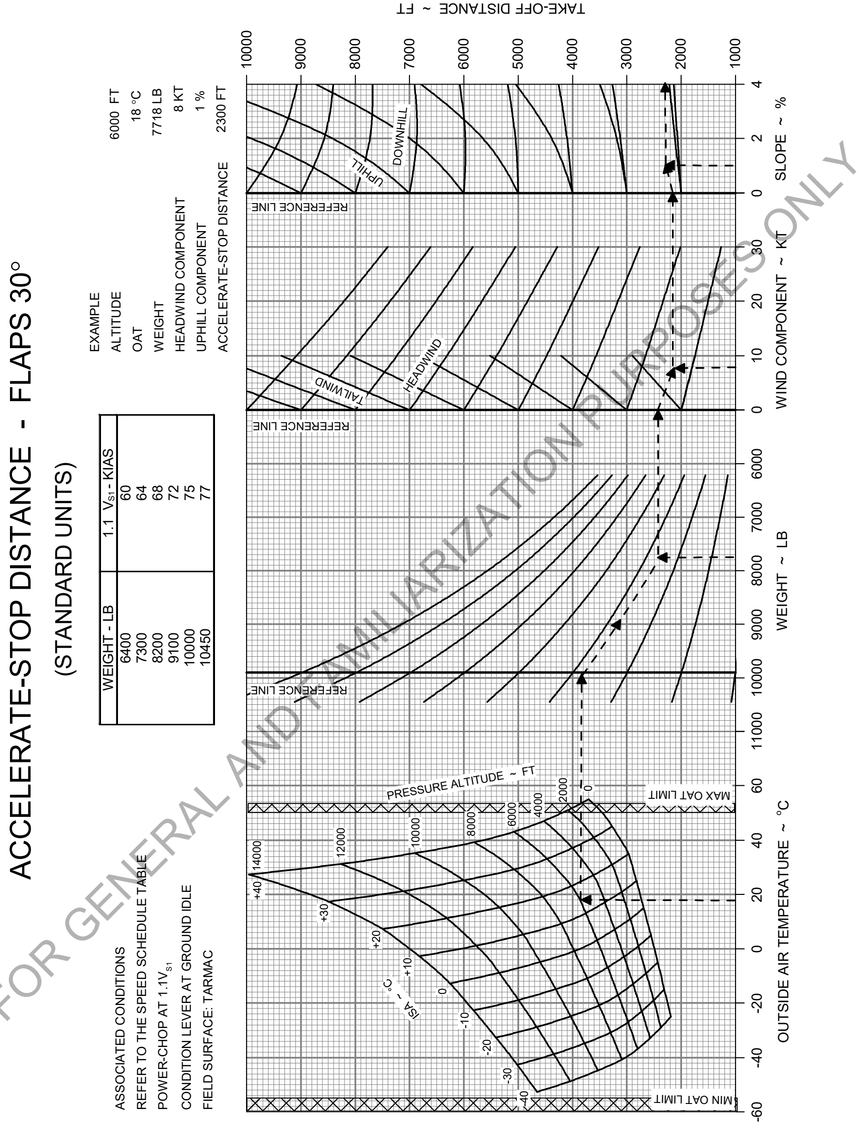


Figure 5-3-3. Static Takeoff Torque



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

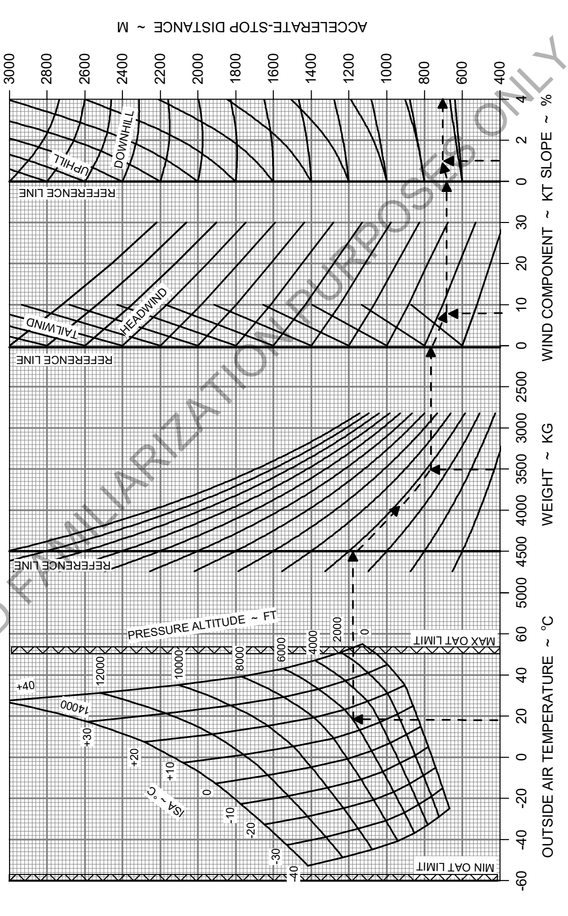
Figure 5-3-4. Accelerate - Stop Distance - Flaps 30° (standard units)

ACCELERATE-STOP DISTANCE - FLAPS 30°
(METRIC UNITS)

ASSOCIATED CONDITIONS
REFER TO THE SPEED SCHEDULE TABLE
POWER-CHOP AT 1.1 V_{S1}
CONDITION LEVER AT GROUND IDLE
RUNWAY SURFACE: TARMAC

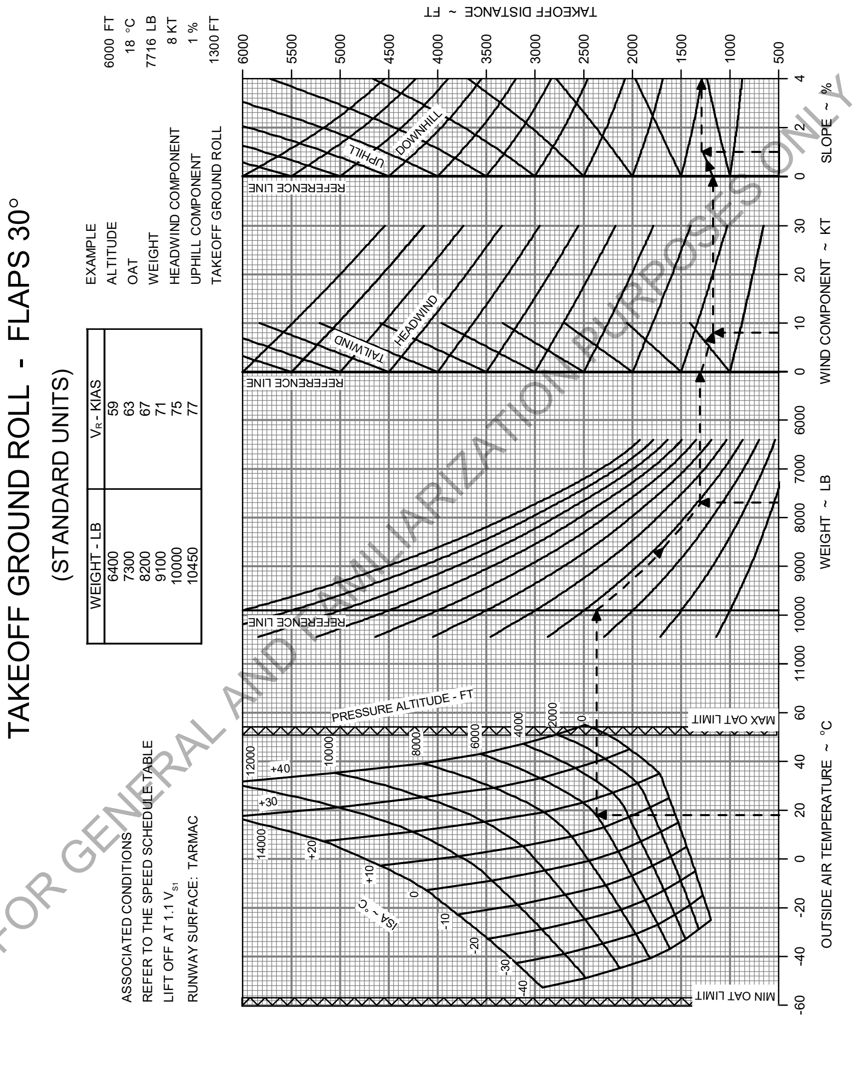
WEIGHT - KG	1.1 V_{S1} - KIAS
2900	60
3300	64
3700	69
4100	73
4500	76
4740	78

EXAMPLE	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	3500 KG
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
ACCELERATE-STOP DISTANCE	700 M



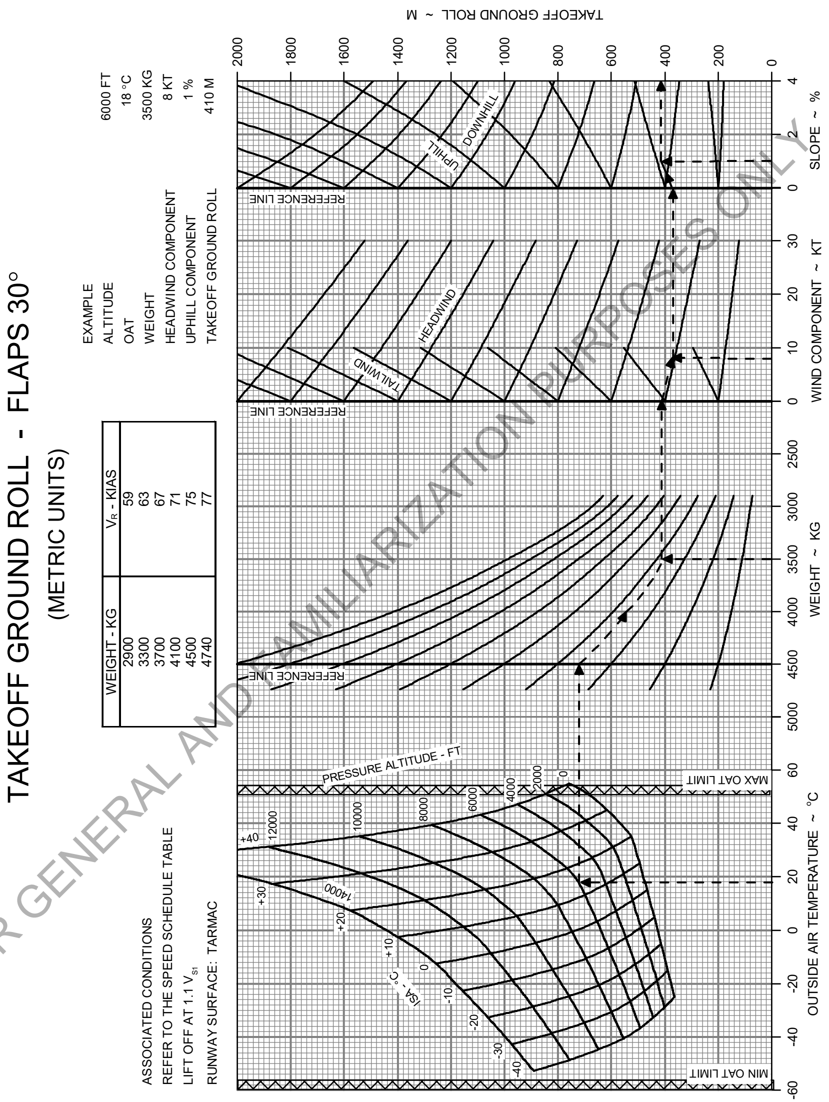
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-5. Accelerate - Stop Distance - Flaps 30° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-6. Takeoff Ground Roll - Flaps 30° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-7. Takeoff Ground Roll - Flaps 30° (metric units)

TAKEOFF TOTAL DISTANCE - FLAPS 30°

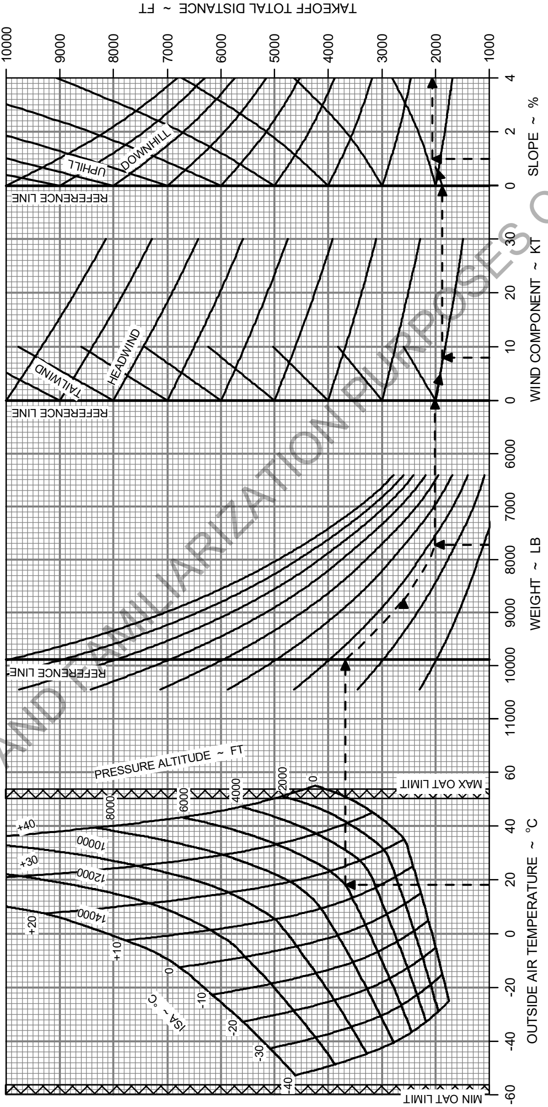
OVER 50 FT OBSTACLE; (STANDARD UNITS)

WEIGHT ~ LB	V_R ~ KIAS	V_{50FT} ~ KIAS
6400	59	72
7300	63	77
8200	67	82
9100	71	86
10000	75	91
10450	77	93

EXAMPLE:

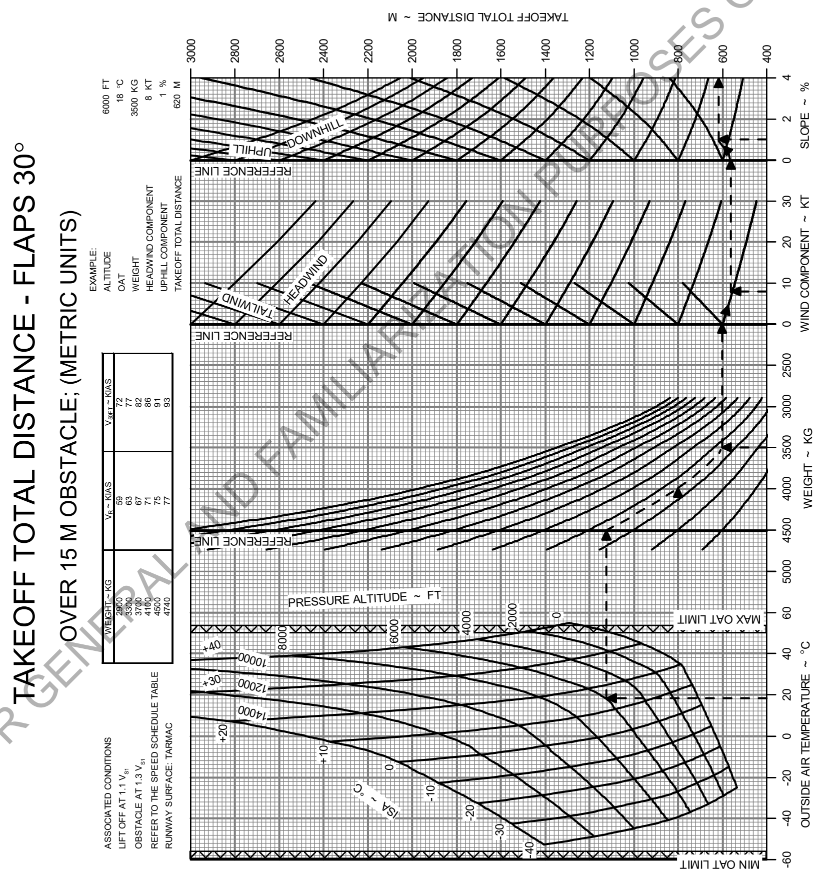
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7718 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF TOTAL DISTANCE	2050 FT

ASSOCIATED CONDITIONS:
LIFT OFF AT 1.1 V_{S1}
OBSTACLE AT 1.3 V_{S1}
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

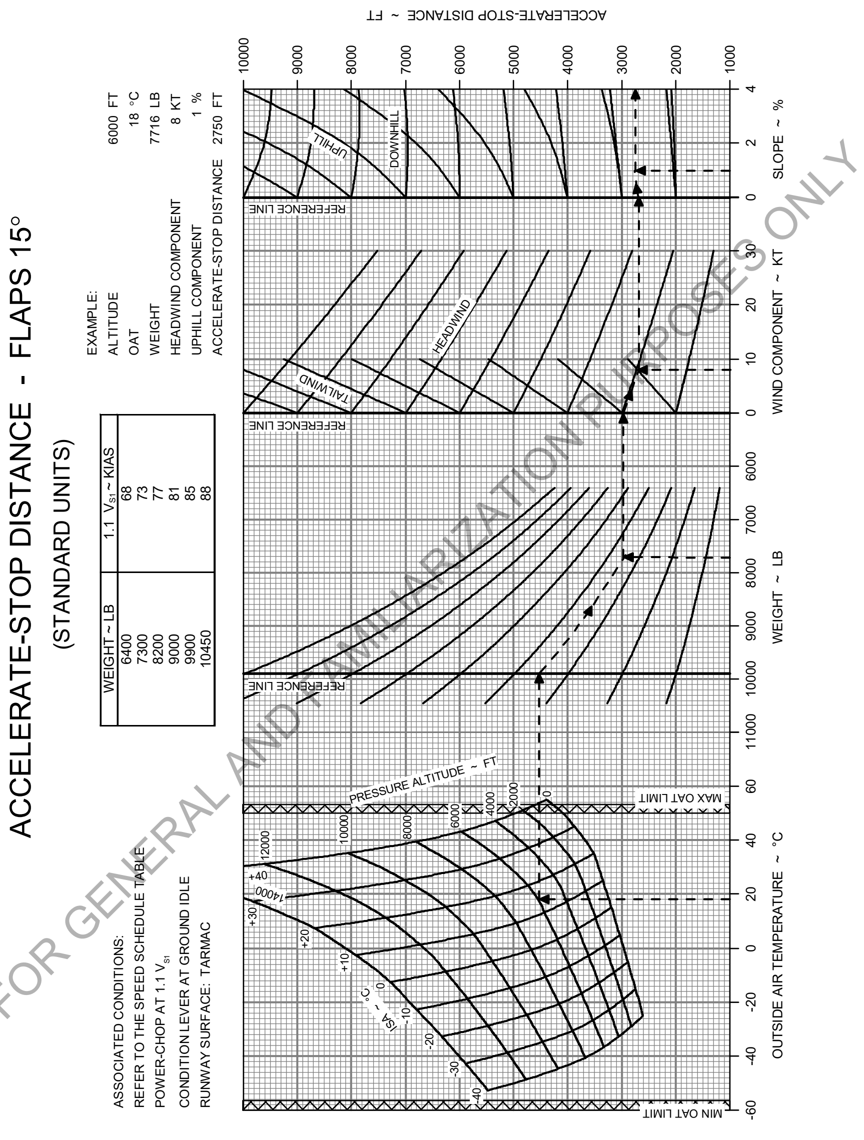
Figure 5-3-8. Takeoff Total Distance - Flaps 30° (standard units)



WEIGHT ~ KG	V_R ~ KIAS	V_{50FT} ~ KIAS
2900	59	72
3300	63	77
3700	67	82
4100	71	86
4500	75	91
4740	77	93

See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-9. Takeoff Total Distance - Flaps 30° (metric units)

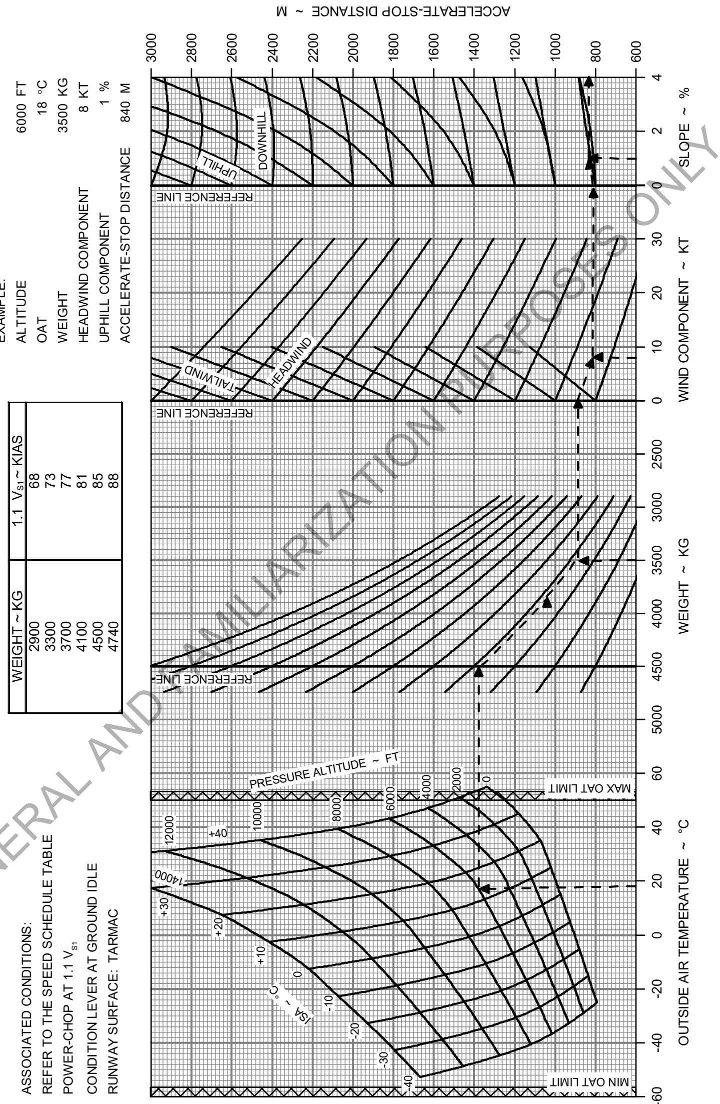


See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-10. Accelerate - Stop Distance - Flaps 15° (standard units)

ACCELERATE-STOP DISTANCE - FLAPS 15°

(METRIC UNITS)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-11. Accelerate - Stop Distance - Flaps 15° (metric units)

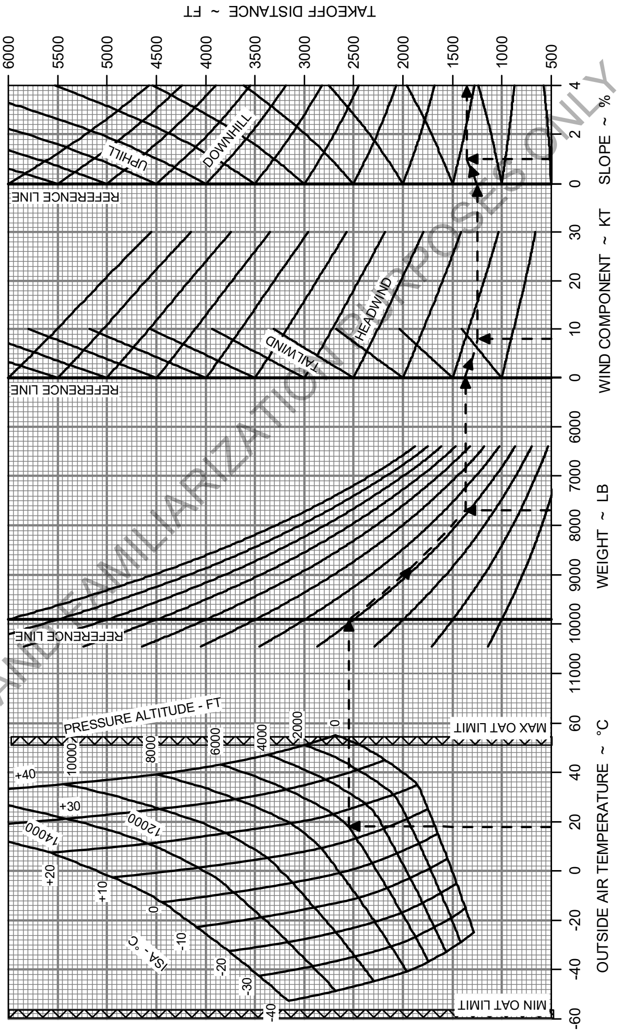
TAKEOFF GROUND ROLL - FLAPS 15°

(STANDARD UNITS)

WEIGHT -LB	V_R- KIAS
6400	65
7300	69
8200	74
9100	78
10000	82
10450	84

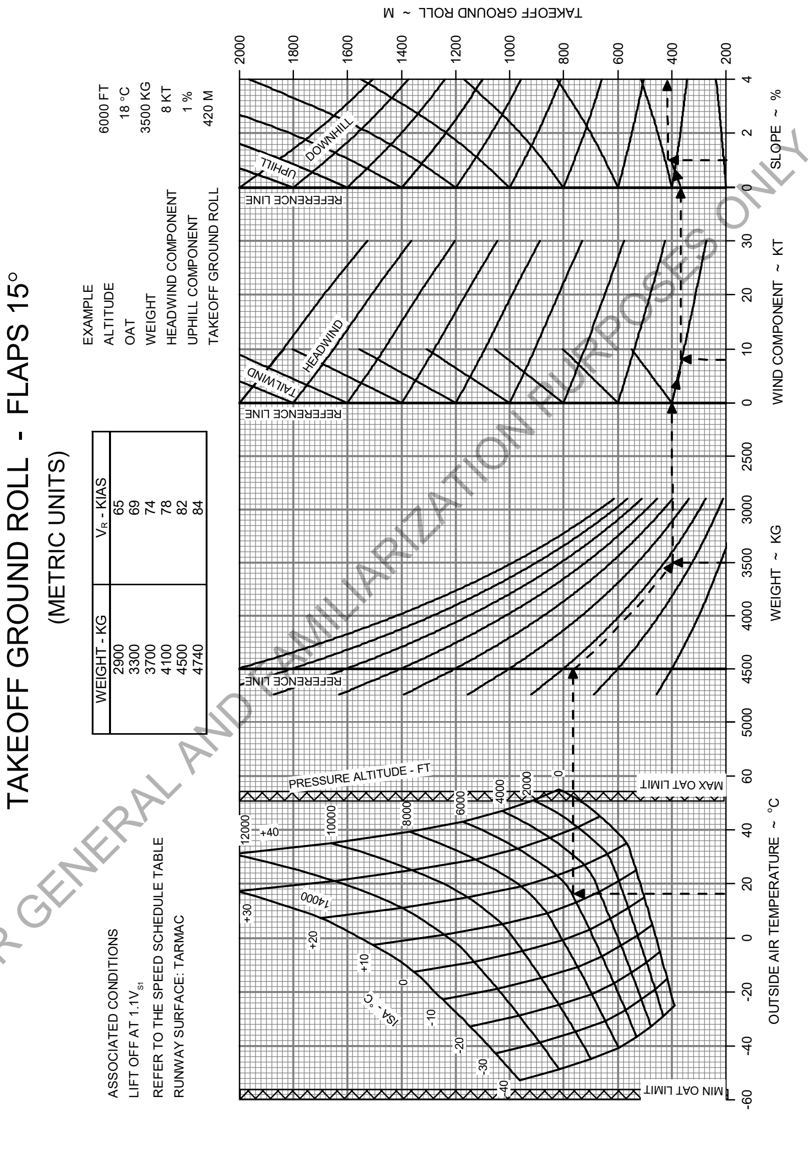
EXAMPLE	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7716 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF GROUND ROLL	1350 FT

ASSOCIATED CONDITIONS
LIFT OFF AT $1.1V_{S1}$
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-12. Takeoff Ground Roll - Flaps 15° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-13. Takeoff Ground Roll - Flaps 15° (metric units)

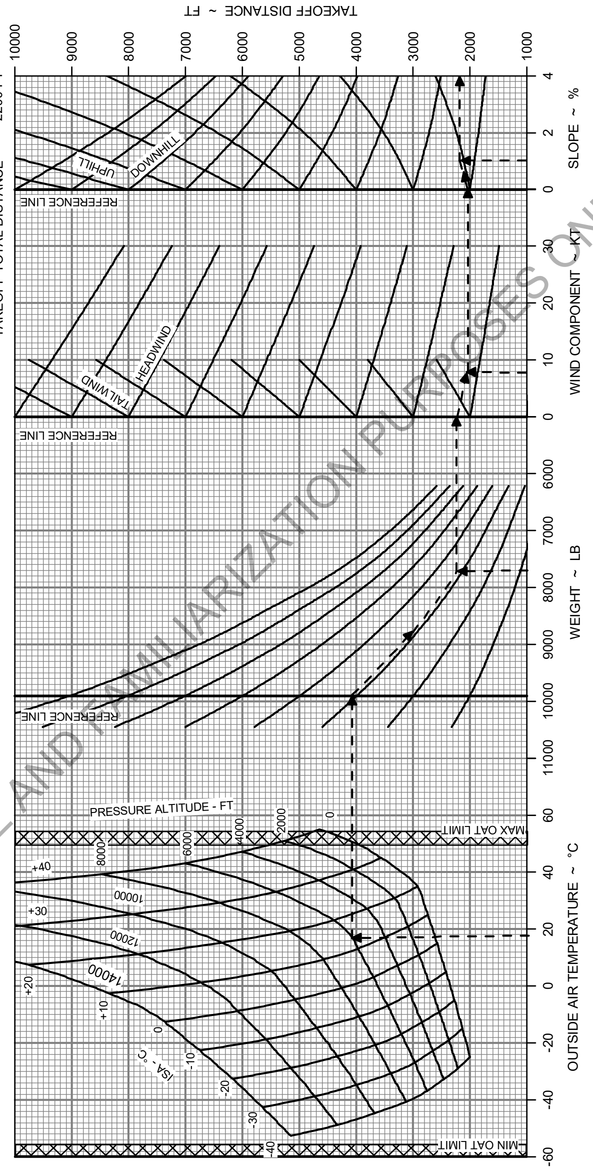
TAKEOFF TOTAL DISTANCE - FLAPS 15°

OVER 50 FT OBSTACLE; (STANDARD UNITS)

WEIGHT ~ LB	V_R ~ KIAS	V_{50FT} ~ KIAS
6400	65	81
7300	69	86
8200	74	92
9100	78	97
10000	82	101
10450	84	104

ASSOCIATED CONDITIONS
LIFT OFF AT 1.1 VS_1
OBSTACLE AT 1.3 VS_1
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC

EXAMPLE	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	7718 LB
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF TOTAL DISTANCE	2200 FT



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-14. Takeoff Total Distance - Flaps 15° (standard units)

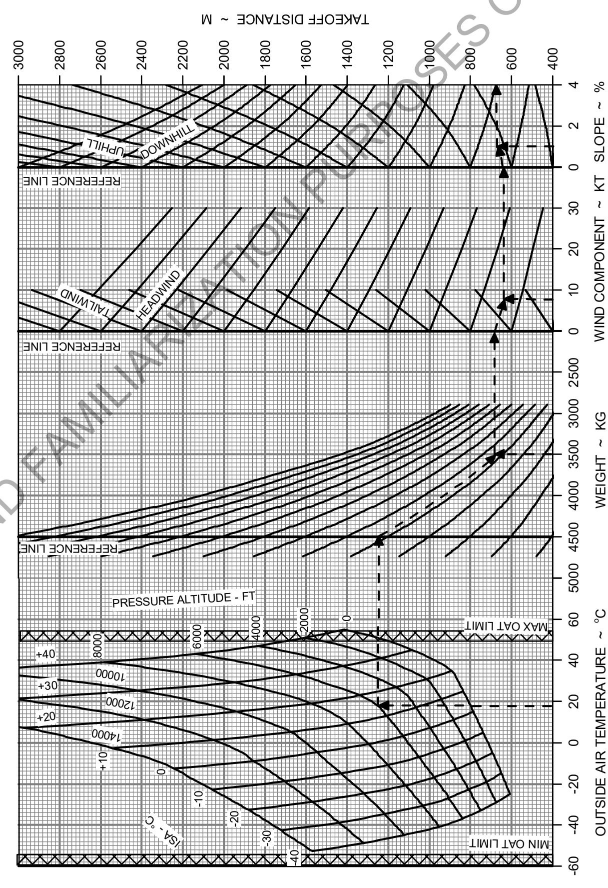
TAKEOFF TOTAL DISTANCE - FLAPS 15°

OVER 15M OBSTACLE; (METRIC UNITS)

WEIGHT - KG	V_R - KIAS	V_{50FT} - KIAS
2900	65	81
3300	69	86
3700	74	92
4100	78	97
4500	82	101
4740	84	104

ASSOCIATED CONDITIONS
LIFT OFF AT $1.1VS_1$
OBSTACLE AT $1.3VS_1$
REFER TO THE SPEED SCHEDULE TABLE
RUNWAY SURFACE: TARMAC

EXAMPLE	
ALTITUDE	6000 FT
OAT	18 °C
WEIGHT	3500 KG
HEADWIND COMPONENT	8 KT
UPHILL COMPONENT	1 %
TAKEOFF TOTAL DISTANCE	680 M



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-15. Takeoff Total Distance - Flaps 15° (metric units)

MAXIMUM CLIMB TORQUE

PROPELLER SPEED 1700 RPM
ICE PROTECTION:
PROBES: ON
WINDSHIELD: ON
INERTIAL SEPERATOR OPERATION CAN REDUCE TORQUE BY 2.2 PSI
DEICE/ANTICE SYSTEMS CAN REDUCE TORQUE BY 3.0 PSI

EXAMPLE:		
ALTITUDE	8000	FT
OAT	26	°C
ENGINE TORQUE	32.25	PSI

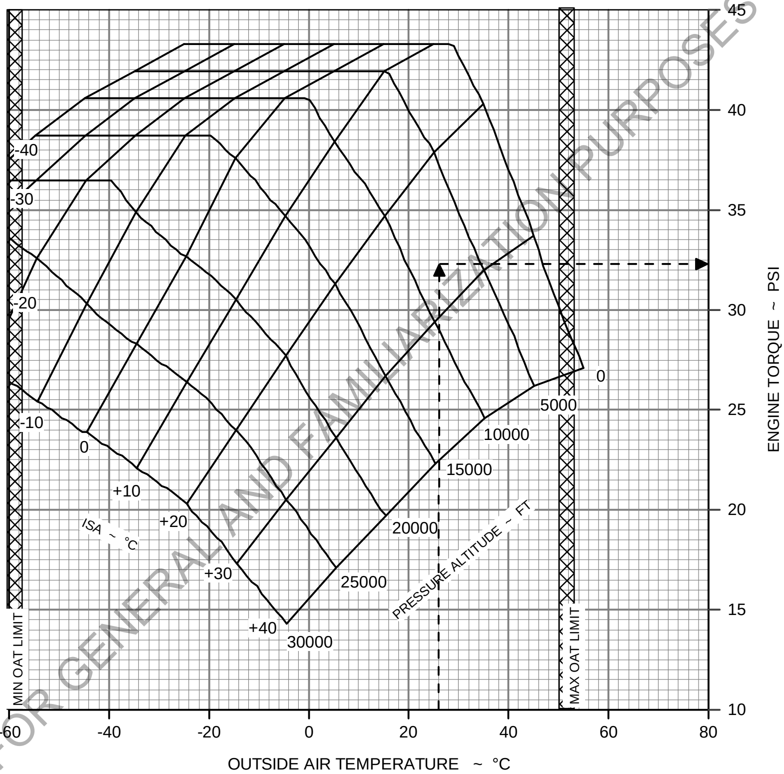
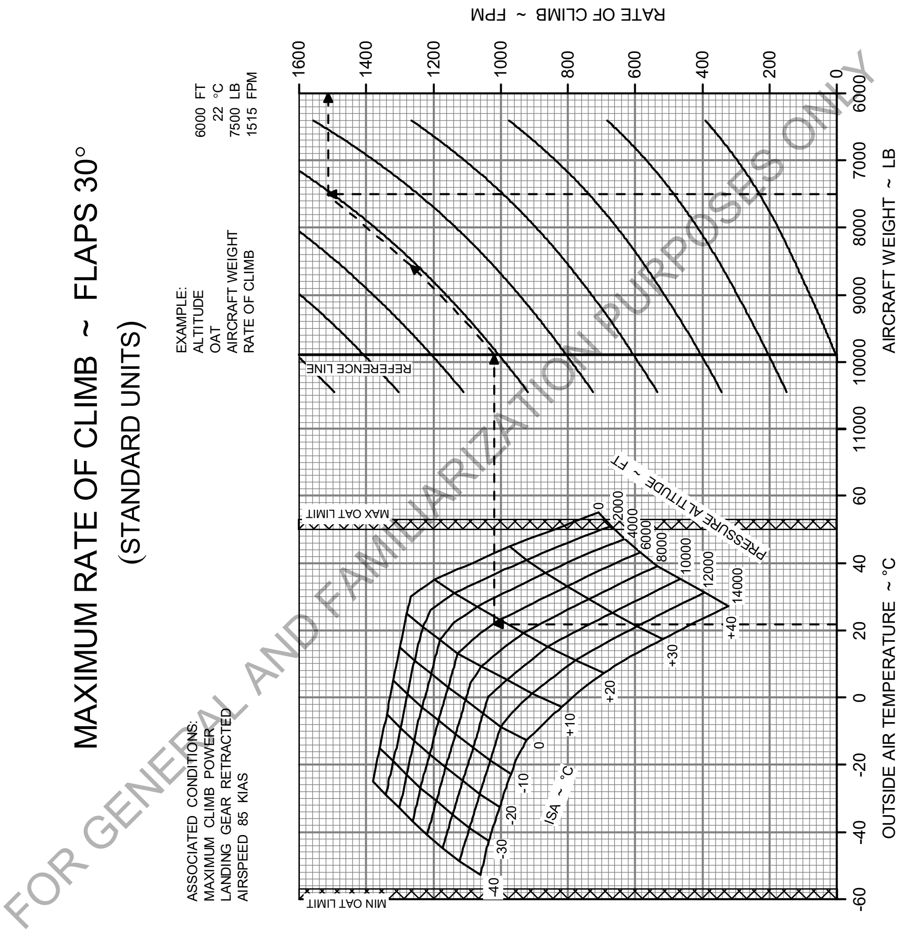


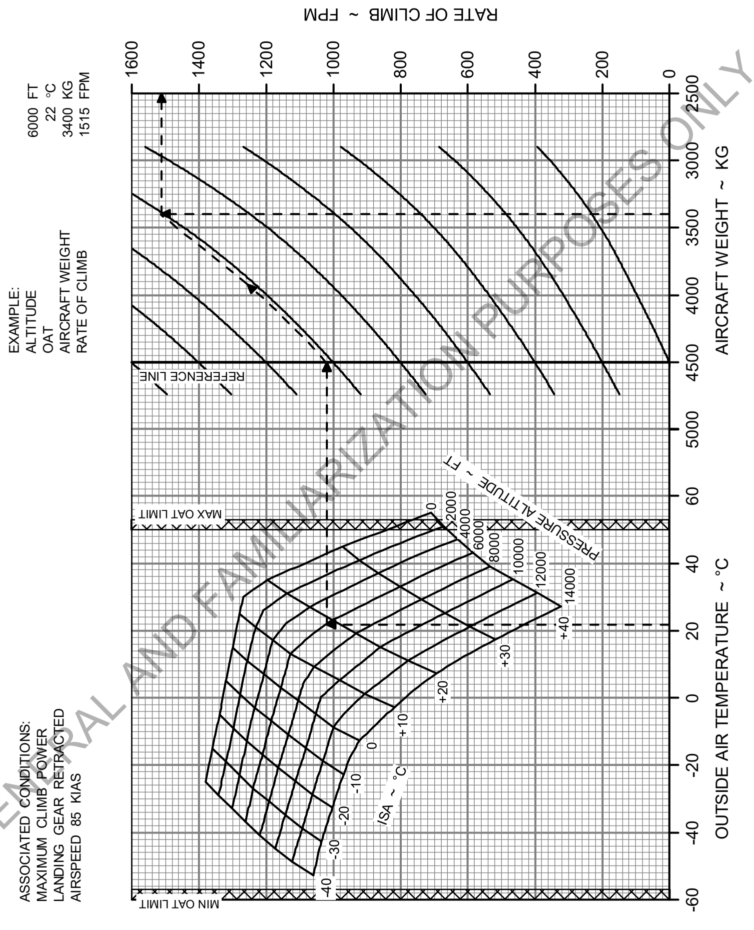
Figure 5-3-16. Maximum Climb Torque



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

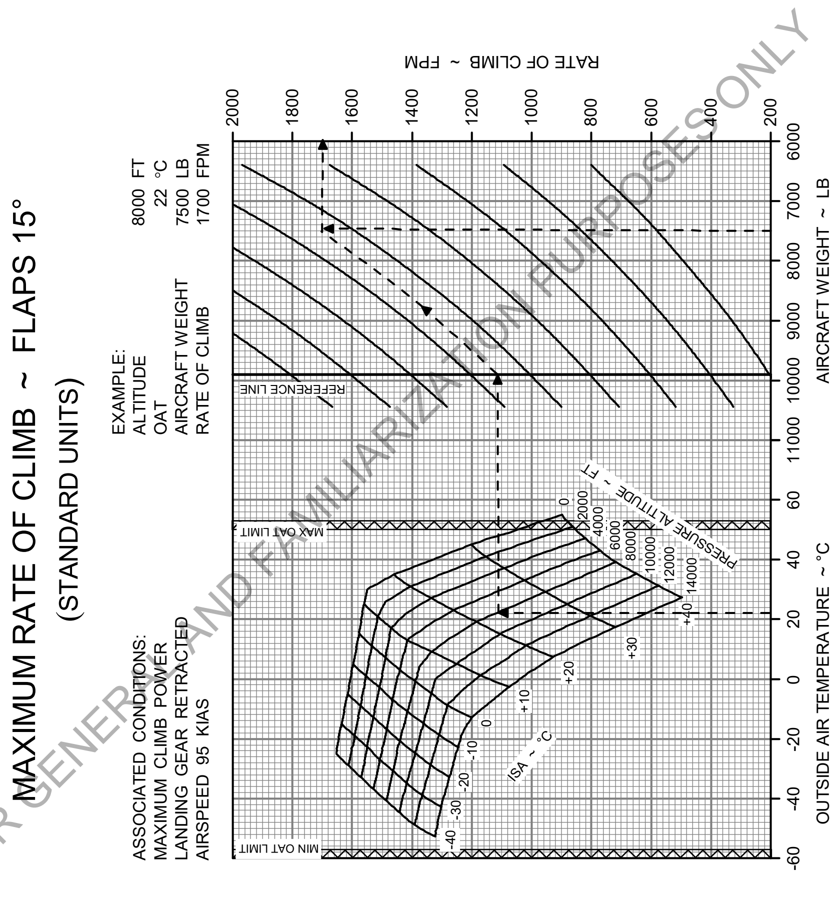
Figure 5-3-17. Maximum Rate of Climb - Flaps 30° (standard units)

MAXIMUM RATE OF CLIMB ~ FLAPS 30°
(METRIC UNITS)



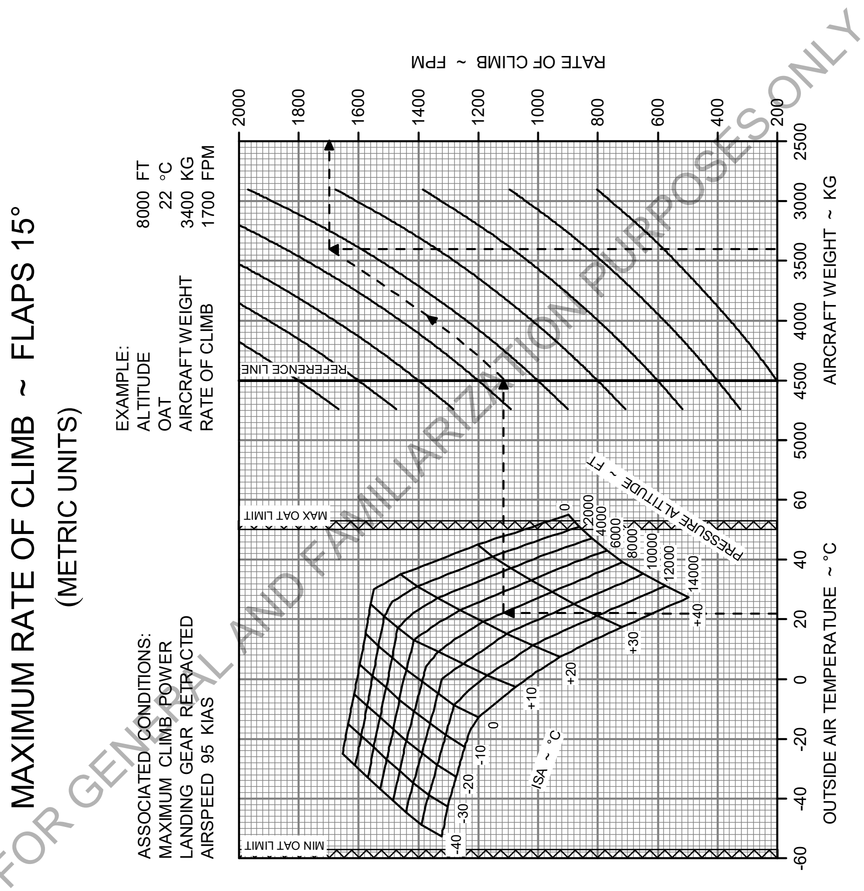
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-18. Maximum Rate of Climb - Flaps 30° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-19. Maximum Rate of Climb - Flaps 15° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

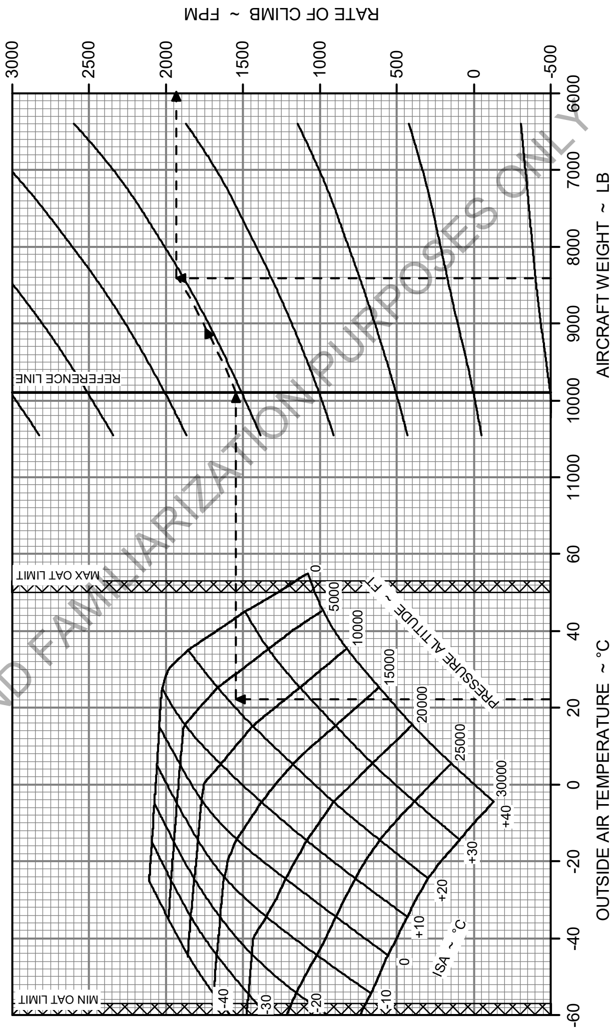
Figure 5-3-20. Maximum Rate of Climb - Flaps 15° (metric units)

MAXIMUM RATE OF CLIMB ~ FLAPS 0°
(STANDARD UNITS)

ALTITUDE ~ FT	AIRSPEED ~ KIAS
0	130
5000	125
15000	125
20000	120
30000	120

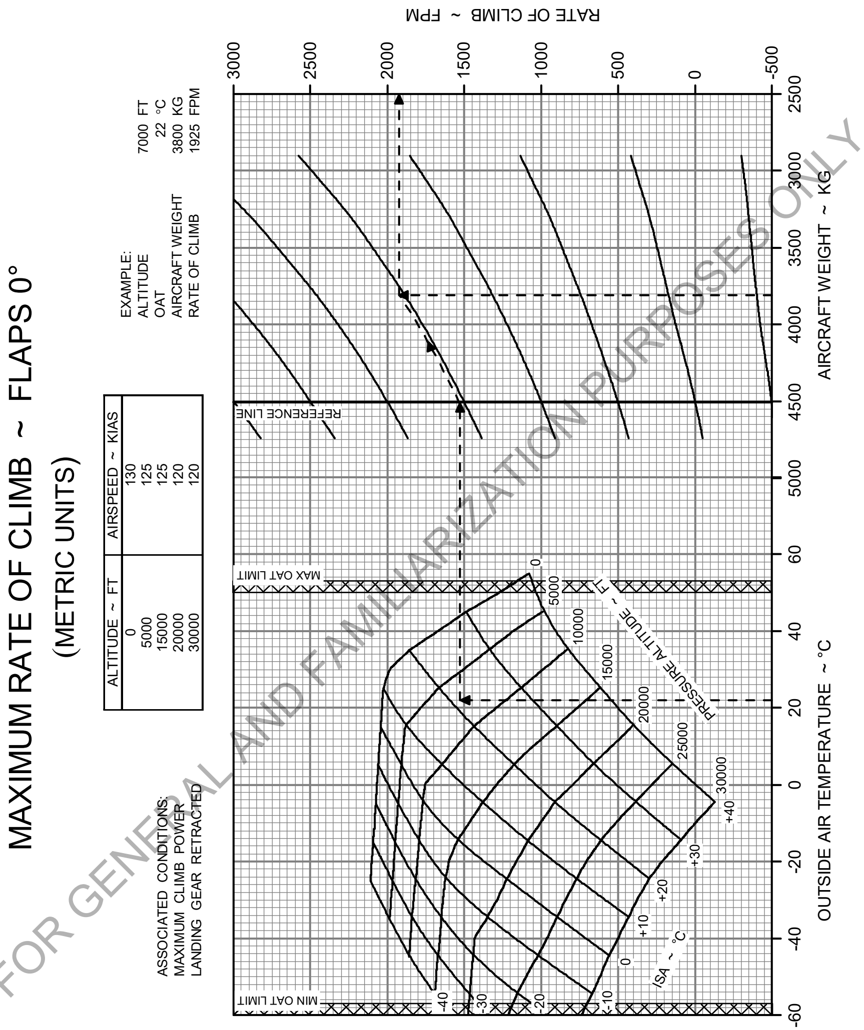
ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED

EXAMPLE:	
ALTITUDE	7000 FT
OAT	22 °C
AIRCRAFT WEIGHT	8400 LB
RATE OF CLIMB	1925 FPM



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-21. Maximum Rate of Climb - Flaps 0° (standard units)



ALTITUDE ~ FT	AIRSPEED ~ KIAS
0	130
5000	125
15000	125
20000	120
30000	120

See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-22. Maximum Rate of Climb - Flaps 0° (metric units)

RATE OF CLIMB ~ CRUISE CLIMB
(STANDARD UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

ALTITUDE ~ FT	AIRSPEED ~ KIAS
0	180
10000	160
20000	140
30000	120

EXAMPLE:

ALTITUDE	7000 FT
OAT	22 °C
AIRCRAFT WEIGHT	8600 LB
RATE OF CLIMB	1450 FPM

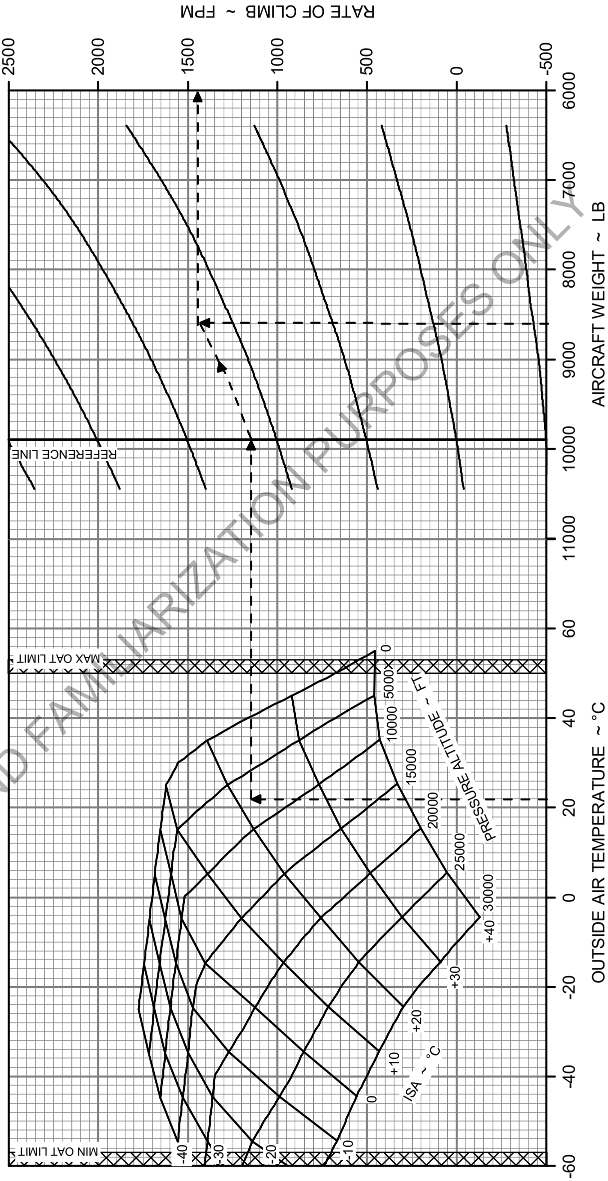


Figure 5-3-23. Rate of Climb - Cruise Climb (standard units)

RATE OF CLIMB ~ CRUISE CLIMB

(METRIC UNITS)

ALTITUDE ~ FT	AIRSPEED ~ KIAS
0	180
10000	160
20000	140
30000	120

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

EXAMPLE:		
ALTITUDE	7000	FT
OAT	22	°C
AIRCRAFT WEIGHT	3900	KG
RATE OF CLIMB	1450	FPM

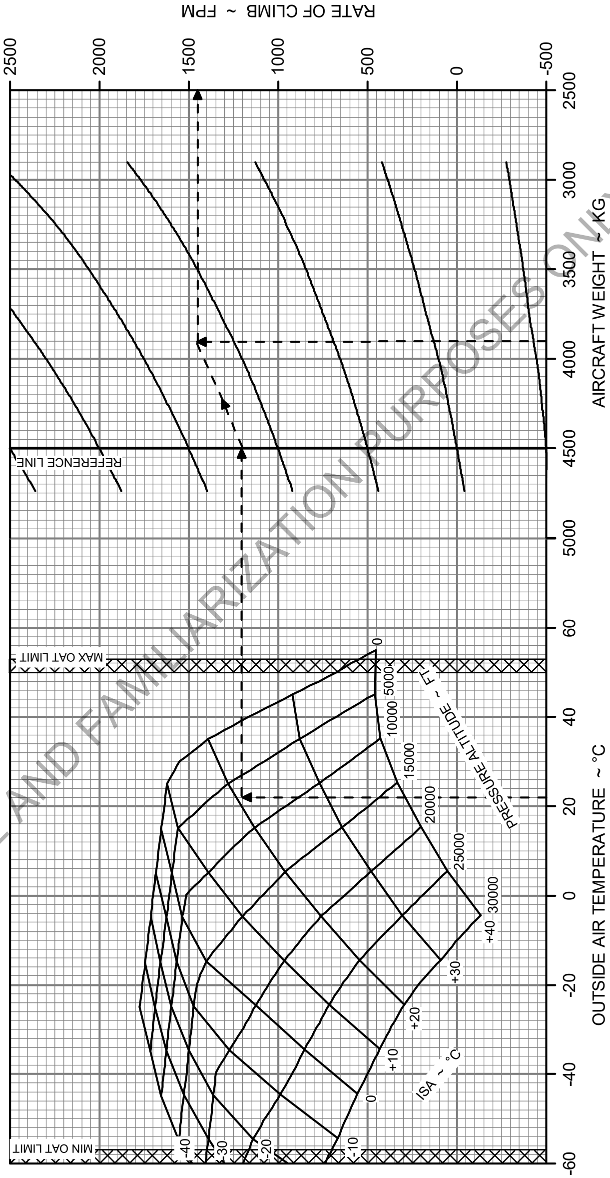


Figure 5-3-24. Rate of Climb - Cruise Climb (metric units)

TIME TO CLIMB ~ CRUISE CLIMB

(STANDARD UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

ALTITUDE ~ FT	AIRSPEED ~ KIAS
0	180
10000	160
20000	140
30000	120

EXAMPLE:

ALTITUDE	25000 FT
OAT	-30 °C
AIRCRAFT WEIGHT	7950 LB
TIME TO CLIMB	13.5 MIN

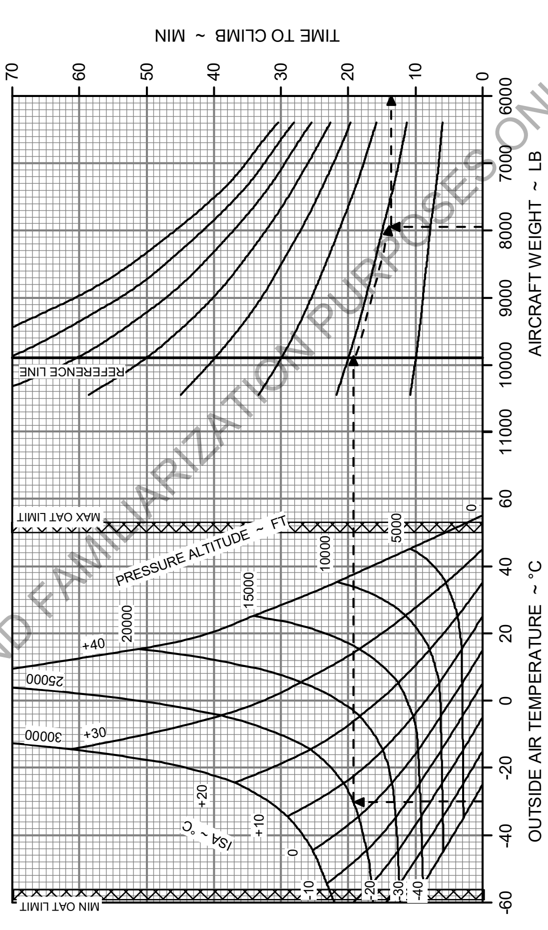


Figure 5-3-25. Time to Climb - Cruise Climb (standard units)

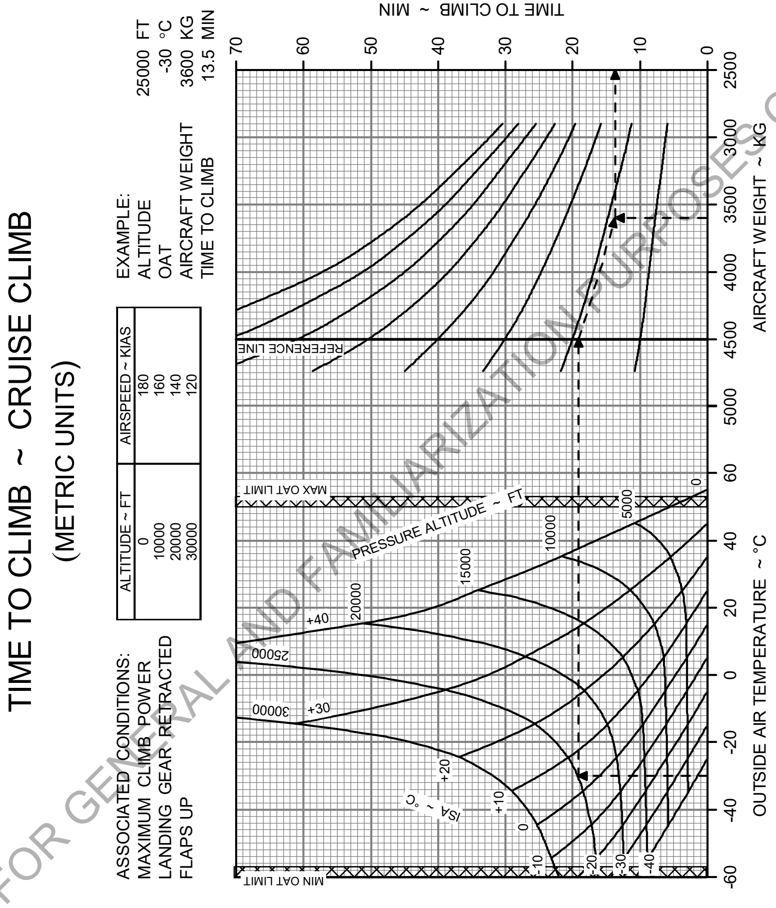


Figure 5-3-26. Time to Climb - Cruise Climb (metric units)

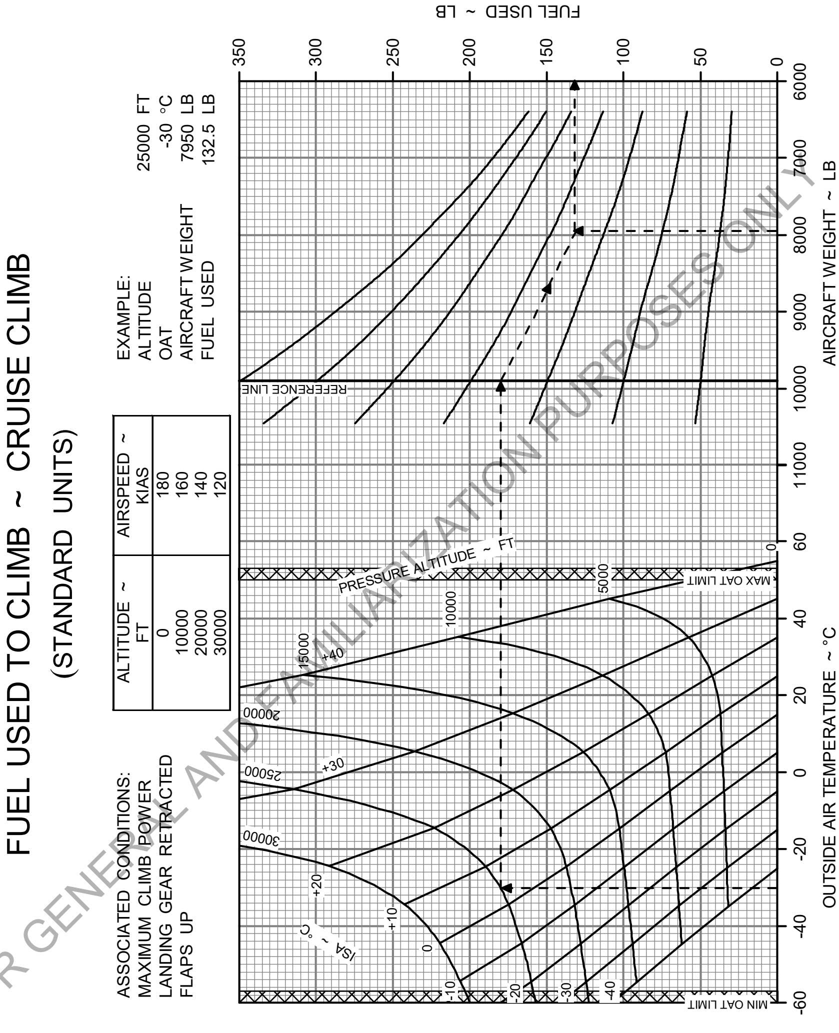


Figure 5-3-27. Fuel Used to Climb - Cruise Climb (standard units)

FUEL USED TO CLIMB ~ CRUISE CLIMB

(METRIC UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

ALTITUDE ~ FT	AIRSPEED ~ KIAS
0	180
10000	160
20000	140
30000	120

EXAMPLE:

ALTITUDE	25000 FT
OAT	-30 °C
AIRCRAFT WEIGHT	3600 KG
FUEL USED	58 KG

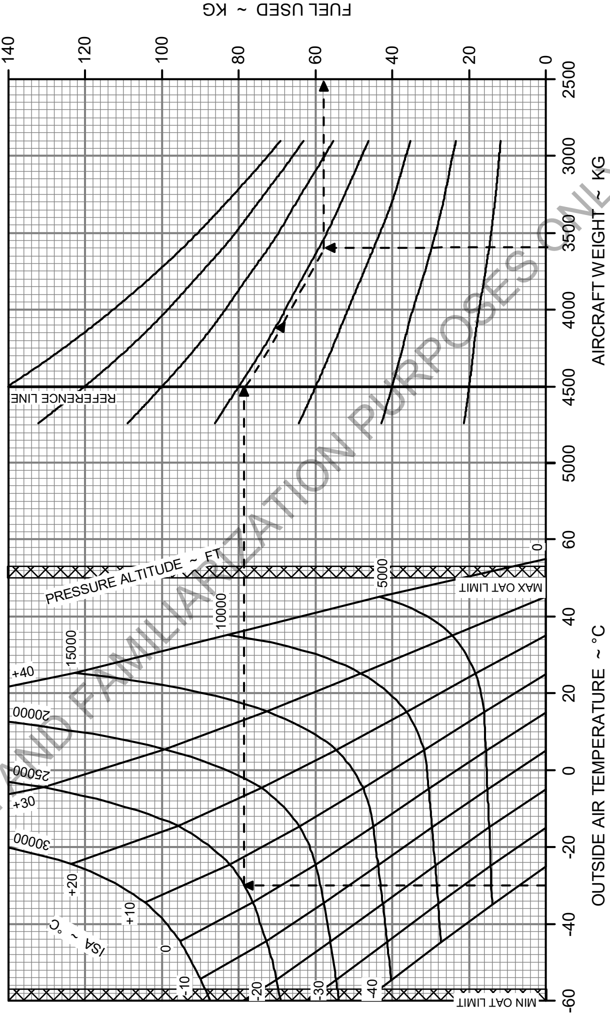


Figure 5-3-28. Fuel Used to Climb - Cruise Climb (metric units)

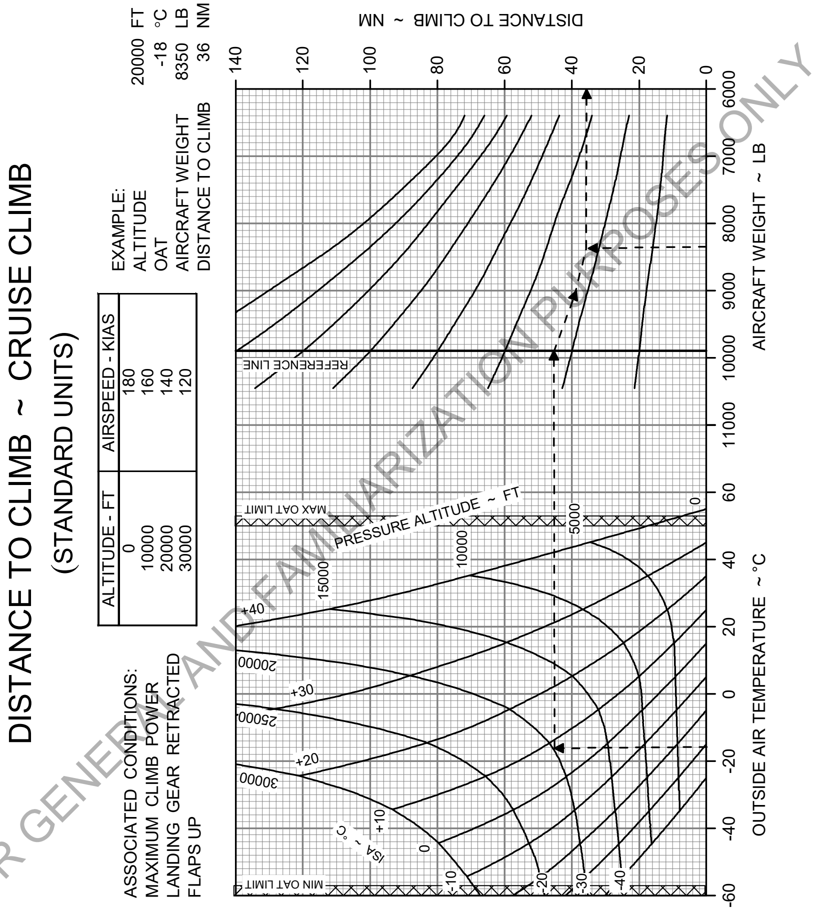


Figure 5-3-29. Distance to Climb - Cruise Climb (standard units)

DISTANCE TO CLIMB ~ CRUISE CLIMB

(METRIC UNITS)

ASSOCIATED CONDITIONS:
MAXIMUM CLIMB POWER
LANDING GEAR RETRACTED
FLAPS UP

ALTITUDE - FT	AIRSPEED - KIAS
0	180
10000	160
20000	140
30000	120

EXAMPLE:
ALTITUDE 20000 FT
OAT -18 °C
AIRCRAFT WEIGHT 3800 KG
DISTANCE TO CLIMB 36 NM

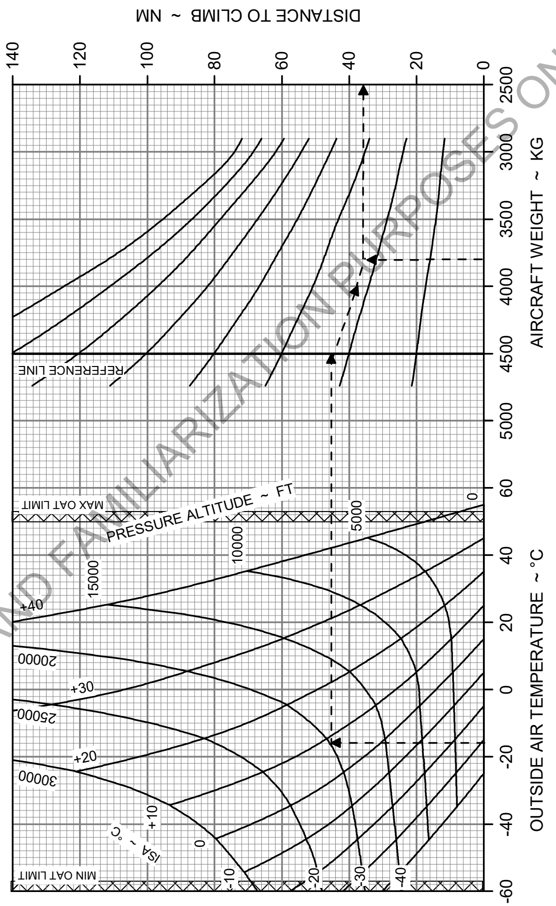


Figure 5-3-30. Distance to Climb - Cruise Climb (metric units)

MAXIMUM CRUISE POWER

NOTE: TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	@ 7000 lb (3175 kg) IAS (kt)	@ 7000 lb (3175 kg) TAS (kt)	@ 8000 lb (3629 kg) IAS (kt)	@ 8000 lb (3629 kg) TAS (kt)	@ 9000 lb (4082 kg) IAS (kt)	@ 9000 lb (4082 kg) TAS (kt)	@ 10000 lb (4536 kg) IAS (kt)	@ 10000 lb (4536 kg) TAS (kt)	@ 10400 lb (4717 kg) IAS (kt)	@ 10400 lb (4717 kg) TAS (kt)
-40	0	-25	36.9	608	276	239	221	238	221	237	220	236	219	236	219
	2000	-29	36.9	590	267	237	226	236	225	235	224	234	223	233	223
	4000	-33	36.9	572	259	235	230	234	229	233	228	232	227	231	227
	6000	-37	36.9	556	252	232	234	232	234	231	233	229	231	229	231
	8000	-41	36.9	541	246	230	239	230	238	229	237	227	236	227	235
	10000	-45	36.9	528	239	228	243	227	243	226	241	225	240	224	239
	12000	-49	36.9	519	236	227	249	226	248	225	247	223	245	223	244
	14000	-53	36.9	511	232	225	254	224	253	223	252	221	250	221	249
	16000	-57	36.9	504	228	223	259	222	258	220	257	219	255	218	254
	18000	-61	36.9	495	224	220	264	220	263	218	261	216	260	216	259
	20000	-65	36.5	483	219	217	269	216	267	215	265	213	263	212	263
	22000	-69	34.7	457	207	209	267	209	267	209	267	208	265	207	265
	24000	-73	32.1	423	192	200	264	200	264	200	264	200	264	200	264
	26000	-77	29.7	391	177	192	262	192	262	192	262	192	262	192	262
	28000	-81	27.2	359	163	184	259	184	259	184	259	184	259	184	259
	30000	-84	25.2	333	151	176	256	176	256	176	256	176	256	176	256
-30	0	-15	36.9	614	279	237	224	236	223	235	223	234	222	233	221
	2000	-19	36.9	596	270	235	228	234	227	233	227	232	225	231	225
	4000	-23	36.9	578	262	232	233	232	232	231	231	230	230	229	229
	6000	-27	36.9	562	255	230	237	230	236	229	235	227	234	227	233
	8000	-31	36.9	547	248	228	242	227	241	226	240	225	238	224	237
	10000	-35	36.9	533	242	226	246	225	245	224	244	222	242	222	242
	12000	-39	36.9	524	238	224	252	223	251	222	249	221	248	220	247
	14000	-43	36.9	517	234	223	257	222	256	220	255	219	253	218	252
	16000	-47	36.9	508	231	221	263	220	262	218	260	217	258	216	257
	18000	-51	36.9	499	226	218	268	217	267	216	265	214	263	214	262
	20000	-55	36.5	487	221	215	272	214	271	212	269	211	267	210	266
	22000	-59	35.4	469	213	209	273	209	273	208	271	206	269	205	269
	24000	-63	32.8	434	197	201	271	201	271	201	271	201	271	201	271
	26000	-67	30.0	398	180	192	268	192	268	192	268	192	268	192	268
	28000	-71	28.0	372	169	184	266	184	266	184	266	184	266	184	266
	30000	-74	26.0	346	157	176	263	176	263	176	263	176	263	176	263

Values applicable with inertial separator closed

Figure 5-3-31. Maximum Cruise Power (Sheet 1 of 4)

MAXIMUM CRUISE POWER

NOTE: TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

ISA (ºC)	Altitude (ft)	SAT (ºC)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	@ 7000 lb (3175 kg) IAS (kt)	@ 7000 lb (3175 kg) TAS (kt)	@ 8000 lb (3629 kg) IAS (kt)	@ 8000 lb (3629 kg) TAS (kt)	@ 9000 lb (4082 kg) IAS (kt)	@ 9000 lb (4082 kg) TAS (kt)	@ 10000 lb (4536 kg) IAS (kt)	@ 10000 lb (4536 kg) TAS (kt)	@ 10400 lb (4717 kg) IAS (kt)	@ 10400 lb (4717 kg) TAS (kt)
-20	0	-5	36.9	621	282	235	226	234	226	233	225	232	224	231	223
	2000	-9	36.9	602	273	233	231	232	230	231	229	230	228	229	227
	4000	-13	36.9	584	265	230	235	230	234	229	233	227	232	227	231
	6000	-17	36.9	567	257	228	239	227	239	226	238	225	236	224	236
	8000	-21	36.9	553	251	226	244	225	243	224	242	223	240	222	240
	10000	-25	36.9	538	244	224	249	223	248	222	247	220	245	219	244
	12000	-29	36.9	530	240	222	254	221	253	220	252	218	250	218	249
	14000	-33	36.9	522	237	220	260	219	259	218	257	216	255	216	255
	16000	-37	36.9	513	233	218	266	218	265	216	263	214	261	214	260
	18000	-41	36.9	504	229	217	272	216	271	214	269	212	267	212	266
	20000	-45	36.5	492	223	214	277	213	275	211	273	209	271	209	271
	22000	-49	35.6	476	216	209	280	208	278	207	276	205	274	205	274
	24000	-53	33.1	442	200	200	277	200	277	200	277	200	277	200	276
	26000	-57	30.9	412	187	192	275	192	275	192	275	192	275	192	275
	28000	-61	28.6	383	174	184	272	184	272	184	272	184	272	184	272
	30000	-64	26.8	359	163	176	270	176	270	176	270	176	270	176	270
-10	0	5	36.9	627	285	233	229	232	228	231	227	230	226	229	225
	2000	1	36.9	608	276	231	233	230	232	229	231	228	230	227	229
	4000	-3	36.9	590	268	228	237	228	237	227	236	225	234	225	234
	6000	-7	36.9	573	260	226	242	225	241	224	240	223	238	222	238
	8000	-11	36.9	558	253	224	247	223	246	222	244	220	243	220	242
	10000	-15	36.9	544	247	222	251	221	251	219	249	218	247	217	247
	12000	-19	36.9	535	243	220	257	219	256	218	254	216	253	215	252
	14000	-23	36.9	527	239	218	263	217	262	216	260	214	258	214	257
	16000	-27	36.9	518	235	216	269	216	268	214	266	213	264	212	264
	18000	-31	36.9	509	231	215	276	214	274	213	273	211	271	210	270
	20000	-35	36.5	496	225	213	282	212	280	210	278	208	276	208	275
	22000	-39	35.6	480	218	209	285	207	283	206	281	204	279	203	278
	24000	-43	34.1	457	207	201	284	201	284	200	282	198	280	197	278
	26000	-47	31.5	423	192	192	281	192	281	192	281	189	277	188	275
	28000	-51	29.5	396	180	184	279	184	279	183	277	180	273	179	271
	30000	-54	27.4	368	167	176	276	176	276	175	274	171	269	170	266

Values applicable with inertial separator closed

Figure 5-3-31. Maximum Cruise Power (Sheet 2 of 4)

MAXIMUM CRUISE POWER

NOTE: TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

						@ 7000 lb (3175 kg)		@ 8000 lb (3629 kg)		@ 9000 lb (4082 kg)		@ 10000 lb (4536 kg)		@ 10400 lb (4717 kg)	
ISA (ºC)	Altitude (ft)	SAT (ºC)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)
0	0	15	36.9	633	287	231	231	230	230	229	229	228	228	227	227
	2000	11	36.9	614	278	229	235	228	234	227	234	226	232	225	231
	4000	7	36.9	596	270	226	240	226	239	225	238	223	236	223	236
	6000	3	36.9	579	262	224	244	223	244	222	242	221	241	220	240
	8000	-1	36.9	563	255	222	249	221	248	220	247	218	245	218	244
	10000	-5	36.9	549	249	220	254	219	253	217	252	216	250	215	249
	12000	-9	36.9	539	245	218	260	217	259	216	257	214	256	214	255
	14000	-13	36.9	532	241	217	266	216	265	214	263	213	262	212	261
	16000	-17	36.9	522	237	215	273	214	272	213	270	211	268	211	267
	18000	-21	36.9	513	233	214	280	213	278	211	276	210	274	209	273
	20000	-25	36.2	497	225	211	285	209	283	208	280	206	278	205	277
	22000	-29	34.2	467	212	204	285	202	282	200	280	198	277	197	275
	24000	-33	32.1	438	199	197	284	195	281	193	278	190	275	189	273
	26000	-37	30.1	409	186	189	282	187	279	185	276	181	272	180	270
	28000	-41	28.0	381	173	181	280	179	277	176	272	173	268	171	266
	30000	-44	25.9	354	161	173	277	170	273	167	268	164	263	162	260
10	0	25	36.9	641	291	229	233	228	232	227	231	226	230	225	229
	2000	21	36.9	620	281	227	237	226	237	225	236	224	234	223	234
	4000	17	36.9	602	273	225	242	224	241	223	240	221	238	221	238
	6000	13	36.9	585	265	222	247	222	246	220	245	219	243	218	242
	8000	9	36.9	568	258	220	252	219	251	218	249	217	248	216	247
	10000	5	36.9	554	251	218	257	218	256	216	255	215	253	214	252
	12000	1	36.9	545	247	217	264	216	262	215	261	213	259	213	258
	14000	-3	36.9	537	244	216	270	215	269	213	267	212	265	211	264
	16000	-7	36.9	528	239	214	277	213	275	211	273	209	271	209	270
	18000	-11	35.2	499	226	209	278	207	276	205	274	203	272	203	271
	20000	-15	33.4	470	213	203	279	201	277	199	274	197	272	196	270
	22000	-19	31.6	443	201	196	279	194	276	192	274	189	270	188	268
	24000	-23	29.8	416	189	189	279	187	276	185	272	182	268	180	266
	26000	-27	27.9	388	176	181	277	179	274	176	270	173	265	172	263
	28000	-31	25.9	361	164	174	275	171	271	168	266	164	260	163	258
	30000	-34	23.9	334	152	166	272	162	267	159	261	155	255	153	252

Values applicable with inertial separator closed

Figure 5-3-31. Maximum Cruise Power (Sheet 3 of 4)

MAXIMUM CRUISE POWER

NOTE: TORQUE AND FUEL FLOW BASED ON 8000 lb (3629 kg)

						@ 7000 lb (3175 kg)		@ 8000 lb (3629 kg)		@ 9000 lb (4082 kg)		@ 10000 lb (4536 kg)		@ 10400 lb (4717 kg)	
ISA (ºC)	Altitude (ft)	SAT (ºC)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)	IAS (kt)	TAS (kt)
20	0	35	36.9	647	294	227	235	227	234	226	233	224	232	224	231
	2000	31	36.9	627	284	225	240	224	239	223	238	222	236	221	236
	4000	27	36.9	608	276	223	244	222	244	221	242	220	241	219	240
	6000	23	36.9	591	268	221	250	220	249	219	247	218	246	217	245
	8000	19	36.9	574	260	219	255	218	254	217	253	216	251	215	250
	10000	15	36.9	560	254	217	261	216	260	215	258	214	256	213	255
	12000	11	36.2	542	246	214	265	213	264	212	262	210	260	209	259
	14000	7	34.8	520	236	209	267	208	266	206	263	205	261	204	260
	16000	3	33.2	493	224	204	269	202	267	201	264	199	262	198	261
	18000	-1	31.5	465	211	198	270	196	267	194	265	192	262	191	260
	20000	-5	29.9	438	198	192	270	190	268	188	265	185	261	184	260
	22000	-9	28.4	412	187	186	270	184	268	181	264	178	260	177	258
	24000	-13	26.9	387	175	179	270	177	267	174	263	171	258	170	256
	26000	-17	25.2	362	164	172	269	170	265	166	260	163	254	161	252
	28000	-21	23.4	336	153	165	267	162	261	158	256	154	250	152	247
	30000	-24	21.7	313	142	157	263	153	258	150	251	145	244	143	240
30	0	45	35.5	641	291	223	234	222	233	221	232	219	230	219	230
	2000	41	35.4	618	280	220	238	220	238	218	236	217	235	216	234
	4000	37	34.8	592	269	217	242	217	241	215	240	214	238	213	237
	6000	33	33.8	565	256	213	245	212	244	211	242	209	240	209	240
	8000	29	32.7	538	244	209	247	207	246	206	244	204	242	203	241
	10000	25	31.6	512	232	204	249	202	247	201	245	199	243	198	242
	12000	21	30.6	491	223	200	252	198	249	196	247	194	245	193	243
	14000	17	29.5	470	213	195	253	193	251	191	249	189	246	188	244
	16000	13	28.2	446	202	190	255	188	252	186	250	183	246	182	245
	18000	9	26.9	421	191	184	256	182	253	180	250	177	246	176	244
	20000	5	25.6	396	180	179	257	177	254	174	250	171	245	169	243
	22000	1	24.3	372	169	173	256	170	253	167	248	164	243	162	241
	24000	-3	23.0	349	158	167	256	163	252	160	246	156	241	155	239
	26000	-7	21.4	326	148	159	254	156	249	152	243	148	236	146	233
	28000	-11	19.9	302	137	152	251	148	245	144	238	139	230	136	226
	30000	-14	18.5	281	128	144	248	140	241	135	232	129	221	124	213

Values applicable with inertial separator closed

Figure 5-3-31. Maximum Cruise Power (Sheet 4 of 4)

LONG RANGE CRUISE

ISA (°C)	Altitude (ft)	SAT (°C)	@ 7000 lb (3175 kg) Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	@ 8000 lb (3629 kg) Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	@ 9000 lb (4082 kg) Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	@ 10000 lb (4536 kg) Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	@ 10400 lb (4717 kg) Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
-40	0	-25	20.0	443	201	187	173	20.0	443	201	185	172	20.0	443	201	183	170	20.0	443	201	181	168	20.0	443	201	179	167
	2000	-29	19.6	421	191	184	175	19.7	423	192	182	174	19.9	424	193	181	173	19.9	425	193	178	170	19.9	425	193	178	169
	4000	-33	19.2	401	182	180	177	19.5	404	183	180	177	19.7	407	184	179	175	19.7	407	185	176	173	19.9	408	185	176	172
	6000	-37	18.8	381	173	177	179	19.2	386	175	177	179	19.6	390	177	177	178	19.6	390	177	174	176	19.8	392	178	174	175
	8000	-41	18.4	363	165	174	181	18.9	368	167	175	181	19.5	374	170	174	181	19.5	374	170	172	178	19.7	377	171	172	178
	10000	-45	18.0	345	157	171	183	18.7	352	160	172	184	19.3	359	163	172	184	19.3	359	163	170	181	19.7	362	164	170	182
	12000	-49	17.6	332	151	169	186	18.4	340	154	170	187	19.2	348	158	170	188	19.2	348	158	168	185	19.6	352	160	168	185
	14000	-53	17.2	319	145	166	189	18.1	328	149	168	190	19.1	337	153	169	192	19.1	337	153	166	188	19.5	342	155	167	189
	16000	-57	16.8	305	138	164	192	17.9	315	143	166	194	18.9	326	148	167	195	18.9	326	148	164	192	19.5	331	150	165	193
	18000	-61	16.4	291	132	161	194	17.6	303	137	163	197	18.8	314	142	165	199	18.8	314	143	162	195	19.4	320	145	163	197
	20000	-65	16.0	277	126	157	196	17.3	290	132	160	200	18.7	303	137	163	203	18.7	303	137	160	199	19.3	309	140	161	201
	22000	-69	15.6	264	120	154	198	17.1	278	126	157	202	18.5	292	133	160	206	18.5	293	133	157	202	19.3	300	136	159	204
	24000	-73	15.2	251	114	150	199	16.8	267	121	154	204	18.4	282	128	157	208	18.4	282	128	154	204	19.2	290	132	156	206
	26000	-77	14.8	240	109	146	200	16.5	257	116	150	206	18.3	273	124	154	211	18.3	274	124	150	206	19.1	282	128	152	209
	28000	-81	14.4	229	104	142	201	16.3	247	112	146	208	18.1	265	120	151	213	18.1	265	120	147	208	19.1	274	124	149	211
	30000	-84	14.0	219	99	137	202	16.0	238	108	143	209	18.0	257	117	147	216	18.0	258	117	143	209	19.0	268	122	145	213
-30	0	-15	20.0	447	203	185	175	20.0	447	203	184	174	20.0	447	203	182	172	20.0	448	203	179	169	20.0	448	203	178	168
	2000	-19	19.6	426	193	182	177	19.7	428	194	181	176	19.9	429	195	180	175	19.9	429	195	177	172	19.9	430	195	176	172
	4000	-23	19.2	406	184	179	179	19.5	409	185	179	179	19.7	411	187	177	178	19.7	412	187	175	175	19.9	413	187	174	175
	6000	-27	18.8	386	175	176	182	19.2	390	177	176	181	19.6	394	179	175	181	19.6	394	179	173	178	19.8	397	180	173	178
	8000	-31	18.4	367	167	173	184	18.9	373	169	174	184	19.5	378	172	173	184	19.5	378	172	171	181	19.7	381	173	171	181
	10000	-35	18.0	349	158	171	186	18.7	356	162	171	187	19.3	363	165	171	187	19.3	363	165	169	184	19.7	366	166	169	184
	12000	-39	17.6	336	152	168	189	18.4	344	156	169	190	19.2	352	159	169	191	19.2	352	159	167	188	19.6	356	161	167	188
	14000	-43	17.2	323	146	165	192	18.1	332	150	166	193	19.1	341	155	168	194	19.1	341	155	165	191	19.5	346	157	165	192
	16000	-47	16.8	309	140	162	194	17.9	319	145	164	196	18.9	330	149	165	198	18.9	330	150	162	194	19.5	335	152	163	195
	18000	-51	16.4	294	133	159	196	17.6	306	139	161	199	18.8	318	144	163	202	18.8	318	144	160	197	19.4	323	147	161	199
	20000	-55	16.0	281	127	156	198	17.3	293	133	158	202	18.7	306	139	161	205	18.7	306	139	158	201	19.3	313	142	159	203
	22000	-59	15.6	267	121	152	200	17.1	281	128	155	204	18.5	296	134	158	208	18.5	296	134	155	204	19.3	303	137	156	206
	24000	-63	15.2	254	115	148	201	16.8	270	122	152	207	18.4	285	129	155	211	18.4	286	130	152	206	19.2	293	133	154	209
	26000	-67	14.8	242	110	144	203	16.5	259	118	149	209	18.3	276	125	152	214	18.3	276	125	148	209	19.1	285	129	150	211
	28000	-71	14.4	232	105	140	204	16.3	250	113	145	211	18.1	268	121	149	216	18.1	268	122	145	210	19.1	277	126	147	213
	30000	-74	14.0	221	100	136	205	16.0	241	109	141	212	18.0	260	118	146	219	18.0	260	118	141	212	19.0	271	123	143	216

Figure 5-3-32. Long Range Cruise (Sheet 1 of 4)

LONG RANGE CRUISE

ISA	Altitude	SAT	@ 7000 lb (3175 kg)					@ 8000 lb (3629 kg)					@ 9000 lb (4082 kg)					@ 10000 lb (4536 kg)					@ 10400 lb (4717 kg)				
(°C)	(ft)	(°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
-20	0	-5	20.0	452	205	184	177	20.0	452	205	182	176	20.0	452	205	180	174	20.0	452	205	178	171	20.0	452	205	177	171
	2000	-9	19.6	430	195	181	180	19.7	432	196	180	178	19.9	434	197	178	177	19.9	434	197	176	174	19.9	435	197	175	174
	4000	-13	19.2	410	186	178	182	19.5	413	187	178	181	19.7	416	189	176	180	19.7	416	189	174	178	19.9	418	189	173	177
	6000	-17	18.8	390	177	175	184	19.2	394	179	175	184	19.6	399	181	174	183	19.6	399	181	172	181	19.8	401	182	172	180
	8000	-21	18.4	371	168	173	187	18.9	377	171	173	187	19.5	383	173	172	187	19.5	383	173	170	184	19.7	385	175	170	184
	10000	-25	18.0	353	160	170	189	18.7	360	163	170	190	19.3	367	166	170	190	19.3	367	166	167	186	19.7	370	168	167	187
	12000	-29	17.6	339	154	167	192	18.4	347	158	167	192	19.2	355	161	168	193	19.2	356	161	165	190	19.6	360	163	165	190
	14000	-33	17.2	326	148	164	194	18.1	335	152	165	195	19.1	345	156	166	197	19.1	345	156	163	193	19.5	350	159	163	194
	16000	-37	16.8	312	142	160	196	17.9	323	146	162	198	18.9	333	151	164	200	18.9	333	151	160	196	19.5	339	154	161	197
	18000	-41	16.4	298	135	157	198	17.6	309	140	159	201	18.8	321	146	161	204	18.8	321	146	158	199	19.4	327	148	159	201
	20000	-45	16.0	284	129	154	201	17.3	297	135	157	204	18.7	310	140	159	207	18.7	310	141	155	203	19.3	316	143	157	205
	22000	-49	15.6	270	123	150	202	17.1	285	129	153	206	18.5	299	135	156	210	18.5	299	136	153	206	19.3	306	139	154	208
	24000	-53	15.2	257	117	146	204	16.8	273	124	150	209	18.4	288	131	153	213	18.4	289	131	149	208	19.2	296	134	151	210
	26000	-57	14.8	245	111	142	205	16.5	262	119	147	211	18.3	279	127	150	216	18.3	279	127	146	210	19.1	288	130	148	213
	28000	-61	14.4	234	106	138	206	16.3	252	114	143	213	18.1	270	123	147	219	18.1	271	123	143	213	19.1	280	127	145	216
	30000	-64	14.0	224	101	134	207	16.0	243	110	140	215	18.0	263	119	144	222	18.0	263	119	139	215	19.0	274	124	141	218
-10	0	5	20.0	457	207	183	180	20.0	457	207	181	178	20.0	457	207	179	176	20.0	457	207	177	174	20.0	457	207	176	173
	2000	1	19.6	435	197	180	182	19.7	437	198	179	181	19.9	438	199	178	179	19.9	438	199	175	177	19.9	439	199	174	176
	4000	-3	19.2	414	188	177	185	19.5	418	189	177	184	19.7	421	191	175	183	19.7	421	191	173	180	19.9	422	192	172	179
	6000	-7	18.8	394	179	175	187	19.2	399	181	174	187	19.6	403	183	173	186	19.6	403	183	171	183	19.8	406	184	170	183
	8000	-11	18.4	375	170	171	189	18.9	381	173	171	189	19.5	387	175	171	189	19.5	387	175	168	186	19.7	390	177	168	185
	10000	-15	18.0	357	162	168	191	18.7	364	165	168	192	19.3	371	168	168	192	19.3	371	168	165	188	19.7	375	170	166	188
	12000	-19	17.6	343	156	165	194	18.4	351	159	166	194	19.2	359	163	166	195	19.2	359	163	163	191	19.6	363	165	164	192
	14000	-23	17.2	330	150	162	196	18.1	339	154	163	197	19.1	349	158	164	198	19.1	349	158	161	195	19.5	353	160	161	195
	16000	-27	16.8	316	143	159	198	17.9	326	148	160	200	18.9	337	153	162	202	18.9	337	153	158	198	19.5	342	155	159	199
	18000	-31	16.4	301	136	156	201	17.6	313	142	158	203	18.8	324	147	159	205	18.8	325	147	156	201	19.4	331	150	157	203
	20000	-35	16.0	287	130	152	203	17.3	300	136	155	206	18.7	313	142	157	209	18.7	313	142	154	204	19.3	320	145	155	206
	22000	-39	15.6	273	124	148	204	17.1	288	130	151	208	18.5	302	137	154	212	18.5	302	137	150	207	19.3	309	140	152	209
	24000	-43	15.2	260	118	145	206	16.8	276	125	148	211	18.4	291	132	151	215	18.4	291	132	147	209	19.2	299	136	149	212
	26000	-47	14.8	248	112	141	207	16.5	265	120	145	213	18.3	282	128	148	218	18.3	282	128	144	212	19.1	291	132	146	214
	28000	-51	14.4	237	107	137	208	16.3	255	116	141	215	18.1	273	124	145	221	18.1	274	124	140	214	19.1	283	128	143	217
	30000	-54	14.0	226	102	133	209	16.0	245	111	138	217	18.0	266	121	142	224	18.0	266	121	137	216	19.0	277	126	139	219

Figure 5-3-32. Long Range Cruise (Sheet 2 of 4)

LONG RANGE CRUISE

			@ 7000 lb (3175 kg)					@ 8000 lb (3629 kg)					@ 9000 lb (4082 kg)					@ 10000 lb (4536 kg)					@ 10400 lb (4717 kg)				
ISA (ºC)	Altitude (ft)	SAT (ºC)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
0	0	15	20.0	461	209	182	182	20.0	461	209	181	181	20.0	461	209	179	179	20.0	461	209	176	176	20.0	461	209	175	175
	2000	11	19.6	439	199	179	185	19.7	440	200	178	184	19.9	442	201	177	182	19.9	442	201	174	179	19.9	443	201	173	178
	4000	7	19.2	418	190	176	187	19.5	421	191	176	186	19.7	424	192	174	185	19.7	424	192	172	182	19.9	426	193	171	181
	6000	3	18.8	398	180	173	189	19.2	402	183	173	189	19.6	407	185	172	188	19.6	407	185	169	185	19.8	409	186	169	184
	8000	-1	18.4	379	172	170	191	18.9	384	174	170	191	19.5	390	177	169	190	19.5	390	177	166	187	19.7	393	178	166	187
	10000	-5	18.0	360	163	167	193	18.7	367	167	167	193	19.3	374	170	167	193	19.3	375	170	164	190	19.7	378	171	164	190
	12000	-9	17.6	346	157	164	196	18.4	354	161	164	196	19.2	362	164	165	197	19.2	362	164	161	193	19.6	366	166	162	194
	14000	-13	17.2	333	151	161	198	18.1	342	155	161	199	19.1	352	159	162	200	19.1	352	159	159	196	19.5	356	162	160	197
	16000	-17	16.8	318	144	157	200	17.9	329	149	159	202	18.9	340	154	160	204	18.9	340	154	157	200	19.5	345	157	157	201
	18000	-21	16.4	303	137	154	203	17.6	315	143	156	205	18.8	327	148	158	207	18.8	327	148	154	203	19.4	333	151	155	204
	20000	-25	16.0	289	131	151	205	17.3	302	137	153	208	18.7	315	143	155	211	18.7	315	143	152	206	19.3	322	146	153	208
	22000	-29	15.6	275	125	147	206	17.1	289	131	150	210	18.5	304	138	152	214	18.5	304	138	148	208	19.3	311	141	150	210
	24000	-33	15.2	262	119	143	208	16.8	278	126	146	213	18.4	293	133	149	217	18.4	293	133	145	211	19.2	301	137	147	213
	26000	-37	14.8	250	113	139	209	16.5	267	121	143	215	18.3	284	129	146	220	18.3	284	129	142	213	19.1	293	133	143	216
	28000	-41	14.4	238	108	135	210	16.3	256	116	139	217	18.1	276	125	143	223	18.1	276	125	138	215	19.1	285	129	140	218
	30000	-44	14.0	227	103	131	211	16.0	247	112	136	219	18.0	268	122	140	225	18.0	268	122	134	217	19.0	279	126	136	220
10	0	25	20.0	466	211	182	185	20.0	466	211	180	183	20.0	466	211	178	181	20.0	466	211	175	178	20.0	466	211	174	177
	2000	21	19.6	443	201	178	187	19.7	445	202	177	186	19.9	447	203	175	184	19.9	447	203	173	181	19.9	448	203	172	180
	4000	17	19.2	422	192	175	189	19.5	426	193	174	188	19.7	429	194	173	186	19.7	429	195	170	183	19.9	431	195	169	183
	6000	13	18.8	402	182	172	191	19.2	407	185	171	190	19.6	411	187	170	189	19.6	412	187	168	186	19.8	414	188	167	186
	8000	9	18.4	383	174	169	193	18.9	389	176	168	193	19.5	395	179	168	192	19.5	395	179	165	189	19.7	398	180	165	189
	10000	5	18.0	364	165	165	195	18.7	372	169	165	195	19.3	379	172	165	195	19.3	379	172	162	191	19.7	382	173	162	192
	12000	1	17.6	350	159	162	198	18.4	358	162	163	198	19.2	366	166	163	199	19.2	366	166	160	195	19.6	371	168	160	195
	14000	-3	17.2	336	152	159	200	18.1	346	157	160	201	19.1	355	161	161	202	19.1	355	161	157	198	19.5	360	163	158	199
	16000	-7	16.8	322	146	156	202	17.9	333	151	157	204	18.9	343	156	158	205	18.9	344	156	155	201	19.5	349	158	156	202
	18000	-11	16.4	306	139	152	204	17.6	319	144	154	207	18.8	331	150	156	209	18.8	331	150	152	204	19.4	337	153	153	206
	20000	-15	16.0	292	132	149	207	17.3	305	138	151	210	18.7	319	144	153	213	18.7	319	145	150	208	19.3	325	148	151	209
	22000	-19	15.6	278	126	145	208	17.1	292	133	148	212	18.5	307	139	150	216	18.5	307	139	146	210	19.3	315	143	148	212
	24000	-23	15.2	264	120	141	210	16.8	280	127	144	214	18.4	296	134	147	219	18.4	297	135	143	212	19.2	305	138	145	215
	26000	-27	14.8	252	114	137	211	16.5	269	122	141	217	18.3	287	130	144	222	18.3	287	130	139	214	19.1	296	134	141	217
	28000	-31	14.4	241	109	133	212	16.3	259	118	137	219	18.1	278	126	141	224	18.1	279	126	136	216	19.1	288	131	138	219
	30000	-34	14.0	230	104	129	213	16.0	250	113	134	221	18.0	270	123	138	227	18.0	271	123	132	218	19.0	281	128	134	221

Figure 5-3-32. Long Range Cruise (Sheet 3 of 4)

LONG RANGE CRUISE

			@ 7000 lb (3175 kg)					@ 8000 lb (3629 kg)					@ 9000 lb (4082 kg)					@ 10000 lb (4536 kg)					@ 10400 lb (4717 kg)				
ISA (°C)	Altitude (ft)	SAT (°C)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	IAS (kt)	TAS (kt)
20	0	35	20.0	471	213	180	187	20.0	471	214	179	185	20.0	471	214	176	182	20.0	471	214	174	180	20.0	471	214	173	179
	2000	31	19.6	448	203	177	189	19.7	450	204	176	187	19.9	452	205	174	185	19.9	452	205	171	182	19.9	453	205	170	181
	4000	27	19.2	427	194	174	191	19.5	430	195	173	190	19.7	433	197	171	188	19.7	434	197	169	185	19.9	435	197	168	184
	6000	23	18.8	407	184	171	193	19.2	411	187	170	192	19.6	416	189	169	191	19.6	416	189	166	188	19.8	419	190	166	187
	8000	19	18.4	387	176	167	195	18.9	393	178	167	195	19.5	399	181	166	194	19.5	399	181	163	190	19.7	402	182	163	190
	10000	15	18.0	369	167	164	197	18.7	376	171	164	197	19.3	383	174	164	197	19.3	383	174	161	193	19.7	387	176	161	193
	12000	11	17.6	354	161	161	199	18.4	363	164	161	200	19.2	371	168	161	200	19.2	371	168	158	196	19.6	376	170	158	197
	14000	7	17.2	340	154	157	202	18.1	350	159	158	203	19.1	360	163	159	204	19.1	360	163	156	199	19.5	365	165	156	200
	16000	3	16.8	325	147	154	204	17.9	336	152	155	206	18.9	347	158	157	207	18.9	347	158	153	203	19.5	353	160	154	204
	18000	-1	16.4	309	140	151	206	17.6	322	146	153	209	18.8	334	152	154	211	18.8	334	152	151	206	19.4	341	154	151	207
	20000	-5	16.0	295	134	147	208	17.3	308	140	150	212	18.7	322	146	152	214	18.7	322	146	148	209	19.3	329	149	149	210
	22000	-9	15.6	281	127	144	210	17.1	296	134	146	214	18.5	311	141	149	217	18.5	311	141	144	211	19.3	318	144	146	213
	24000	-13	15.2	268	121	140	211	16.8	284	129	143	216	18.4	300	136	146	220	18.4	300	136	141	213	19.2	308	140	143	216
	26000	-17	14.8	255	116	136	213	16.5	273	124	139	218	18.3	290	132	142	223	18.3	290	132	137	216	19.1	299	136	139	218
	28000	-21	14.4	243	110	132	214	16.3	262	119	136	221	18.1	281	128	139	226	18.1	281	128	133	217	19.1	291	132	136	220
	30000	-24	14.0	232	105	128	215	16.0	253	115	132	222	18.0	274	124	136	228	18.0	274	124	130	218	19.0	285	129	132	222
30	0	45	20.0	477	216	179	188	20.0	477	216	177	186	20.0	477	216	175	184	20.0	477	216	172	181	20.0	477	216	171	180
	2000	41	19.6	454	206	176	190	19.7	456	207	175	189	19.9	458	208	173	187	19.9	458	208	170	184	19.9	459	208	169	183
	4000	37	19.2	433	196	173	193	19.5	436	198	172	191	19.7	440	199	170	190	19.7	440	200	167	186	19.9	442	200	167	186
	6000	33	18.8	413	187	169	195	19.2	418	190	169	194	19.6	423	192	167	192	19.6	423	192	165	189	19.8	425	193	164	189
	8000	29	18.4	394	179	166	197	18.9	400	182	165	196	19.5	406	184	165	195	19.5	406	184	162	192	19.7	409	186	162	192
	10000	25	18.0	376	171	163	199	18.7	383	174	162	199	19.3	390	177	162	198	19.3	390	177	159	194	19.7	393	178	159	195
	12000	21	17.6	361	164	159	201	18.4	369	168	160	201	19.2	377	171	160	202	19.2	377	171	157	198	19.6	381	173	157	198
	14000	17	17.2	347	157	156	203	18.1	356	161	157	204	19.1	365	166	157	205	19.1	365	166	154	201	19.5	370	168	155	202
	16000	13	16.8	331	150	153	206	17.9	342	155	154	207	18.9	352	160	155	209	18.9	352	160	152	204	19.5	358	162	152	205
	18000	9	16.4	315	143	149	208	17.6	327	148	151	210	18.8	339	154	152	212	18.8	339	154	149	207	19.4	345	156	150	208
	20000	5	16.0	299	136	146	210	17.3	313	142	148	213	18.7	326	148	150	216	18.7	326	148	146	210	19.3	333	151	147	212
	22000	1	15.6	285	129	142	212	17.1	299	136	145	216	18.5	314	142	147	219	18.5	314	142	143	212	19.3	322	146	144	214
	24000	-3	15.2	271	123	138	213	16.8	287	130	141	218	18.4	303	137	144	222	18.4	303	137	139	215	19.2	311	141	141	217
	26000	-7	14.8	258	117	134	214	16.5	275	125	138	220	18.3	293	133	141	225	18.3	294	133	135	216	19.1	303	137	137	219
	28000	-11	14.4	246	112	130	216	16.3	265	120	134	222	18.1	285	129	137	227	18.1	285	129	131	218	19.1	295	134	133	221
	30000	-14	14.0	235	107	126	216	16.0	256	116	130	224	18.0	277	125	134	230	18.0	277	126	127	219	19.0	287	130	129	222

Figure 5-3-32. Long Range Cruise (Sheet 4 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

				@ 7000 lb (3175 kg)			@ 8000 lb (3629 kg)			@ 9000 lb (4082 kg)			@ 10000 lb (4536 kg)			@ 10400 lb (4717 kg)		
ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)
-40	0	-25	107.0	9.53	326.4	148.1	9.96	331.3	150.3	10.46	337.0	152.9	10.99	343.0	155.6	11.22	345.6	156.8
	2000	-29	110.0	9.39	311.0	141.1	9.81	315.7	143.2	10.34	321.4	145.8	10.98	328.5	149.0	11.21	331.0	150.1
	4000	-33	113.2	9.24	296.3	134.4	9.66	300.8	136.4	10.33	308.0	139.7	10.98	314.9	142.8	11.21	317.4	144.0
	6000	-37	116.5	9.09	282.6	128.2	9.66	288.5	130.9	10.34	295.6	134.1	10.99	302.3	137.1	11.23	304.7	138.2
	8000	-41	119.9	9.09	271.1	123.0	9.67	276.9	125.6	10.33	283.6	128.6	10.98	290.1	131.6	11.21	292.5	132.7
	10000	-45	123.5	9.09	259.2	117.6	9.65	264.7	120.1	10.33	271.5	123.2	10.98	278.0	126.1	11.22	280.3	127.1
	12000	-49	127.3	9.04	249.1	113.0	9.62	254.8	115.6	10.31	261.7	118.7	11.05	269.0	122.0	11.34	271.9	123.3
	14000	-53	131.2	9.01	239.7	108.7	9.61	245.6	111.4	10.37	253.1	114.8	11.17	261.1	118.4	11.47	264.0	119.7
	16000	-57	135.3	9.04	230.6	104.6	9.67	236.8	107.4	10.51	245.0	111.1	11.34	253.2	114.8	11.65	256.3	116.3
	18000	-61	139.6	9.10	221.0	100.2	9.79	227.8	103.3	10.66	236.3	107.2	11.51	244.6	110.9	11.84	247.9	112.4
	20000	-65	144.0	9.21	212.1	96.2	9.92	219.1	99.4	10.81	227.7	103.3	11.71	236.6	107.3	12.05	239.9	108.8
	22000	-69	148.7	9.35	203.9	92.5	10.09	211.2	95.8	11.03	220.4	100.0	11.98	229.8	104.2	12.35	233.4	105.9
	24000	-73	153.6	9.52	196.4	89.1	10.30	204.1	92.6	11.30	214.0	97.1	12.28	223.7	101.5	12.66	227.4	103.1
	26000	-77	158.7	9.70	190.2	86.3	10.52	198.4	90.0	11.56	208.7	94.7	12.60	218.9	99.3	13.00	222.9	101.1
	28000	-81	164.1	9.91	185.5	84.1	10.78	194.0	88.0	11.88	205.0	93.0	12.98	215.8	97.9	13.39	219.9	99.7
	30000	-84	169.7	10.17	181.6	82.4	11.10	190.8	86.5	12.29	202.5	91.9	13.44	213.8	97.0	13.89	218.2	99.0
-30	0	-15	109.1	9.48	328.9	149.2	9.90	333.7	151.4	10.39	339.3	153.9	11.02	346.6	157.2	11.25	349.3	158.4
	2000	-19	112.2	9.33	313.0	142.0	9.74	317.6	144.1	10.38	324.7	147.3	11.02	331.9	150.5	11.25	334.5	151.7
	4000	-23	115.5	9.17	298.2	135.3	9.71	304.1	137.9	10.38	311.4	141.3	11.02	318.4	144.4	11.26	320.9	145.6
	6000	-27	118.9	9.14	285.7	129.6	9.71	291.6	132.3	10.37	298.7	135.5	11.02	305.5	138.6	11.25	307.9	139.7
	8000	-31	122.5	9.13	274.0	124.3	9.68	279.7	126.9	10.35	286.5	130.0	11.00	293.2	133.0	11.23	295.5	134.0
	10000	-35	126.2	9.08	262.2	118.9	9.65	267.9	121.5	10.34	274.7	124.6	11.03	281.6	127.7	11.33	284.6	129.1
	12000	-39	130.1	9.04	252.1	114.4	9.63	258.0	117.0	10.36	265.3	120.3	11.17	273.4	124.0	11.46	276.3	125.3
	14000	-43	134.1	9.06	243.2	110.3	9.66	249.2	113.0	10.50	257.5	116.8	11.32	265.7	120.5	11.64	268.9	122.0
	16000	-47	138.4	9.10	234.1	106.2	9.80	241.0	109.3	10.65	249.4	113.1	11.50	257.8	116.9	11.83	261.1	118.4
	18000	-51	142.8	9.21	225.1	102.1	9.93	232.2	105.3	10.80	240.7	109.2	11.71	249.7	113.3	12.04	253.0	114.8
	20000	-55	147.4	9.32	216.2	98.1	10.05	223.3	101.3	10.98	232.5	105.5	11.93	241.8	109.7	12.29	245.4	111.3
	22000	-59	152.3	9.48	208.1	94.4	10.26	215.8	97.9	11.25	225.6	102.3	12.24	235.3	106.7	12.61	238.9	108.4
	24000	-63	157.4	9.68	200.9	91.1	10.50	209.0	94.8	11.53	219.1	99.4	12.56	229.3	104.0	12.96	233.2	105.8
	26000	-67	162.7	9.89	195.0	88.5	10.74	203.4	92.3	11.83	214.2	97.2	12.91	224.8	102.0	13.33	228.9	103.8
	28000	-71	168.3	10.12	190.0	86.2	11.03	199.0	90.3	12.18	210.4	95.4	13.31	221.5	100.5	13.74	225.8	102.4
	30000	-74	174.1	10.38	186.0	84.4	11.34	195.5	88.7	12.55	207.4	94.1	13.73	219.1	99.4	14.19	223.7	101.5

Figure 5-3-33. Maximum Endurance Cruise (Sheet 1 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

				@ 7000 lb (3175 kg)			@ 8000 lb (3629 kg)			@ 9000 lb (4082 kg)			@ 10000 lb (4536 kg)			@ 10400 lb (4717 kg)		
ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)
-20	0	-5	111.2	9.43	331.0	150.1	9.83	335.7	152.3	10.42	342.6	155.4	11.06	350.0	158.8	11.29	352.7	160.0
	2000	-9	114.4	9.26	315.0	142.9	9.75	320.6	145.4	10.42	328.1	148.8	11.06	335.4	152.1	11.28	338.0	153.3
	4000	-13	117.8	9.19	300.9	136.5	9.76	307.2	139.3	10.42	314.6	142.7	11.06	321.7	145.9	11.29	324.2	147.1
	6000	-17	121.3	9.18	288.6	130.9	9.73	294.5	133.6	10.39	301.6	136.8	11.04	308.5	139.9	11.27	311.0	141.1
	8000	-21	125.0	9.14	276.6	125.5	9.70	282.4	128.1	10.38	289.5	131.3	11.03	296.2	134.4	11.31	299.2	135.7
	10000	-25	128.8	9.11	265.3	120.3	9.69	271.2	123.0	10.38	278.1	126.1	11.18	286.2	129.8	11.48	289.2	131.2
	12000	-29	132.8	9.09	255.6	115.9	9.68	261.6	118.7	10.49	269.8	122.4	11.31	278.0	126.1	11.63	281.2	127.6
	14000	-33	137.0	9.10	246.6	111.9	9.79	253.4	114.9	10.63	261.9	118.8	11.49	270.5	122.7	11.80	273.7	124.1
	16000	-37	141.4	9.21	238.0	108.0	9.91	245.0	111.1	10.79	253.8	115.1	11.68	262.7	119.2	12.02	266.0	120.7
	18000	-41	146.0	9.32	229.0	103.9	10.05	236.2	107.1	10.97	245.3	111.3	11.90	254.6	115.5	12.27	258.2	117.1
	20000	-45	150.8	9.45	220.3	99.9	10.22	227.9	103.4	11.19	237.5	107.7	12.17	247.2	112.1	12.54	250.9	113.8
	22000	-49	155.8	9.64	212.6	96.4	10.45	220.5	100.0	11.47	230.7	104.6	12.50	240.8	109.2	12.89	244.7	111.0
	24000	-53	161.1	9.85	205.6	93.3	10.70	213.9	97.0	11.77	224.6	101.9	12.85	235.2	106.7	13.25	239.2	108.5
	26000	-57	166.6	10.08	199.7	90.6	10.98	208.6	94.6	12.12	219.8	99.7	13.23	230.8	104.7	13.67	235.1	106.6
	28000	-61	172.4	10.35	195.0	88.5	11.29	204.3	92.7	12.49	216.0	98.0	13.66	227.6	103.2	14.12	232.1	105.3
	30000	-64	178.5	10.64	191.0	86.6	11.63	200.7	91.0	12.89	213.1	96.7	14.14	225.4	102.2	14.61	230.1	104.4
-10	0	5	113.3	9.36	333.1	151.1	9.80	338.4	153.5	10.46	346.1	157.0	11.09	353.7	160.4	11.32	356.4	161.7
	2000	1	116.6	9.23	317.3	143.9	9.80	323.9	146.9	10.46	331.5	150.4	11.09	338.9	153.7	11.33	341.6	154.9
	4000	-3	120.0	9.22	304.0	137.9	9.78	310.2	140.7	10.43	317.6	144.1	11.07	324.8	147.3	11.30	327.4	148.5
	6000	-7	123.7	9.19	291.3	132.1	9.74	297.3	134.9	10.41	304.6	138.2	11.06	311.7	141.4	11.29	314.2	142.5
	8000	-11	127.4	9.15	279.2	126.6	9.73	285.3	129.4	10.41	292.5	132.7	11.16	300.5	136.3	11.46	303.7	137.8
	10000	-15	131.4	9.14	268.2	121.7	9.73	274.2	124.4	10.51	282.2	128.0	11.31	290.5	131.8	11.63	293.6	133.2
	12000	-19	135.5	9.15	259.1	117.5	9.80	265.7	120.5	10.63	274.2	124.4	11.49	282.8	128.3	11.80	286.0	129.7
	14000	-23	139.8	9.22	250.8	113.8	9.92	257.8	116.9	10.79	266.6	120.9	11.66	275.5	125.0	12.00	278.9	126.5
	16000	-27	144.4	9.32	241.9	109.7	10.05	249.2	113.0	10.95	258.3	117.2	11.87	267.6	121.4	12.23	271.2	123.0
	18000	-31	149.1	9.44	233.1	105.7	10.19	240.5	109.1	11.15	250.1	113.4	12.13	259.9	117.9	12.50	263.6	119.6
	20000	-35	154.0	9.59	224.5	101.8	10.38	232.3	105.4	11.40	242.4	110.0	12.41	252.4	114.5	12.80	256.3	116.3
	22000	-39	159.2	9.79	216.8	98.3	10.63	225.2	102.2	11.69	235.6	106.9	12.76	246.2	111.7	13.17	250.2	113.5
	24000	-43	164.7	10.02	210.1	95.3	10.91	218.8	99.2	12.04	229.9	104.3	13.15	240.8	109.2	13.57	245.0	111.1
	26000	-47	170.4	10.29	204.5	92.8	11.23	213.7	96.9	12.40	225.2	102.2	13.57	236.7	107.4	14.02	241.1	109.4
	28000	-51	176.4	10.58	199.8	90.6	11.55	209.4	95.0	12.80	221.7	100.6	14.03	233.8	106.0	14.50	238.4	108.1
	30000	-54	182.7	10.90	196.0	88.9	11.93	206.2	93.5	13.25	219.1	99.4	14.55	231.8	105.1	15.04	236.7	107.4

Figure 5-3-33. Maximum Endurance Cruise (Sheet 2 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	@ 7000 lb (3175 kg) Torque (psi)	@ 7000 lb Fuel flow (lb/h)	@ 7000 lb Fuel flow (kg/h)	@ 8000 lb (3629 kg) Torque (psi)	@ 8000 lb Fuel flow (lb/h)	@ 8000 lb Fuel flow (kg/h)	@ 9000 lb (4082 kg) Torque (psi)	@ 9000 lb Fuel flow (lb/h)	@ 9000 lb Fuel flow (kg/h)	@ 10000 lb (4536 kg) Torque (psi)	@ 10000 lb Fuel flow (lb/h)	@ 10000 lb Fuel flow (kg/h)	@ 10400 lb (4717 kg) Torque (psi)	@ 10400 lb Fuel flow (lb/h)	@ 10400 lb Fuel flow (kg/h)
0	0	15	115.3	9.29	334.3	151.6	9.84	340.9	154.6	10.49	348.8	158.2	11.12	356.3	161.6	11.35	359.2	162.9
	2000	11	118.7	9.27	319.7	145.0	9.82	326.2	148.0	10.47	333.9	151.5	11.11	341.4	154.9	11.34	344.1	156.1
	4000	7	122.2	9.24	306.1	138.8	9.79	312.3	141.7	10.45	319.8	145.1	11.09	327.2	148.4	11.32	329.8	149.6
	6000	3	126.0	9.20	293.0	132.9	9.76	299.3	135.8	10.43	306.8	139.2	11.12	314.4	142.6	11.42	317.7	144.1
	8000	-1	129.9	9.18	281.1	127.5	9.76	287.4	130.4	10.48	295.2	133.9	11.29	303.8	137.8	11.58	307.0	139.3
	10000	-5	133.9	9.20	270.4	122.7	9.81	276.7	125.5	10.64	285.4	129.5	11.47	294.0	133.4	11.79	297.3	134.9
	12000	-9	138.2	9.24	261.9	118.8	9.93	269.0	122.0	10.79	277.8	126.0	11.64	286.5	130.0	11.97	290.0	131.5
	14000	-13	142.6	9.34	253.8	115.1	10.06	261.1	118.4	10.93	270.0	122.5	11.85	279.5	126.8	12.19	282.9	128.3
	16000	-17	147.3	9.45	245.2	111.2	10.17	252.6	114.6	11.12	262.2	118.9	12.09	272.0	123.4	12.45	275.7	125.1
	18000	-21	152.1	9.57	235.8	107.0	10.36	243.7	110.5	11.36	253.8	115.1	12.36	263.9	119.7	12.74	267.6	121.4
	20000	-25	157.2	9.73	227.2	103.1	10.56	235.5	106.8	11.61	246.0	111.6	12.66	256.5	116.3	13.06	260.5	118.2
	22000	-29	162.6	9.96	219.9	99.7	10.83	228.6	103.7	11.93	239.6	108.7	13.03	250.5	113.6	13.45	254.7	115.5
	24000	-33	168.2	10.22	213.6	96.9	11.14	222.7	101.0	12.30	234.2	106.2	13.46	245.6	111.4	13.90	250.0	113.4
	26000	-37	174.1	10.50	208.0	94.3	11.47	217.6	98.7	12.70	229.7	104.2	13.90	241.6	109.6	14.37	246.2	111.7
	28000	-41	180.3	10.82	203.6	92.4	11.84	213.7	96.9	13.13	226.4	102.7	14.40	238.9	108.4	14.90	243.8	110.6
	30000	-44	186.8	11.17	199.9	90.7	12.24	210.5	95.5	13.61	223.9	101.6	14.94	237.2	107.6	15.46	242.5	110.0
10	0	25	117.3	9.31	337.5	153.1	9.86	344.4	156.2	10.52	352.4	159.8	11.15	360.1	163.3	11.38	362.9	164.6
	2000	21	120.8	9.29	322.8	146.4	9.84	329.3	149.4	10.48	337.0	152.9	11.12	344.6	156.3	11.35	347.4	157.6
	4000	17	124.4	9.25	308.8	140.1	9.79	315.2	143.0	10.46	322.9	146.5	11.11	330.4	149.9	11.37	333.6	151.3
	6000	13	128.2	9.21	295.8	134.2	9.78	302.3	137.1	10.46	309.9	140.6	11.25	318.8	144.6	11.54	322.1	146.1
	8000	9	132.2	9.21	284.0	128.8	9.79	290.4	131.7	10.60	299.2	135.7	11.40	308.1	139.8	11.72	311.5	141.3
	10000	5	136.4	9.25	273.5	124.1	9.93	280.7	127.3	10.76	289.5	131.3	11.62	298.5	135.4	11.93	301.8	136.9
	12000	1	140.7	9.35	265.9	120.6	10.05	273.1	123.9	10.92	282.1	128.0	11.81	291.4	132.2	12.15	294.9	133.8
	14000	-3	145.3	9.45	257.6	116.8	10.17	265.1	120.2	11.09	274.6	124.6	12.03	284.4	129.0	12.40	288.1	130.7
	16000	-7	150.1	9.57	248.5	112.7	10.34	256.4	116.3	11.31	266.4	120.8	12.30	276.7	125.5	12.68	280.5	127.2
	18000	-11	155.1	9.72	239.2	108.5	10.53	247.5	112.3	11.56	258.1	117.1	12.59	268.6	121.8	12.99	272.7	123.7
	20000	-15	160.4	9.89	230.8	104.7	10.75	239.5	108.6	11.83	250.5	113.6	12.91	261.5	118.6	13.32	265.7	120.5
	22000	-19	165.9	10.14	223.8	101.5	11.04	232.9	105.6	12.18	244.4	110.9	13.32	255.8	116.0	13.75	260.2	118.0
	24000	-23	171.7	10.42	217.5	98.7	11.37	227.0	103.0	12.57	239.0	108.4	13.76	250.9	113.8	14.21	255.4	115.8
	26000	-27	177.7	10.73	212.3	96.3	11.73	222.2	100.8	12.99	234.8	106.5	14.24	247.3	112.2	14.72	252.1	114.4
	28000	-31	184.1	11.07	208.2	94.4	12.12	218.6	99.2	13.46	231.9	105.2	14.78	245.0	111.1	15.28	250.1	113.4
	30000	-34	190.9	11.45	204.8	92.9	12.56	215.8	97.9	13.97	229.8	104.2	15.34	244.0	110.7	15.87	249.4	113.1

Figure 5-3-33. Maximum Endurance Cruise (Sheet 3 of 4)

MAXIMUM ENDURANCE CRUISE

NOTE: INDICATED AIRSPEED IS 115 KTS CONSTANT

				@ 7000 lb (3175 kg)			@ 8000 lb (3629 kg)			@ 9000 lb (4082 kg)			@ 10000 lb (4536 kg)			@ 10400 lb (4717 kg)		
ISA (ºC)	Altitude (ft)	SAT (ºC)	TAS (kt)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)	Torque (psi)	Fuel flow (lb/h)	Fuel flow (kg/h)
20	0	35	119.2	9.33	341.1	154.7	9.88	347.9	157.8	10.52	355.8	161.4	11.16	363.7	165.0	11.38	366.5	166.2
	2000	31	122.8	9.30	326.0	147.9	9.83	332.4	150.8	10.49	340.4	154.4	11.13	348.1	157.9	11.36	350.9	159.2
	4000	27	126.5	9.24	311.7	141.4	9.81	318.4	144.4	10.48	326.3	148.0	11.21	334.8	151.9	11.50	338.3	153.5
	6000	23	130.4	9.23	298.8	135.5	9.81	305.5	138.6	10.56	314.0	142.4	11.36	323.2	146.6	11.65	326.6	148.1
	8000	19	134.5	9.26	287.1	130.2	9.89	294.2	133.4	10.71	303.3	137.6	11.55	312.7	141.8	11.86	316.1	143.4
	10000	15	138.8	9.35	276.0	125.2	10.04	283.5	128.6	10.90	292.9	132.9	11.76	302.3	137.1	12.10	306.1	138.8
	12000	11	143.3	9.45	267.7	121.4	10.17	275.4	124.9	11.05	285.0	129.3	11.97	295.0	133.8	12.33	298.8	135.5
	14000	7	148.0	9.56	259.8	117.8	10.30	267.7	121.4	11.25	277.8	126.0	12.23	288.3	130.8	12.60	292.3	132.6
	16000	3	152.9	9.70	251.4	114.0	10.48	259.7	117.8	11.50	270.4	122.7	12.52	281.2	127.6	12.90	285.3	129.4
	18000	-1	158.0	9.85	242.5	110.0	10.70	251.3	114.0	11.76	262.4	119.0	12.82	273.5	124.1	13.23	277.7	126.0
	20000	-5	163.4	10.06	234.5	106.4	10.94	243.6	110.5	12.05	255.1	115.7	13.17	266.7	121.0	13.59	271.1	123.0
	22000	-9	169.1	10.33	227.7	103.3	11.26	237.2	107.6	12.43	249.3	113.1	13.60	261.4	118.6	14.05	266.0	120.7
	24000	-13	175.1	10.62	221.6	100.5	11.60	231.7	105.1	12.84	244.3	110.8	14.07	256.8	116.5	14.54	261.6	118.7
	26000	-17	181.3	10.96	216.8	98.3	12.00	227.3	103.1	13.30	240.5	109.1	14.60	253.6	115.0	15.09	258.7	117.3
	28000	-21	187.9	11.33	212.9	96.6	12.42	223.9	101.6	13.80	237.8	107.9	15.14	251.6	114.1	15.66	256.9	116.5
	30000	-24	194.8	11.75	209.9	95.2	12.88	221.4	100.4	14.33	236.3	107.2	15.74	250.8	113.8	16.29	256.4	116.3
30	0	45	121.1	9.35	343.5	155.8	9.89	350.4	158.9	10.53	358.7	162.7	11.17	366.8	166.4	11.39	369.7	167.7
	2000	41	124.8	9.30	327.8	148.7	9.85	334.7	151.8	10.51	343.0	155.6	11.16	351.2	159.3	11.45	354.8	160.9
	4000	37	128.6	9.26	313.0	142.0	9.83	320.1	145.2	10.51	328.5	149.0	11.31	338.4	153.5	11.60	342.0	155.1
	6000	33	132.6	9.26	299.6	135.9	9.84	306.7	139.1	10.65	316.6	143.6	11.47	326.5	148.1	11.78	330.3	149.8
	8000	29	136.8	9.31	287.6	130.5	10.00	295.7	134.1	10.83	305.7	138.7	11.68	315.9	143.3	12.00	319.7	145.0
	10000	25	141.2	9.45	277.2	125.7	10.15	285.4	129.5	11.01	295.6	134.1	11.92	306.3	138.9	12.26	310.3	140.7
	12000	21	145.8	9.55	269.1	122.1	10.27	277.4	125.8	11.20	288.3	130.8	12.16	299.4	135.8	12.52	303.7	137.8
	14000	17	150.6	9.67	261.5	118.6	10.45	270.5	122.7	11.43	281.8	127.8	12.43	293.3	133.0	12.81	297.6	135.0
	16000	13	155.6	9.83	253.7	115.1	10.65	263.0	119.3	11.69	274.7	124.6	12.74	286.6	130.0	13.13	291.1	132.0
	18000	9	160.9	10.01	245.4	111.3	10.88	255.1	115.7	11.96	267.1	121.2	13.06	279.3	126.7	13.48	284.0	128.8
	20000	5	166.4	10.24	238.0	108.0	11.14	248.0	112.5	12.28	260.4	118.1	13.44	273.0	123.8	13.88	277.8	126.0
	22000	1	172.3	10.52	231.7	105.1	11.48	242.0	109.8	12.69	255.0	115.7	13.91	268.0	121.6	14.37	272.7	123.7
	24000	-3	178.4	10.84	226.1	102.6	11.86	236.8	107.4	13.14	250.2	113.5	14.40	263.1	119.3	14.88	268.0	121.6
	26000	-7	184.8	11.22	221.5	100.5	12.28	232.6	105.5	13.63	246.4	111.8	14.95	259.9	117.9	15.45	265.1	120.2
	28000	-11	191.6	11.61	218.1	98.9	12.73	229.5	104.1	14.14	244.0	110.7	15.52	258.2	117.1	16.04	263.7	119.6
	30000	-14	198.7	12.04	215.3	97.7	13.21	227.3	103.1	14.70	242.5	110.0	16.15	257.8	116.9	16.70	263.7	119.6

Figure 5-3-33. Maximum Endurance Cruise (Sheet 4 of 4)

SPECIFIC AIR RANGE

7000 LB (3175 KG) - ISA-20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	232	KT
SPECIFIC AIR RANGE	0.57	NM/LB

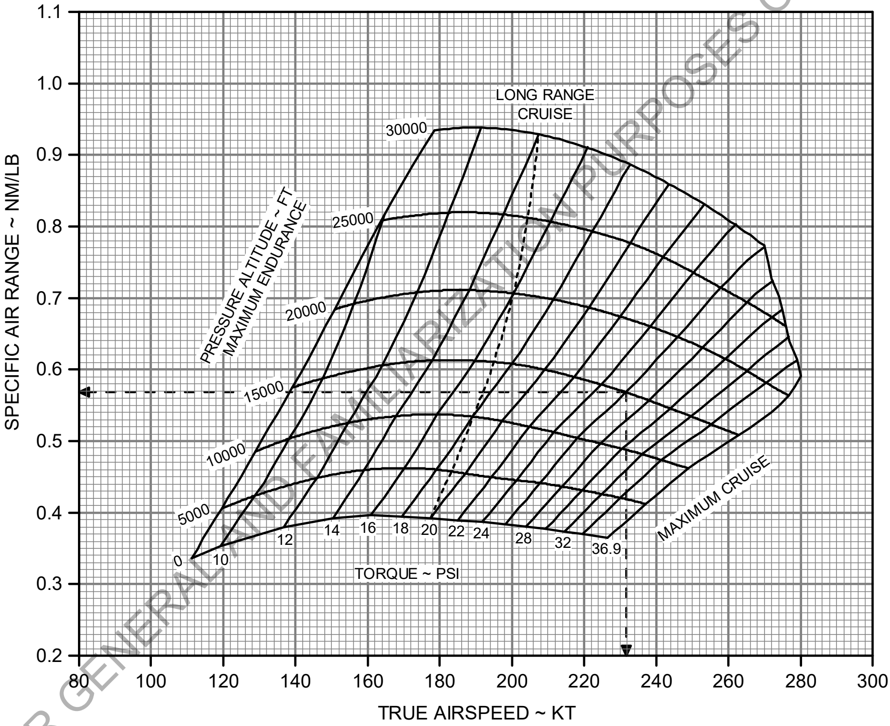


Figure 5-3-34. Specific Air Range - 7000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

7000 LB (3175 KG) - ISA

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	237	KT
SPECIFIC AIR RANGE	0.57	NM/LB

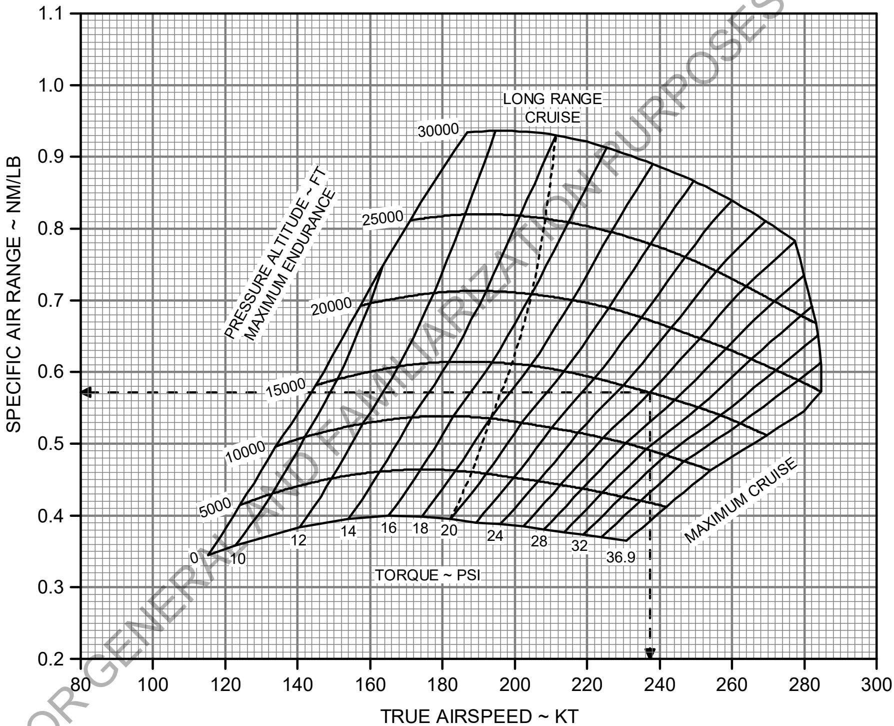


Figure 5-3-34. Specific Air Range - 7000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

7000 LB (3175 KG) - ISA+20°

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	242	KT
SPECIFIC AIR RANGE	0.57	NM/LB

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

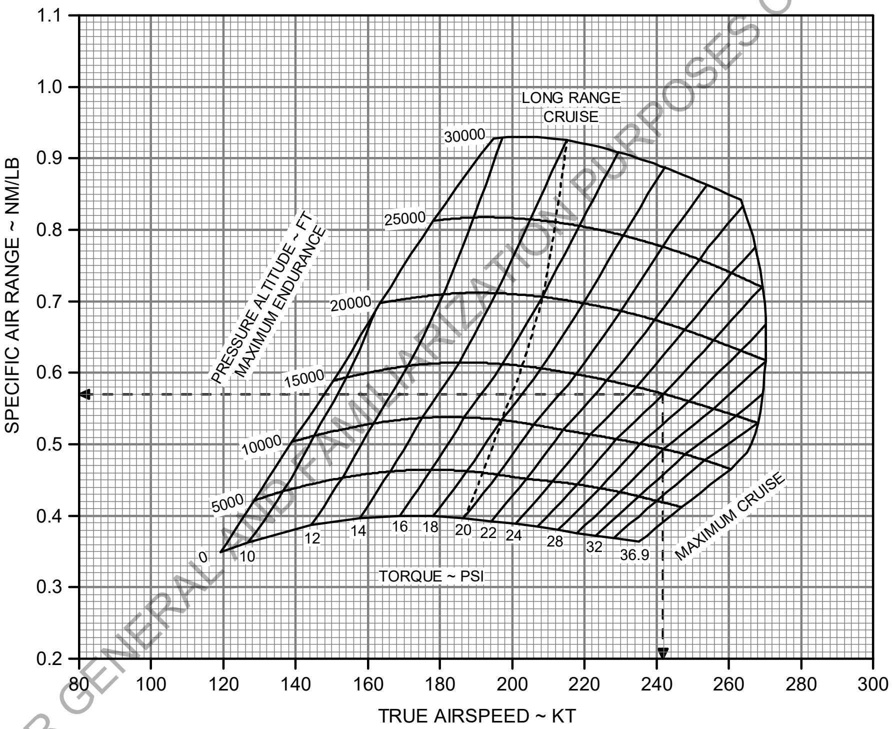


Figure 5-3-34. Specific Air Range - 7000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

8000 LB (3629 KG) - ISA-20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	230	KT
SPECIFIC AIR RANGE	0.56	NM/LB

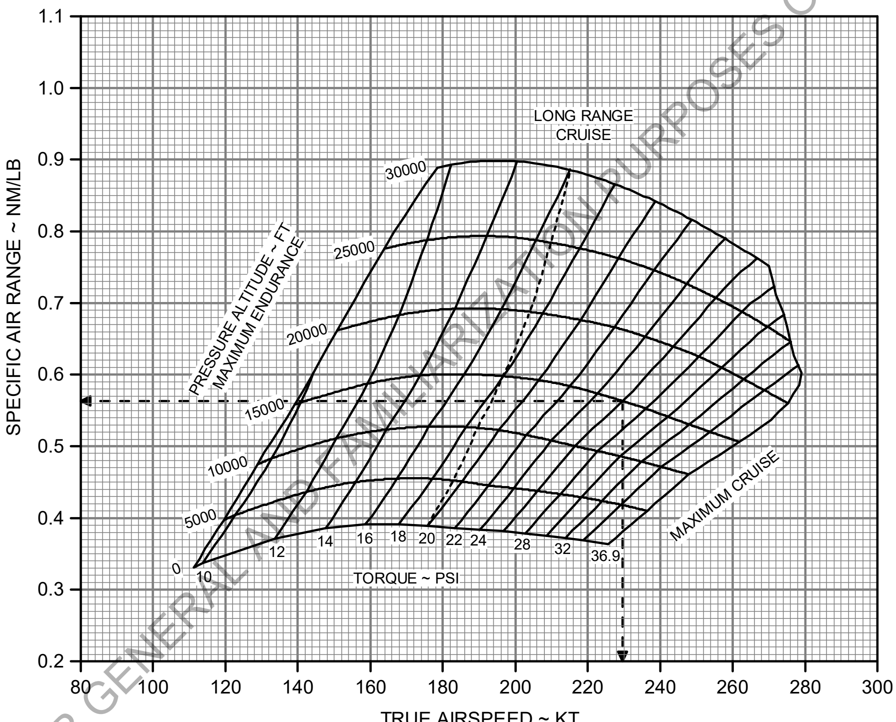


Figure 5-3-35. Specific Air Range - 8000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

8000 LB (3629 KG) - ISA

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	235	KT
SPECIFIC AIR RANGE	0.57	NM/LB

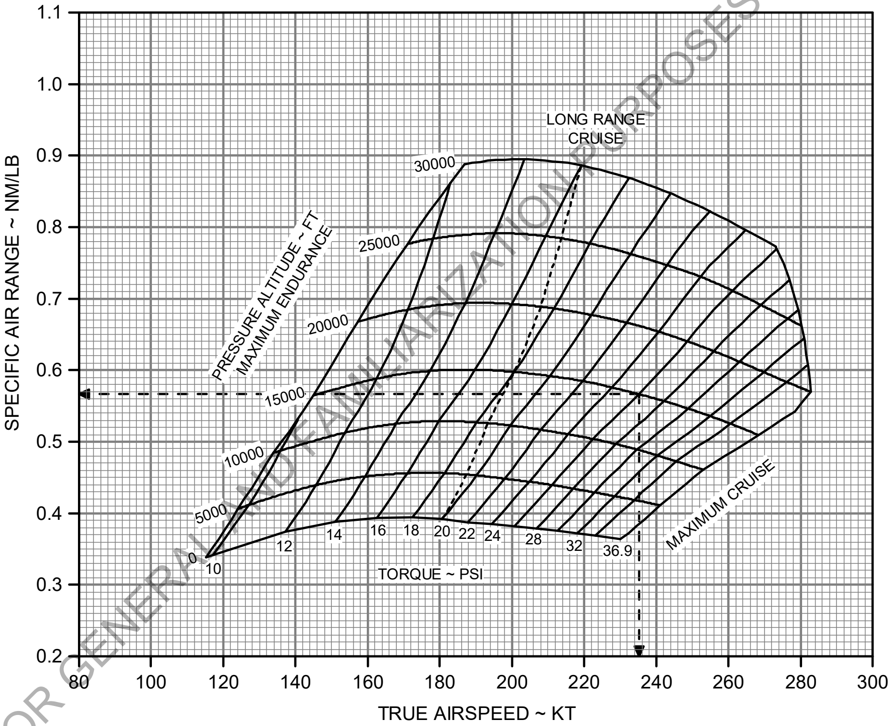


Figure 5-3-35. Specific Air Range - 8000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

8000 LB (3629 KG) - ISA+20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:		
PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	240	KT
SPECIFIC AIR RANGE	0.57	NM/LB

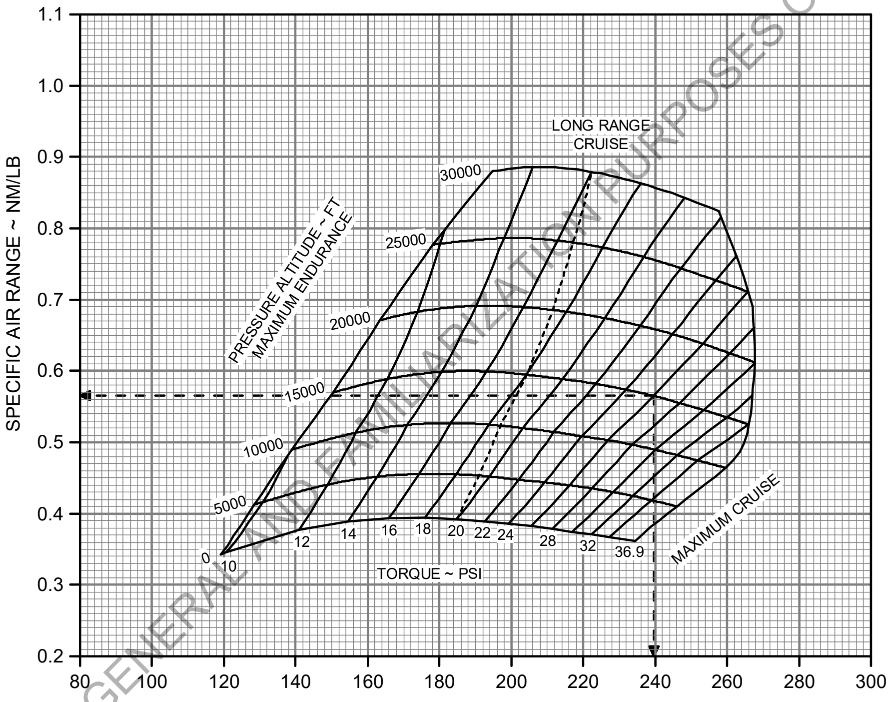


Figure 5-3-35. Specific Air Range - 8000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

9000 LB (4082 KG) - ISA-20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	228	KT
SPECIFIC AIR RANGE	0.56	NM/LB

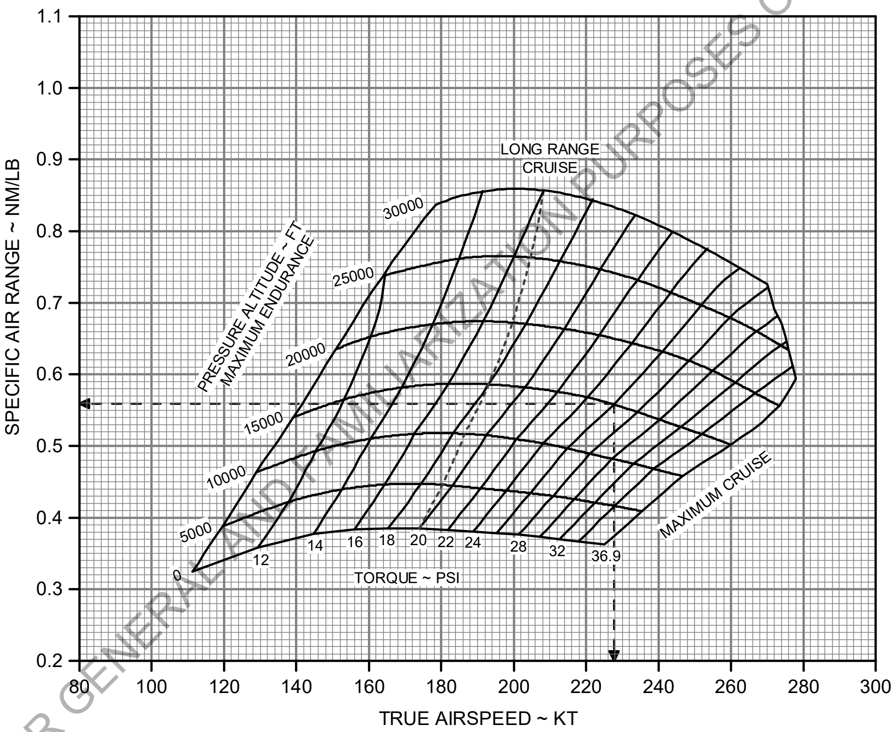


Figure 5-3-36. Specific Air Range - 9000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

9000 LB (4082 KG) - ISA

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	233	KT
SPECIFIC AIR RANGE	0.56	NM/LB

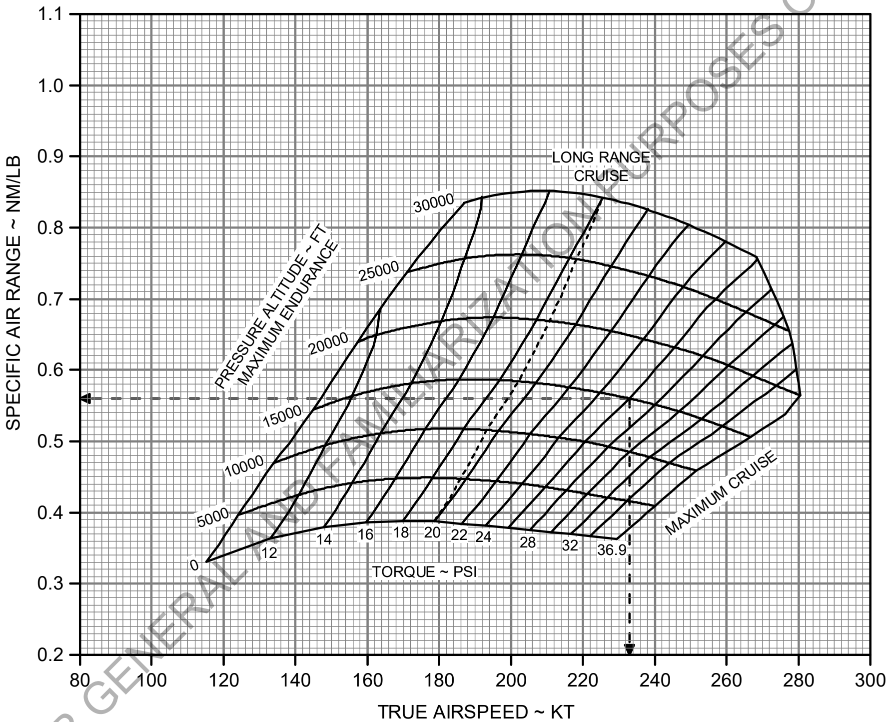


Figure 5-3-36. Specific Air Range - 9000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

9000 LB (4082 KG) - ISA+20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	237	KT
SPECIFIC AIR RANGE	0.56	NM/LB

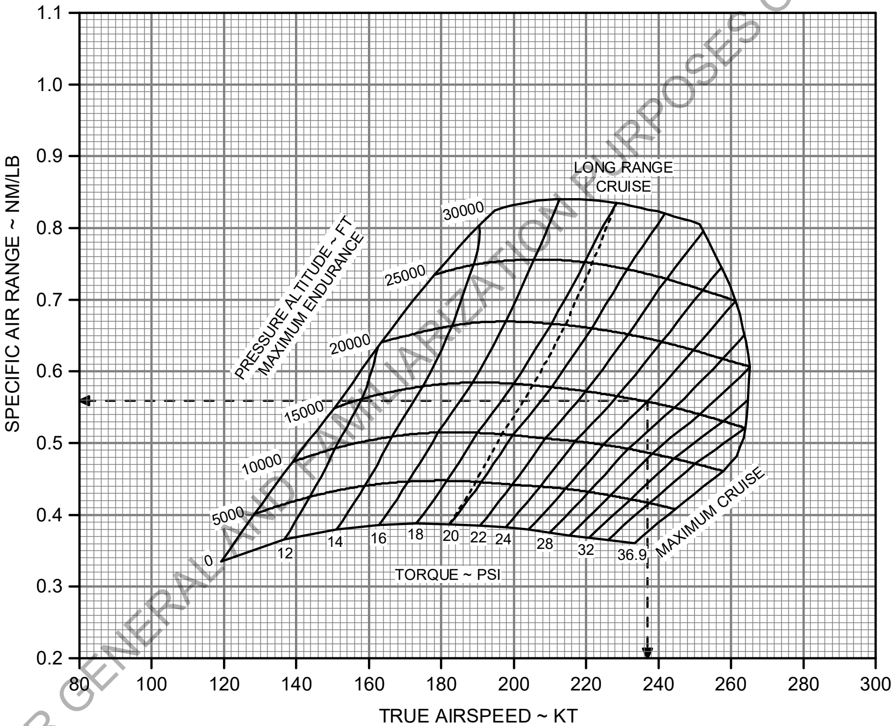


Figure 5-3-36. Specific Air Range - 9000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

10000 LB (4536 KG) - ISA-20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	225	KT
SPECIFIC AIR RANGE	0.55	NM/LB

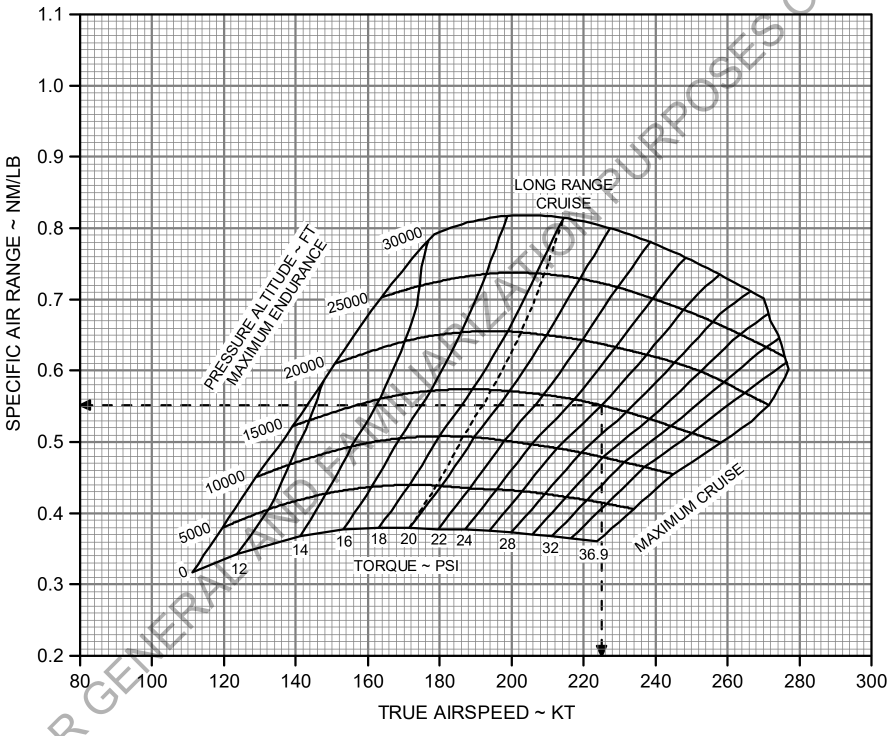


Figure 5-3-37. Specific Air Range - 10000 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

10000 LB (4536 KG) - ISA

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	230	KT
SPECIFIC AIR RANGE	0.55	NM/LB

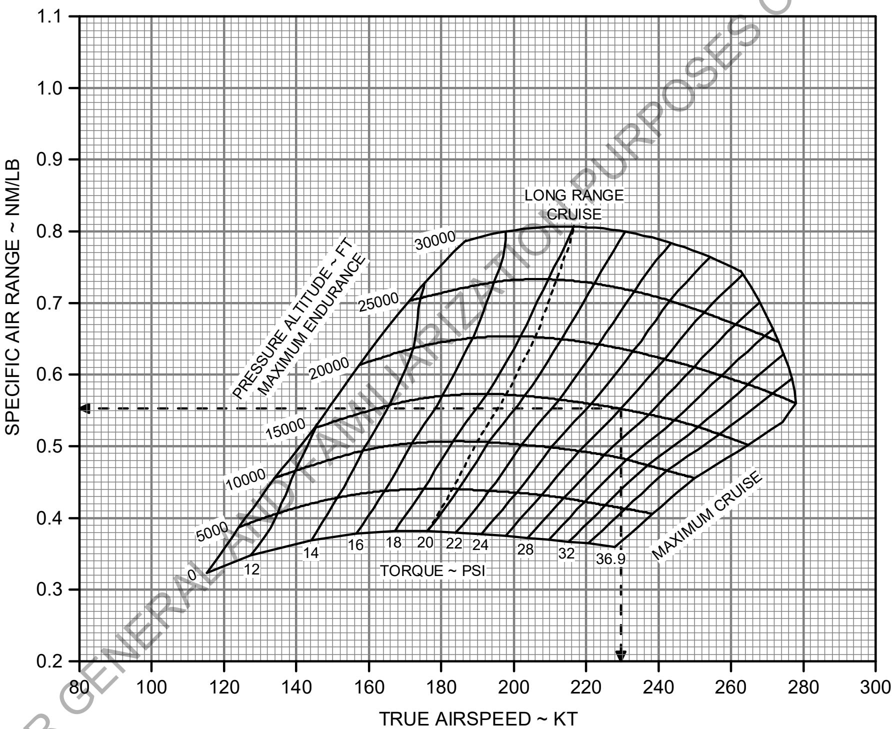


Figure 5-3-37. Specific Air Range - 10000 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

10000 LB (4536 KG) - ISA+20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	233	KT
SPECIFIC AIR RANGE	0.55	NM/LB

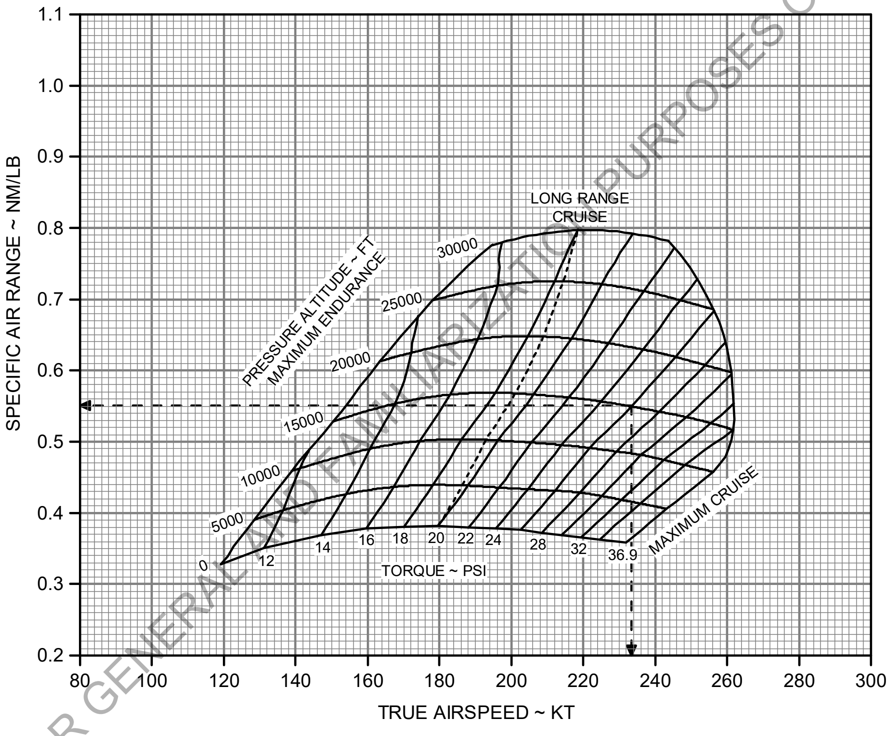


Figure 5-3-37. Specific Air Range - 10000 lb (Sheet 3 of 3)

SPECIFIC AIR RANGE

10400 LB (4717 KG) - ISA-20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	224	KT
SPECIFIC AIR RANGE	0.55	NM/LB

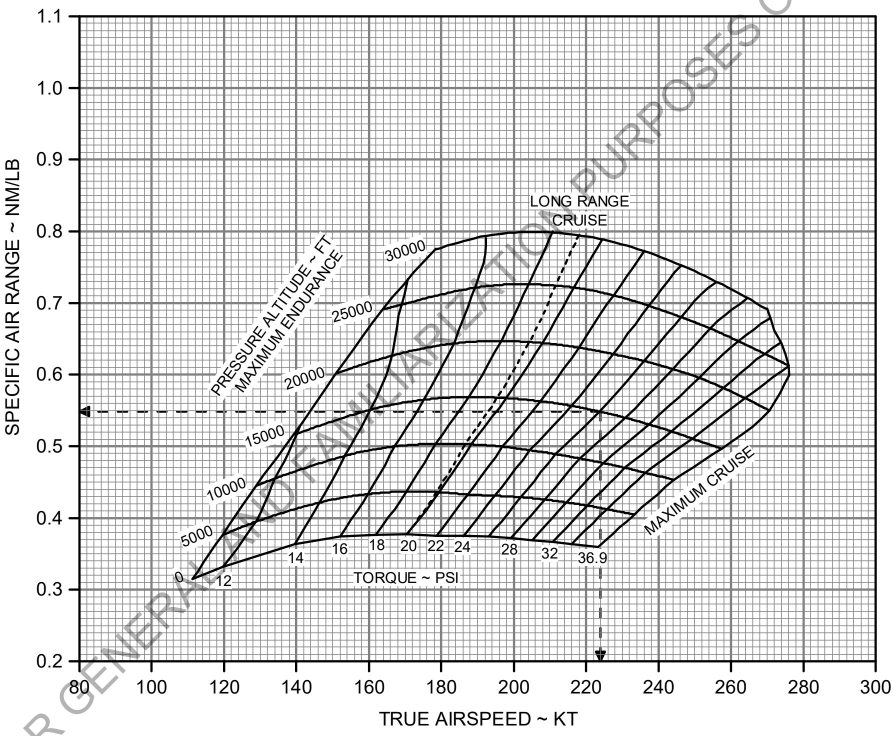


Figure 5-3-38. Specific Air Range - 10400 lb (Sheet 1 of 3)

SPECIFIC AIR RANGE

10400 LB (4717 KG) - ISA

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:

PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	228	KT
SPECIFIC AIR RANGE	0.55	NM/LB

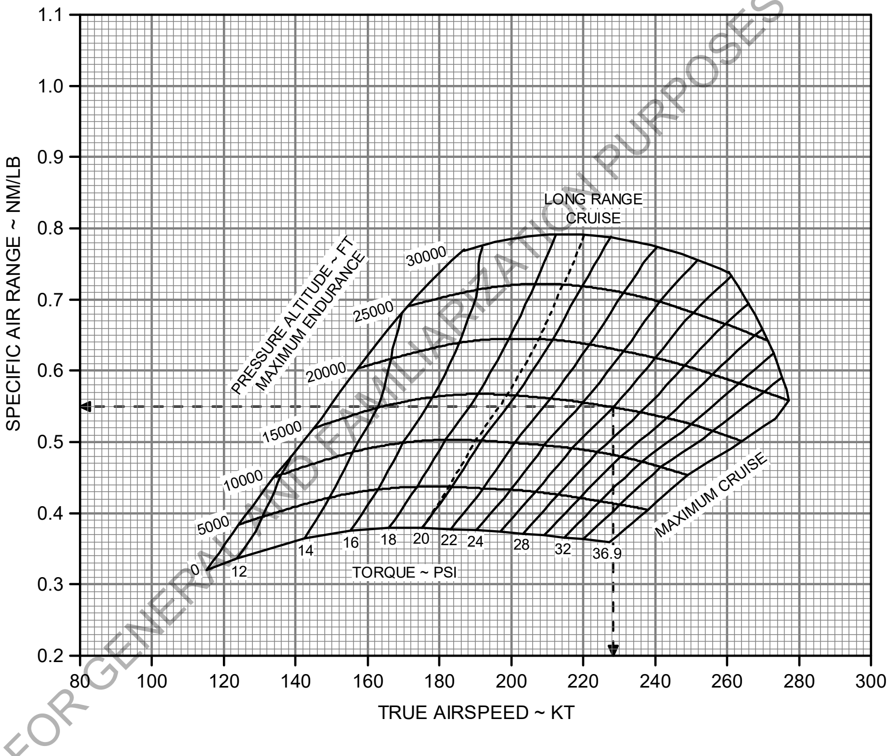


Figure 5-3-38. Specific Air Range - 10400 lb (Sheet 2 of 3)

SPECIFIC AIR RANGE

10400 LB (4717 KG) - ISA+20°

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED
FLAPS UP
INERTIAL SEPARATOR CLOSED

EXAMPLE:		
PRESSURE ALTITUDE	15000	FT
TORQUE	26	PSI
TRUE AIRSPEED	232	KT
SPECIFIC AIR RANGE	0.55	NM/LB

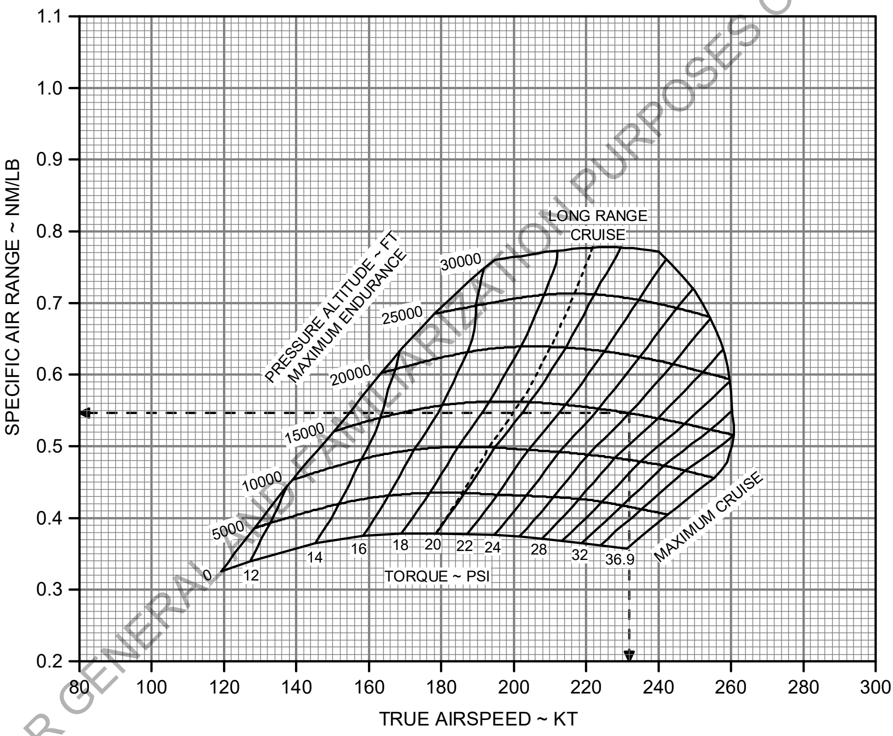
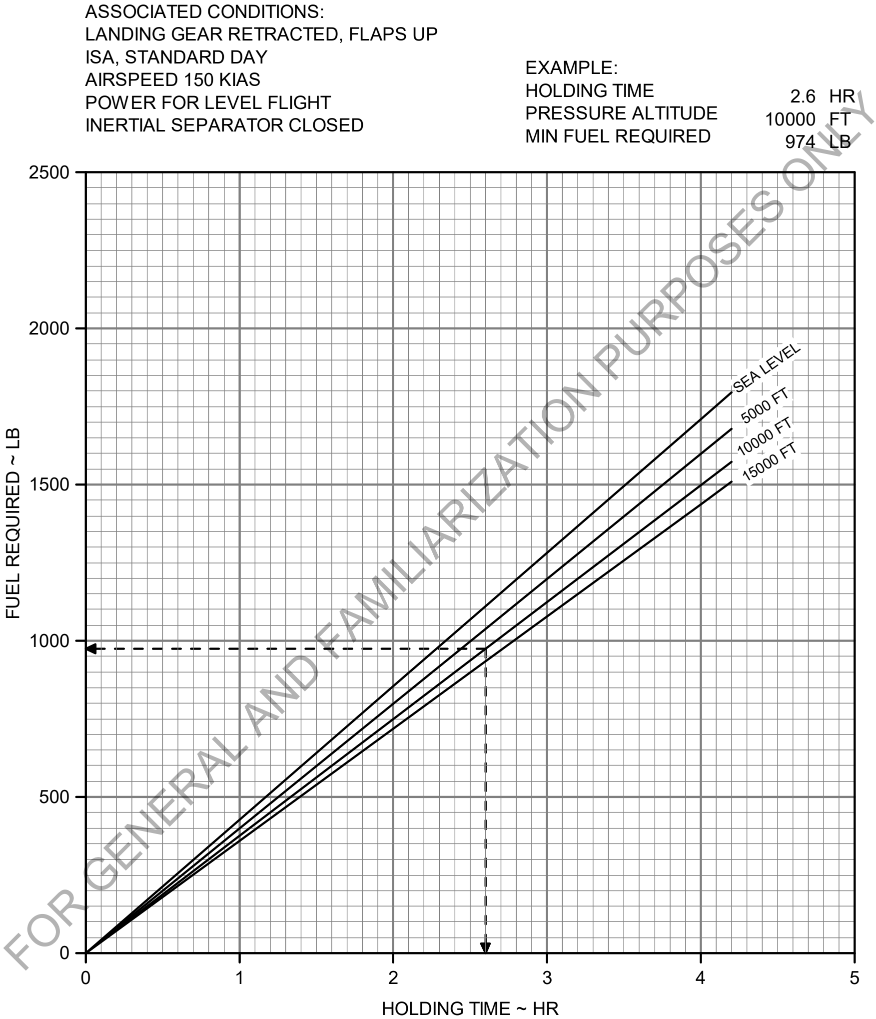


Figure 5-3-38. Specific Air Range - 10400 lb (Sheet 3 of 3)

HOLDING TIME AND FUEL



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-39. Holding Time and Fuel

TIME TO DESCEND

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED - FLAPS UP
POWER AS REQUIRED TO
DESCEND AT 2000 FPM
AIRSPEED: MACH 0.48 OR 236 KIAS,
WHICHEVER IS LOWER

EXAMPLE:
ALTITUDE 12000 FT
TIME 6 MIN

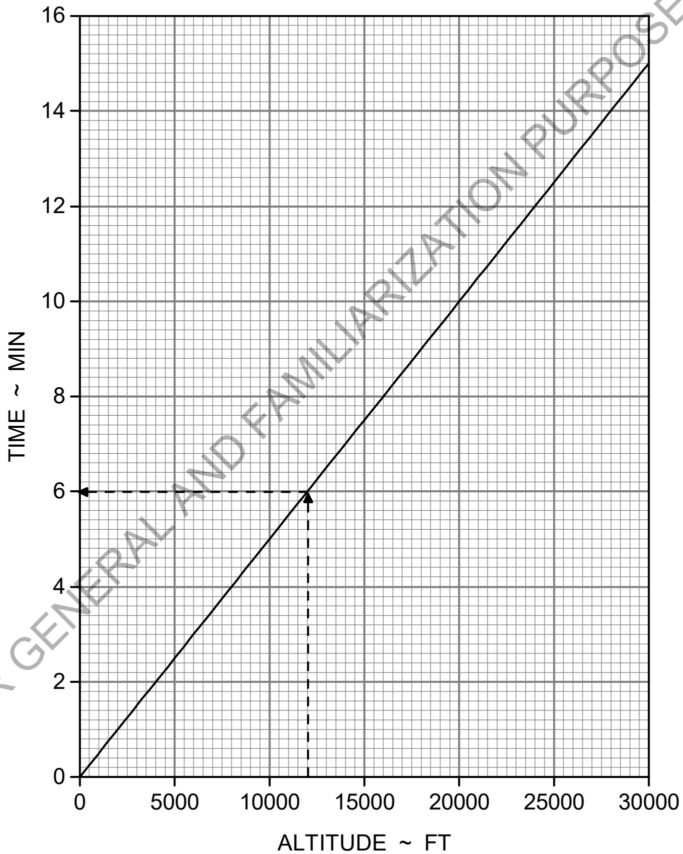


Figure 5-3-40. Time to Descend

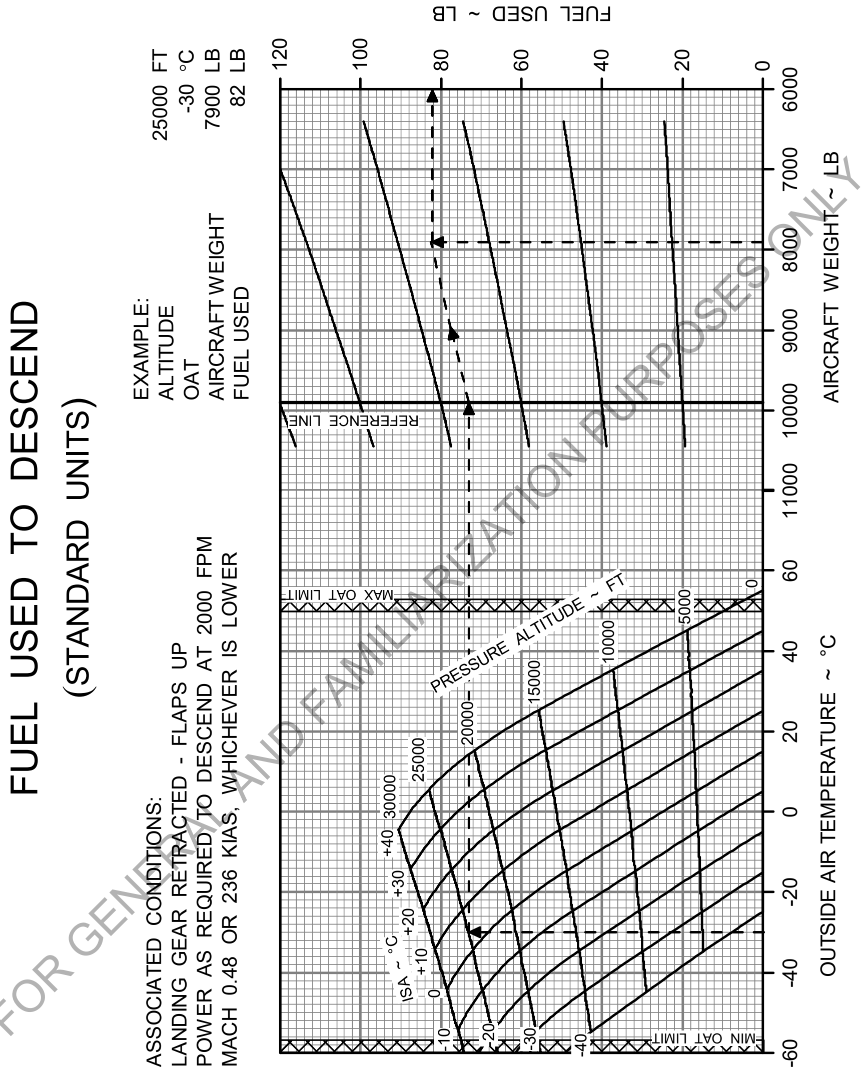


Figure 5-3-41. Fuel Used to Descend (standard units)

FUEL USED TO DESCEND
(METRIC UNITS)

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED - FLAPS UP
POWER AS REQUIRED TO DESCEND AT 2000 FPM
MACH 0.48 OR 236 KIAS, WHICHEVER IS LOWER

EXAMPLE:	
ALTITUDE	25000 FT
OAT	-30 °C
AIRCRAFT WEIGHT	3600 KG
FUEL USED	36 KG

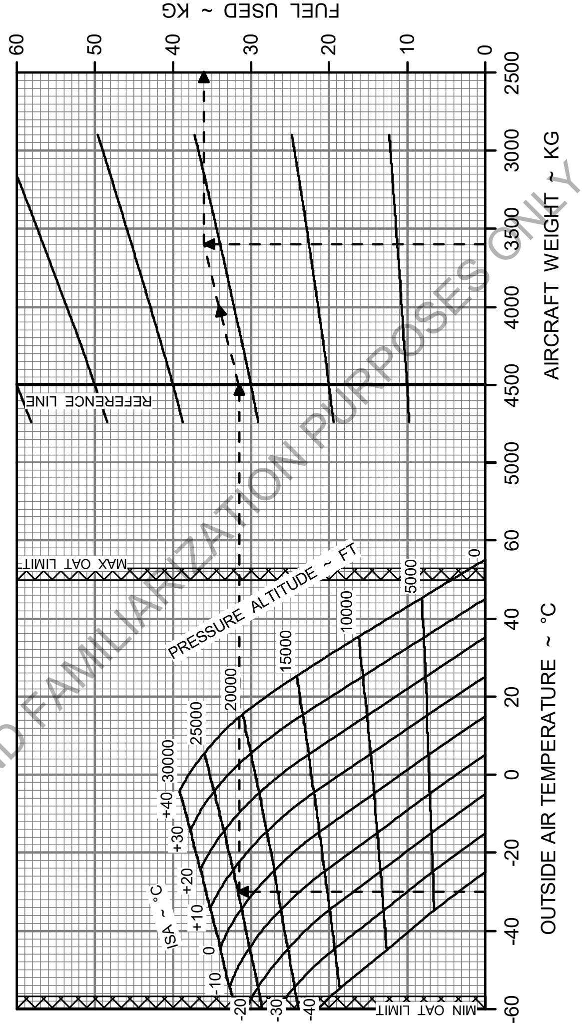


Figure 5-3-42. Fuel Used to Descend (metric units)

DISTANCE TO DESCEND

ASSOCIATED CONDITIONS:
LANDING GEAR RETRACTED - FLAPS UP
POWER AS REQUIRED TO
DESCEND AT 2000 FPM
AIRSPEED: MACH 0.48 OR 236 KIAS,
WHICHEVER IS LOWER

EXAMPLE:
ALTITUDE 25000 FT
OAT -32 °C
DISTANCE 58 NM

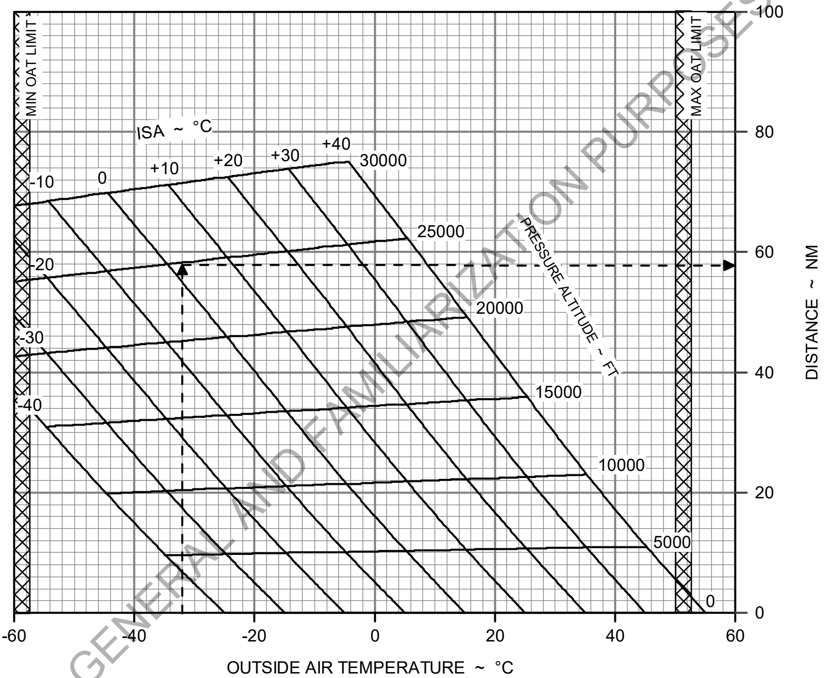


Figure 5-3-43. Distance to Descend

POWER-OFF GLIDE TIME
(STANDARD UNITS)

ASSOCIATED CONDITIONS:
POWER OFF
PROPELLER FEATHERED
LANDING GEAR RETRACTED
FLAPS UP

WEIGHT ~ LB	KIAS
10450	119
9920	116
9040	110
8160	105
7280	99
6400	93

EXAMPLE:

ALTITUDE	25000 FT
OAT	-30 °C
AIRCRAFT WEIGHT	6950 LB
GLIDE TIME	33 MIN

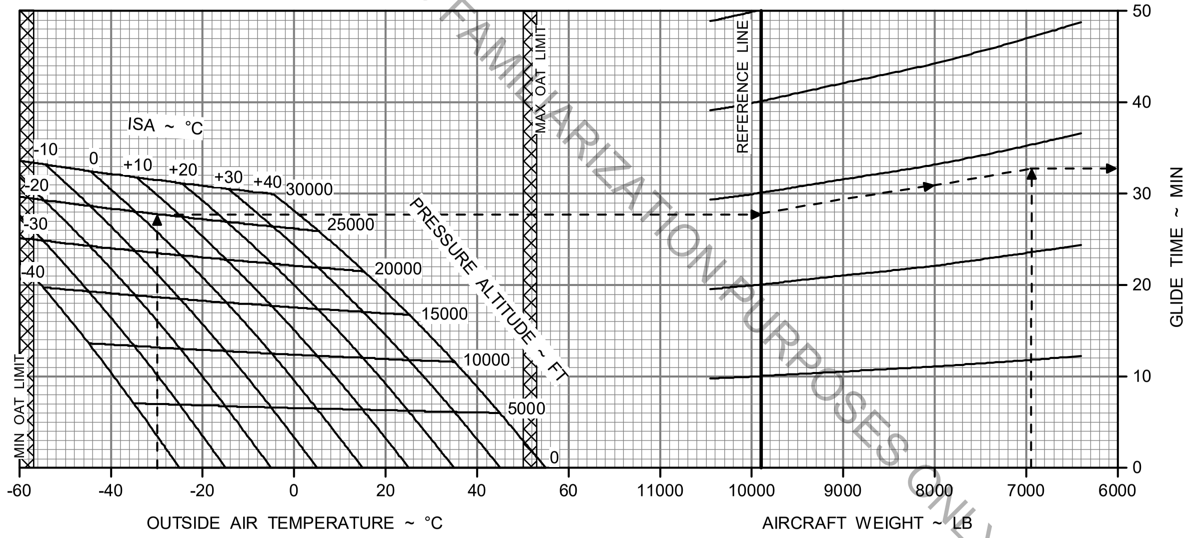
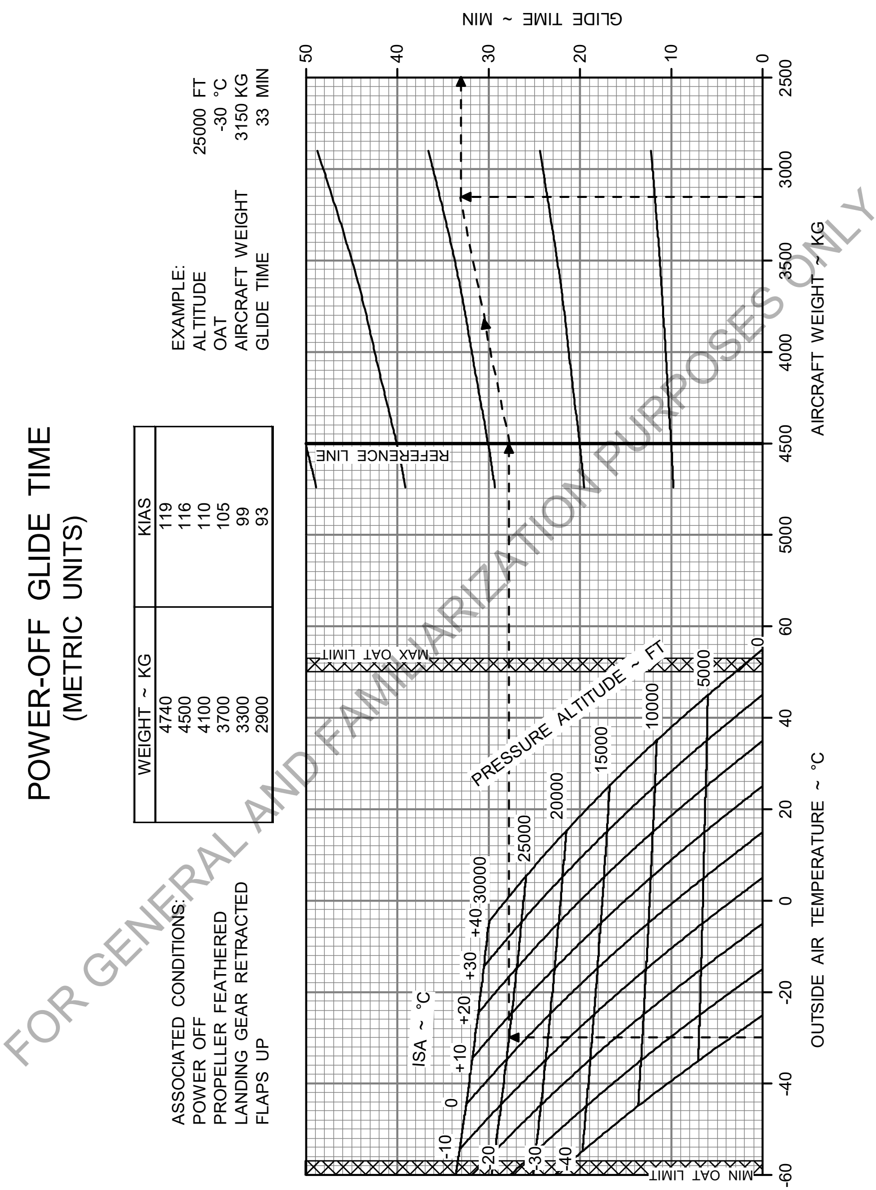


Figure 5-3-44. Power-off Glide Time (standard units)



WEIGHT ~ KG	KIAS
4740	119
4500	116
4100	110
3700	105
3300	99
2900	93

Figure 5-3-45. Power-off Glide Time (metric units)

POWER-OFF GLIDE DISTANCE
(VALID FOR ALL AIRCRAFT WEIGHTS)

ASSOCIATED CONDITIONS:
POWER OFF
PROPELLER FEATHERED
LANDING GEAR RETRACTED
FLAPS UP

WEIGHT ~ LB	WEIGHT ~ KG	KIAS
10450	4740	119
9920	4500	116
9040	4100	110
8160	3700	105
7280	3300	99
6400	2900	93

EXAMPLE:
ALTITUDE 25000 FT
OAT -30 °C
GLIDE DISTANCE 65 NM

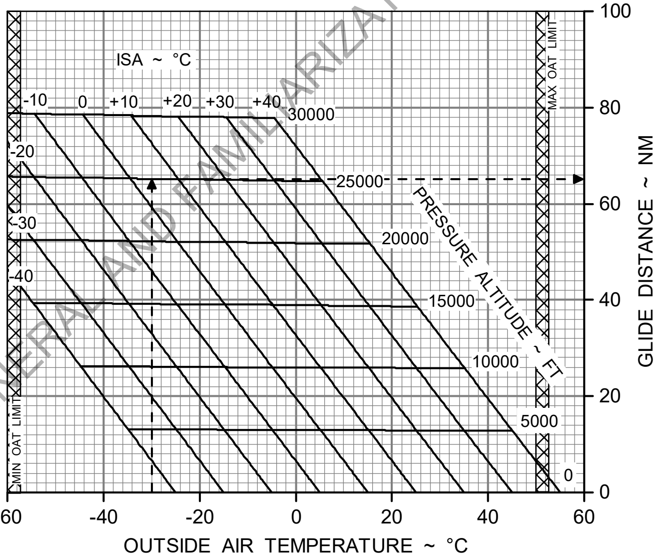


Figure 5-3-46. Power-off Glide Distance

BALKED LANDING TORQUE

PROPELLER SPEED 1700 RPM

ICE PROTECTION:

PROBES: ON

WINDSHIELD: ON

INERTIAL SEPERATOR OPERATION HAS NO EFFECT ON TORQUE

DEICE/ANTICE SYTEMS CAN REDUCE TORQUE BY 0.2 PSI

EXAMPLE:

ALTITUDE	8000	FT
OAT	26	°C
ENGINE TORQUE	34.6	PSI

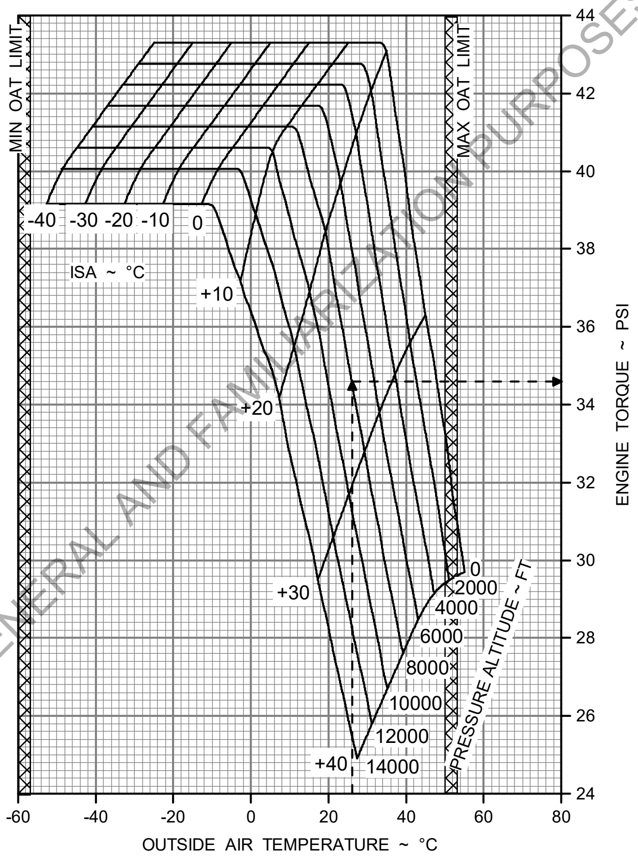
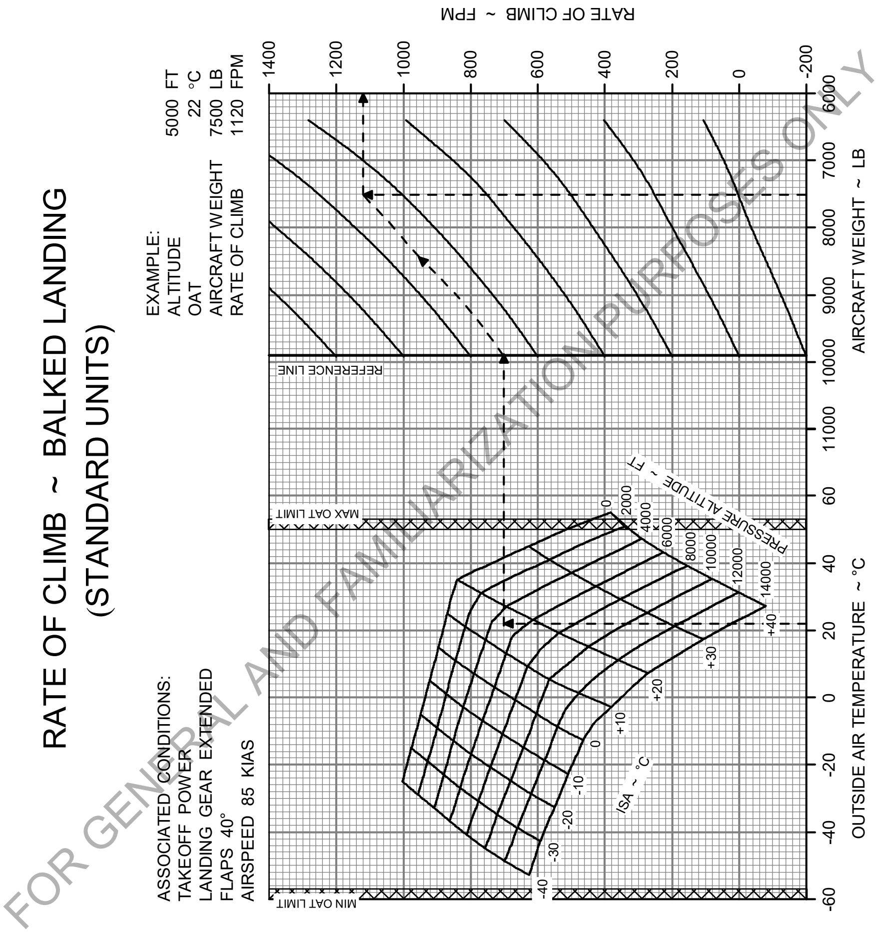
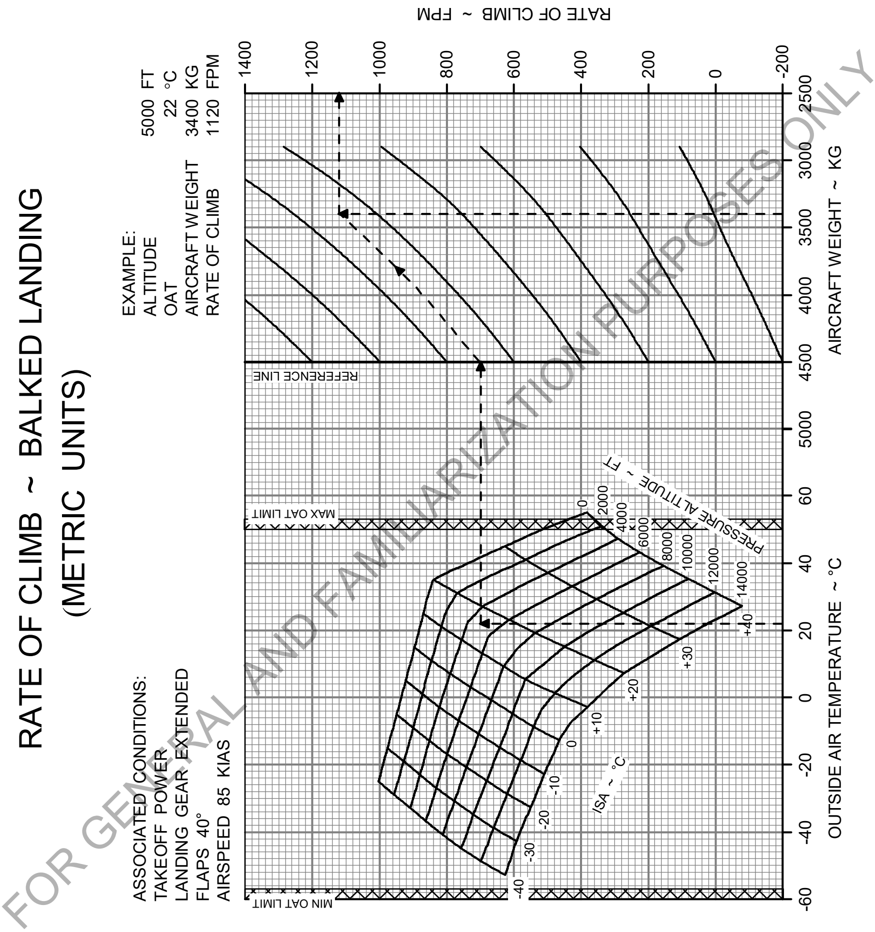


Figure 5-3-47. Balked Landing Torque



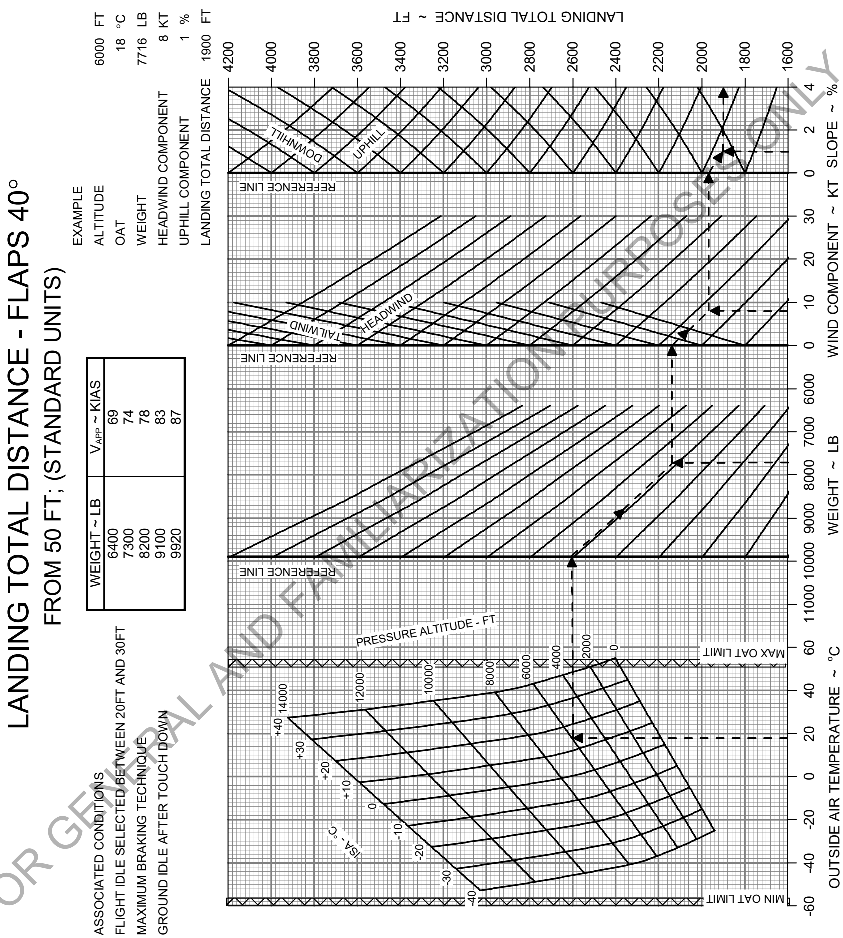
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-48. Rate of Climb - Balked Landing (standard units)



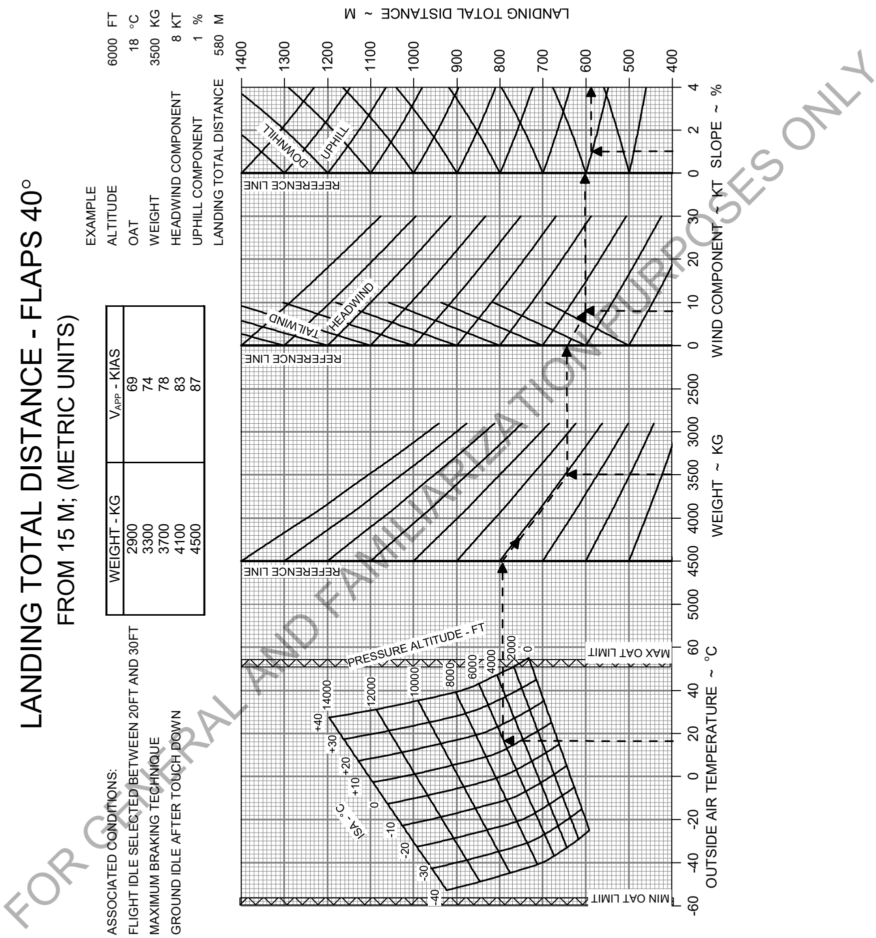
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-49. Rate of Climb - Balked Landing (metric units)



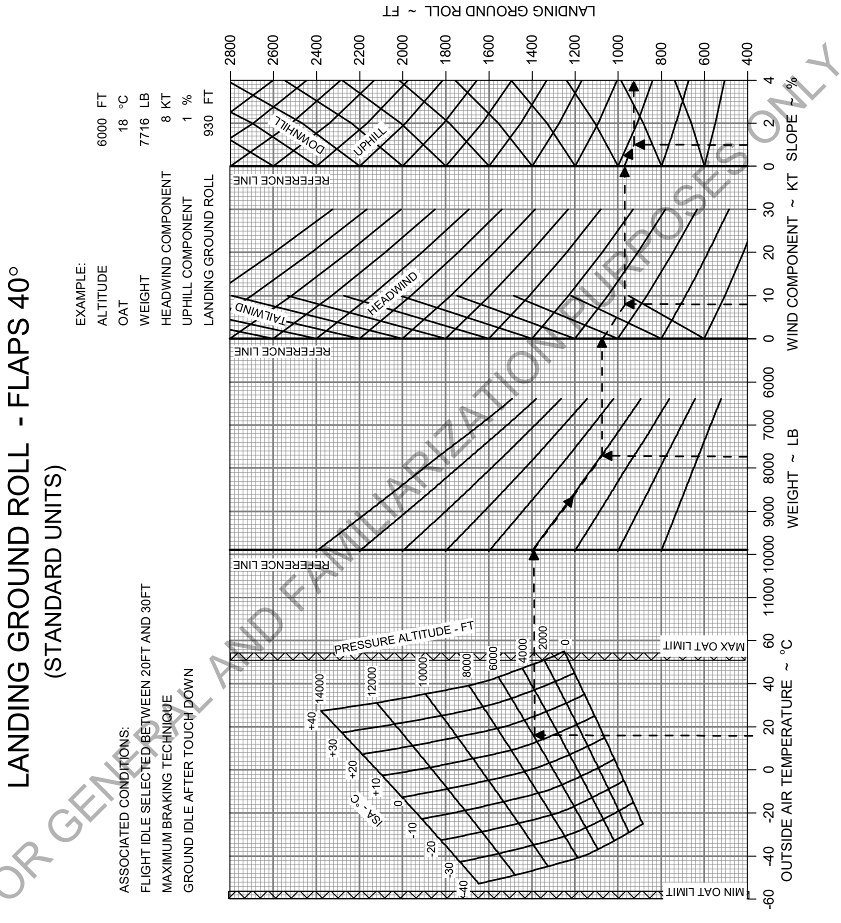
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-50. Landing Total Distance - Flaps 40° (standard units)



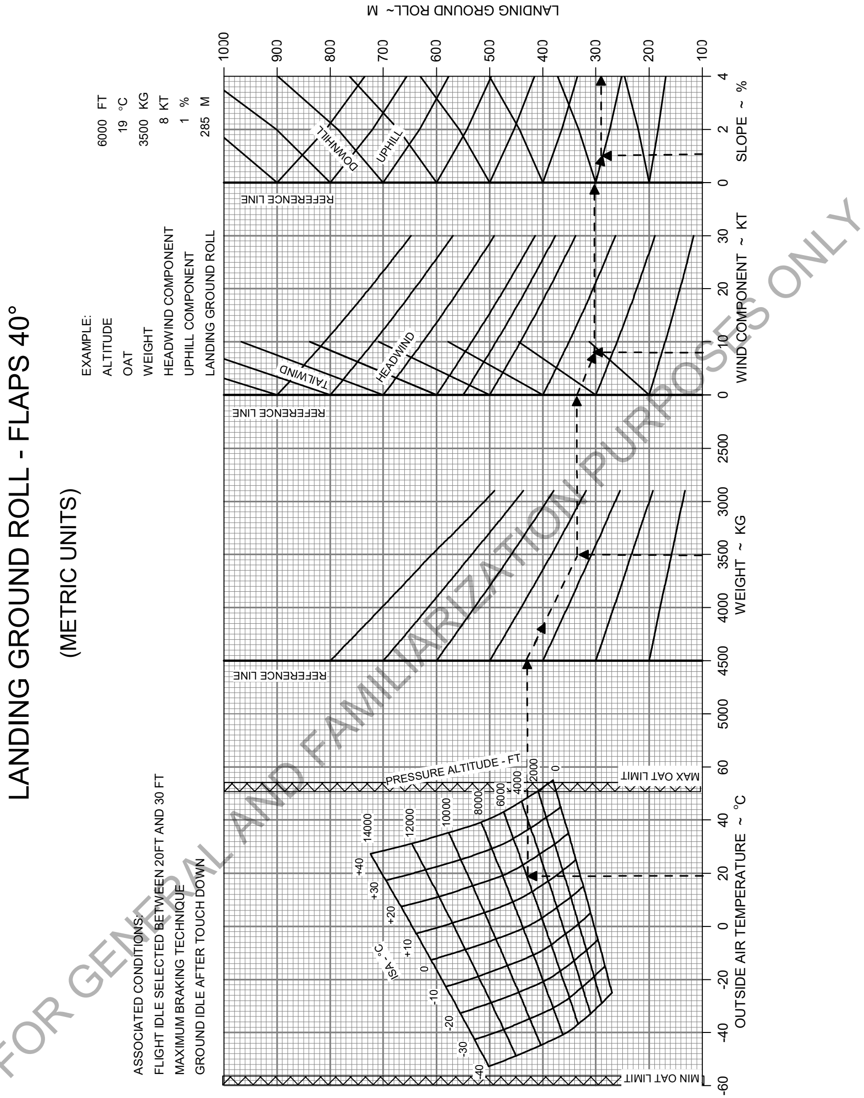
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-51. Landing Total Distance - Flaps 40° (metric units)



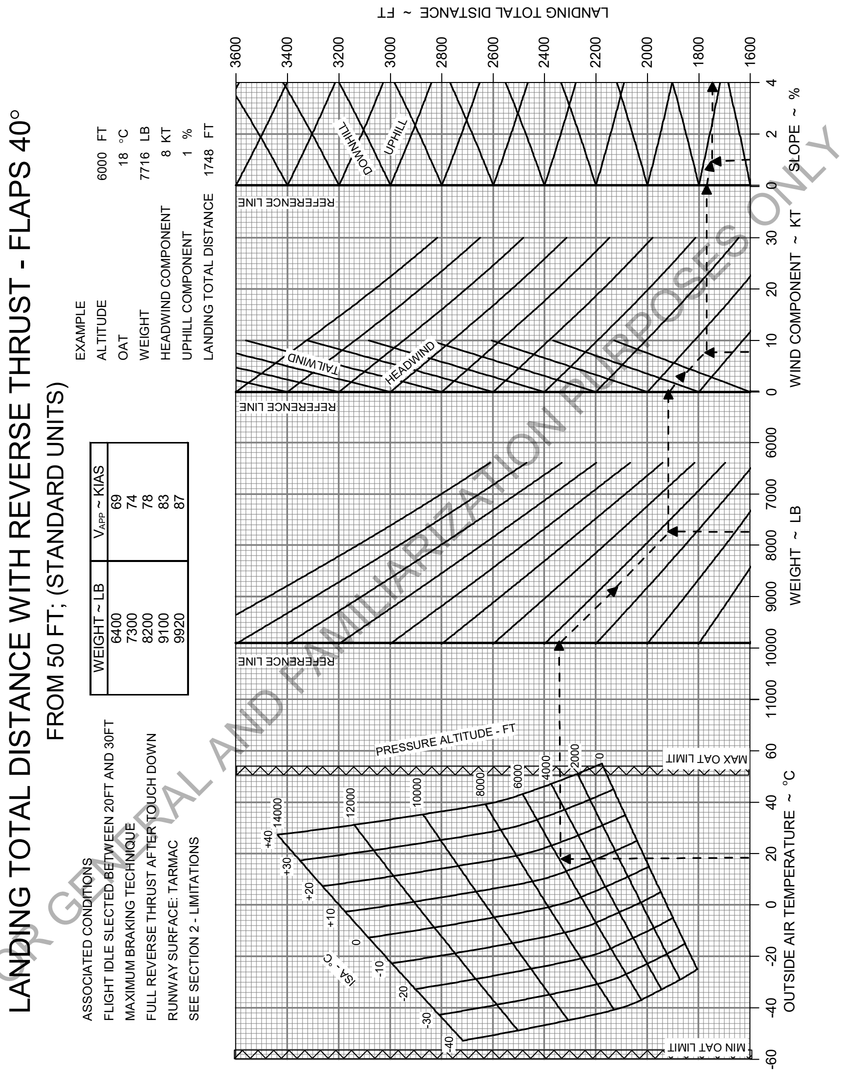
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-52. Landing Ground Roll - Flaps 40° (standard units)



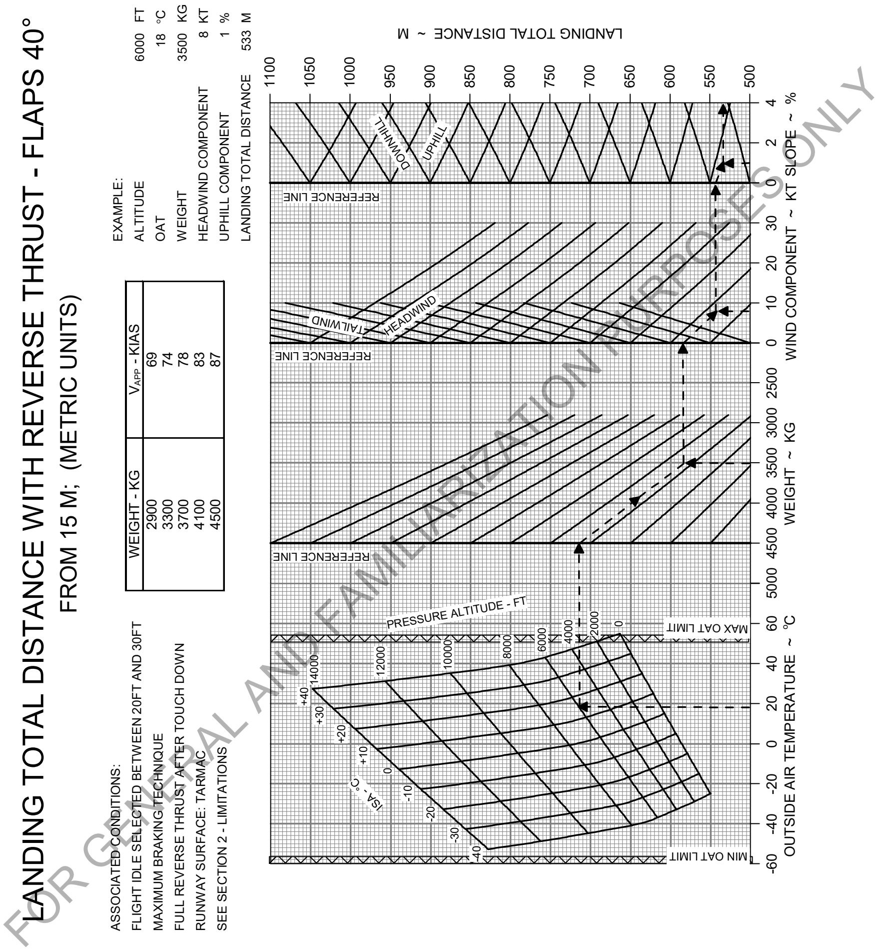
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-53. Landing Ground Roll - Flaps 40° (metric units)



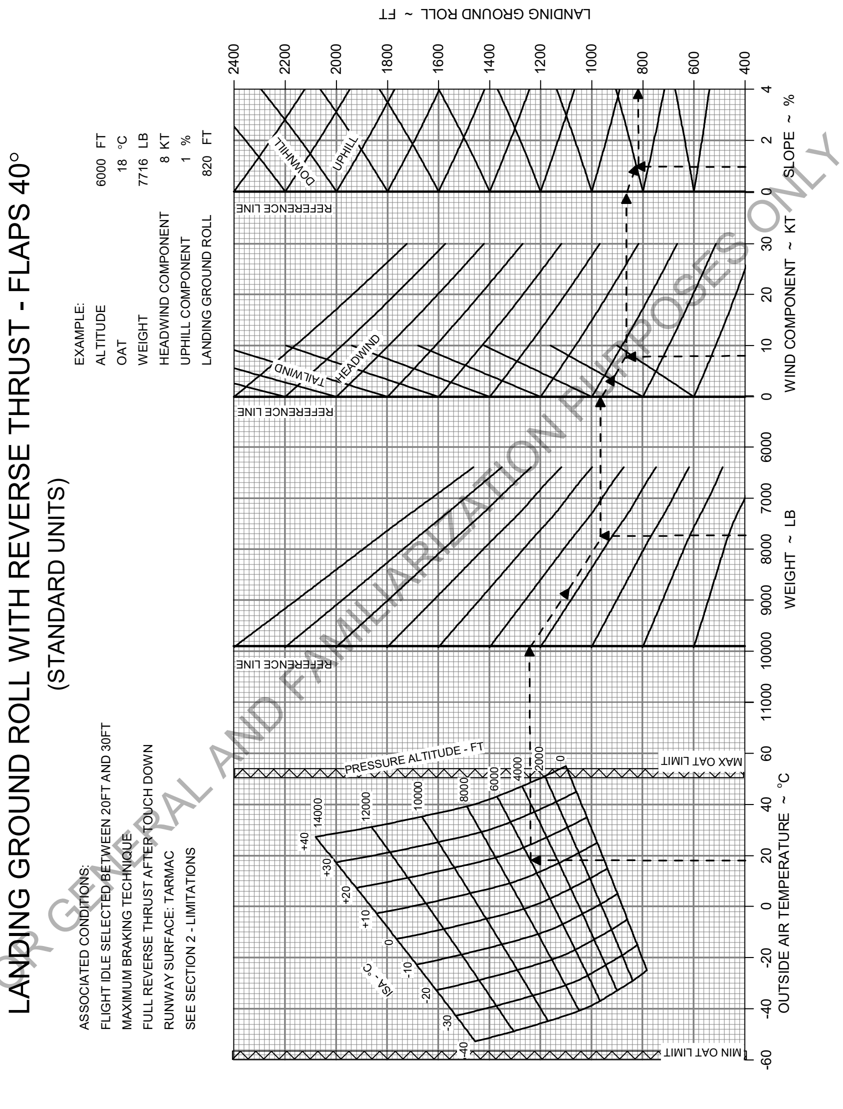
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-54. Landing Total Distance with the use of Reverse Thrust - Flaps 40° (standard units)



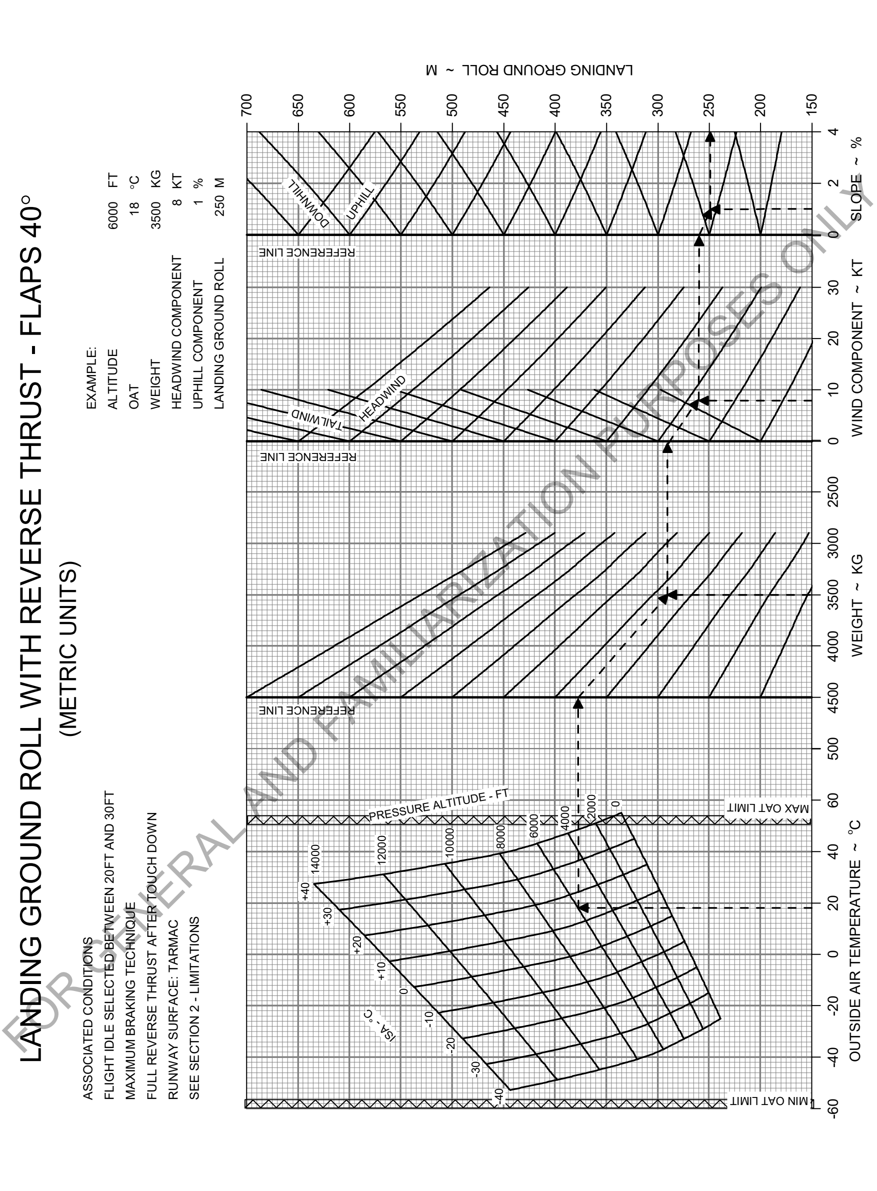
See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-55. Landing Total Distance with the use of Reverse Thrust - Flaps 40° (metric units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-56. Landing Ground Roll with the use of Reverse Thrust - Flaps 40° (standard units)



See FLIGHT IN ICING CONDITIONS para for info on effect of icing

Figure 5-3-57. Landing Ground Roll with the use of Reverse Thrust - Flaps 40° (metric units)

FLIGHT IN ICING CONDITIONS

The following section presents performance information related to the operation in or into known icing conditions. This information was derived analytically from actual wind tunnel tests with natural ice. The following cases are considered:

- 45 minutes holding in moderate icing conditions with fully operational pneumatic de-ice boots and substantial ice accretion on unprotected surfaces.
- 20 minutes holding in moderate icing conditions with ice accretion on the total airframe due to inoperative pneumatic de-ice boots.

Besides these aerodynamic degradations, performance losses to the aircraft's propulsive system have been considered (increased bleed air extraction, inertial separator open, less ram recovery, and ice-build up on unprotected parts of the propeller blades).

FLAPS

When operating in or into known icing conditions, the use of Flaps 30° or 40° is prohibited

When operating in or into known icing conditions with fully operational pneumatic de-ice boots, the flap position is limited to a maximum of 15°.

When operating in or into known icing conditions with failed operational pneumatic de-ice boots, the flap position is limited to a maximum of 0°.

STALL SPEEDS

When operating in STICK PUSHER ICE MODE the stick pusher computer automatically reduces the shaker and pusher settings as measured by the angle of attack vanes, by 8°. With operational pneumatic de-ice boots, this results in an increase of the stall speed at the maximum takeoff weight of 12 kts with flaps set to 0° and 9 kts with flaps set to 15°.

The wings level stall speeds at the maximum takeoff weight of 10450 lb (4740 kg) and with flight idle power are summarized in Table 1.

Table 1 - Stall Speeds in accordance with ICE Mode Set

FLAPS	STALL SPEED (PUSHER ACTIVATION) AT MTOW - KIAS	
0°	Non icing	95
	Icing conditions (STICK PUSHER ICE MODE)	107
	Pneumatic de-ice boots failure (unprotected)	110
15°	Non icing	78
	Icing conditions (STICK PUSHER ICE MODE)	87

ENGINE TORQUE

When the engine inlet inertial separator is open and during flight, the maximum torque available can be reduced by up to 2.2 psi in non-icing conditions, and up to 3.0 psi in icing conditions.

TAKEOFF PERFORMANCE

The flaps must be set to 15° for takeoff. The use of flaps 30° for takeoff is prohibited.

When de-icing / anti-icing fluids are applied to the aircraft before departure, and/or when the stick pusher is in ICE mode: The takeoff reference speeds must be adjusted to the values indicated by the corresponding correction table.

The total takeoff distance is calculated by first computing the total takeoff distance in non-icing conditions from Figure 5-3-14 (standard units) or Figure 5-3-15 (metric units) and then correcting that distance for takeoff in or into known icing conditions by using the corrections in Table 2.

Table 2 - Icing Corrections to Takeoff Total Distance

TABLE A	**TAKEOFF WEIGHT - KG**					
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
V_R / V_{50ft} (KIAS)	**72 / 88**	**77 / 94**	**81 / 100**	**86 / 105**	**90 / 110**	**92 / 113**
0 FT	+21	+26	+27	+28	+29	+30
2000 FT	+23	+26	+27	+28	+30	+31
4000 FT	+26	+26	+27	+29	+30	+32
6000 FT	+26	+26	+28	+29	+31	+32
8000 FT	+26	+27	+28	+30	+32	+33
10000 FT	+25	+27	+28	+30	+32	+33
12000 FT	+26	+27	+29	+30	+32	+33
14000 FT	+27	+29	+30	+31	+33	+33
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE A	**TAKEOFF WEIGHT - LB**					

TABLE B	**TAKEOFF WEIGHT - KG**
WIND CORRECTION (%)	**2900 - 4740**
10 KTS TAILWIND	-3
NO WIND	0
10 KTS HEADWIND	+1
20 KTS HEADWIND	+3
30 KTS HEADWIND	+5
WIND CORRECTION (%)	**6393 - 10450**
TABLE B	**TAKEOFF WEIGHT - LB**

TABLE C	**TAKEOFF WEIGHT - KG**					
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
4% DOWN	+2	+2	+1	-1	-2	-2
2% DOWN	+2	+2	-1	-1	-1	-1
NO SLOPE	0	0	0	0	0	0
2% UP	+4	+2	+2	+3	+4	+4
4% UP	+7	+5	+5	+7	+9	+10
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE C	**TAKEOFF WEIGHT - LB**					

ICING CORRECTION (%) = A + B + C

Analogically, the takeoff ground roll is derived correcting the distances obtained from Figure 5-3-12 (standard units) or Figure 5-3-13 (metric units) by using Table 3.

Table 3 - Icing Corrections to Takeoff Ground Roll

TABLE A	TAKEOFF WEIGHT - KG					
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500	4740
V_R / V_{50ft} (KIAS)	72 / 88	77 / 94	81 / 100	86 / 105	90 / 110	92 / 113
0 FT	+28	+28	+29	+29	+30	+30
2000 FT	+28	+28	+29	+29	+30	+30
4000 FT	+28	+28	+29	+29	+30	+30
6000 FT	+28	+28	+29	+29	+30	+30
8000 FT	+28	+28	+29	+29	+30	+30
10000 FT	+28	+28	+29	+29	+30	+30
12000 FT	+28	+28	+29	+29	+30	+30
14000 FT	+28	+29	+30	+30	+31	+32
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921	10450
TABLE A	TAKEOFF WEIGHT - LB					

TABLE B	TAKEOFF WEIGHT - KG
WIND CORRECTION (%)	2900 - 4740
10 KTS TAILWIND	-4
NO WIND	0
10 KTS HEADWIND	+2
20 KTS HEADWIND	+5
30 KTS HEADWIND	+8
WIND CORRECTION (%)	6393 - 10450
TABLE B	TAKEOFF WEIGHT - LB

TABLE C	TAKEOFF WEIGHT - KG					
SLOPE CORRECTION (%)	2900	3300	3700	4100	4500	4740
4% DOWN	0	0	-1	-1	-1	-1
2% DOWN	0	0	0	0	0	-1
NO SLOPE	0	0	0	0	0	0
2% UP	+1	+1	+1	+2	+2	+3
4% UP	+1	+2	+3	+4	+6	+6
SLOPE CORRECTION (%)	6393	7275	8157	9039	9921	10450
TABLE C	TAKEOFF WEIGHT - LB					

ICING CORRECTION (%) = A + B + C

Example:

- Pressure Altitude 6000 ft
- Outside Air Temperature 18°C
- Weight 3500 kg
- Headwind Component 8 kt
- Uphill Component 1%
- Takeoff Ground Roll 420 m (from Figure 5-3-13)
- Icing Correction (A + B +C) = 28.5% + 1.6% + 0.5% = 30.6%
- Takeoff Ground Roll in Icing Conditions = 420 m x 1.306 = 549 m.

ACCELERATE STOP PERFORMANCE

The flaps must be set to 15° for takeoff. The use of Flaps 30° for takeoff is prohibited.

The maximum speed for power chop is assumed to be 10 kts higher than that for non-icing conditions.

The total accelerate-stop distance is calculated by first computing the total accelerate-stop distance in non-icing conditions from Figure 5-3-10 (standard units) or Figure 5-3-11 (metric units) and then correcting that distance for takeoff in or into known icing conditions by using the corrections in Table 4.

Table 4 - Icing Corrections to Accelerate Stop Distance

TABLE A	TAKEOFF WEIGHT - KG					
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
POWER CHOP SPEED (KIAS)	**76**	**81**	**86**	**90**	**95**	**97**
0 FT	+25	+26	+27	+28	+28	+29
2000 FT	+25	+26	+27	+28	+29	+29
4000 FT	+26	+27	+28	+28	+29	+29
6000 FT	+26	+27	+28	+29	+29	+30
8000 FT	+26	+27	+28	+29	+30	+30
10000 FT	+27	+28	+28	+29	+30	+30
12000 FT	+27	+28	+29	+29	+30	+30
14000 FT	+28	+29	+30	+30	+31	+32
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE A	**TAKEOFF WEIGHT - LB**					

TABLE B	TAKEOFF WEIGHT - KG
WIND CORRECTION (%)	**2900 - 4740**
10 KTS TAILWIND	-3
NO WIND	0
10 KTS HEADWIND	+2
20 KTS HEADWIND	+3
30 KTS HEADWIND	+5
WIND CORRECTION (%)	**6400 - 10450**
TABLE B	**TAKEOFF WEIGHT - LB**

TABLE C	TAKEOFF WEIGHT - KG					
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**	**4740**
4% DOWN	+2	+2	+2	+2	+2	+2
2% DOWN	+1	+1	+1	+1	+1	+1
NO SLOPE	0	0	0	0	0	0
2% UP	0	0	0	+1	+1	+2
4% UP	0	+1	+1	+2	+4	+6
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**	**10450**
TABLE C	**TAKEOFF WEIGHT - LB**					

ICING CORRECTION (%) = A + B + C

MAXIMUM RATE OF CLIMB

The use of Flaps 30° is prohibited in or into known icing conditions. After icing encounters, and with visible ice accretion on the airframe, a climb is performed with the flaps retracted and a climb speed based on the schedule below.

Table 5 - Climb Speed in Icing Conditions

FLAPS UP	NON-ICING	ICING	PNEUMATIC DE-ICE BOOT FAILURE
ALTITUDE	**KIAS**	**KIAS**	**KIAS**
0 FT	130	135	140
5000 FT	125		
10000 FT	125		
15000 FT	125		
20000 FT	120		
25000 FT	120		
30000 FT	120		

The total climb performance is calculated by first computing the Rate of Climb in non-icing conditions from Figure 5-3-21 (standard units) or Figure 5-3-22 (metric units) and then correcting the Rate of Climb in or into known icing conditions by using the corrections in Table 6 (with operational pneumatic de-ice boots) or Table 7 (with the pneumatic de-ice boots inoperative).

Table 6 - Icing Corrections to Maximum Rate of Climb with Operational Pneumatic De-ice Boots

RATE OF CLIMB CORRECTION (FEET PER MINUTE)				
ALTITUDE - FT	**TAKEOFF WEIGHT - KG**			
	2900	**3500**	**4500**	**4740**
0	-1230	-1030	-790	-750
5000	-1280	-1060	-800	-760
10000	-1320	-1090	-830	-780
15000	-1330	-1100	-840	-790
20000	-1380	-1140	-850	-800
25000	-1400	-1150	-870	-820
30000	-1430	-1180	-880	-840
ALTITUDE - FT	**6393**	**7716**	**9921**	**10450**
	TAKEOFF WEIGHT - LB			

Table 7 - Icing Corrections to Maximum Rate of Climb with Pneumatic De-ice Boots Inoperative

RATE OF CLIMB CORRECTION (FEET PER MINUTE)				
ALTITUDE - FT	TAKEOFF WEIGHT - KG			
	2900	3500	4500	4740
0	-1510	-1270	-970	-920
5000	-1590	-1330	-1010	-950
10000	-1650	-1380	-1050	-990
15000	-1700	-1410	-1080	-1010
20000	-1810	-1500	-1130	-1060
25000	-1870	-1540	-1170	-1100
30000	-1940	-1600	-1210	-1150
ALTITUDE - FT	6393	7716	9921	10450
	TAKEOFF WEIGHT - LB			

Example:

- Pressure Altitude 7000 ft
- Outside Air Temperature 22°C
- Aircraft Weight 3800 kg
- Rate of Climb (non-icing) 1925 fpm (from Figure 5-2-22)
- Icing Correction -994 fpm (interpolated from Table 6)
- Max. Rate of Climb in Icing Conditions = 1925 fpm - 994 fpm = 931 fpm.

HOLDING ENDURANCE

During holding flight in icing conditions, a higher engine torque is required to maintain level flight. Table 8 and Table 9 give the increases in fuel flow with respect to non-icing conditions. Refer to Figure 5-3-39.

Table 8 - Icing Corrections to Holding Fuel Flow with Operational Pneumatic De-ice Boots

FUEL FLOW CORRECTION (%)	
ALTITUDE - FT	AIRCRAFT WEIGHT - KG
	2900 - 4740
0 FT	+29
5000 FT	+33
10000 FT	+37
15000 FT	+45
ALTITUDE - FT	6393 - 10450
	AIRCRAFT WEIGHT - LB

Table 9 - Icing Corrections to Holding Fuel Flow with Pneumatic De-ice Boots Inoperative

FUEL FLOW CORRECTION (%)	
ALTITUDE - FT	AIRCRAFT WEIGHT - KG
	2900 - 4740
0 FT	+36
5000 FT	+41
10000 FT	+48
15000 FT	+57
ALTITUDE - FT	6393 - 10450
	AIRCRAFT WEIGHT - LB

BALKED RATE OF CLIMB

The use of Flaps 30° or Flaps 40° is prohibited in or into known icing conditions.

After icing encounters and with visible ice accretion on the airframe, a balked landing climb is performed with Flaps 15° and a climb speed of 105 KIAS. The total climb performance is calculated by first computing the Rate of Climb in non-icing conditions from Figure 5-3-48 (standard units) or Figure 5-3-49 (metric units) and then correcting the Rate of Climb in or into known icing conditions by using the corrections in Table 10.

Table 10 - Icing Corrections to Balked Landing Climb with Operational Pneumatic De-ice Boots

RATE OF CLIMB CORRECTION (FEET PER MINUTE)			
ALTITUDE - FT	LANDING WEIGHT - KG		
	2900	3500	4500
0	-140	-100	-80
2000	-140	-100	-80
4000	-150	-100	-80
6000	-150	-100	-80
8000	-150	-110	-90
10000	-160	-110	-90
12000	-150	-110	-80
14000	-150	-110	-80
ALTITUDE - FT	6393	7716	9921
	LANDING WEIGHT - LB		

After failure of the airframe pneumatic boots in icing conditions, a balked landing climb is performed with Flaps 0° and a climb speed of 130 KIAS. The total climb performance is calculated by first computing the Rate of Climb in non-icing conditions from Figure 5-3-48 (standard units) or Figure 5-3-49 (metric units) and then correcting the Rate of Climb in or into known icing conditions by using the corrections in the Table 11.

Table 11 - Icing Corrections to Balked Landing Climb with Pneumatic De-ice Boots inoperative

RATE OF CLIMB CORRECTION (FEET PER MINUTE)			
ALTITUDE - FT	**LANDING WEIGHT - KG**		
	2900	**3500**	**4500**
0	-580	-450	-320
2000	-620	-480	-340
4000	-670	-520	-360
6000	-700	-540	-380
8000	-740	-580	-400
10000	-780	-610	-420
12000	-800	-630	-440
14000	-950	-750	-530
ALTITUDE - FT	**6393**	**7716**	**9921**
	LANDING WEIGHT - LB		

LANDING PERFORMANCE

The flaps must be set to 15° for landing. The use of Flaps 30° or 40° for landing is prohibited. With pneumatic de-ice boots failed; a flaps-up-landing must be performed. For both flap configurations, the landing reference speed must be adjusted to the values indicated by the corresponding correction table.
The landing distance is calculated by first computing the landing distance in non-icing conditions and then correcting that distance for landing in or into known icing conditions by using the following correction tables:

Table 12 - Landing in Icing Conditions - Overview

Reverse Thrust	Pneumatic De-ice Boots	Flap Setting	Landing Performance Information	Non-icing Figure No.	Icing Correction Table
No	Operational	Flaps 15°	Landing Total Distance	Figure 5-3-50/51	Table 13
			Landing Ground Roll	Figure 5-3-52/53	Table 14
	Inoperative	Flaps 0°	Landing Total Distance	Figure 5-3-50/51	Table 15
			Landing Ground Roll	Figure 5-3-52/53	Table 16
Yes	Operational	Flaps 15°	Landing Total Distance	Figure 5-3-54/55	Table 17
			Landing Ground Roll	Figure 5-3-56/57	Table 18
	Inoperative	Flaps 0°	Landing Total Distance	Figure 5-3-54/55	Table 19
			Landing Ground Roll	Figure 5-3-56/57	Table 20

Table 13 - Icing Corrections to Landing Total Distance – Flaps 15° - No Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500
V_{APP} (KIAS)	84	90	95	100	105
0 FT	+38	+41	+43	+45	+47
2000 FT	+39	+42	+44	+46	+48
4000 FT	+41	+44	+46	+48	+49
6000 FT	+42	+45	+47	+49	+50
8000 FT	+44	+46	+48	+50	+52
10000 FT	+45	+47	+50	+51	+53
12000 FT	+46	+49	+51	+52	+53
14000 FT	+48	+50	+52	+52	+52
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921
TABLE A	LANDING WEIGHT - LB				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	2900	3300	3700	4100	4500
10 KTS TAILWIND	-5	-5	-5	-5	-5
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+3	+3	+3	+3	+3
20 KTS HEADWIND	+6	+6	+6	+6	+6
30 KTS HEADWIND	+11	+10	+10	+10	+9
WIND CORRECTION (%)	6393	7275	8157	9039	9921
TABLE B	LANDING WEIGHT - LB				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	2900 - 4500
4% DOWN	+1
2% DOWN	0
NO SLOPE	0
2% UP	0
4% UP	0
SLOPE CORRECTION (%)	6393 - 9921
TABLE C	LANDING WEIGHT - LB

ICING CORRECTION (%) = A + B + C

Table 14- Icing Corrections to Landing Ground Roll – Flaps 15° - No Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**84**	**90**	**95**	**100**	**105**
0 FT	+64	+59	+56	+57	+58
2000 FT	+61	+57	+57	+58	+59
4000 FT	+59	+56	+58	+59	+60
6000 FT	+56	+57	+58	+59	+60
8000 FT	+57	+58	+59	+61	+62
10000 FT	+57	+59	+60	+61	+63
12000 FT	+58	+59	+61	+62	+64
14000 FT	+59	+61	+62	+64	+65
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-7	-7	-6	-5	-5
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+6	+5	+4	+4	+4
20 KTS HEADWIND	+14	+11	+9	+9	+8
30 KTS HEADWIND	+23	+19	+16	+15	+14
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	**2900 - 4500**
4% DOWN	-3
2% DOWN	-1
NO SLOPE	0
2% UP	+2
4% UP	+4
SLOPE CORRECTION (%)	**6393 - 9921**
TABLE C	**LANDING WEIGHT - LB**

ICING CORRECTION (%) = A + B + C

Table 15 - Icing Corrections to Landing Total Distance – Flaps 0° - No Reverse Thrust

TABLE A	**LANDING WEIGHT - KG**				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**104**	**111**	**118**	**124**	**130**
0 FT	+86	+92	+97	+101	+104
2000 FT	+89	+94	+99	+103	+106
4000 FT	+93	+98	+103	+107	+110
6000 FT	+95	+100	+105	+109	+113
8000 FT	+99	+104	+109	+113	+118
10000 FT	+101	+107	+112	+116	+121
12000 FT	+104	+109	+115	+120	+120
14000 FT	+108	+114	+120	+119	+117
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	**LANDING WEIGHT - KG**				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-12	-11	-11	-11	-11
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+7	+6	+6	+6	+6
20 KTS HEADWIND	+15	+14	+14	+13	+13
30 KTS HEADWIND	+25	+24	+23	+22	+21
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	**LANDING WEIGHT - KG**				
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
4% DOWN	-2	-3	-4	-4	-3
2% DOWN	-1	-1	-1	-1	-1
NO SLOPE	0	0	0	0	0
2% UP	+2	+2	+2	+2	+2
4% UP	+3	+3	+3	+3	+3
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE C	**LANDING WEIGHT - LB**				

ICING CORRECTION (%) = A + B + C

Table 16 - Icing Corrections to Landing Ground Roll – Flaps 0° - No Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**104**	**111**	**118**	**124**	**130**
0 FT	+117	+112	+111	+113	+115
2000 FT	+114	+110	+112	+115	+117
4000 FT	+111	+112	+115	+118	+121
6000 FT	+110	+114	+117	+121	+124
8000 FT	+113	+117	+121	+125	+129
10000 FT	+115	+120	+124	+129	+133
12000 FT	+118	+122	+127	+132	+138
14000 FT	+122	+127	+134	+137	+137
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-13	-12	-11	-10	-10
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+12	+10	+9	+8	+8
20 KTS HEADWIND	+26	+22	+19	+18	+17
30 KTS HEADWIND	+46	+38	+33	+30	+28
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	LANDING WEIGHT - KG				
SLOPE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
4% DOWN	-7	-7	-6	-7	-6
2% DOWN	-3	-3	-3	-2	-2
NO SLOPE	0	0	0	0	0
2% UP	+6	+6	+6	+6	+6
4% UP	+12	+11	+11	+11	+10
SLOPE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE C	**LANDING WEIGHT - LB**				

ICING CORRECTION (%) = A + B + C

Table 17 - Icing Corrections to Landing Total Distance – Flaps 15° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500
V_{APP} (KIAS)	84	90	95	100	105
0 FT	+32	+36	+38	+40	+41
2000 FT	+34	+37	+39	+40	+42
4000 FT	+36	+38	+40	+42	+43
6000 FT	+37	+39	+41	+42	+44
8000 FT	+39	+41	+42	+44	+43
10000 FT	+40	+41	+43	+43	+45
12000 FT	+40	+42	+43	+45	+46
14000 FT	+42	+42	+45	+46	+47
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921
TABLE A	LANDING WEIGHT - LB				

TABLE B	LANDING WEIGHT - KG
WIND CORRECTION (%)	2900 - 4500
10 KTS TAILWIND	-5
NO WIND	0
10 KTS HEADWIND	+3
20 KTS HEADWIND	+6
30 KTS HEADWIND	+11
WIND CORRECTION (%)	6393 - 9921
TABLE B	LANDING WEIGHT - LB

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	2900 - 4500
4% DOWN	0
2% DOWN	0
NO SLOPE	0
2% UP	0
4% UP	+1
SLOPE CORRECTION (%)	6393 - 9921
TABLE C	LANDING WEIGHT - LB

ICING CORRECTION (%) = A + B + C

Table 18 - Icing Corrections to Landing Ground Roll – Flaps 15° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500
V_{APP} (KIAS)	84	90	95	100	105
0 FT	+55	+52	+49	+50	+50
2000 FT	+53	+50	+50	+50	+50
4000 FT	+52	+50	+50	+50	+51
6000 FT	+50	+50	+50	+50	+51
8000 FT	+50	+50	+51	+51	+51
10000 FT	+50	+50	+51	+51	+51
12000 FT	+50	+51	+51	+51	+52
14000 FT	+50	+51	+51	+52	+52
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921
TABLE A	LANDING WEIGHT - LB				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	2900	3300	3700	4100	4500
10 KTS TAILWIND	-7	-7	-7	-6	-6
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+5	+5	+4	+4	+4
20 KTS HEADWIND	+12	+10	+9	+8	+8
30 KTS HEADWIND	+21	+18	+15	+14	+13
WIND CORRECTION (%)	6393	7275	8157	9039	9921
TABLE B	LANDING WEIGHT - LB				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	2900 - 4500
4% DOWN	-2
2% DOWN	-1
NO SLOPE	0
2% UP	+2
4% UP	+3
SLOPE CORRECTION (%)	6393 - 9921
TABLE C	LANDING WEIGHT - LB

ICING CORRECTION (%) = A + B + C

Table 19 - Icing Corrections to Landing Total Distance – Flaps 0° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
V_{APP} (KIAS)	**104**	**111**	**118**	**124**	**130**
0 FT	+77	+84	+88	+91	+94
2000 FT	+80	+86	+89	+93	+95
4000 FT	+84	+89	+92	+95	+98
6000 FT	+86	+90	+94	+97	+99
8000 FT	+89	+93	+96	+99	+99
10000 FT	+91	+95	+98	+98	+103
12000 FT	+93	+96	+97	+102	+105
14000 FT	+95	+95	+102	+105	+107
ALTITUDE CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE A	**LANDING WEIGHT - LB**				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	**2900**	**3300**	**3700**	**4100**	**4500**
10 KTS TAILWIND	-13	-13	-14	-14	-9
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+6	+6	+6	+6	+6
20 KTS HEADWIND	+14	+14	+14	+13	+13
30 KTS HEADWIND	+24	+23	+23	+22	+21
WIND CORRECTION (%)	**6393**	**7275**	**8157**	**9039**	**9921**
TABLE B	**LANDING WEIGHT - LB**				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	**2900 - 4500**
4% DOWN	-3
2% DOWN	-1
NO SLOPE	0
2% UP	+2
4% UP	+3
SLOPE CORRECTION (%)	**6393 - 9921**
TABLE C	**LANDING WEIGHT - LB**

ICING CORRECTION (%) = A + B + C

Table 20 - Icing Corrections to Landing Ground Roll – Flaps 0° - With Reverse Thrust

TABLE A	LANDING WEIGHT - KG				
ALTITUDE CORRECTION (%)	2900	3300	3700	4100	4500
V_{APP} (KIAS)	104	111	118	124	130
0 FT	+103	+99	+96	+97	+98
2000 FT	+101	+97	+97	+98	+98
4000 FT	+99	+97	+98	+99	+99
6000 FT	+97	+98	+99	+99	+100
8000 FT	+98	+99	+100	+101	+102
10000 FT	+98	+100	+101	+102	+104
12000 FT	+99	+100	+102	+103	+105
14000 FT	+100	+102	+104	+106	+105
ALTITUDE CORRECTION (%)	6393	7275	8157	9039	9921
TABLE A	LANDING WEIGHT - LB				

TABLE B	LANDING WEIGHT - KG				
WIND CORRECTION (%)	2900	3300	3700	4100	4500
10 KTS TAILWIND	-14	-13	-13	-13	-12
NO WIND	0	0	0	0	0
10 KTS HEADWIND	+11	+9	+8	+8	+7
20 KTS HEADWIND	+24	+21	+18	+17	+16
30 KTS HEADWIND	+42	+36	+31	+29	+27
WIND CORRECTION (%)	6393	7275	8157	9039	9921
TABLE B	LANDING WEIGHT - LB				

TABLE C	LANDING WEIGHT - KG
SLOPE CORRECTION (%)	2900 - 4500
4% DOWN	-6
2% DOWN	-3
NO SLOPE	0
2% UP	+4
4% UP	+8
SLOPE CORRECTION (%)	6393 - 9921
TABLE C	LANDING WEIGHT - LB

ICING CORRECTION (%) = A + B + C

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SECTION 5-4

FLIGHT PLANNING EXAMPLE

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FLIGHT PLANNING EXAMPLE

GENERAL

This section gives an example of flight planning for aircraft with a four bladed propeller. Before performance calculations can begin, it will be necessary to determine the aircraft loading. Refer to Section 6, Weight and Balance to calculate the actual aircraft loading.

Aircraft Configuration:			
Takeoff Weight	8798 lb	Total Trip Distance	765 nm
Usable Fuel	1650 lb		
Departure Airport Conditions:		**Destination Airport Conditions:**	
Field Pressure Altitude	4000 ft	Field Pressure Altitude	2000 ft
OAT	+17°C (ISA +10°C)	OAT	+16°C (ISA + 5°C)
Wind Component	9 kt (headwind)	Wind Component	6 kt (headwind)
Runway Slope	1% (uphill)	Runway Slope	1.5% (downhill)
Field Length	3690 ft	Field Length	2550 ft
Total Trip Distance	765 nm		
Cruise Conditions:			
Pressure Altitude	FL 280		
Forecast Temperature	-31°C (ISA +10°C)		
Forecast Wind Component	10 kt (headwind)		

TAKEOFF

Apply the departure airport conditions and the aircraft weight to the appropriate takeoff performance charts and check that the corresponding distances are less than the available field length at the departure airport.

Apply the departure airport conditions to the Takeoff Power Chart to determine maximum torque to be applied before brake release.

CLIMB

NOTE

The climb performance chart assumes a no wind condition. The pilot must consider the effect of the winds aloft when computing time, fuel, and distance to climb. The fuel to climb includes the fuel consumed during the takeoff run.

Apply the cruise conditions of pressure altitude and temperature (respectively 28000 ft and ISA + 10°C in this case) to the appropriate chart to determine the time, fuel, and distance to climb from sea level to the cruise altitude at the specified takeoff weight (8798 lb in this case). Next, apply the departure airport conditions (respectively 4000 ft and ISA + 10°C in this case) to the same chart to determine those same values to climb from sea level to the departure airport. Subtract the values for the departure airport from those for the cruise altitude. The remaining values are the time, fuel, and distance to climb from the departure airport to the cruise altitude.

Climb	Time	Fuel	Distance
From S. L. to 28000 ft	23 min	190 lb	66 nm
From S. L. to departure airport	3 min	25 lb	6 nm
Departure airport to 28000 ft.	20 min	165 lb	60 nm

DESCENT

NOTE

The descent performance chart assumes a no wind condition. The pilot must consider the effect of the winds aloft when computing time, fuel, and distance to descend.

Apply the cruise conditions of pressure altitude and temperature (respectively 28000 ft and ISA + 10°C in this case) to the appropriate chart to determine the time, fuel, and distance to descend from cruise altitude to sea level. The weight at the beginning of the descent is not known exactly at this stage, but it can be estimated in practice as shown in the following table:

Takeoff weight	- Usable fuel	+ Fuel reserve*	+ Allowance for descent	= Weight at beginning of descent
8798 lb	- 1650 lb	+ 300 lb	+ 100 lb	= 7548 lb

*As required by operating regulations; here a reserve corresponding to 45 min hold at 5000 ft is assumed.

Next, apply the destination airport conditions (respectively 2000 ft and ISA + 5°C in this case) to the same chart to determine those same values to descend from the destination airport to sea level. Subtract the values for the destination airport from those for the cruise altitude. The remaining values are the time, fuel, and distance to descend from the cruise altitude to the destination airport.

Descent	**Time**	**Fuel**	**Distance**
From 28000 ft. to S. L.	14 min	90 lb	66 nm
From destination airport to S. L.	1 min	8 lb	4 nm
From 28000 ft. to destination airport	13 min	82 lb	62 nm

CRUISE

Calculate the cruise distance by subtracting the climb and descent distances from the total trip distance. Select a cruise power setting and refer to the appropriate chart to determine the true airspeed and fuel flow for the forecast cruise conditions. Adjust the true airspeed for the winds aloft headwind component to determine the ground speed. Divide the cruise distance by the ground speed to determine the cruise time. Calculate the cruise fuel required by multiplying the fuel flow by the cruise time.

Total trip distance	- Climb distance	- Descent distance	= Cruise distance
765 nm	- 60 nm	- 62 nm	= 643 nm

By assuming an average cruise weight of 8500 lb, Maximum Cruise Power setting for 28000 ft. at ISA +10°C yields 263 KTAS at 356 lb/hr.

Cruise Speed	+/- Headwind Component	= Ground Speed
263 KTAS	-10 kt	253 KTAS

Cruise Distance	/ Ground Speed	= Cruise Time
643 nm	/ 253 kt	= 2.54 hr (2hr 32 min)

Cruise Time	x Fuel Flow	= Cruise Fuel
2.54 hr	x 356 lb/hr	= 905 lb

LANDING

Calculate the estimated landing weight by the subtracting the weight of the fuel for climb, descent, and cruise from the takeoff weight.

Takeoff weight	- Climb Fuel	- Descent Fuel	- Cruise Fuel	= Landing Weight
8798 lb	- 165 lb	- 82 lb	- 905 lb	= 7646 lb

Apply the destination airport conditions and the calculated aircraft weight to the appropriate landing performance charts and check that the corresponding distances are less than the available field length at the destination airport.

TOTAL FLIGHT TIME

The total flight time is the sum of the time to climb, descent, and cruise.

Climb Time	+ Descent Time	+ Cruise Time	= Total Time
20 min	+ 13 min	+ 2 hr 32 min	3 hr 5 min

TOTAL FUEL REQUIRED

The total fuel required is the sum of the fuel consumed during engine start and ground operation, takeoff and climb, descent, and cruise.

Ground Ops	+ TO & Climb	+ Descent	+ Cruise	+ Reserve	= Total
40 lb	+ 165 lb	+ 82 lb	+ 905 lb	+ 300 lb	=1432 lb

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SECTION 6

WEIGHT AND BALANCE

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GENERAL

This section contains the information required to determine the Basic Empty Weight and Moment of the aircraft, adjust the B.E.W. & M as equipment is added or removed, and calculate aircraft loading for various flight operations. Sample loading forms are provided.

To achieve the performance designed for the aircraft it must be flown with approved weight and center of gravity limits.

It is the responsibility of the pilot in command to make sure that the aircraft does not exceed the maximum weight limits and is loaded within the center of gravity range before takeoff.

Weight in excess of the maximum takeoff weight may be a contributing factor to an accident, especially with other factors of temperature, airfield elevation and runway conditions. The aircraft's climb, cruise and landing performance will also be affected. Loads that the aircraft was not designed for may be put on the structure, particularly during landing.

The pilot should routinely determine the balance of the aircraft since it is possible to be within the maximum weight limit and still exceed the center of gravity limits. Information regarding the Basic Empty Weight can be found on the Weight and Balance Record in this section. Installed equipment information can be found in the Equipment List at the back of this manual. Using the basic empty weight and moment together with the Loading Form the pilot can determine the weight and moment for the loaded aircraft by computing the total weight and moment and then determine whether they are within the Center of Gravity Envelope.

AIRPLANE WEIGHING

PREPARATION

1. Make sure that all applicable items listed on the airplane equipment list are installed in their proper locations.

2. Clean airplane. Remove dirt, excessive grease, water, and foreign items.

3. Completely defuel the fuel tanks. Use the wing fuel drain ports for the completion of the task.

4. Fill oil, hydraulic fluid, and all other operating fluids to full capacity.

5. Make sure that the flaps are fully retracted and that the flight controls are in the neutral position.

6. Place crew seats in the center position and make sure the cabin passenger seats are in the correct positions. Refer to the relevant Interior Configuration Code Seat Location Chart in this Section.

7. Close access panels and passenger door.

8. Make sure that all tires are inflated to normal operating pressure.

9. Place airplane in a closed hangar to prevent scale reading errors due to wind.

WEIGHING PROCEDURE WITH LOAD PLATES

LEVELING

Open the cargo door and place a level across the seat tracks. Adjust the main gear tire pressure (do not exceed the recommended maximum tire pressure) until the airplane is laterally level. Place the level along the top of the inboard seat track and adjust the nose tire pressure until the airplane is longitudinally level. Refer to Section 8 of this Handbook for more information concerning airplane leveling. Remove the level and carefully close the cargo door.

WEIGHING

1. Record the tare weight for each applicable scale on Figure 6-1A Sheet 1 Airplane Weighing Form.
2. Refer to the manufacturer's instructions and position the aircraft on the load plates.
3. With the airplane level and brakes released, record the weight shown on each scale in the appropriate section on Figure 6-1A Sheet 1 Airplane Weighing Form.
4. Subtract the tare weight from the applicable scale reading. Record the resulting net weights in the appropriate section on Figure 6-1A Sheet 1 Airplane Weighing Form.
5. Refer to Figure 6-1A Sheet 2 and 3. Record the strut extensions of the nose gear (a), the left main gear (b) and the right main gear (c) on Figure 6-1A Sheet 2 Airplane Weighing Form. Calculate the average of the main gear strut extensions (b) and (c) and record the average (B) on Figure 6-1A Sheet 2 Airplane Weighing Form.
6. Calculate the arm of the nose gear (A) from the extension of the nose gear strut (a) using the table in Figure 6-1A Sheet 2. If the extension of the nose gear strut (a) is in between two values in the table, the arm of the nose gear (A) must be calculated by linear interpolation. Record the arm of the nose gear (A) in the appropriate section on Figure 6-1A Sheet 2 Airplane Weighing Form.
7. Calculate the arm of the main gear (B) from the average extension of the main gear struts (b) and (c) using the table in Figure 6-1A Sheet 3. If the average extension of the main gear struts is in between two values in the table, the arm of the main gear (B) must be calculated by linear interpolation. Record the arm of the main gear (B) in the appropriate section on Figure 6-1A Sheet 2 Airplane Weighing Form.
8. Calculate the airplane C.G. arm using the formula in Figure 6-1A Sheet 3 and record it in the appropriate section on Figure 6-2, Airplane Basic Empty Weight.

9. Refer to Figure 6-2. Adjust weight and moment for unusable fuel and optional equipment installed after airplane weighing to determine airplane Total Basic Empty Weight and Moment.
10. Update Figure 6-3, Weight and Balance Record, as required.
11. After weighing return tire pressures to operational values. Refer to Section 8 for instructions.

Scale Position	Symbol	Scale Reading lb (kg)	Tare lb (kg)	Net Weight lb (kg)
Nose Landing Gear	N			
Left Main Landing Gear	L			
Right Main Landing Gear	R			
TOTAL AIRCRAFT WEIGHT				

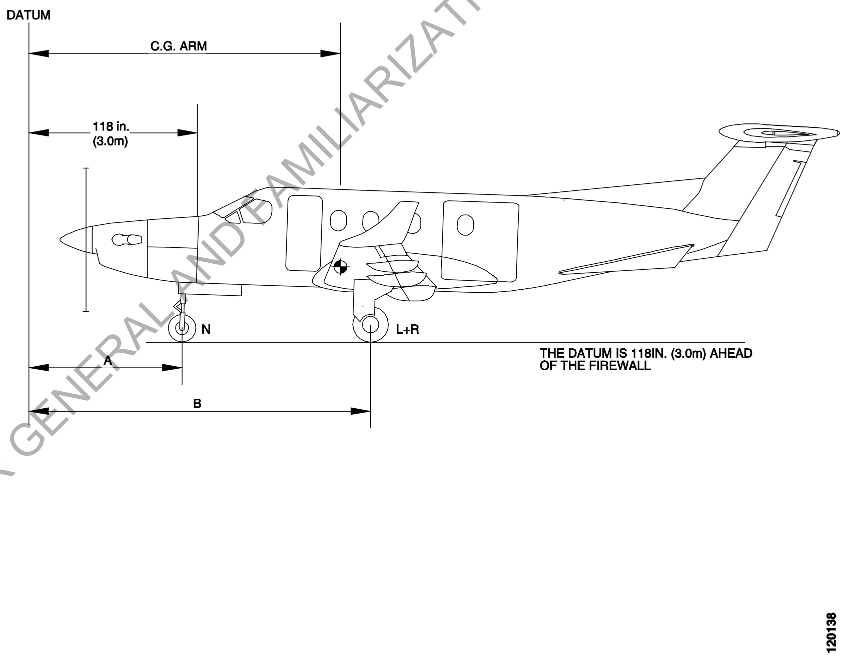
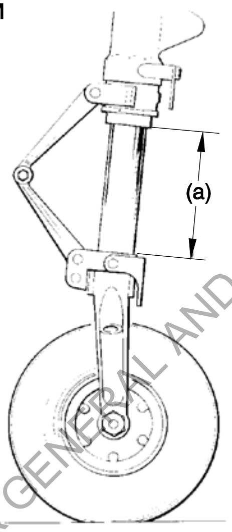


Figure 6-1A. Airplane Weighing Form
(Sheet 1 of 3)

Landing Gear	Symbol	Dimension mm	Average (b) mm	Arm in (mm)	
Nose	(a)		- -		(A)
Left Main	(b)		(L+R) / 2		(B)
Right Main	(c)				



Dimension (a) (mm)	Arm (A) (in)	Arm (A) (mm)
0	111.90	2842
20	111.82	2840
40	111.74	2838
60	111.62	2835
80	111.54	2833
100	111.46	2831
120	111.34	2828
140	111.27	2826
160	111.19	2824
180	111.07	2821
200	110.99	2819
220	110.91	2817
240	110.79	2814

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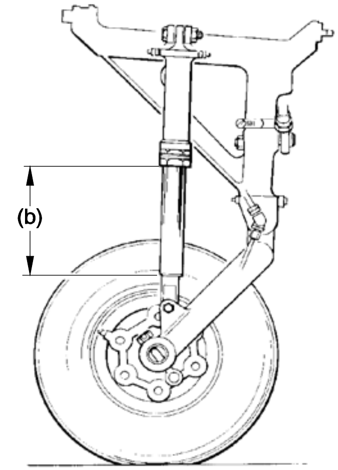
Figure 6-1A. Airplane Weighing Form
(Sheet 2 of 3)

MAIN GEAR ARM



Dimension (b) is strut extension

Dimension (b) (mm)	Arm (B) (in)	Arm (B) (mm)
110	254.78	6471
130	254.46	6463
150	254.07	6453
170	253.60	6441
190	253.04	6427
210	252.41	6411
230	251.71	6393
250	250.88	6372
270	249.97	6349
290	248.91	6322
310	247.73	6292

Calculate the airplane C.G. arm as weighed:

$$\text{C.G. Arm (In or m)} = \frac{N \times A + (L + R) \times B}{T}$$

Where:
A = Nose Landing gear arm
B = Main Landing gear arm
N = Nose Landing gear weight
L = Left main landing gear weight
R = Right main landing gear weight
T = Total weight of N + L + R

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Figure 6-1A. Airplane Weighing Form
(Sheet 3 of 3)

WEIGHING PROCEDURE WITH JACKS AND LOAD CELLS

LEVELING

Put the jacks in position below the wing and tail jacking points. The fuselage jacking points must not be used. Refer to the manufacturer's instructions for the use of the load cell equipment. Position the load cells and adapters and slowly raise the aircraft clear of the ground.

Open the cargo door and place a level across the seat tracks. Place the level along the top of the inboard seat track and adjust the tail jack until the airplane is longitudinally level. Refer to Section 8 of this Handbook for more information concerning airplane leveling. Remove the level and carefully close the cargo door.

WEIGHING

1. With the airplane level, record the weight shown on each load cell in the appropriate section on Figure 6-1B, Airplane Weighing Form.

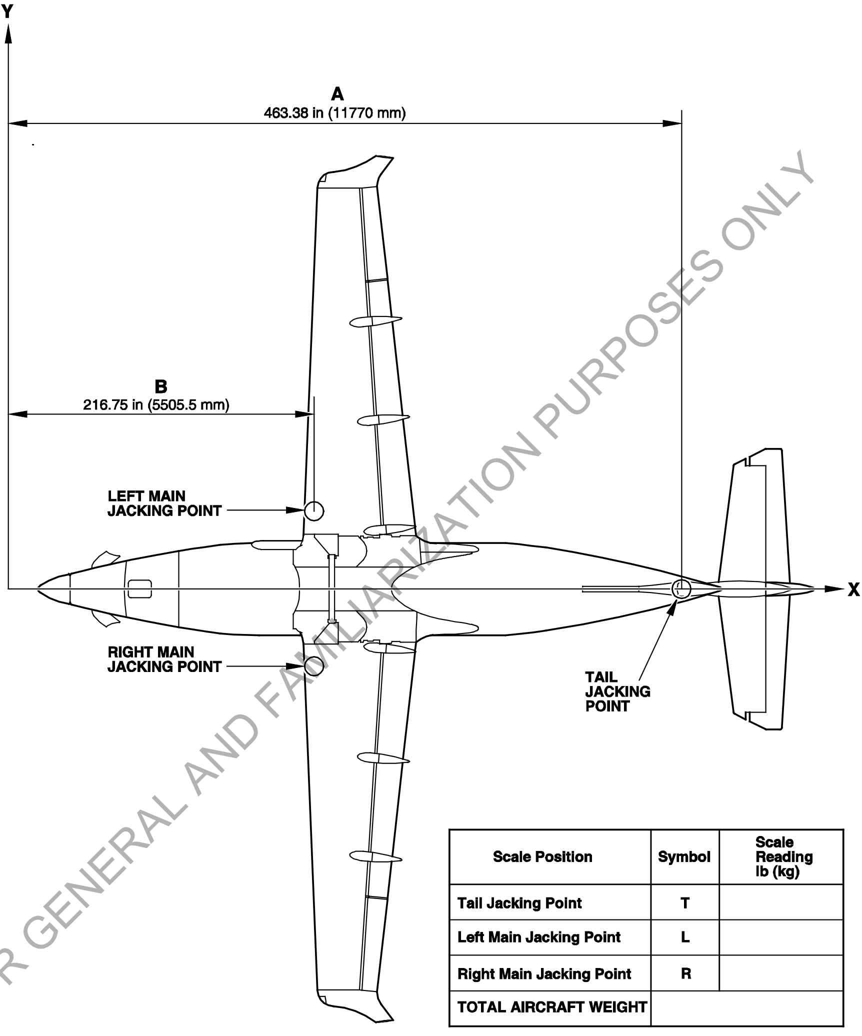
2. Calculate airplane C.G. Arm and record on Figure 6-2, Airplane Basic Empty Weight. The C. G. Arm calculation formula is:

   $$\text{C. G. Arm in (m)} = \frac{(L + R) \times B + T \times A}{L + R + T}$$

3. Adjust weight and moment for unusable fuel and optional equipment installed after airplane weighing to determine airplane Total Basic Empty Weight and Moment.

4. Calculate Basic Empty Weight C.G.

5. Update Figure 6-3, Weight and Balance Record, as required.



Scale Position	Symbol	Scale Reading lb (kg)
Tail Jacking Point	T	
Left Main Jacking Point	L	
Right Main Jacking Point	R	
TOTAL AIRCRAFT WEIGHT		

Figure 6-1B. Airplane Weighing Form

Model:	Serial No.:	Registration No.:	Date:			
Item	Weight		C.G. Arm		Moment	
	lb	kg	in	m	lb-in	mkg
1. Airplane Weight, C.G. arm, and moment. (As weighed in Figure 6-1)						
2. Unusable Fuel	32.9	14.9	225.6	5.73	7422	85.39
3. Optional equipment, if applicable						
4. Optional equipment, if applicable						
5. Optional equipment, if applicable						
6. TOTAL BASIC EMPTY WEIGHT AND MOMENT (Sum of 1 thru 5)						

AIRPLANE USEFUL LOAD - NORMAL CATEGORY OPERATION

Ramp Weight		- Basic Empty Weight		= Useful Load	
lb	kg	lb	kg	lb	kg
		-	-	=	=

The Basic Empty Weight, C.G., and Useful Load are for the airplane as licensed at the factory. These figures are only applicable to the specific airplane serial number and registration number shown. Refer to Figure 6-3. Weight and Balance Record when modifications to the airplane have been made.

Figure 6-2. Airplane Basic Empty Weight

WEIGHT AND BALANCE RECORD

Figure 6-3. Weight and Balance Record is a log of the modifications that occurred after the airplane was licensed at the factory. Any change to the permanently installed equipment or airplane modifications which effect the airplane Basic Empty Weight or Total Moment must be entered in Figure 6-3. Weight and Balance Record. The last entry on the Weight and Balance Record will be the current airplane Basic Empty Weight and Total Moment.

Serial Number			Registration Number					
Page Number								
Date	Item No.	Description of Article or Modification	Add (+) Rem (-)	Weight Change			Running Basic Empty Weight	
				Wt lb (kg)	Arm in (m)	Moment lb-in / 1000 (mkg)	Wt lb (kg)	Moment lb-in / 1000 (mkg)
		As Delivered						

120141

Figure 6-3. Weight and Balance Record
(Sheet 1 of 2)

	Serial Number		Registration Number				Page Number	
Date	Item No.	Description of Article or Modification	Add (+) Rem (-)	Weight Change			Running Basic Empty Weight	
				Wt lb (kg)	Arm in (m)	Moment lb-in / 1000 (mkg)	Wt lb (kg)	Moment lb-in / 1000 (mkg)

120142

Figure 6-3. Weight and Balance Record
(Sheet 2 of 2)

GENERAL LOADING RECOMMENDATIONS

The following general loading recommendation is intended as only a guide. Refer to Section 2 for Seating and Cargo Limitations. The pilot in command must refer to the appropriate moment charts, loading form, and the C.G. Envelope to determine that the airplane is properly loaded.

Fuel load may be limited by maximum weight.

Load fuel equally between the left and right wing fuel tanks.

CARGO

Before loading airplane, attach the tail support stand to prevent the tail from contacting the ramp surface while ground personnel are in the aft cabin during the loading process.

Observe the maximum floor and seat rail load limits given on the placard on the forward and rear cargo door frame. Figure 6-4 gives the cabin dimensions and loading areas.

Cargo having a total weight less than 66 lbs (30 kg) may be stowed aft of the cargo net. Heavier cargo is to be secured in the cabin area with tie-down straps attached to seat rail anchor points. Refer to Figures 6-5 thru 6-14 for cargo weight calculation, restraining bar installation and tie-down strap installation. Refer to Figure 6-15 for cargo net installation.

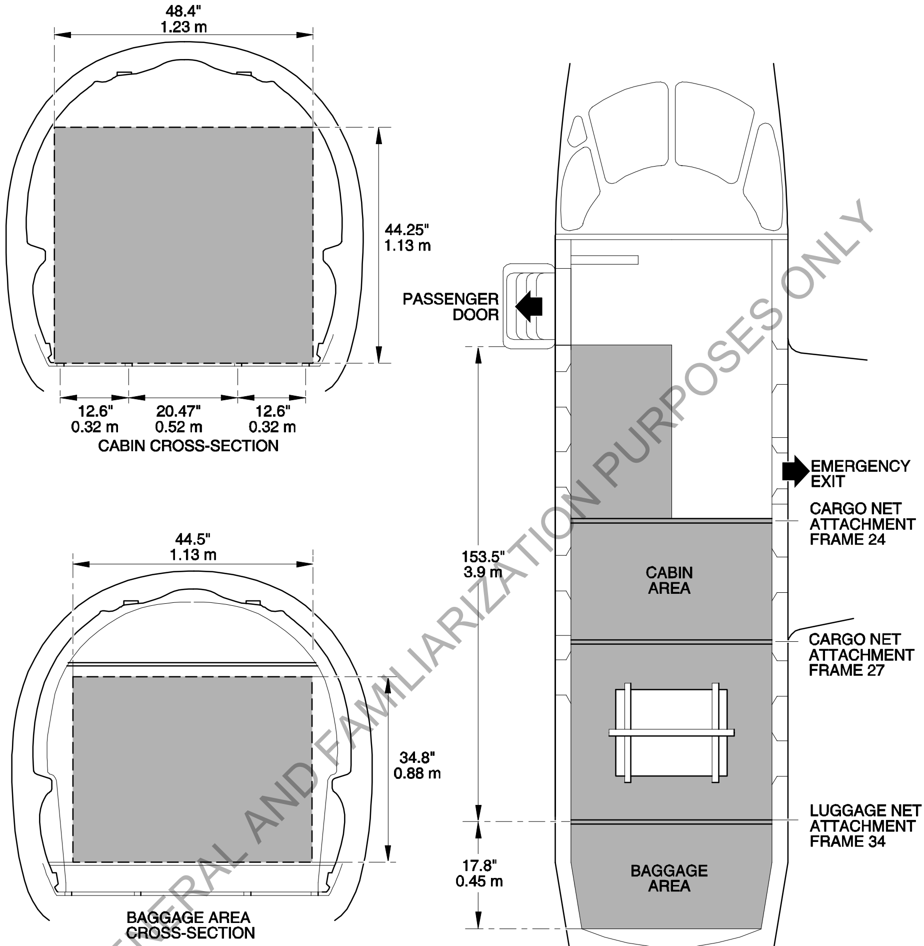
Refer to the Illustrated Parts Catalog (IPC) Chapter 25 for the part numbers of the approved cargo restraint nets, tie down straps, load carriers and retaining bars.

HAZARDOUS MATERIALS

Protection against the damaging effects of leakage of hazardous materials has not been provided in the cargo area. Provisions should be made for protection if carriage of these materials is planned.

In addition to the pilot in command, other personnel used for loading and unloading should be properly trained concerning the handling, storage, loading and unloading of hazardous materials if they are to be carried.

Information and regulations pertaining to the air transportation of hazardous materials is outlined in the Code of Federal Regulations (CFR) Title 49 and in the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air.



PASSENGER DOOR

HEIGHT	**4' 5" (1.35 m)**
WIDTH	**2' 0" (0.61 m)**

CARGO DOOR

HEIGHT	**4' 4" (1.32 m)**
WIDTH	**4' 5" (1.35 m)**

COMPARTMENT VOLUME
(WITHIN DIMENSIONED AREAS)

CABIN	**190.25 ft^3 (5.4 m^3)**
BAGGAGE	**16.0 ft^3 (0.45 m^3)**

CARGO MAY BE LOCATED ANYWHERE IN SHADED AREA

ALL CARGO MUST BE ARRANGED TO PERMIT FREE ACCESS TO THE PASSENGER DOOR AND EMERGENCY OVERWING EXIT

ALL CARGO MUST BE SECURED BY APPROVED CARGO RESTRAINTS

120136

Figure 6-4. Loading Areas

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER (WITHOUT SPECIAL EQUIPMENT)

The maximum allowable weight is based on the package dimensions, vertical c.g. and the number of seat rails used to secure the fore-aft tie-down straps.

The flowcharts below can be used to determine whether the weight of a cargo item is acceptable, which Restraint Bars are to be used, and how the cargo is to be loaded.

The cargo dimensions are defined as shown in Figure 6-5.

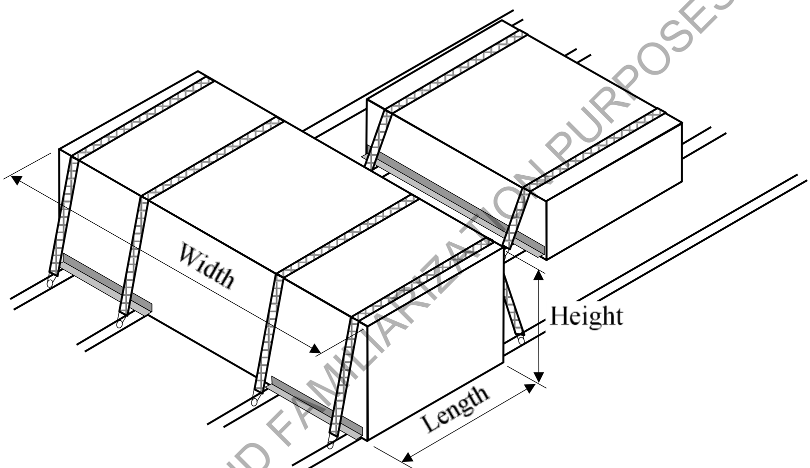


Figure 6-5 . Cargo Dimensions

The process to decide whether and how cargo can be tied down follows the following 4 steps

Step 1:Determine the cargo size and orientation

Step 2:Determine the correct restraint bars

Step 3:Determine the correct cargo tie-down configuration chart and curve

Step 4:Determine allowable cargo weight

These steps are explained in the following flowcharts, followed by an example to demonstrate their use.

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER (WITHOUT SPECIAL EQUIPMENT)

Step One

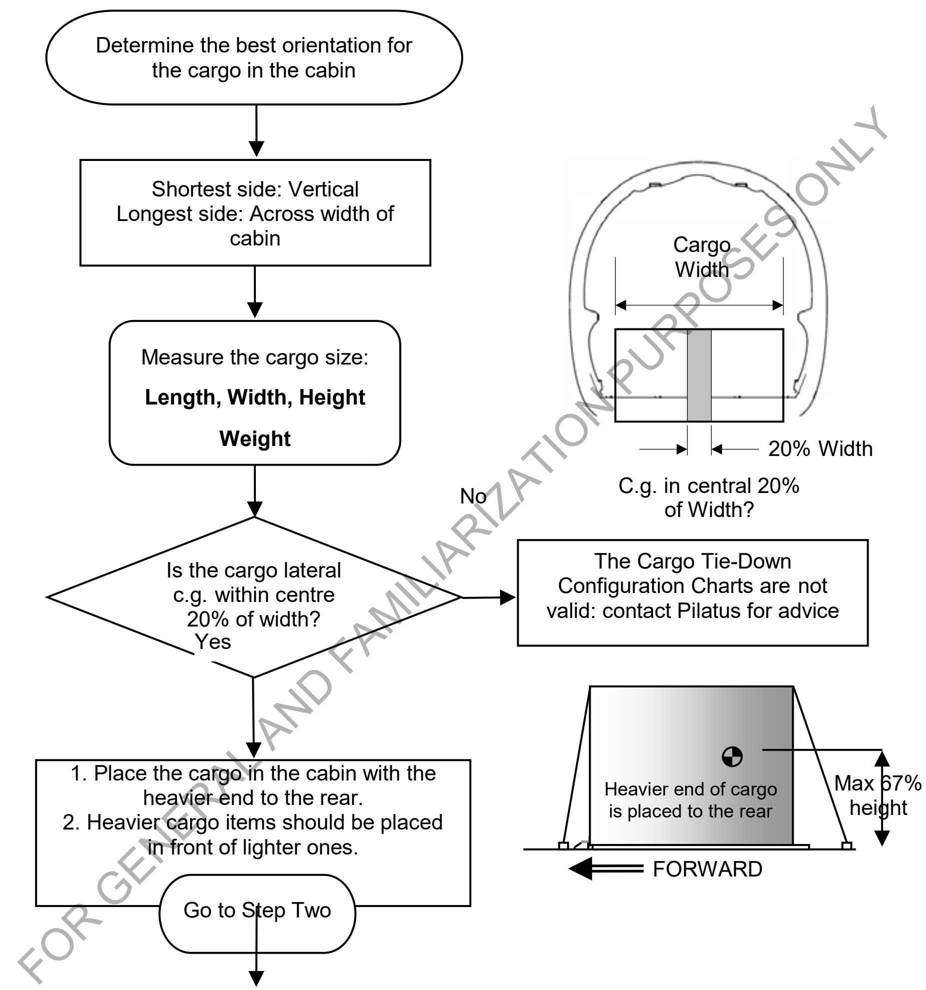


Figure 6-6. Cargo Size and Orientation

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER
(WITHOUT SPECIAL EQUIPMENT)

Step Two

Choose the correct Restraint Bar(s) based on the cargo width

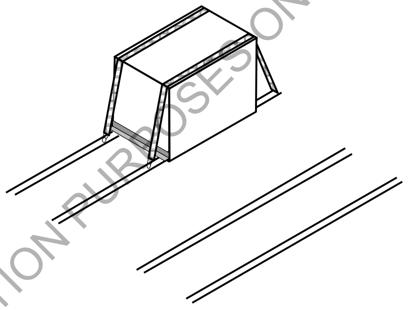
↓

Cargo width between 14 ½” and 15 ¾”
(between 370mm and 400mm)

Use a single, short Restraint Bar

(525.25.12.072 or
525.25.12.171 or
525.25.12.276)

at one side of the aircraft

→ 

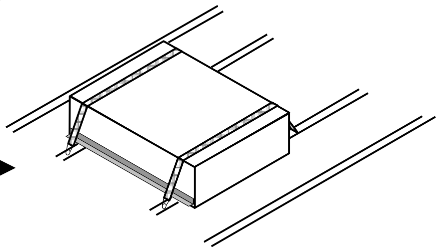
↓

Cargo width between 22 ½” and 33”
(between 570mm and 840mm)

Use a single, long Restraint Bar

(525.25.12.073 or
525.25.12.172 or
525.25.12.277)

in the centre of the aircraft

→ 

↓

Cargo width between 33” and 48.4”
(between 840mm and 1’230mm)

Use both short Restraint Bars

(525.25.12.072 or
525.25.12.171 or
525.25.12.276)

one either side of the aircraft

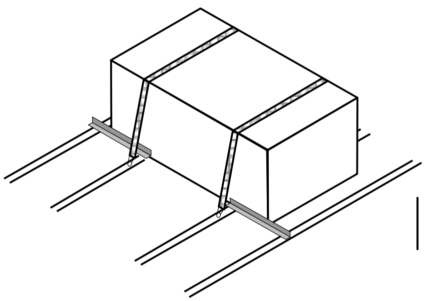
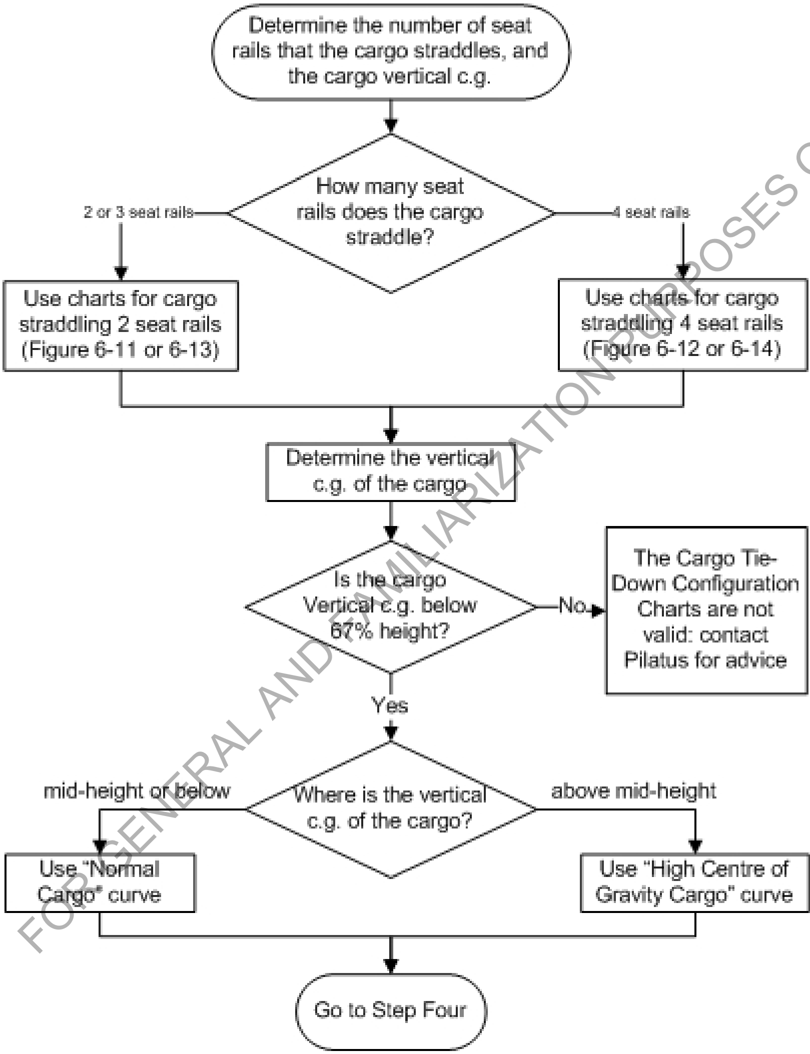
→ 

Figure 6-7. Determine the Correct Cargo Restraint Bars

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER
(WITHOUT SPECIAL EQUIPMENT)

Step Three



MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER
(WITHOUT SPECIAL EQUIPMENT)

Step Four

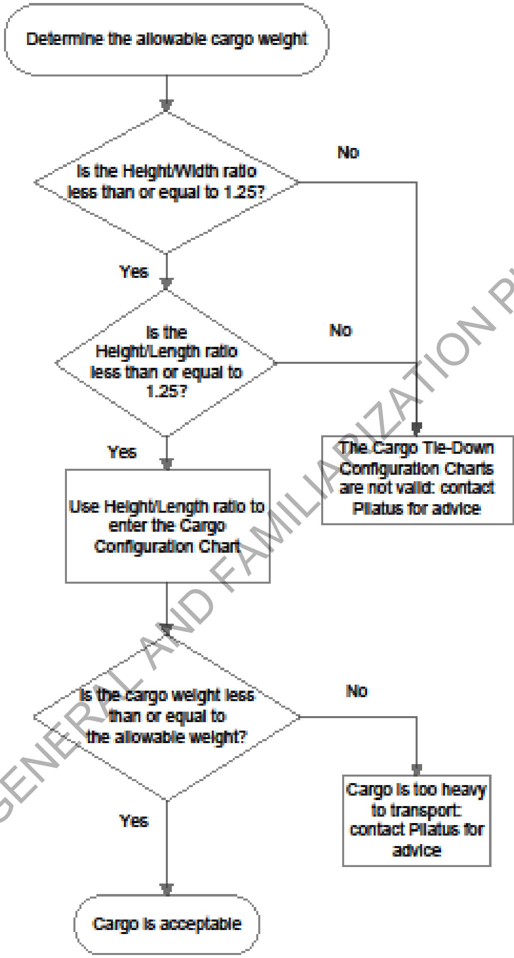


Figure 6-9. Determine Allowable Cargo Weight

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER (WITHOUT SPECIAL EQUIPMENT)

RESTRAIN CARGO IN CABIN

Fit the Restraint Bars and the Load Carrier Assemblies to the aircraft. If there is more than one cargo item, try to place the heavier items forward of the lighter ones.

Place cargo in cabin: ensure cargo is firmly against Restraint Bar(s)

Restrain cargo with straps attached to the seat rails.

- The straps shall be placed in the fore-aft direction: do not place diagonally.
- Place front strap fitting as close as feasible to Restraint Bar. Place rear fitting to give a strap angle of 10° to 20°, as shown in Figure 6-10.
- Additional straps may be placed laterally on cargo straddling the centre two seat rails, if desired.

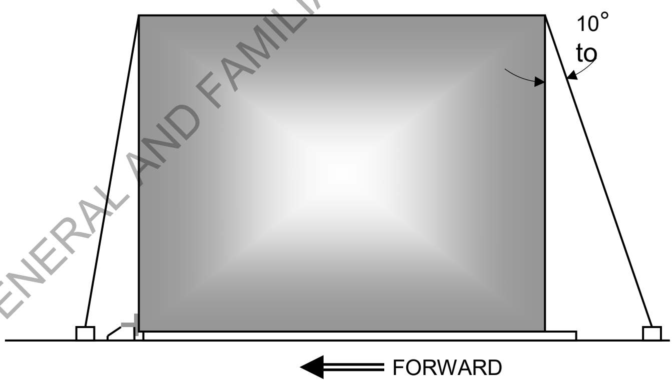


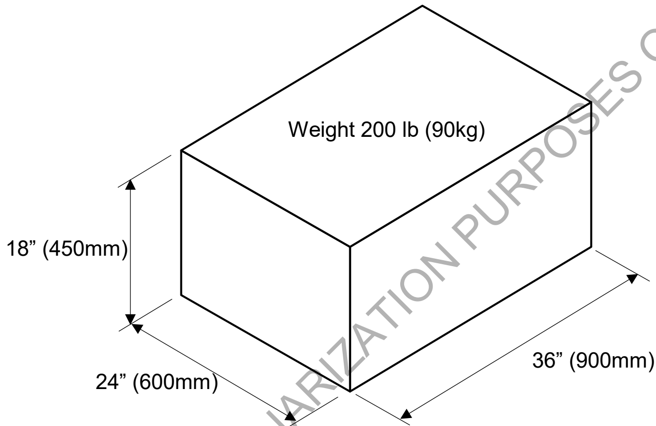
Figure 6-10. Fore-aft Strap Angles

Perform the Weight and Balance check to verify that the MTOW and aircraft c.g. position are within the limits given in Section 2.

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER (WITHOUT SPECIAL EQUIPMENT)

EXAMPLE

The cargo to be transported is shown below. Looking down, the c.g. is roughly in the centre of the box, but its height is unknown.



Step 1: Determine the cargo size and orientation

1a. The best orientation in the cabin is with the shortest side (18”) vertical and the longest side (36”) across the cabin width. Figure 6-4 shows that this will fit in the cargo area.

1b. Using the definitions of Figure 6-5, the cargo dimensions are:

Height	18” (450mm)
Length	24” (600mm)
Width	36” (900mm)

1c. The cargo lateral c.g. is approximately in middle of the box: the charts are valid.

Step 2:Determine the correct restraint bars

2a. The cargo width is 36” (900mm). Both short restraining bars are used.

2b. Two cargo-restraining straps, fitted to the inner seat rails, are required.

Step 3: Determine the correct cargo tie-down configuration chart and curve

3a. The front stop is attached to 4 seat rails, but cargo tie down straps can only be fitted to the inner seat tracks. This cargo straddles 2 seat rails. The restraining Bars are angle shaped (not “T”-section) and thus Figure 6-11 is used.

3b. The cargo vertical c.g. position is unknown: use the “high centre of gravity” curve.

Step 4: Determine allowable cargo weight

4a. Height/Width = 18”/36” = 0.33. Less than 1.25, therefore OK.

4b. Height/Length = 18”/24” = 0.75. Less than 1.25, therefore OK.

4c. From Figure 6-11, the allowable cargo weight is 214 lb (97kg): cargo weight is acceptable.

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER (WITHOUT SPECIAL EQUIPMENT)

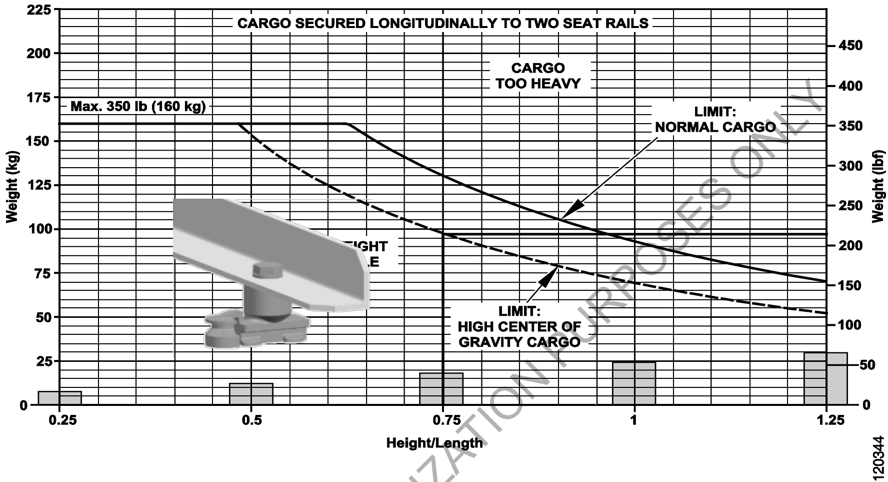


Figure 6-11. Cargo straddling two (2) seat rails: Angle Restraining Bar

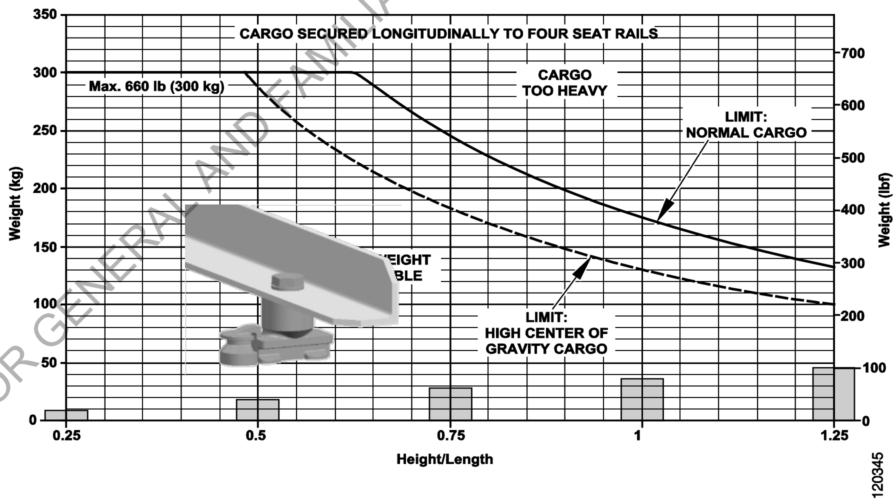


Figure 6-12. Cargo straddling four (4) seat rails: Angle Restraining Bar

MAXIMUM ALLOWABLE WEIGHT PER SINGLE CONTAINER (WITHOUT SPECIAL EQUIPMENT)

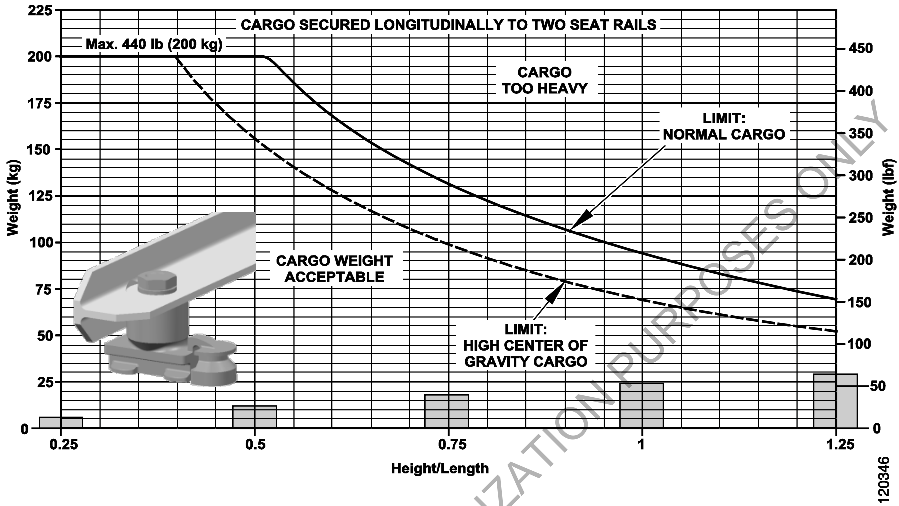


Figure 6-13. Cargo straddling two (2) seat rails: "T" Restraining Bar

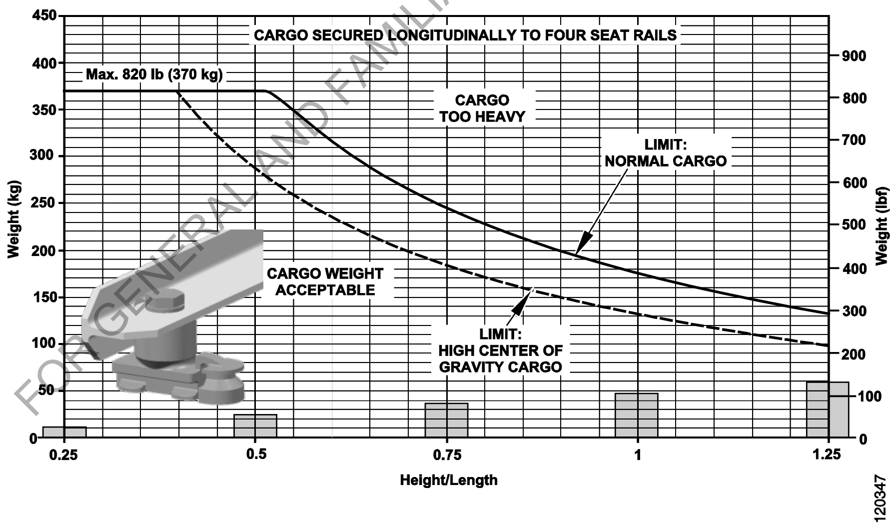


Figure 6-14. Cargo straddling four (4) seat rails: "T" Restraining Bar

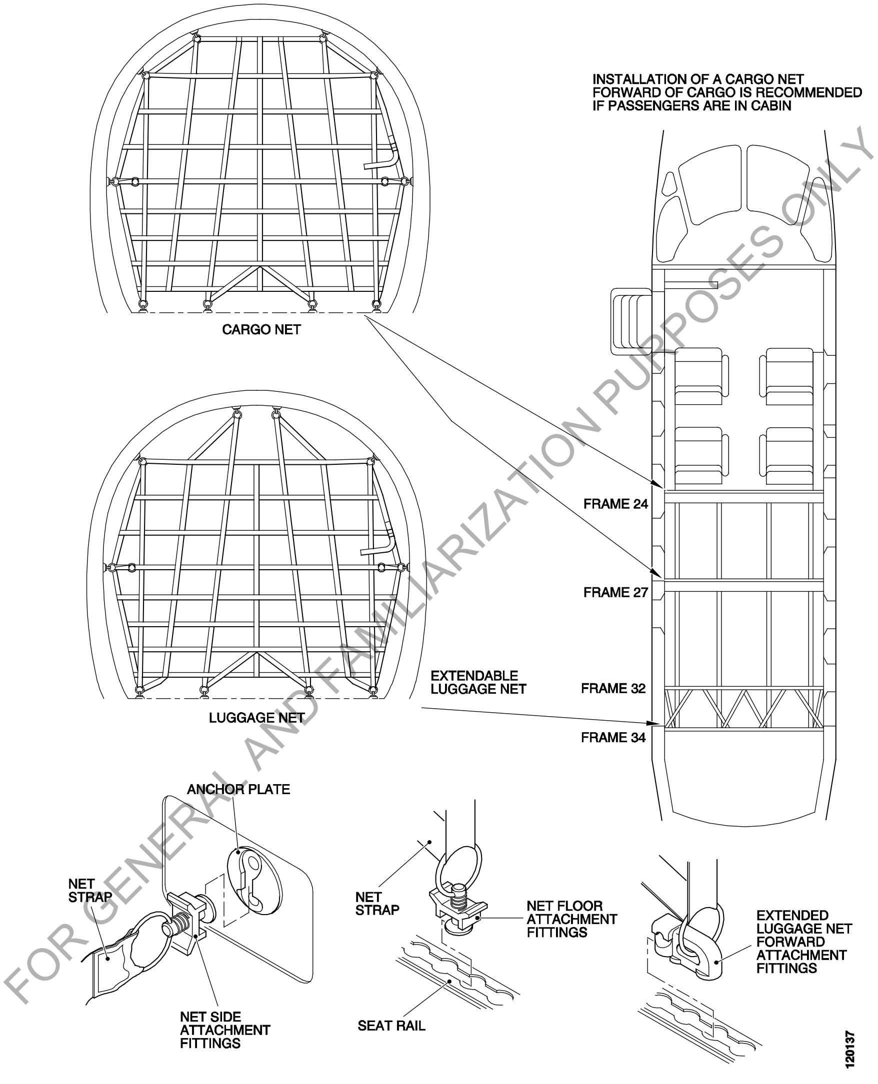


Figure 6-15. Cargo and Luggage Restraint Installation

WEIGHT AND BALANCE DETERMINATION FOR FLIGHT

This section contains the crew seats, baggage, fuel load moments charts and C of G envelopes in LB-IN and MKG.

Refer to the Interior Configurations section for the passenger seat moments. Find the correct Moment Chart for the Interior Code No. of the aircraft.

An Example Loading Form and a blank Loading Form for owners/operators use are given in Figure 6-17. Instructions on how to use the charts, complete the loading form and to determine if center of gravity is within approved limits are given below.

COMPLETION OF THE LOADING FORM

Enter the current Running Basic Empty Weight and Total Moment from Figure 6-3 in the appropriate space on the Loading Form, Figure 6-17 (be careful to factor the moment by 1000 if appropriate).

Enter the weights of all of the crew, passengers, items stowed in cabinets and baggage to be loaded, in the appropriate space on the Loading Form, Figure 6-17.

Use the Moment Charts in Figure 6-16, to determine the moment for the crew and baggage.

Use the correct Interior Code No. Moment Chart in the Interior Configurations section, to determine the moment for the passengers.

Enter the moment of each item in the appropriate space on the Loading Form, Figure 6-17.

Add the weight and moment of all of the items to the Basic Empty Weight and Moment of the airplane to determine the Zero Fuel Weight and Moment. Divide the moment by the weight to determine the C.G. arm.

Locate this point in the C.G. Envelope, Figure 6-18. If the point falls within the envelope, the loading meets the weight and balance requirements.

Use the Moment Chart in Figure 6-16, to determine the moment of the fuel load.

Enter the weight and moment of the fuel in the appropriate space on the Loading Form, Figure 6-17.

Add the fuel weight and moment to the calculated Zero Fuel Weight and Moment to determine the Ramp Weight and Moment. Divide the moment by the weight to determine the C.G. arm.

Locate this point in the C.G. Envelope, Figure 6-18. If the point falls within the envelope, the loading meets the weight and balance requirements.

Subtract the weight and moment of the fuel allowance for engine start and ground operations to determine Takeoff Weight and Moment. Divide the moment by the weight to determine the C.G. arm. Nose and main landing gear retraction or extension and flap retraction or extension weight and balance effects need not to be considered by the pilot for the weight and balance calculation.

Locate this point in the C.G. Envelope, Figure 6-18. If the point falls within the envelope, the loading meets the weight and balance requirements for takeoff.

COMBI CONVERSION

A Combi Conversion can be made from the removal of cabin seats from a Corporate Commuter and the removal of cabin seats and furnishings from an Executive Interior aircraft. The Combi Interior consists of 2 crew seats and payload or a combination of seats and payload. Cargo nets can be installed to attachment points at frames 24 and 27. Refer to Section 2 for the Cargo Limitations.

The airplane is weighed at the factory before the time of delivery. When other interior configurations are required, adjust the Basic Empty Weight and Moment and complete the landing form as follows:

- Make a temporary mark on the seat rail at the forward edge of the Corporate Commuter Seat(s) or mark position of the Executive Seat attachment fittings of the seat(s) to be removed with masking tape or similar material to expedite re-installation. Remove the passenger seats and furnishings as required.
- Use the passenger seats and furnishings weight and moment data in the relevant Interior Code section and determine the total weight and moment difference of the interior items removed from the aircraft.

Example: Three Seat Bench removed. Frame 27 Cargo Net installed.

ITEM	WEIGHT LB (KG)	MOMENT LB IN (M KG)
Three Seat Bench	- 145.84 (- 66.15)	- 47277 (- 544.70)
Frame 27 Cargo Net	+ 3.6 (+ 1.65)	+ 1049 (+ 12.21)
Total Value	- 142.2 (- 64.5)	- 46228 (- 532.5)

NOTE: The figures are taken from the “Passenger Seats and Furnishings Weight and Moment Chart”.

Enter the Total Value on line 2 of the Loading Form, Figure 6-17.

- Calculate the cargo moment as follows:

  Locate one of the luggage net floor attachment points at frame 34.
  Measure distance from the attachment point to the center of the cargo i.e.35 in (0,889 m).
  The fuselage station dimension at the luggage net attachment point is 361.15 in (9,170 m)
  The arm of the cargo is the fuselage station dimension of the net attachment point minus the distance to the center of the cargo.

  Example: Distance to cargo center = 35 in (0,889 m)
  Net Fuselage Station = 361.15 in (9,170 m)
  Cargo Arm = 361.15 in – 35 in = 326.15 in (9,170 m – 0,889 m = 8,281 m)

  Enter the cargo arm and the weight of the cargo plus tie down straps and cargo arm on the Loading Form.

- Complete the remainder of the Loading Form as given above.

When re-installing the passenger seats, return the seats to their original positions and verify the dimensions as shown in the Seat Location Chart for the aircraft configuration. Secure the arresting pin on the Corporate Commuter Seat(s) or install the locking needles on the Executive Seat(s). Remove the temporary seat rail marks.

CREW OCCUPANT MOMENTS (LB - IN) ARM 160.27 IN*							
WEIGHT lb	**MOMENT** lb - in*	**WEIGHT** lb	**MOMENT** lb - in*	**WEIGHT** lb	**MOMENT** lb - in*	**WEIGHT** lb	**MOMENT** lb - in*
50	8014	**100**	16027	**150**	24040	**200**	32054
60	9616	**110**	17630	**160**	25643	**210**	33657
70	11219	**120**	19232	**170**	27246	**220**	35259
80	12822	**130**	20835	**180**	28849	**230**	36862
90	14424	**140**	22438	**190**	30451	**240**	38465

* Arm for center position only. Adjust arm 0.69 inch for each hole from center position. Maximum seat travel is +/- 4 holes or +/- 2.76 inches from center position.

CREW OCCUPANT MOMENTS (Kg - m) ARM 4.071 m*							
WEIGHT kg	**MOMENT** Kg - m	**WEIGHT** kg	**MOMENT** kg - m	**WEIGHT** kg	**MOMENT** kg - m	**WEIGHT** kg	**MOMENT** kg - m
25	101.78	**50**	203.55	**75**	305.33	**100**	407.10
30	122.13	**55**	223.91	**80**	325.68	**105**	427.46
35	142.49	**60**	244.26	**85**	346.04	**110**	447.81
40	162.84	**65**	264.62	**90**	366.39	**115**	468.17
45	183.20	**70**	284.97	**95**	386.75	**120**	488.52

* Arm for center position only. Adjust arm 0.018 meter for each hole from center position. Maximum seat travel is +/- 4 holes or +/- 0.070 meters from center position.

Figure 6-16. Moment Chart
(Sheet 1 of 4)

REAR BAGGAGE AREA MOMENTS (LB - IN)
STANDARD NET AT FRAME 34 - ARM 371.0 IN

WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in
10	3,710	110	40,810	210	77,910	310	115,010
20	7,420	120	44,520	220	81,620	320	118,720
30	11,130	130	48,230	230	85,330	330	122,430
40	14,840	140	51,940	240	89,040	340	126,140
50	18,550	150	55,650	250	92,750	350	129,850
60	22,260	160	59360	260	96,460	360	133,560
70	25,970	170	63,070	270	100,170	370	137,270
80	29,680	180	66,780	280	103,880	380	140,980
90	33,390	190	70,490	290	107,590	390	144,690
100	37,100	200	74,200	300	111,300	397	147,287

REAR BAGGAGE AREA MOMENTS (Kg - m)
STANDARD NET AT FRAME 34 - ARM 9.420 M

WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m
5	47.10	55	518.10	105	989.10	155	1460.10
10	94.20	60	565.20	110	1036.20	160	1507.20
15	141.30	65	612.30	115	1083.30	165	1554.30
20	188.40	70	659.40	120	1130.40	170	1601.40
25	235.50	75	706.50	125	1177.50	175	1648.50
30	282.60	80	753.60	130	1224.60	180	1695.60
35	329.70	85	800.70	135	1271.70		
40	376.80	90	847.80	140	1318.80		
45	423.90	95	894.90	145	1365.90		
50	471.00	100	942.00	150	1413.00		

Figure 6-16. Moment Chart
(Sheet 2 of 4)

REAR BAGGAGE AREA MOMENTS (LB - IN) EXTENDABLE NET AT FRAME 32 - ARM 361.0 IN							
WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in
10	3610	140	50543	270	97476	400	144409
20	7220	150	54154	280	101087	410	148020
30	10831	160	57764	290	104697	420	151630
40	14441	170	61374	300	108307	430	155240
50	18051	180	64984	310	111917	440	158850
60	21661	190	68594	320	115528	450	162461
70	25272	200	72205	330	119138	460	166071
80	28882	210	75815	340	122748	470	169681
90	32492	220	79425	350	126358	480	173291
100	36102	230	83035	360	129969	490	176902
110	39713	240	86646	370	133579	500	180512
120	43323	250	90256	380	137189		
130	46933	260	93866	390	140799		

REAR BAGGAGE AREA MOMENTS (Kg - m) EXTENDABLE NET AT FRAME 32 - ARM 9.17 M							
WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m
5	45.85	70	641.90	135	1237.95	200	1834.00
10	91.70	75	687.75	140	1283.80	205	1879.85
15	137.55	80	733.60	145	1329.65	210	1925.70
20	183.40	85	779.45	150	1375.50	215	1971.55
25	229.25	90	825.30	155	1421.35	220	2017.40
30	275.10	95	871.15	160	1467.20	225	2063.25
35	320.95	100	917.00	165	1513.05		
40	366.80	105	962.85	170	1558.90		
45	412.65	110	1008.70	175	1604.75		
50	458.50	115	1054.55	180	1650.60		
55	504.35	120	1100.40	185	1696.45		
60	550.20	125	1146.25	190	1742.30		
65	596.05	130	1192.10	195	1788.15		

Figure 6-16. Moment Chart
(Sheet 3 of 4)

FUEL LOAD MOMENTS (LB - IN)							
WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in	WEIGHT lb	MOMENT lb - in
100	22572	800	183555	1500	347656	2200	511463
200	45161	900	207111	1600	371079	2300	534839
300	67776	1000	230572	1700	394500	2400	558130
400	90443	1100	253974	1800	417912	2500	581450
500	113351	1200	277441	1900	441347	2600	604724
600	136538	1300	300811	2000	464746	2700	628029
700	159955	1400	324221	2100	488120		

FUEL LOAD MOMENTS (Kg - m)							
WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m	WEIGHT kg	MOMENT kg - m
50	286.64	400	2337.14	750	4419.61	1100	6497.53
100	573.59	450	2635.13	800	4717.33	1150	6793.90
150	860.84	500	2932.34	850	5014.59	1200	7090.37
200	1149.27	550	3230.45	900	5312.14	1250	7385.69
250	1441.88	600	3526.99	950	5608.06		
300	1738.40	650	3824.03	1000	5905.10		
350	2037.52	700	4122.29	1050	6201.26		

NOTE

Unusable fuel is considered in empty weight. The chart shows only additional fuel.

Figure 6-16. Moment Chart
(Sheet 4 of 4)

PC-12/47E EXAMPLE LOADING FORM		INTERIOR CODE: STD-9S	
ITEM	**WEIGHT lb**	**ARM AFT OF DATUM in**	**MOMENT lb-in**
1. **Basic Empty Weight**	5613	225.16	1263823
2. Combi Interior Conversion	NA	NA	NA
3. Pilot	170	160.27	27246
4. Copilot (Right Seat Passenger)	170	160.27	27246
5. Passenger 1	170	215.00	36550
6. Passenger 2	170	212.03	36045
7. Passenger 3	170	248.00	42160
8. Passenger 4	170	245.03	41655
9. Passenger 5	170	281.00	47770
10. Passenger 6	170	278.05	47269
11. Passenger 7	170	314.00	53380
12. Passenger 8	170	311.03	52875
13. Passenger 9	170	344.03	58485
14. Optional Wardrobe		191.00	
15. LH Cabinet		212.10	
16. RH Cabinet		211.19	
17. a. Rear Baggage (net at frame 32) b. Rear Baggage (net at frame 34)	215	361.00 371.00	79765
18. Cargo			
19. **Zero Fuel Weight** MZFW 9039 lb (Sum of 1 thru 18)	7698	235.68	1814269
20. Fuel	1650	-	382790
21. **Ramp Weight** MRW 10495 lb (Sum of 19 + 20)	9348	235.03	2197059
22. Less Fuel for Ground Operations	- 40	-	
23. Fuel at Takeoff (Sum of 20 + 22)	1610	-	373421
24. **Takeoff Weight** MTOW 10450 lb (Sum of 19 + 23)	9308	235.03	2187690

Figure 6-17. Example Loading Form – Imperial Units (Sheet 1 of 2)

PC-12/47E LOADING FORM	INTERIOR CODE:		
ITEM	**WEIGHT lb (kg)**	**ARM AFT OF DATUM in (m)**	**MOMENT lb-in (kg-m)**
1. **Basic Empty Weight**			
2. Combi Interior Conversion			
3. Pilot		160.27 (4.071)	
4. Copilot (Right Seat Passenger)		160.27 (4.071)	
5. Passenger 1			
6. Passenger 2			
7. Passenger 3			
8. Passenger 4			
9. Passenger 5			
10. Passenger 6			
11. Passenger 7			
12. Passenger 8			
13. Passenger 9			
14. Optional Wardrobe		191.00 (4.851)	
15. LH Cabinet		212.10 (5.387)	
16. RH Cabinet		211.19 (5.364)	
17. a. Rear Baggage (net at frame 32) b. Rear Baggage (net at frame 34)		361.00 (9.170) 371.00 (9.423)	
18. Cargo			
19. **Zero Fuel Weight** MZFW 9039 lb (4100 kg) (Sum of 1 thru 18)			
20. Fuel		-	
21. **Ramp Weight** MRW 10495 lb (4760 kg) (Sum of 19 + 20)			
22. Less Fuel for Ground Operations		-	-
23. Fuel at Takeoff (Sum of 20 + 22)			
24. **Takeoff Weight** MTOW 10450 lb (4740 kg) (Sum of 19 + 23)			

Figure 6-17. Loading Form (Sheet 2 of 2)

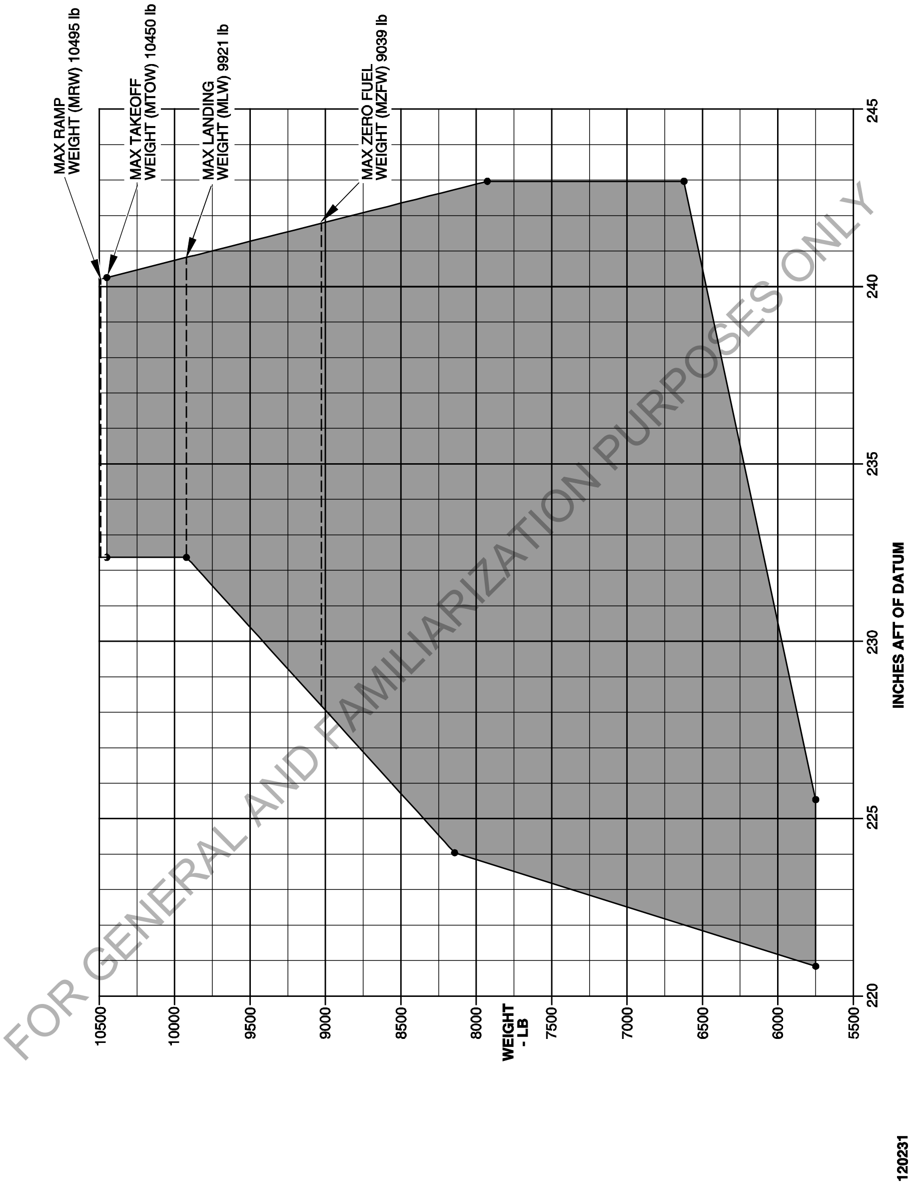


Figure 6-18. C. G. Envelope
(Sheet 1 of 2)

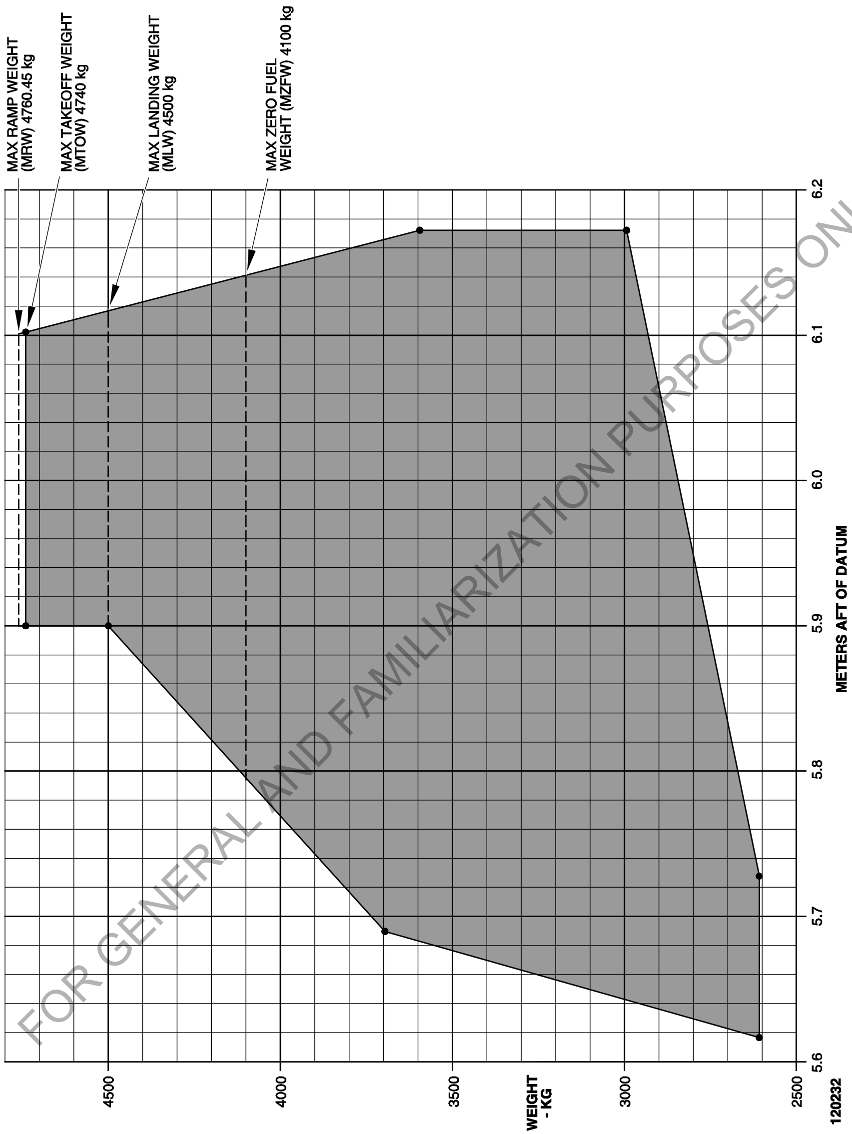


Figure 6-18. C. G. Envelope(Sheet 2 of 2)

EQUIPMENT LIST

Refer to Pilatus Report No. 02047, Airplane equipment List, attached to the back of this report. The equipment list itemizes the installed equipment included in the Basic Empty Weight indicated in Figure 6-2 of this Airplane Flight Manual.

INTERIOR CONFIGURATIONS

The PC-12 was designed and certified initially with two basic cabin interior configurations, a Corporate Commuter (Code STD-9S) and an Executive interior (Code EX-6S). The Corporate Commuter interior consists of two crew seats and 9 standard passenger seats. The Executive interior consists of two crew seats and 6 executive seats with forward storage cabinets and a toilet.

Variations to the two basic interior configurations are continuously being developed. The various configurations that have been approved are given below. Before using them it is the operators responsibility to check whether they require authorization by their regulatory authority. Some of the configurations require structural and system modifications, check with the Service Bulletin Index for the applicable SB's.

A Code Number is given to each interior configuration. The code is shown on a placard which is installed on the cargo door frame. The placard code gives the type and number of seats that are installed in the aircraft. Before making any changes to the interior configuration, contact Pilatus to make sure that any modification work or SB's are identified for embodiment. The placard must then be changed to show the correct code for the new configuration.

It is possible for aircraft with the executive interior to have more than one placard installed on the cargo door frame. The removal or installation of the rear seats must be done in accordance with an approved configuration. The correct weight and moment charts for the configuration must then be used for weight and balance determination for flight.

An optional three seat bench can be installed at the rear of the cabin in a Corporate Commuter and an Executive aircraft. A large baggage net can be installed in these configurations.

The following code numbers have been allocated and the seat locations are given in the following sub-sections:

- CORPORATE COMMUTER Interior Layout CODE STD-9S (nine standard seats)
- EXECUTIVE Interior Layout CODE EX-6S-2 (six executive seats)
- EXECUTIVE Interior Layout CODE EX-8S (eight executive seats)
- EXECUTIVE Interior Layout CODE EX-4S-3B (four executive seats and three seat bench)
- EXECUTIVE Interior Layout CODE EX-6S-STD-2S (six executive seats and two standard seats)
- EXECUTIVE Interior Layout CODE EX-4S-STD-4S (four executive seats and four standard seats)

CORPORATE COMMUTER INTERIOR CODE STD-9S

GENERAL

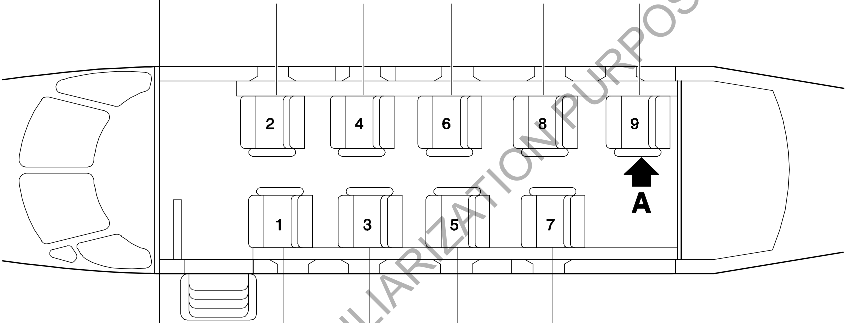
The basic Corporate Commuter Interior consisting of 9 standard passenger seats. The section contains the following information:

- passenger seat location chart
- permitted passenger seat Part Nos. that can be installed
- passenger seat and furnishings weight and moment chart (standard and metric units)
- passenger seat occupant moment charts (standard and metric units)

CORPORATE COMMUTER INTERIOR CODE STD-9S

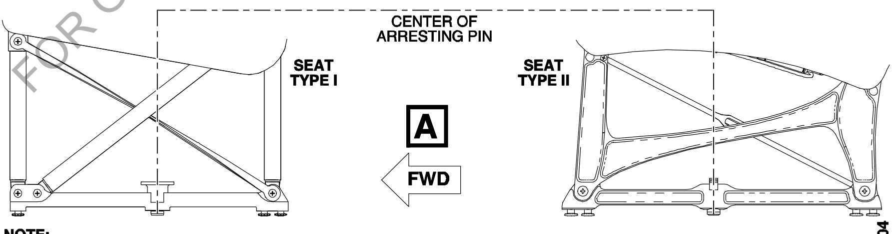
SEAT LOCATIONS

SEAT TYPE I	FUSELAGE STATION	179.88" 4.569 m	211.13" 5.363 m	244.13" 6.201 m	277.13" 7.039 m	310.13" 7.877 m	343.13" 8.716 m
	DISTANCE FROM DIVIDER AFT SURFACE	0" 0 m	31.25" 0.794 m	64.25" 1.632 m	97.25" 2.470 m	130.25" 3.308 m	163.25" 4.147 m
SEAT TYPE II	FUSELAGE STATION	179.88" 4.569 m	209.13" 5.312 m	242.13" 6.150 m	275.13" 6.988 m	308.13" 7.827 m	341.13" 8.665 m
	DISTANCE FROM DIVIDER AFT SURFACE	0" 0 m	29.25" 0.743 m	62.25" 1.581 m	95.25" 2.419 m	128.25" 3.258 m	161.25" 4.096 m
			PAX 2	PAX 4	PAX 6	PAX 8	PAX 9



			PAX 1	PAX 3	PAX 5	PAX 7
SEAT TYPE I	DISTANCE FROM DIVIDER AFT SURFACE	0" 0 m	34.25" 0.870 m	67.25" 1.708 m	100.25" 2.546 m	133.25 3.385 m
	FUSELAGE STATION	179.88" 4.569 m	214.13" 5.439 m	247.13 6.277 m	280.13" 7.115 m	313.13" 7.954 m
SEAT TYPE II	DISTANCE FROM DIVIDER AFT SURFACE	0" 0 m	32.25" 0.819 m	65.25" 1.657 m	98.25" 2.496 m	131.25 3.334 m
	FUSELAGE STATION	179.88" 4.569 m	212.13" 5.388 m	245.13 6.226 m	278.13" 7.065 m	311.13" 7.903 m

NOTE: PAX 9 SEAT INSTALLATION IS NOT PERMITTED ON THE LEFT HAND SIDE OF THE AIRPLANE CABIN.



NOTE:
CABIN SEAT LOCATION IS DEFINED AS THE DISTANCE FROM THE AFT SURFACE ON THE FORWARD DIVIDER PANEL TO THE CENTER OF THE CENTER ARRESTING PIN ON EACH SEAT.

CORPORATE COMMUTER INTERIOR CODE STD-9S

PERMITTED PASSENGER SEAT PART Nos. THAT CAN BE INSTALLED

	SEAT TYPE I	SEAT TYPE II
SEAT NO	REMOVABLE CUSHIONS	
1,3,5,7	525.22.12.011	959.30.01.445 959.30.01.447
2,4,6,8,9	525.22.12.012	959.30.01.446 959.30.01.448

NOTE: The lap belt extension Part No. 959.30.01.590 can be installed on all of the above TYPE I seats only.

NOTE: It is not allowed to install TYPE I and II seats behind each other.

CORPORATE COMMUTER INTERIOR CODE STD-9S

PASSENGER SEATS AND FURNISHINGS WEIGHT AND MOMENT CHART

	SEAT TYPE I		SAT TYPE II	
ITEM	**WEIGHT LB (KG)**	**MOMENT LB-IN (KG-M)**	**WEIGHT LB (KG)**	**MOMENT LB-IN (KG-M)**
PASS SEAT 1	29.10 (13.2)	6358 (73.25)	31.60 (14.3)	6890 (79.38)
PASS SEAT 2	29.10 (13.2)	6271 (72.25)	31.60 (14.3)	6795 (78.29)
PASS SEAT 3	29.10 (13.2)	7318 (84.31)	31.60 (14.3)	7933 (91.40)
PASS SEAT 4	29.10 (13.2)	7231 (83.32)	31.60 (14.3)	7838 (90.30)
PASS SEAT 5	29.10 (13.2)	8278 (95.38)	31.60 (14.3)	8975 (103.41)
PASS SEAT 6	29.10 (13.2)	8192 (94.38)	31.60 (14.3)	8881 (102.32)
PASS SEAT 7	29.10 (13.2)	9239 (106.44)	31.60 (14.3)	10018 (115.42)
PASS SEAT 8	29.10 (13.2)	9152 (105.44)	31.60 (14.3)	9923 (114.33)
PASS SEAT 9	29.10 (13.2)	10112 (116.51)	31.60 (14.3)	10966 (126.35)
FR 24 CARGO NET	3.6 (1.65)	941 (10.96)	3.6 (1.65)	941 (10.96)
FR 27 CARGO NET	3.6 (1.65)	1049 (12.21)	3.6 (1.65)	1049 (12.21)
FR 32 EXTENDABLE BAGGAGE NET	6.44 (2.92)	2325 (26.78)	6.44 (2.92)	2325 (26.78)
FR 34 BAGGAGE NET	5.13 (2.325)	1855 (21.38)	5.13 (2.325)	1855 (21.38)

Adjust the aircraft Basic Empty Weight on the Loading Form for items removed/added when converting to or from a Combi Interior Conversion.

When installing the extendable baggage net refer to Section 2 for the Luggage Limitations.

CORPORATE COMMUTER INTERIOR CODE STD-9S

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT TYPE I & II OCCUPANT MOMENTS (LB - IN)									
WEIGHT lb	PAX 1 215.00 in	PAX 2 212.00 in	PAX 3 248.00 in	PAX 4 245.00 in	PAX 5 281.00 in	PAX 6 278.00 in	PAX 7 314.00 in	PAX 8 311.00 in	PAX 9 344. 00 in
50	10750	10602	12400	12252	14050	13902	15700	15552	17202
60	12900	12722	14880	14702	16860	16682	18840	18662	20642
70	15050	14842	17360	17152	19670	19462	21980	21772	24082
80	17200	16963	19840	19603	22480	22243	25120	24883	27523
90	19350	19083	22320	22053	25290	25023	28260	27993	30963
100	21500	21203	24800	24503	28100	27803	31400	31103	34403
110	23650	23323	27280	26953	30910	30583	34540	34213	37843
120	25800	25444	29760	29404	33720	33364	37680	37324	41284
130	27950	27564	32240	31854	36530	36144	40820	40434	44724
140	30100	29684	34720	34304	39340	38924	43960	43544	48164
150	32250	31805	37200	36755	42150	41705	47100	46655	51605
160	34400	33925	39680	39205	44960	44485	50240	49765	55045
170	36550	36045	42160	41655	47770	47265	53380	52875	58485
180	38700	38166	44640	44106	50580	50046	56520	55986	61926
190	40850	40286	47120	46556	53390	52826	59660	59096	65366
200	43000	42406	49600	49006	56200	55606	62800	62206	68806
210	45150	44527	52080	51457	59010	58387	65940	65317	72247
220	47300	46647	54560	53907	61820	61167	69080	68427	75687
230	49450	48767	57040	56357	64630	63947	72220	71537	79127
240	51600	50888	59520	58808	67440	66728	75360	74648	82568

CORPORATE COMMUTER INTERIOR CODE STD-9S

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT TYPE I & II OCCUPANT MOMENTS (KG - M)									
WEIGHT	**PAX 1**	**PAX 2**	**PAX 3**	**PAX 4**	**PAX 5**	**PAX 6**	**PAX 7**	**PAX 8**	**PAX 9**
kg	5.461 m	5.386 m	6.299 m	6.224 m	7.137 m	7.062 m	7.976 m	7.900 m	8.738 m
25	136.5	134.6	157.5	155.6	178.4	176.6	199.4	197.5	218.5
30	163.8	161.6	189.0	186.7	214.1	211.9	239.3	237.0	262.2
35	191.1	188.5	220.5	217.8	249.8	247.2	279.1	276.5	305.8
40	218.4	215.4	252.0	249.0	285.5	282.5	319.0	316.0	349.5
45	245.7	242.4	283.5	280.1	321.2	317.8	358.9	355.5	393.2
50	273.1	269.3	315.0	311.2	356.9	353.1	398.8	395.0	436.9
55	300.4	296.2	346.5	342.3	392.6	388.4	438.7	434.5	480.6
60	327.7	323.1	378.0	373.4	428.2	423.7	478.5	474.0	524.3
65	355.0	350.1	409.4	404.5	463.9	459.0	518.4	513.5	568.0
70	382.3	377.0	440.9	435.7	499.6	494.3	558.3	553.0	611.7
75	409.6	403.9	472.4	466.8	535.3	529.7	598.2	592.5	655.4
80	436.9	430.8	503.9	497.9	571.0	565.0	638.0	632.0	699.1
85	464.2	457.8	535.4	529.0	606.7	600.3	677.9	671.5	742.8
90	491.5	484.7	566.9	560.1	642.4	635.6	717.8	711.0	786.5
95	518.8	511.6	598.4	591.3	678.1	670.9	757.7	750.5	830.1
100	546.1	538.6	629.9	622.4	713.7	706.2	797.6	790.0	873.8
105	573.4	565.5	661.4	653.5	749.4	741.5	837.4	829.5	917.5
110	600.7	592.4	692.9	684.6	785.1	776.8	877.3	869.0	961.2
115	628.0	619.3	724.4	715.7	820.8	812.1	917.2	908.5	1004.9
120	655.3	646.3	755.9	746.9	856.5	847.4	957.1	948.0	1048.6

EXECUTIVE INTERIOR CODE EX 6S-2

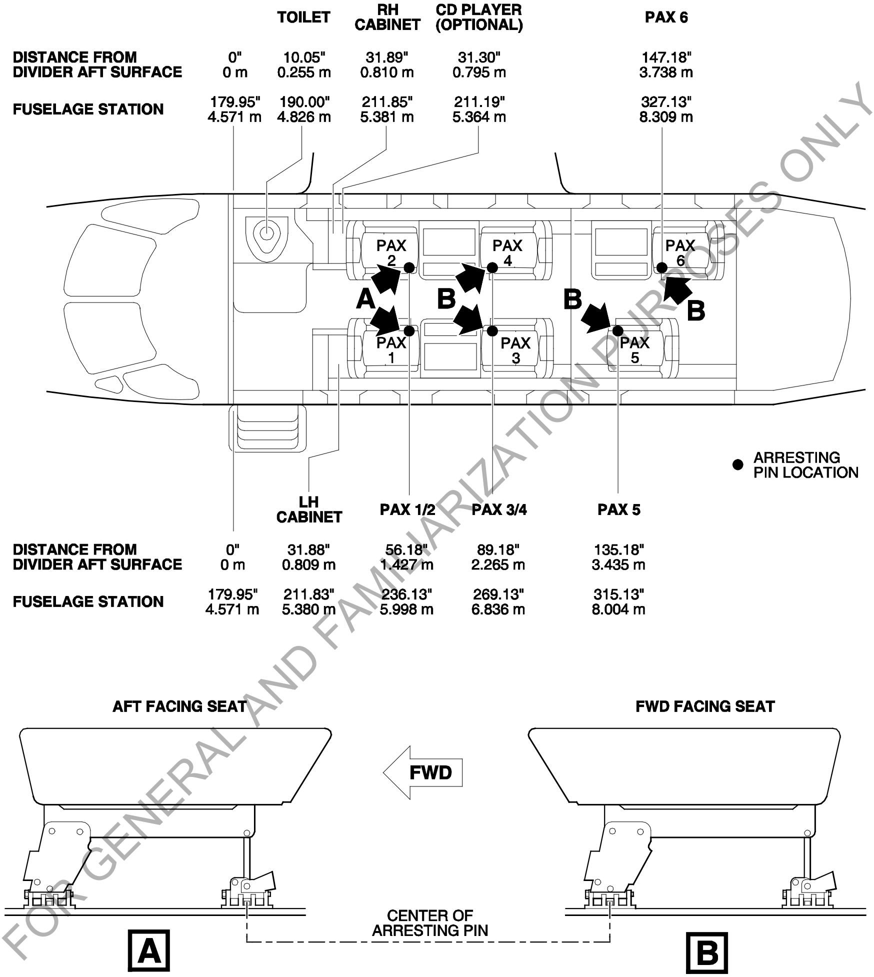
GENERAL

The basic Executive Interior consisting of 6 executive passenger seats. The section contains the following information:

- passenger seat location chart
- permitted passenger seat Part Nos. that can be installed
- passenger seats and furnishings weight and moment chart (standard and metric units)
- passenger seat occupant moment charts (standard and metric units)

EXECUTIVE INTERIOR CODE EX-6S-2

SEAT LOCATIONS



NOTE:
CABIN SEAT LOCATION IS DEFINED AS THE DISTANCE FROM THE AFT SURFACE ON THE FORWARD DIVIDER PANEL TO THE CENTER OF THE ARRESTING PIN ON EACH SEAT.

120099

EXECUTIVE INTERIOR CODE EX-6S-2

PERMITTED PASSENGER PART Nos. THAT CAN BE INSTALLED

SEAT NO.	Pacific Scientific Restraint	Schroth Restraint		
1	959.30.01.601	959.30.01.613	or	959.30.01.625
		959.30.01.617		959.30.01.627
		959.30.01.619		959.30.01.629
		959.30.01.621		959.30.01.631
		959.30.01.623		
		959.30.01.815		959.30.01.817
		959.30.01.819		959.30.01.821
2	959.30.01.602	959.30.01.614	or	959.30.01.626
		959.30.01.618		959.30.01.628
		959.30.01.620		959.30.01.630
		959.30.01.622		959.30.01.632
		959.30.01.624		
		959.30.01.816		959.30.01.818
		959.30.01.820		959.30.01.822
3, 5	959.30.01.609	959.30.01.615	or	959.30.01.649
		959.30.01.633		959.30.01.651
		959.30.01.635		959.30.01.653
		959.30.01.637		959.30.01.655
		959.30.01.639		959.30.01.657
		959.30.01.641		959.30.01.659
		959.30.01.643		959.30.01.661
		959.30.01.645		959.30.01.663
		959.30.01.647		
		959.30.01.823		959.30.01.825
		959.30.01.827		959.30.01.829
		959.30.01.831		959.30.01.833
		959.30.01.835		959.30.01.837
4, 6	959.30.01.610	959.30.01.616	or	959.30.01.650
		959.30.01.634		959.30.01.652
		959.30.01.636		959.30.01.654
		959.30.01.638		959.30.01.656
		959.30.01.640		959.30.01.658
		959.30.01.642		959.30.01.660
		959.30.01.644		959.30.01.662
		959.30.01.646		959.30.01.664
		959.30.01.648		
		959.30.01.824		959.30.01.826
		959.30.01.828		959.30.01.830
		959.30.01.832		959.30.01.834
		959.30.01.836		959.30.01.838

EXECUTIVE INTERIOR CODE EX-6S-2

PASSENGER SEATS AND FURNISHINGS WEIGHT AND MOMENT CHART

ITEM	WEIGHT lb (kg)	MOMENT lb-in (kg-m)
PASS SEAT 1 OR 2	44.10 (20.00)	10143.4 (116.87)
PASS SEAT 3 OR 4	48.61 (22.05)	13570.5 (156.35)
PASS SEAT 5	48.61 (22.05)	15806.5 (182.11)
PASS SEAT 6	48.61 (22.05)	16389.8 (188.83)
TOILET	81.0 (36.7)	15390.0 (177.3)
LH CABINET	31.3 (14.2)	6630.3 (76.5)
RH CABINET	27.0 (12.3)	5720 (66.0)
CD PLAYER (optional)	5 (2.5)	1162 (13.41)
FR 24 CARGO NET	3.6 (1.65)	941 (10.96)
FR 27 CARGO NET	3.6 (1.65)	1049 (12.21)
FR 32 EXTENDABLE BAGGAGE NET	6.44 (2.92)	2325 (26.78)
FR 34 BAGGAGE NET	5.13 (2.325)	1855 (21.38)

Adjust the aircraft Basic Empty Weight on the Loading Form for items removed/added when converting to or from a Combi Interior Conversion.

When installing the extendable baggage net refer to Section 2 for the Luggage Limitations.

EXECUTIVE INTERIOR CODE EX-6S-2

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT OCCUPANT MOMENTS (LB - IN)				
WEIGHT lb	**PAX 1/2** 234.09 in	**PAX 3/4** 276.12 in	**PAX 5** 322.13 in	**PAX 6** 334.12 in
50	11705	13806	16107	16706
60	14046	16567	19328	20047
70	16387	19329	22549	23388
80	18728	22090	25771	26729
90	21068	24851	28992	30070
100	23409	27612	32213	33412
110	25750	30374	35434	36753
120	28091	33135	38656	40094
130	30432	35896	41877	43435
140	32773	38657	45098	46776
150	35114	41419	48320	50117
160	37455	44180	51541	53459
170	39796	46941	54762	56800
180	42137	49702	57984	60141
190	44478	52464	61205	63482
200	46819	55225	64426	66823
210	49160	57986	67648	70164
220	51501	60747	70869	73506
230	53842	63508	74090	76847
240	56183	66270	77312	80188

EXECUTIVE INTERIOR CODE EX-6S-2

PASSENGER SEAT OCCUPANT MOMENT CHART

EXECUTIVE INTERIOR CODE EX 6S-2 PASSENGER SEAT OCCUPANT MOMENTS (KG - M)				
WEIGHT	**PAX 1/2**	**PAX 3/4**	**PAX 5**	**PAX 6**
kg	5.946 m	7.014 m	8.182 m	8.487 m
25	148.65	175.34	204.55	212.16
30	178.38	210.41	245.46	254.60
35	208.11	245.47	286.38	297.03
40	237.84	280.54	327.29	339.46
45	267.57	315.61	368.20	381.89
50	297.30	350.68	409.11	424.33
55	327.03	385.75	450.02	466.76
60	356.76	420.81	490.93	509.19
65	386.49	455.88	531.84	551.63
70	416.22	490.95	572.75	594.06
75	445.95	526.02	613.66	636.49
80	475.68	561.08	654.57	678.92
85	505.41	596.15	695.48	721.36
90	535.14	631.22	736.39	763.79
95	564.87	666.29	777.30	806.22
100	594.60	701.35	818.21	848.65
105	624.33	736.42	859.13	891.09
110	654.06	771.49	900.04	933.52
115	683.79	806.56	940.95	975.95
120	713.52	841.63	981.86	1018.39

EXECUTIVE INTERIOR CODE EX-8S

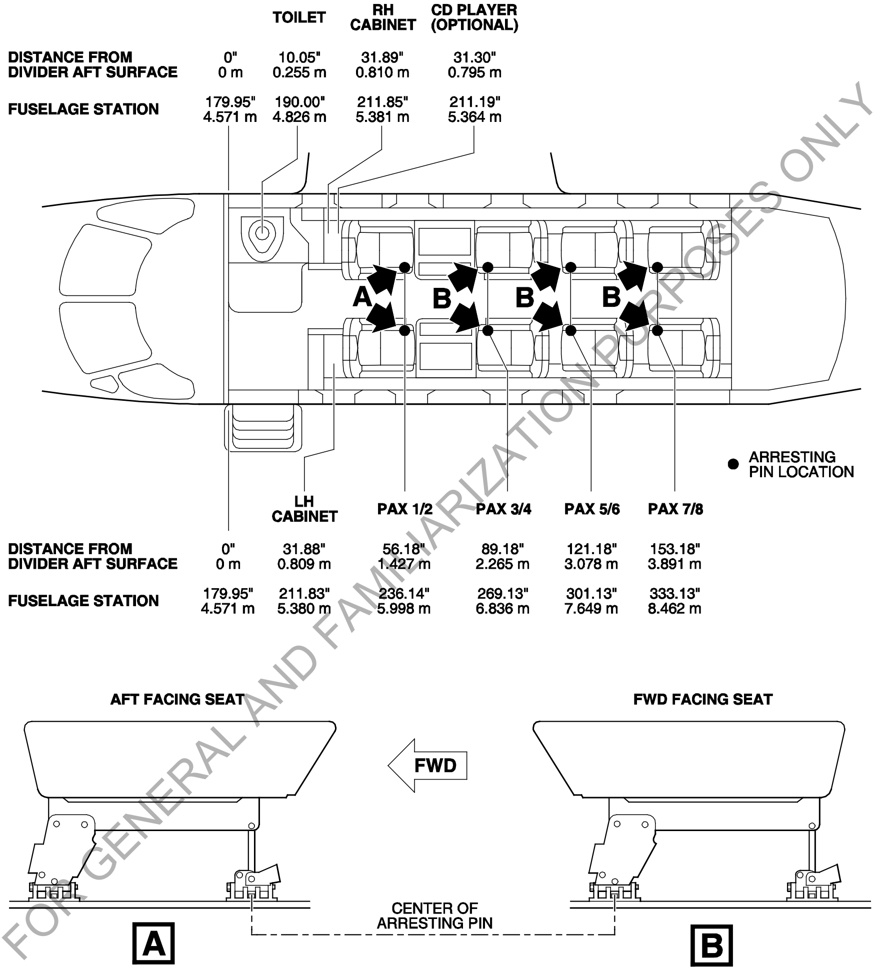
GENERAL

This configuration is a variation of the basic executive interior and consists of 8 executive passenger seats. It is the operator's responsibility to check before using this configuration whether they require authorization by their regulatory authority. The following information is given:

- passenger seat location chart
- permitted passenger seat Part Nos. that can be installed
- passenger seats and furnishings weight and moment chart (standard and metric units)
- passenger seat occupant moment charts (standard and metric units)

EXECUTIVE INTERIOR CODE EX-8S

SEAT LOCATIONS



NOTE:
CABIN SEAT LOCATION IS DEFINED AS THE DISTANCE FROM THE AFT SURFACE ON THE FORWARD DIVIDER PANEL TO THE CENTER OF THE ARRESTING PIN ON EACH SEAT.

120113

EXECUTIVE INTERIOR CODE EX-8S

PERMITTED PASSENGER SEAT PART Nos. THAT CAN BE INSTALLED

SEAT NO.			
1	959.30.01.613	or	959.30.01.625
	959.30.01.617		959.30.01.627
	959.30.01.619		959.30.01.629
	959.30.01.621		959.30.01.631
	959.30.01.623		
	959.30.01.815		959.30.01.817
	959.30.01.819		959.30.01.821
2	959.30.01.614	or	959.30.01.626
	959.30.01.618		959.30.01.628
	959.30.01.620		959.30.01.630
	959.30.01.622		959.30.01.632
	959.30.01.624		
	959.30.01.816		959.30.01.818
	959.30.01.820		959.30.01.822
3, 5, 7	959.30.01.615	or	959.30.01.649
	959.30.01.633		959.30.01.651
	959.30.01.635		959.30.01.653
	959.30.01.637		959.30.01.655
	959.30.01.639		959.30.01.657
	959.30.01.641		959.30.01.659
	959.30.01.643		959.30.01.661
	959.30.01.645		959.30.01.663
	959.30.01.647		
	959.30.01.823		959.30.01.825
	959.30.01.827		959.30.01.829
	959.30.01.831		959.30.01.833
	959.30.01.835		959.30.01.837
4, 6, 8	959.30.01.616	or	959.30.01.650
	959.30.01.634		959.30.01.652
	959.30.01.636		959.30.01.654
	959.30.01.638		959.30.01.656
	959.30.01.640		959.30.01.658
	959.30.01.642		959.30.01.660
	959.30.01.644		959.30.01.662
	959.30.01.646		959.30.01.664
	959.30.01.648		
	959.30.01.824		959.30.01.826
	959.30.01.828		959.30.01.830
	959.30.01.832		959.30.01.834
	959.30.01.836		959.30.01.838

EXECUTIVE INTERIOR CODE EX-8S

PASSENGER SEATS AND FURNISHINGS WEIGHT AND MOMENT CHART

ITEM	WEIGHT lb (kg)	MOMENT lb-in (kg-m)
PASS SEAT 1 OR 2	44.10 (20.00)	10143.4 (116.87)
PASS SEAT 3 OR 4	48.61 (22.05)	13570.5 (156.35)
PASS SEAT 5 OR 6	48.61 (22.05)	15126.0 (174.27)
PASS SEAT 7 OR 8	48.61 (22.05)	16681.5 (192.19)
TOILET	81.0 (36.7)	15390.0 (177.3)
LH CABINET	31.3 (14.2)	6630.3 (76.5)
RH CABINET	27.0 (12.3)	5720 (66.0)
CD PLAYER (optional)	5 (2.5)	1162 (13.41)
FR 24 CARGO NET	3.6 (1.65)	941 (10.96)
FR 27 CARGO NET	3.6 (1.65)	1049 (12.21)
FR 32 EXTENDABLE BAGGAGE NET	6.44 (2.92)	2325 (26.78)
FR 34 BAGGAGE NET	5.13 (2.325)	1855 (21.38)

Adjust the aircraft Basic Empty Weight on the Loading Form for items removed/added when converting to or from a Combi Interior Conversion.

When installing the extendable baggage net refer to Section 2 for the Luggage Limitations.

EXECUTIVE INTERIOR CODE EX-8S

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT OCCUPANT MOMENTS (LB - IN)				
WEIGHT lb	**PAX 1/2** 234.09 in	**PAX 3/4** 276.12 in	**PAX 5/6** 308.12 in	**PAX 7/8** 340.12 in
50	11705	13806	15406	17006
60	14046	16567	18487	20407
70	16387	19329	21569	23809
80	18728	22090	24650	27210
90	21068	24851	27731	30611
100	23409	27612	30812	34012
110	25750	30374	33894	37414
120	28091	33135	36975	40815
130	30432	35896	40056	44216
140	32773	38657	43137	47617
150	35114	41419	46219	51019
160	37455	44180	49300	54420
170	39796	46941	52381	57821
180	42137	49702	55462	61222
190	44478	52464	58544	64624
200	46819	55225	61625	68025
210	49160	57986	64706	71426
220	51501	60747	67787	74827
230	53842	63508	70868	78228
240	56183	66270	73950	81630

EXECUTIVE INTERIOR CODE EX-8S

PASSENGER SEAT OCCUPANT MOMENT CHART

CREW AND PASSENGER SEAT OCCUPANT MOMENTS (KG - M)				
WEIGHT kg	**PAX 1/2** 5.946 m	**PAX 3/4** 7.014 m	**PAX 5/6** 7.826 m	**PAX 7/8** 8.639 m
25	148.65	175.34	195.66	215.98
30	178.38	210.41	234.79	259.17
35	208.11	245.47	273.92	302.37
40	237.84	280.84	313.05	345.57
45	267.57	315.61	352.19	388.76
50	297.30	350.68	391.32	431.96
55	327.03	385.75	430.45	475.15
60	356.76	420.81	469.58	518.35
65	386.49	455.88	508.71	561.54
70	416.22	490.95	547.84	604.74
75	445.95	526.02	586.98	647.94
80	475.68	561.08	626.11	691.13
85	505.41	596.15	665.24	734.33
90	535.14	631.22	704.37	777.52
95	564.87	666.29	743.50	820.72
100	594.60	701.35	782.63	863.91
105	624.33	736.42	821.77	907.11
110	654.06	771.49	860.90	950.31
115	683.79	806.56	900.03	993.50
120	713.52	841.63	939.16	1036.70

EXECUTIVE INTERIOR CODE EX-4S-3B

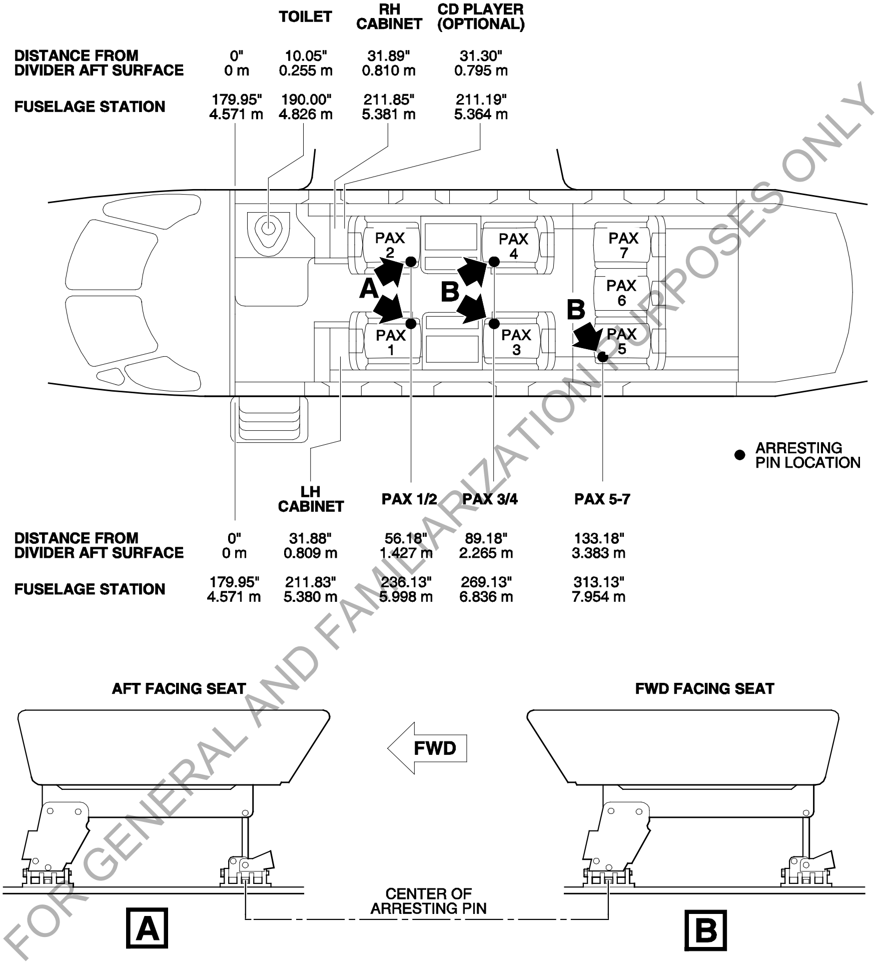
GENERAL

This configuration is a variation of the basic Executive interior and consists of 4 executive passenger seats and a 3 seat bench. It is the operator's responsibility to check before using this configuration whether they require authorization by their regulatory authority. The following information is given:

- passenger seat location chart
- permitted passenger seat Part Nos. that can be installed
- passenger seats and furnishings weight and moment chart (standard and metric units)
- passenger seat occupant moments (standard and metric units)

EXECUTIVE INTERIOR CODE EX-4S-3B

SEAT LOCATIONS



NOTE:
CABIN SEAT LOCATION IS DEFINED AS THE DISTANCE FROM THE AFT SURFACE ON THE FORWARD DIVIDER PANEL TO THE CENTER OF THE ARRESTING PIN ON EACH SEAT.

120121

EXECUTIVE INTERIOR CODE EX-4S-3B

PERMITTED PASSENGER SEAT PART Nos. THAT CAN BE INSTALLED

SEAT NO.	Pacific Scientific Restraint	Schroth Restraint		
1	959.30.01.601	959.30.01.613	or	959.30.01.625
		959.30.01.617		959.30.01.627
		959.30.01.619		959.30.01.629
		959.30.01.621		959.30.01.631
		959.30.01.623		
		959.30.01.815		959.30.01.817
		959.30.01.819		959.30.01.821
2	959.30.01.602	959.30.01.614	or	959.30.01.626
		959.30.01.618		959.30.01.628
		959.30.01.620		959.30.01.630
		959.30.01.622		959.30.01.632
		959.30.01.624		
		959.30.01.816		959.30.01.818
		959.30.01.820		959.30.01.822
3	959.30.01.603	959.30.01.615	or	959.30.01.649
	959.30.01.609	959.30.01.633		959.30.01.651
		959.30.01.635		959.30.01.653
		959.30.01.637		959.30.01.655
		959.30.01.639		959.30.01.657
		959.30.01.641		959.30.01.659
		959.30.01.643		959.30.01.661
		959.30.01.645		959.30.01.663
		959.30.01.647		
		959.30.01.823		959.30.01.825
		959.30.01.827		959.30.01.829
		959.30.01.831		959.30.01.833
		959.30.01.835		959.30.01.837
4	959.30.01.604	959.30.01.616	or	959.30.01.650
	959.30.01.610	959.30.01.634		959.30.01.652
		959.30.01.636		959.30.01.654
		959.30.01.638		959.30.01.656
		959.30.01.640		959.30.01.658
		959.30.01.642		959.30.01.660
		959.30.01.644		959.30.01.662
		959.30.01.646		959.30.01.664
		959.30.01.648		
		959.30.01.824		959.30.01.826
		959.30.01.828		959.30.01.830
		959.30.01.832		959.30.01.834
		959.30.01.836		959.30.01.838

5, 6, 7		959.30.01.801 or 959.30.01.804 959.30.01.802 959.30.01.805 959.30.01.803 (bench seat)

NOTES: The extendable baggage net can be used with this interior.

A bulkhead plus curtain Part No. 525.24.12.023 can be installed at frame 32.

EXECUTIVE INTERIOR CODE EX-4S-3B

PASSENGER SEATS AND FURNISHINGS WEIGHT AND MOMENT CHART

ITEM	WEIGHT lb (kg)	MOMENT lb-in (kg-m)
PASS SEAT 1 OR 2	44.10 (20.00)	10143.4 (116.87)
PASS SEAT 3 OR 4	48.61 (22.05)	13570.5 (156.35)
PASS SEAT 5, 6, 7	145.84 (66.15)	47131.1 (543.02)
TOILET	81.0 (36.7)	15390.0 (177.3)
LH CABINET	31.3 (14.2)	6630.3 (76.5)
RH CABINET	27.0 (12.3)	5720 (66.0)
CD PLAYER (optional)	5 (2.5)	1162 (13.41)
FR 24 CARGO NET	3.6 (1.65)	941 (10.96)
FR 27 CARGO NET	3.6 (1.65)	1049 (12.21)
FR 32 EXTENDABLE BAGGAGE NET	6.44 (2.92)	2325 (26.78)
FR 34 BAGGAGE NET	5.13 (2.325)	1855 (21.38)

Adjust the aircraft Basic Empty Weight on the Loading Form for items removed/added when converting to or from a Combi Interior Conversion.

When installing the extendable baggage net refer to Section 2 for the Luggage Limitations.

EXECUTIVE INTERIOR CODE EX-4S-3B

PASSENGER SEAT OCCUPANT MOMENTS

PASSENGER SEAT OCCUPANT MOMENTS (LB - IN)			
WEIGHT lb	**PAX 1/2** 234.09 in	**PAX 3/4** 276.12 in	**PAX 5/6/7** 320.12 in
50	11705	13806	16006
60	14046	16567	19207
70	16387	19329	22409
80	18728	22090	25610
90	21068	24851	28811
100	23409	27612	32012
110	25750	30374	35214
120	28091	33135	38415
130	30432	35896	41616
140	32773	38657	44817
150	35114	41419	48019
160	37455	44180	51220
170	39796	46941	54421
180	42137	49702	57622
190	44478	52464	60824
200	46819	55225	64025
210	49160	57986	67226
220	51501	60747	70427
230	53842	63508	73628
240	56183	66270	76830

EXECUTIVE INTERIOR CODE EX-4S-3B

PASSENGER SEAT OCCUPANT MOMENTS

PASSENGER SEAT OCCUPANT MOMENTS (KGM)			
WEIGHT kg	**PAX 1/2** 5.946 m	**PAX 3/4** 7.014 m	**PAX 5/6/7** 8.131 m
25	148.65	175.34	203.28
30	178.38	210.41	243.93
35	208.11	245.47	284.59
40	237.84	280.54	325.25
45	267.57	315.61	365.90
50	297.30	350.68	406.56
55	327.03	385.75	447.21
60	356.76	420.81	487.87
65	386.49	455.88	528.52
70	416.22	490.95	569.18
75	445.95	526.02	609.84
80	475.68	561.08	650.49
85	505.41	596.15	691.15
90	535.14	631.22	731.80
95	564.87	666.29	772.46
100	594.60	701.35	813.11
105	624.33	736.42	853.77
110	654.06	771.49	894.43
115	683.79	806.56	935.08
120	713.52	841.63	975.74

EXECUTIVE INTERIOR CODE EX-6S-STD-2S

GENERAL

This configuration is a variation of the basic Executive interior and consists of 6 executive passenger seats and 2 standard seats. It is the operator's responsibility to check before using this configuration whether they require authorization by their regulatory authority. The following information is given:

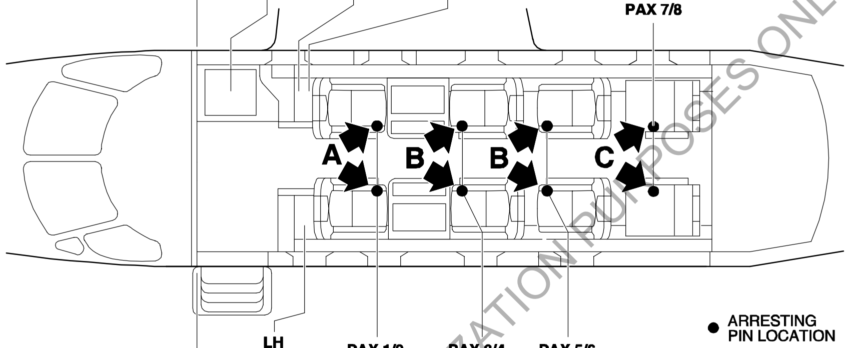
- passenger seat location chart
- permitted passenger seat Part Nos. that can be installed
- passenger seats and furnishings weight and moment chart
- passenger seat occupant moments (standard and metric units)

SIX EXECUTIVE AND TWO STANDARD INTERIOR CODE EX-6S-STD-2S

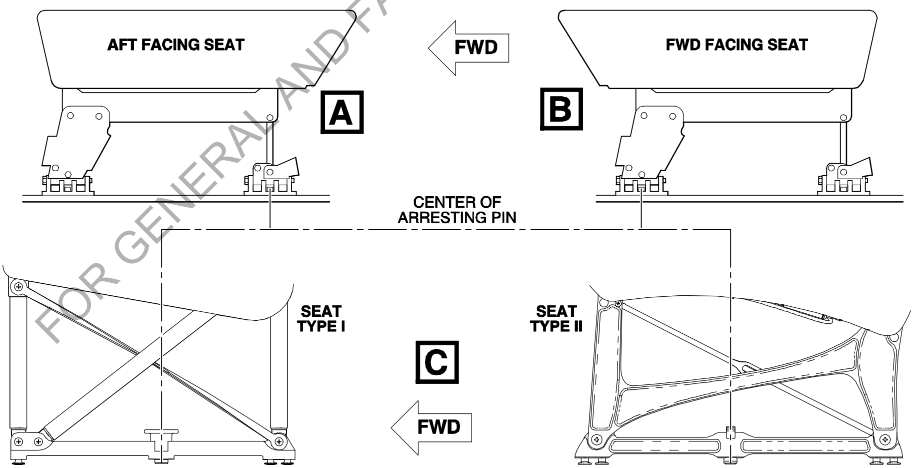
SEAT LOCATIONS

		LAVATORY/ WARDROBE	RH CABINET	CD PLAYER (OPTIONAL)	SEAT TYPE I	SEAT TYPE II
DISTANCE FROM DIVIDER AFT SURFACE	0" 0 m	10.05" 0.255 m	31.89" 0.810 m	31.30" 0.795 m	160.18" 4.067 m	158.18" 4.018 m
FUSELAGE STATION	179.95" 4.571 m	190.00" 4.826 m	211.85" 5.381 m	211.19" 5.364 m	340.13" 8.639 m	338.13" 8.589 m

PAX 7/8



		LH CABINET	PAX 1/2	PAX 3/4	PAX 5/6
FUSELAGE STATION	179.95" 4.571 m	211.83" 5.380 m	236.13" 5.998 m	269.13" 6.836 m	301.13" 7.649 m
DISTANCE FROM DIVIDER AFT SURFACE	0" 0 m	31.88" 0.809 m	56.18" 1.427 m	89.18" 2.265 m	121.18" 3.078 m



NOTE:
CABIN SEAT LOCATION IS DEFINED AS THE DISTANCE FROM THE AFT SURFACE ON THE FORWARD DIVIDER PANEL TO THE CENTER OF THE ARRESTING PIN ON EACH SEAT.

120124

EXECUTIVE INTERIOR CODE EX-6S-STD-2S

PERMITTED PASSENGER SEAT PART Nos. THAT CAN BE INSTALLED

SEAT NO.			
1	959.30.01.613	or	959.30.01.625
	959.30.01.617		959.30.01.627
	959.30.01.619		959.30.01.629
	959.30.01.621		959.30.01.631
	959.30.01.623		
	959.30.01.815		959.30.01.817
	959.30.01.819		959.30.01.821
2	959.30.01.614	or	959.30.01.626
	959.30.01.618		959.30.01.628
	959.30.01.620		959.30.01.630
	959.30.01.622		959.30.01.632
	959.30.01.624		
	959.30.01.816		959.30.01.818
	959.30.01.820		959.30.01.822
3, 5	959.30.01.615	or	959.30.01.649
	959.30.01.633		959.30.01.651
	959.30.01.635		959.30.01.653
	959.30.01.637		959.30.01.655
	959.30.01.639		959.30.01.657
	959.30.01.641		959.30.01.659
	959.30.01.643		959.30.01.661
	959.30.01.645		959.30.01.663
	959.30.01.647		
	959.30.01.823		959.30.01.825
	959.30.01.827		959.30.01.829
	959.30.01.831		959.30.01.833
	959.30.01.835		959.30.01.837
4, 6	959.30.01.616	or	959.30.01.650
	959.30.01.634		959.30.01.652
	959.30.01.636		959.30.01.654
	959.30.01.638		959.30.01.656
	959.30.01.640		959.30.01.658
	959.30.01.642		959.30.01.660
	959.30.01.644		959.30.01.662
	959.30.01.646		959.30.01.664
	959.30.01.648		
	959.30.01.824		959.30.01.826
	959.30.01.828		959.30.01.830
	959.30.01.832		959.30.01.834
	959.30.01.836		959.30.01.838

SEAT NO.	SEAT TYPE I	SEAT TYPE II
7	525.22.12.011	959.30.01.445 959.30.01.447
8	525.22.12.012	959.30.01.446 959.30.01.448

NOTE: The lap belt extension Part No. 959.30.01.590 can be installed on Type I seats 7 and 8 only.

NOTE: It is not allowed to install TYPE I and II seats behind each other.

EXECUTIVE INTERIOR CODE EX-6S-STD-2S

PASSENGER SEATS AND FURNISHINGS WEIGHT AND MOMENT CHART

ITEM		WEIGHT LB (KG)	MOMENT LB-IN (KG-M)
PASS SEAT 1 OR 2		44.1 (20.0)	10143.4 (116.87)
PASS SEAT 3 OR 4		48.61 (22.05)	13570.5 (156.35)
PASS SEAT 5 OR 6		48.61 (22.05)	15126.0 (174.27)
PASS SEAT 7 OR 8	SEAT TYPE I	29.10 (13.2)	10024.3 (115.5)
	SEAT TYPE II	31.6 (14.3)	10871.5 (125.25)
TOILET or WARDROBE		81.0 (36.7) 45.0 (20.4)	15390 (177.3) 8595 (98.97)
LH CABINET		31.3 (14.2)	6630.3 (76.5)
RH CABINET		27.0 (12.3)	5720 (66.0)
CD PLAYER (optional)		5 (2.5)	1162 (13.41)
FR 24 CARGO NET		3.6 (1.65)	941 (10.96)
FR 27 CARGO NET		3.6 (1.65)	1049 (12.21)
FR 32 EXTENDABLE BAGGAGE NET		6.44 (2.92)	2325 (26.78)
FR 34 BAGGAGE NET		5.13 (2.325)	1855 (21.38)

Adjust the aircraft Basic Empty Weight on the Loading Form for items removed/added when converting to or from a Combi Interior Conversion.

When installing the extendable baggage net refer to Section 2 for the Luggage Limitations.

EXECUTIVE INTERIOR CODE EX-6S-STD-2S

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT TYPE I & II OCCUPANT MOMENTS (LB - IN)				
WEIGHT lb	**PAX 1/2** 234.09 in	**PAX 3/4** 276.12 in	**PAX 5/6** 308.12 in	**PAX 7/8** 341.00 in
50	11705	13806	15406	17050
60	14046	16567	18487	20460
70	16387	19329	21569	23870
80	18728	22090	24650	27280
90	21068	24851	27731	30690
100	23409	27612	30812	34100
110	25750	30374	33894	37510
120	28091	33135	36975	40920
130	30432	35896	40056	44330
140	32773	38657	43137	47740
150	35114	41419	46219	51150
160	37455	44180	49300	54560
170	39796	46941	52381	57970
180	42137	49702	55462	61380
190	44478	52464	58544	64790
200	46819	55225	61625	68200
210	49160	57986	64706	71610
220	51501	60747	67787	75020
230	53842	63508	70868	78430
240	56183	66270	73950	81840

EXECUTIVE INTERIOR CODE EX-6S-STD-2S

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT TYPE I & II OCCUPANT MOMENTS (KG - M)				
WEIGHT kg	**PAX 1/2** 5.946 m	**PAX 3/4** 7.014 m	**PAX 5/6** 7.826 m	**PAX 7/8** 8.661 m
25	148.65	175.34	195.66	216.54
30	178.38	210.41	234.79	259.84
35	208.11	245.47	273.92	303.15
40	237.84	280.84	313.05	346.46
45	267.57	315.61	352.19	389.76
50	297.30	350.68	391.32	433.07
55	327.03	385.75	430.45	476.38
60	356.76	420.81	469.58	519.68
65	386.49	455.88	508.71	562.99
70	416.22	490.95	547.84	606.30
75	445.95	526.02	586.98	649.61
80	475.68	561.08	626.11	692.91
85	505.41	596.15	665.24	736.22
90	535.14	631.22	704.37	779.53
95	564.87	666.29	743.50	822.83
100	594.60	701.35	782.63	866.14
105	624.33	736.42	821.77	909.45
110	654.06	771.49	860.90	952.75
115	683.79	806.56	900.03	996.06
120	713.52	841.63	939.16	1039.37

EXECUTIVE INTERIOR CODE EX-4S-STD-4S

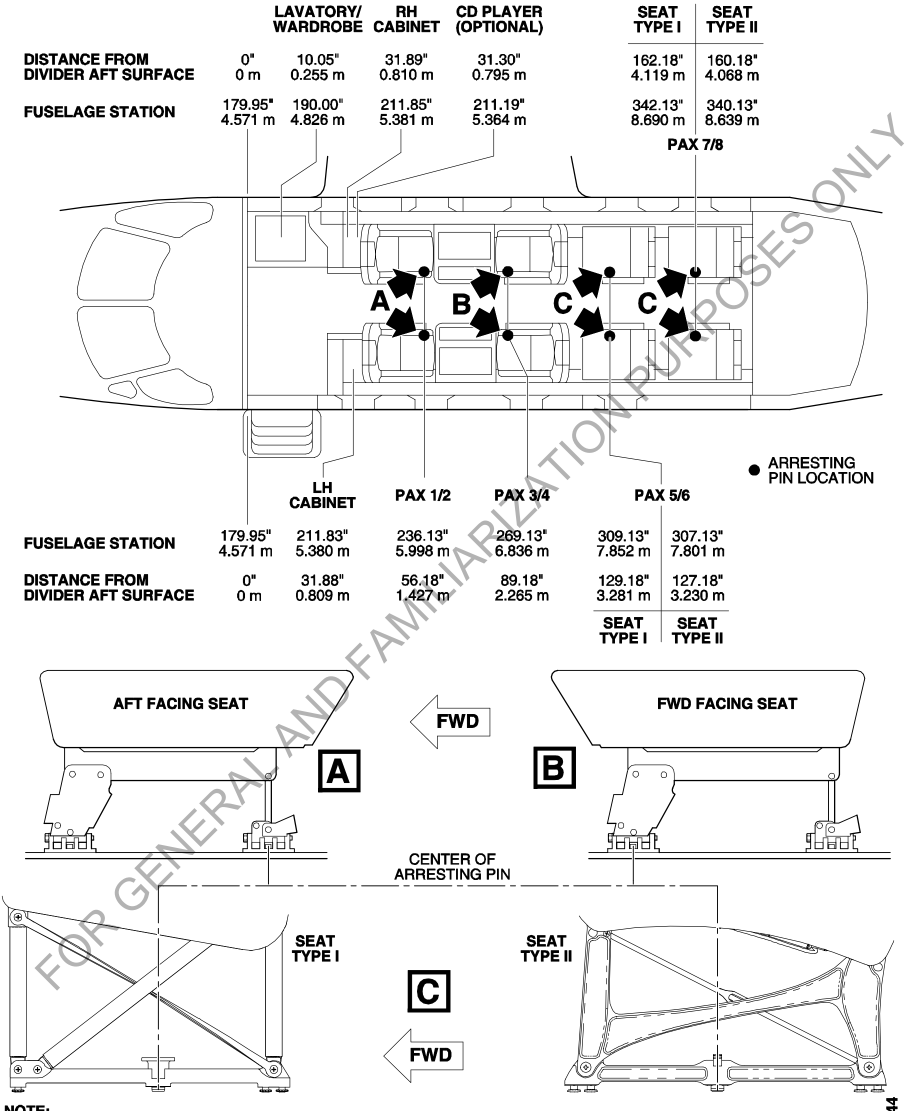
GENERAL

This configuration is a variation of the basic Executive interior and consists of 4 executive passenger seats and 4 standard seats. It is the operator's responsibility to check before using this configuration whether they require authorization by their regulatory authority. The following information is given:

- passenger seat location chart
- permitted passenger seat Part Nos. that can be installed
- passenger seats and furnishings weight and moment chart
- passenger seat occupant moments (standard and metric units)

FOUR EXECUTIVE AND FOUR STANDARD INTERIOR CODE EX-4S-STD-4S

SEAT LOCATIONS



NOTE:
CABIN SEAT LOCATION IS DEFINED AS THE DISTANCE FROM THE AFT SURFACE ON THE FORWARD DIVIDER PANEL TO THE CENTER OF THE ARRESTING PIN ON EACH SEAT.

EXECUTIVE INTERIOR CODE EX-4S-STD-4S

PERMITTED PASSENGER SEAT PART Nos. THAT CAN BE INSTALLED

SEAT NO.			
1	959.30.01.613	or	959.30.01.625
	959.30.01.617		959.30.01.627
	959.30.01.619		959.30.01.629
	959.30.01.621		959.30.01.631
	959.30.01.623		
	959.30.01.815		959.30.01.817
	959.30.01.819		959.30.01.821
2	959.30.01.614	or	959.30.01.626
	959.30.01.618		959.30.01.628
	959.30.01.620		959.30.01.630
	959.30.01.622		959.30.01.632
	959.30.01.624		
	959.30.01.816		959.30.01.818
	959.30.01.820		959.30.01.822
3	959.30.01.615	or	959.30.01.649
	959.30.01.633		959.30.01.651
	959.30.01.635		959.30.01.653
	959.30.01.637		959.30.01.655
	959.30.01.639		959.30.01.657
	959.30.01.641		959.30.01.659
	959.30.01.643		959.30.01.661
	959.30.01.645		959.30.01.663
	959.30.01.647		
	959.30.01.823		959.30.01.825
	959.30.01.827		959.30.01.829
	959.30.01.831		959.30.01.833
	959.30.01.835		959.30.01.837
4	959.30.01.616	or	959.30.01.650
	959.30.01.634		959.30.01.652
	959.30.01.636		959.30.01.654
	959.30.01.638		959.30.01.656
	959.30.01.640		959.30.01.658
	959.30.01.642		959.30.01.660
	959.30.01.644		959.30.01.662
	959.30.01.646		959.30.01.664
	959.30.01.648		
	959.30.01.824		959.30.01.826
	959.30.01.828		959.30.01.830
	959.30.01.832		959.30.01.834
	959.30.01.836		959.30.01.838

SEAT NO.	SEAT TYPE I	SEAT TYPE II
5, 7	525.22.12.011	959.30.01.445 959.30.01.447
6, 8	525.22.12.012	959.30.01.446 959.30.01.448

NOTE: The lap belt extension Part No. 959.30.01.590 can be installed on TYPE I seats 5 through 8 only.

NOTE: It is not allowed to install TYPE I and II seats behind each other.

EXECUTIVE INTERIOR CODE EX-4S-STD-4S

PASSENGER SEATS AND FURNISHINGS WEIGHT AND MOMENT CHART

ITEM		WEIGHT LB (KG)	MOMENT LB-IN (KG-M)
PASS SEAT 1 OR 2		44.1 (20.0)	10143.4 (116.87)
PASS SEAT 3 OR 4		48.61 (22.05)	13570.5 (156.35)
PASS SEAT 5 OR 6	SEAT TYPE I	29.10 (13.2)	9122.1 (105.10)
	SEAT TYPE II	31.6 (14.3)	9891.9 (113.97)
PASS SEAT 7 OR 8	SEAT TYPE I	29.10 (13.2)	10082.5 (116.16)
	SEAT TYPE II	31.6 (14.3)	10934.7 (125.98)
TOILET or WARDROBE		81.0 (36.7) 45.0 (20.4)	15390 (177.3) 8595 (98.97)
LH CABINET		31.3 (14.2)	6630.3 (76.5)
RH CABINET		27.0 (12.3)	5720 (66.0)
CD PLAYER (optional)		5 (2.5)	1162 (13.41)
FR 24 CARGO NET		3.6 (1.65)	941 (10.96)
FR 27 CARGO NET		3.6 (1.65)	1049 (12.21)
FR 32 EXTENDABLE BAGGAGE NET		6.44 (2.92)	2325 (26.78)
FR 34 BAGGAGE NET		5.13 (2.325)	1855 (21.38)

Adjust the aircraft Basic Empty Weight on the Loading Form for items removed/added when converting to or from a Combi Interior Conversion.

When installing the extendable baggage net refer to Section 2 for the Luggage Limitations.

EXECUTIVE INTERIOR CODE EX-4S-STD-4S

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT TYPE I & II OCCUPANT MOMENTS (LB - IN)				
WEIGHT lb	PAX 1/2 234.09 in	PAX 3/4 276.12 in	PAX 5/6 310.00 in	PAX 7/8 343.00 in
50	11705	13806	15500	17150
60	14046	16567	18600	20580
70	16387	19329	21700	24010
80	18728	22090	24800	27440
90	21068	24851	27900	30870
100	23409	27612	31000	34300
110	25750	30374	34100	37730
120	28091	33135	37200	41160
130	30432	35896	40300	44590
140	32773	38657	43400	48020
150	35114	41419	46500	51450
160	37455	44180	49600	54880
170	39796	46941	52700	58310
180	42137	49702	55800	61740
190	44478	52464	58900	65170
200	46819	55225	62000	68600
210	49160	57986	65100	72030
220	51501	60747	68200	75460
230	53842	63508	71300	78890
240	56183	66270	74400	82320

EXECUTIVE INTERIOR CODE EX-4S-STD-4S

PASSENGER SEAT OCCUPANT MOMENT CHART

PASSENGER SEAT TYPE I & II OCCUPANT MOMENTS (KG - M)				
WEIGHT kg	PAX 1/2 5.9460 m	PAX 3/4 7.0135 m	PAX 5/6 7.8740 m	PAX 7/8 8. 7122 m
25	148.65	175.34	196.85	217.81
30	178.38	210.41	236.22	261.37
35	208.11	245.47	275.59	304.93
40	237.84	280.54	314.96	348.49
45	267.57	315.61	354.33	392.05
50	297.30	350.68	393.70	435.61
55	327.03	385.75	433.07	479.17
60	356.76	420.81	472.44	522.73
65	386.49	455.88	511.81	566.29
70	416.22	490.95	551.18	609.85
75	445.95	526.02	590.55	653.42
80	475.68	561.08	629.92	696.98
85	505.41	596.15	669.29	740.54
90	535.14	631.22	708.66	784.10
95	564.87	666.29	748.03	827.66
100	594.60	701.35	787.40	871.22
105	624.33	736.42	826.77	914.78
110	654.06	771.49	866.14	958.34
115	683.79	806.56	905.51	1001.90
120	713.52	841.63	944.88	1045.46

VOLUME 2

OF

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

PC-12/47E

MSN 545, 1001 - 1719, 1721 - 1942

Report No. 02277

Manufacturer's Serial No. - ____________________

Registration No. - ___________________________

EASA Type Certificate No: EASA.A.089
FAA Type Certificate No: A78EU

PILATUS AIRCRAFT LTD.
CH-6370 STANS
SWITZERLAND

SECTION 7

AIRPLANE AND SYSTEMS DESCRIPTION

TABLE OF CONTENTS

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AIRFRAME

GENERAL

The airplane is a low wing, T-tail, single engine, retractable landing gear type designed to transport passengers, cargo, or various combinations of both passengers and cargo. Construction is conventional semimonocoque, primarily incorporating aluminum alloy, but composite structures are used in certain areas.

Flush riveting is used where appropriate to minimize drag. Access panels are installed to facilitate inspection and maintenance. The complete airframe is electrically bonded to eliminate electro-magnetic interference and static discharge wicks are used to reduce static charges while in flight.

FUSELAGE

The fuselage consists of the engine area, nose gear assembly, cockpit, cabin, and aft fuselage. The engine area contains the powerplant, and associated accessories. The engine cowling is constructed from a carbon/nomex honeycomb material and is covered by a copper foil for lightning protection. The engine mount is welded steel tubing and bolted to the firewall in four places. The firewall is titanium and protected by insulation material.

A left and a right windshield, two side windows, and a direct vision (DV) window provide cockpit visibility. The windshield is of two glass layers with an interlayer, while the two side windows and the DV window are of two stretched acrylic layers with an interlayer. All windows are of two ply laminated design.

The cabin area is from the cockpit to the aft pressure bulkhead and contains the passenger door, the cargo door, and an emergency overwing exit. The nine cabin windows are two ply laminated monolithic stretched acrylic and incorporate dry neoprene seals. Airplane avionics are mounted under the cabin floor, running the length of the center cabin, and are accessible through quick release panels. The cabin carry-through spar attachment fittings are one piece machined aluminum. Fuselage fairings are constructed from either carbon/nomex or aramid/nomex honeycomb material.

A safety net is installed aft of the rear pressure bulkhead to protect the bulkhead from damage during maintenance.

EMPENNAGE

The empennage is a T-tail design with the horizontal stabilizer mounted on top of the vertical stabilizer. The vertical and horizontal stabilizer assemblies are conventional aluminum construction. The horizontal stabilizer is a trimmable structure. The dorsal fin is glass fiber honeycomb and ventral fin is kevlar honeycomb material.

WINGS

The wings are of conventional construction incorporating front and rear spars, ribs, and skin. The front and rear spars are mainly from machined aluminum alloy plate. Both spars include fuselage and integral landing gear attachment points, while the rear spar also integrates flap actuator attachment points. Main load carrying ribs are machined from aluminum alloy plate. All other ribs are formed sheet metal. The ribs incorporate lightening holes to reduce weight and integral beads for stiffening. The wing skin is stiffened clad aluminum alloy sheet riveted to the spars and ribs. Access panels are in the wing bottom only.

Each wing is attached to the fuselage using three titanium shear bolts and, at the aft upper fitting, one steel tension bolt.

Each wing contains an integral fuel tank, aileron, flaps, deice boot, and main landing gear. The fuel tanks are located between ribs 3 and 16, forward of the main spar to the nose rib and between ribs 6 and 16 behind the main spar to the rear spar.

The ailerons are conventional construction with a single spar and ribs. The aileron access panels are a carbon/nomex honeycomb construction. The ailerons are mass balanced and the aileron/wing gap is sealed.

Each wing incorporates a single piece Fowler flap of conventional construction, with three support arms and associated linkages. The wing trailing edges above the flaps are foam core covered with carbon laminate while the flap fairings are a carbon laminate with nomex honeycomb reinforcement strips.

A surface mounted deice boot is attached to the nose skin of each wing. Each wing has a main landing gear attached to the front and rear spar, with a carbon fiber/nomex honeycomb gear door attached to the leg. The wing tips are constructed of carbon fiber/honeycomb with a top layer of copper foil for lightning protection.

FLIGHT CONTROLS

GENERAL

Refer to Figure 7-3-1, Flight Controls for system controls and flap operation.

The flight control system is conventional using push-pull rods and carbon steel cables. Electric trim systems are provided for the aileron, rudder, and elevator. All trim systems can be disconnected in the event of a runaway condition.

An aileron/rudder interconnect system is installed to improve lateral stability and turn coordination.

When the pilot initiates a turn by giving a roll control input, the spring package in the interconnect systems applies a force to the rudder cables that tends to deflect the rudder in the direction of the turn. Alternatively, when the pilot gives a yaw control input by pushing one of the rudder pedals, the spring package applies a force to the aileron control system which tends to roll the aircraft in the direction of turn.

AILERON

The ailerons are connected to the cockpit control wheels by control cables in the fuselage and push-pull rods in the wings. Each aileron is attached to the wing at two hinge points.

Each aileron has a trim tab which is connected to a geared lever (Flettner) mechanism. The mechanism is installed inside the aileron and makes the trim tabs act as balance tabs when the ailerons are moved. They move in the opposite direction to the ailerons. The left aileron trim tab is also operated electrically from the cockpit. Refer to Trim system, this section, for more information.

ELEVATOR

The elevator is a two piece unit attached to the horizontal stabilizer at a total of five hinge points and is connected to the cockpit control wheel by carbon steel control cables. A down spring is installed in the control circuit to improve longitudinal stability. The elevator is equipped with static wicks to dissipate static charges to the atmosphere.

Pitch trim is provided by positioning the horizontal stabilizer. Refer to Trim system, this section, for more information.

RUDDER

The rudder is a single piece unit attached to the vertical stabilizer at two hinge points and is connected to the cockpit rudder pedals by carbon steel control cables. Both pilot and copilot rudder pedals are adjustable by use of a crank located between each set of rudder pedals. Clockwise rotation of the crank moves the pedals aft. The rudder is equipped with static wicks to dissipate static charges to the atmosphere.

The rudder incorporates a trim tab that is electrically operated from the cockpit. Refer to Trim system, this section, for more information.

TRIM

The aileron, horizontal stabilizer and rudder trim are electrically operated. Aileron and horizontal stabilizer trim operation is controlled by a switch on the outboard yoke of each control wheel, rudder trim operation is controlled by a switch on the Engine Power Control Lever. Before selecting pitch or aileron trim, press and hold the trim engage switch located on the forward side of each outboard control wheel yoke. A display for aileron, horizontal stabilizer and rudder trim position is shown on the systems Multi Function Display (MFD).

Pitch trim is accomplished by an electrically controlled actuator connected to the moveable horizontal stabilizer. The actuator has two separate motors - a manual stabilizer trim motor (controlled by the manual trim switches) and an alternate stabilizer trim motor (controlled by the autopilot). The alternate stabilizer trim motor can also be used as a back-up system by the pilot. To activate alternate Stabilizer trim, press the ALTERNATE STAB TRIM switch on the center console to NOSE UP or NOSE DOWN as needed.

The leading edge of the horizontal stabilizer moves down for nose-up trim and moves up for nose-down trim. At the root of the left horizontal stabilizer leading edge are trim range indicator markings to show full travel in either direction and the take-off trim range. As part of the pre-flight inspection these trim indicator markings should be used to verify the cockpit trim position indication.

If there is uncommanded trim operation, all trim operation (manual and auto trim) can be stopped by lifting the switch guard and pressing the TRIM INTR switch located in front of the Engine Control quadrant on the center console.

FLAPS

Each wing trailing edge has a single piece Fowler type flap supported by three flap arms. The flaps are controlled by a selector handle located to the right of the power controls on the center console. The flaps may be set to one of the four preset positions 0°, 15°, 30° and 40° by moving the handle to the appropriate position. If the flap lever is not at one of the four preset positions, the Flap Control and Warning Unit (FCWU) will drive the flaps to the nearest preset position.

The flaps are electrically actuated. There is a single flap Power Drive Unit (PDU) installed below the cabin floor at the rear main frame. It drives screw actuators at the inboard and middle stations through flexible shafts. The screw actuators are connected to the flap actuating arms.

The flap control system incorporates a failure detection system. The system can detect a failure of a flexible shaft by disconnection or jamming, potentially resulting in flap asymmetry or failure of the system to achieve the selected flap position. The system can detect a failure of a single actuator, potentially resulting in single flap panel twisting. If a failure is detected, the FCWU disconnects the power to the PDU and the Crew Alerting System (CAS) will show a Flaps caution. This condition cannot be reset by pilot action, a landing should be made, refer to the EMERGENCY PROCEDURES.

A rotation sensor is installed on each of the outer flap screw actuators. These sense the rotation of the flexible shafts and give signals to the FCWU. The FCWU monitors these signals for asymmetrical flexible shaft rotation of more than 20 rotations (caused by a broken inner flap drive shaft). If failure is detected the FCWU disconnects the power to the PDU and the CAS will show a Flaps caution. This condition cannot be reset by pilot action. To detect satisfactory system operation, the FCWU monitors the left sensor for 10 rotations of the flexible shaft in the first 7 seconds of a flap up or down selection. If the selected flap position is not achieved the FCWU disconnects the power to the PDU and a CAS Flaps caution will be shown.

There are five position sensors in the flap system, one at each center flap actuating arm, one at each inner flap actuating arm and one on the flap position lever, which give signals to the FCWU. The FCWU monitors the signals from the left and right flap sensors for flap asymmetry (caused by a broken inner flap drive shaft). If an asymmetry is detected, power to the PDU is disconnected and the CAS Flaps caution will come on. Flap panel asymmetry occurs when the difference between the left and right flap angle exceeds a specific angle in accordance with the table below.

Flap position between:	Asymmetry occurs when the left and right flap panel difference is at least:
0˚ and 15˚	1.6˚
15˚ and 30˚	4.3˚
30˚ and 40˚	5˚

The FCWU also monitors the signals from the left and right flap sensors for twisting of the left or right flap (caused by a broken outer flap drive shaft or unequal movement of the flap screw actuators). If a failure is detected, the FCWU disconnects the power to the PDU and the CAS will show a Flaps caution.

Additionally if flap asymmetry or twist is detected and the flap angle is greater than 2° after 10 seconds, the CAS Pusher caution will show and the stick pusher will default to ‘safe’ mode. The Pusher Safe Mode advisory will show in the CAS window. In the ‘safe’ mode the stick pusher will operate at the flap 0° flap speed setting.

If the Power Drive Unit (PDU) motor overheats or a stalled motor condition is detected, a signal from the PDU will open the FLAP circuit breaker on the Generator 1 Bus circuit breaker panel. The FCWU then removes the up or down command to the PDU and the CAS will show a Flaps caution. After waiting for a period of 5 minutes the FLAP circuit breaker can be reset (max. 2 attempts) and normal flap operation resumes. This is the only pilot re-settable failure and cycling the flap circuit breaker if it has not opened will not reset any other failure mode detected.

To avoid an inadvertent flap down command at high speed, flap down enable is disabled when the flap selector handle is in the 0° position.

Flap system operation may be stopped at any time by lifting the switch guard and pressing the INTERRUPT FLAP switch on the center console to INTR. The CAS will show a Flaps caution. If the switch is moved back to the NORM position, normal operation will not resume, even if the FCWU does not detect any failures.

A FLAP GROUND RESET switch is installed on the maintenance test panel (right sidewall behind the co-pilot seat). The FLAP GROUND RESET switch is only operational on the ground for maintenance purposes.

INDICATION / WARNING

Symbolic aircraft views of the trim positions for the aileron trim tab (roll), rudder trim tab (yaw) and horizontal stabilizer (pitch) are shown in the TRIM window of the systems MFD. In flight the trim indications are shown in white. An invalid trim status will be shown with an amber cross. On the ground the trim logic changes and the colors change based on the trim position. The neutral trim positions change to green and the pitch trim also has a green diamond (aft cg). The aircraft symbols change to green when each trim position is correctly set for takeoff. If the trim position is not correctly set the aircraft symbol will be white and the Takeoff Configuration advisory will be displayed on the Crew Alerting System (CAS). A green trim in motion indicator will show when the autopilot is moving the rudder and horizontal stabilizer trim. An invalid autopilot trim parameter will be shown with a amber cross over the indicator.

Flap position is shown in the FLAP window of the systems MFD, by a white symbolic flap pointer which moves in relation to flap movement. The window is marked in white with the positions 0, 15, 30 and 40. The pointer and the degree position mark will change to green when the pointer reaches the selected flap position and is adjacent to the mark. When aircraft is on ground and flaps are at 40° the pointer will show white and the Takeoff Configuration advisory will be displayed on the CAS. When airborne and the flaps are up, the flap indications change from their default white to a grey color after 20 seconds. An invalid flap condition or status related to the flap position will be shown by a amber cross.

If the airspeed goes above the maximum limit for the current flap setting the Flight Alerting System (FAS) will initiate an “Overspeed” warning on the PFD and a “Speed” voice callout will be heard. A red Vconstraint bar will be shown on the right side of the PFD ASI tape and the airspeed digital read out will change to red.

If a stabilizer trim runaway of the main system is sensed a CAS “Pitch Trim Runaway” warning will be displayed and a “Trim Runaway” will be heard.

On the ground and with weight on the wheels the aircraft is monitored for Takeoff Configuration by the Monitoring Warning System (MWS). The MWS monitors the position of the trim tabs, horizontal stabilizer, the condition lever position, flaps and the engine and airspeed conditions. If any of the trims or the flap position are not in the takeoff range with the engine running, a Takeoff Configuration advisory will be shown in the CAS window of the systems MFD. If any of the trims or the flap position are not in the takeoff range or the condition lever is not at flight idle and the engine torque is increased more than 20 psi with an airspeed of less than 50 KIAS, the Flight Alerting System (FAS) will initiate a NO TAKEOFF warning on the PFD and a No Takeoff voice callout will be heard.

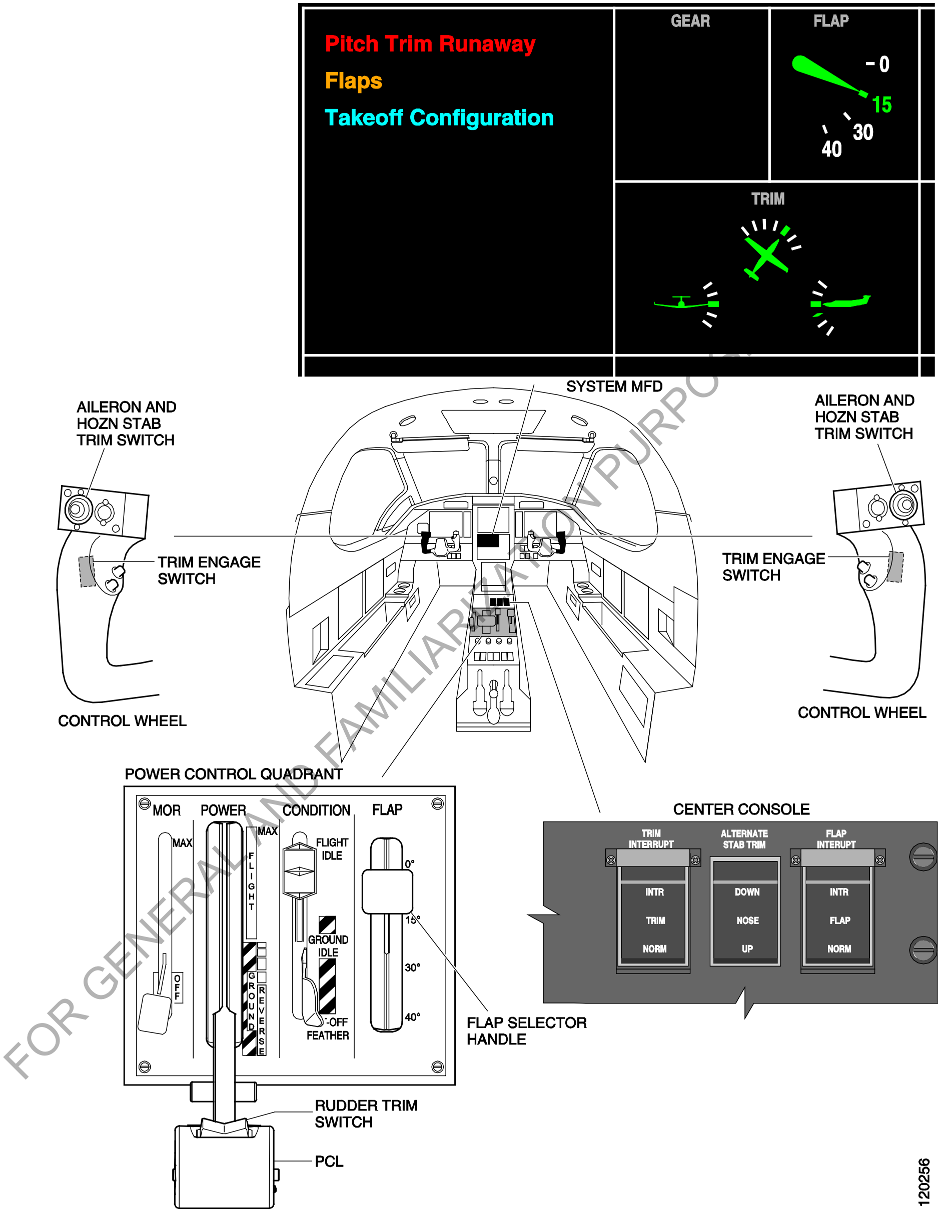

Fig 7-3-1. Flight Controls – General

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LANDING GEAR

GENERAL

Refer to Figure 7-4-1, Landing Gear System, for system operation.

The landing gear is a conventional tricycle configuration that is extended and retracted using hydraulic pressure produced by an electrically powered hydraulic pump. Landing gear extension and retraction is the only function of the hydraulic system. Landing gear operation is completely automatic upon pilot gear selection.

A nitrogen charged accumulator is used to maintain hydraulic pressure and hold the landing gear in the retracted position in normal operation and following a hydraulic system failure. If required, the landing gear can be lowered manually through a combination of free-falling and the emergency landing gear hand pump.

Landing gear position is shown on three icons in the GEAR window of the systems MFD.

Nosewheel steering is accomplished by mechanical nosewheel steering and by differential braking.

Aircraft braking is controlled by toe pedals that operate brake assemblies attached to the left and right landing gear. Propeller reverse also contributes to aircraft braking. Refer to Propeller system, this section, for more information.

DESCRIPTION

The nose gear is a hydraulic fluid and nitrogen filled shock strut. The shock strut consists of a piston and fork assembly that slides inside a cylinder. A torque link connects the piston/fork assembly to the cylinder. The cylinder is mounted inside the nosewheel well. The nose gear is locked in the extended position by putting the folding strut in an over-center position. A spring is attached to the nose gear to assist in free fall during emergency extension. The nose gear doors are spring loaded to the open position and are mechanically closed during nose gear retraction. The nose gear retracts rearward into the nosewheel well and is completely enclosed by the gear doors when the landing gear is retracted.

Both main landing gear are trailing link types. A hydraulic fluid and nitrogen filled shock strut connects the trailing link to the main leg hinge point. Each main gear actuator incorporates a mechanical down-lock and a gear down and locked indicator switch. The main landing gear doors consist of a single door that is attached to the main gear leg and the outside edge of the main gear wheel well. Each main gear retracts inward into the main gear wheel well. With the landing gear retracted the main landing gear wheel and tire assemblies are not enclosed and protrude out of the main gear wheel well approximately one inch (25.4 mm).

All landing gear are held in the fully retracted position by hydraulic pressure. No mechanical up-locks are required.

Nose wheel steering is accomplished using the rudder pedals which are mechanically connected to the nosewheel. Additional nosewheel steering is done through differential braking. Use of rudder pedal only will turn the nosewheel ± 12 degrees from center while differential braking will turn the nosewheel ± 60 degrees from center. A shimmy damper is installed on the nose landing gear strut to eliminate nosewheel oscillations.

The tires are a low pressure type that allow operations from soft and unimproved fields.

HYDRAULIC SYSTEM DESCRIPTION

The main hydraulic system comprises a power pack located in the hydraulic service bay in the left wing root behind the main spar, a nitrogen charged accumulator in the same location, a landing gear selector valve mounted in the cockpit mechanically linked to the pilots control panel selector handle by a push/pull rod and three actuators, one for each landing gear leg.

The power pack features an electrically driven variable displacement hydraulic pump along with associated filtration, pressure regulation and failure protection systems, and an integral reservoir with a visual sight gauge. It provides the main source of hydraulic pressure and flow to facilitate landing gear extension and retraction. It is pressurized with nitrogen from a pressure cylinder to prevent pump cavitation. Filtration consists of an integral filter with automatic by-pass and visual by-pass indication. (pop out button). Thermal protection is provided.

The nitrogen pressure cylinder also contains hydraulic fluid thus increasing the system fluid volume. A visual level indicator is installed at the rear of the cylinder and can be seen at the wing root when the cargo door is open. This enables the hydraulic fluid level status to be seen during a pre flight inspection.

Electrical power supply for the system is provided from the SECONDARY POWER LINE and is applied to the power pack, causing the pump to operate when low hydraulic pressure is sensed by the system pressure switch. The hydraulic control circuit is powered from the ESSENTIAL BUS.

The selector valve is a two position, four way rotary type located in the cockpit and mechanically actuated by the landing gear selector handle.

The nitrogen charged accumulator is present for fluid thermal expansion and to ensure system pressure is maintained after power pack failure. Its size accounts for normal system pressure leakage rates to ensure that after such a failure, the landing gear will be maintained in the retracted position for 200 minutes.

NOTE

The landing gear may partially extend during large gust loads and then return to the retracted position. After 200 minutes, the landing gear may start extending due to loss of system pressure.

The accumulator is charged via a charging valve located in the service bay with pressure indicated on a gauge at the same location. A service selector valve, located in the service bay, allows the system to be operated from a ground hydraulic service unit.

The actuators are of the linear type with the main landing gear actuators also incorporating the down locking mechanism.

Cockpit controls consist of the following -

- A landing gear selector handle is located on the pilot's lower right panel and facilitates extension or retraction of the landing gear. It acts directly, via a rod, on the landing gear selector valve. The handle is equipped with an electrical spring loaded solenoid which prevents it from moving to the retracted position when the airplane is on the ground. The airplane on ground status is sensed by the Modular Avionics Unit (MAU).

- An emergency landing gear hand pump and operating handle, located at the rear of the center console, is used to assist in free fall emergency landing gear deployment after failure of the main system.

HYDRAULIC SYSTEM OPERATION

The system pressure switch monitors the hydraulic system accumulator pressure and controls the operation of the power pack pump. When the pressure in the hydraulic system accumulator is less than 2450 psi the system pressure switch operates and starts the power pack pump. When the pressure in the hydraulic system accumulator is between 2725 and 2875 psi the system pressure switch operates and stops power pack pump. The power pack pump is powered on the ground with the engine running and always in the air. This allows the hydraulic system to operate in the event of an engine failure in flight.

The low pressure switch monitors the hydraulic system fluid pressure. It will make the CAS show a Hydraulics caution if the hydraulic system fluid pressure falls to below 1800 psi.

Movement of the landing gear selector valve to pass pressure to the appropriate side of the main landing gear and nose landing gear actuator retracts the landing gear, which is then held there by continued application of hydraulic pressure. In normal operation, the landing gear is extended by moving the landing gear selector valve to apply pressure to the other side of all three actuators. Locking of the main landing gear actuators is accomplished by internal locks within the actuator housings which are actuated and released by the application of hydraulic pressure in the appropriate sense. The nose landing gear is held in its extended position by an over-center two piece drag link.

If the power pack pump overheats the thermal protection operates and disconnects the power supply to the power pack. When the pump cools the thermal protection operates and re-connects the power supply to the power pack.

INDICATION/WARNING

Extended position indication is provided by micro switches internal to the main landing gear actuators and a proximity switch on the nose landing gear drag link. Retraction position indication is provided by proximity switches on the landing gear doors.

Landing gear position is shown by three icons (one for each gear) in the GEAR window of the systems MFD. Each icon can show gear displays for the following conditions:

Condition of left main gear, right main gear and nose gear	Color and Font	Gear Display
State is 'undetermined'	Amber cross on black background	
State is 'Gear Up' normal	White UP with white box outline	
State is 'Gear Up' declutter (flaps up)	Grey UP with grey box outline	
State is 'Gear Up' warning	White UP in red box	
State is 'Gear Down'	Black DN with green background	
State is 'Gear in Transit'	White hatched lines with black background	
State is 'Gear in Transit Warning'	White hatched lines with red background	

The Crew Alerting System (CAS) will show a Hydraulics caution for two different functions:

- In flight a continuous Hydraulics caution means that the power pack pump has been operating for more than 2 minutes or the main system pressure has fallen below operational limits (nominal 1,800 psi) and cannot be relied upon for proper landing gear system operation. The Hydraulics caution is given 30 seconds after the pump has been operating for more than 2 minutes or low pressure is sensed by a low pressure switch mounted in the power pack pressure supply line upstream of the landing gear selector valve

- On ground after landing a continuous Hydraulics caution means that the power pack has been automatically initiated in flight more than six times in an hour by the system pressure switch in order to maintain system pressure. This indicates that the pressure leak rate from the system is too high or a low fluid level condition exists. Pilot initiated landing gear cycle will reset this counter to zero when there are less than six counts in an hour

The Flight Alerting System (FAS) will initiate a Gear warning message on the PFD and an aural warning will sound if the landing gear is not down and locked whilst in the air with:

- an airspeed of less than 130 KIAS and the PCL at idle
- the flaps set to 30 or 40°
- a radar altitude of less than 200 ft and a power setting of less than 10 psi

EMERGENCY EXTENSION SYSTEM

To manually extend the landing gear, set the landing gear selector handle to DN with airspeed less than 110 KIAS (power to idle momentarily). This will allow the landing gear to free fall. If the landing gear does not completely extend and show three green indicators, pull the emergency landing gear hand pump handle out of the aft center console and begin pumping. Stop pumping when all three landing gear indicators show green. Experience has shown that approximately 60 to 80 strokes of the hand pump are required to fully extend the landing gear. Stow the emergency landing gear hand pump handle back into the aft center console before landing. If necessary, yawing the airplane to use the aerodynamic load may assist the emergency extension.

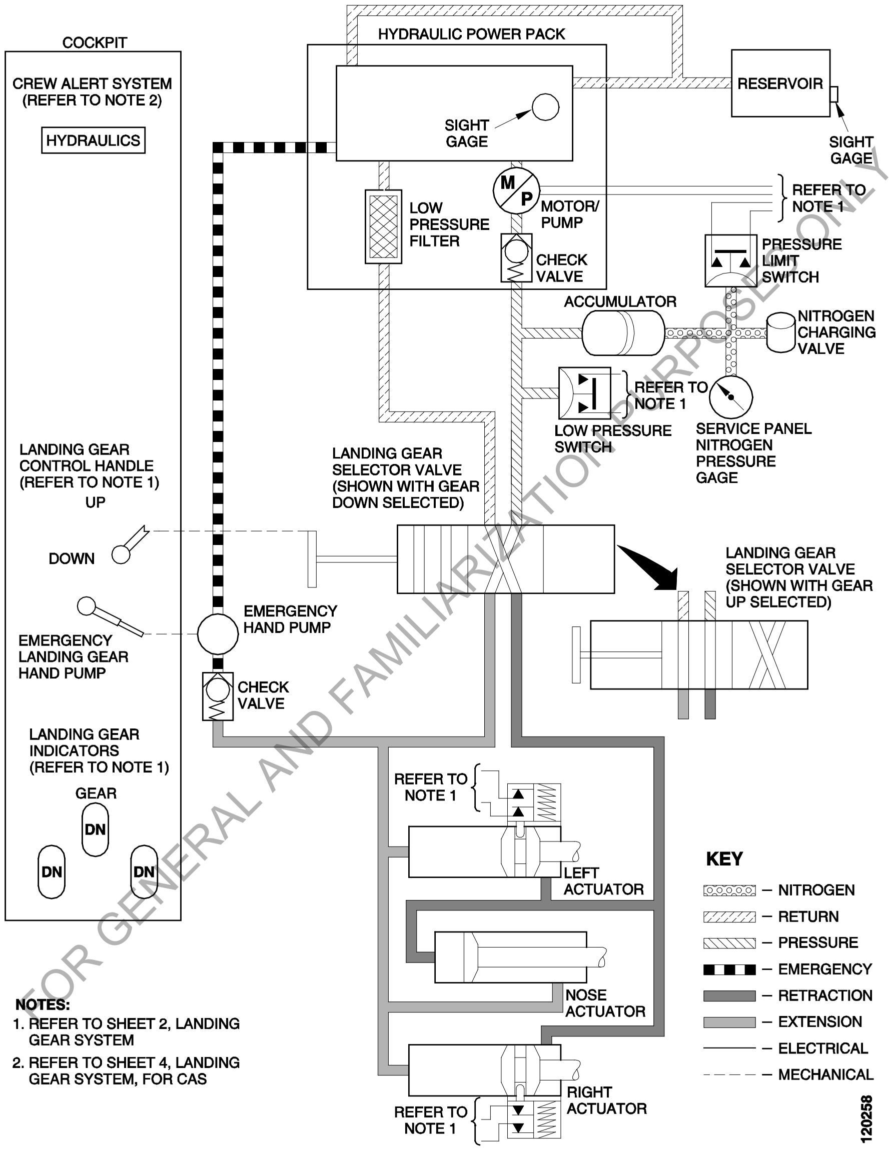

Figure 7-4-1. Landing Gear System
(Sheet 1 of 4)

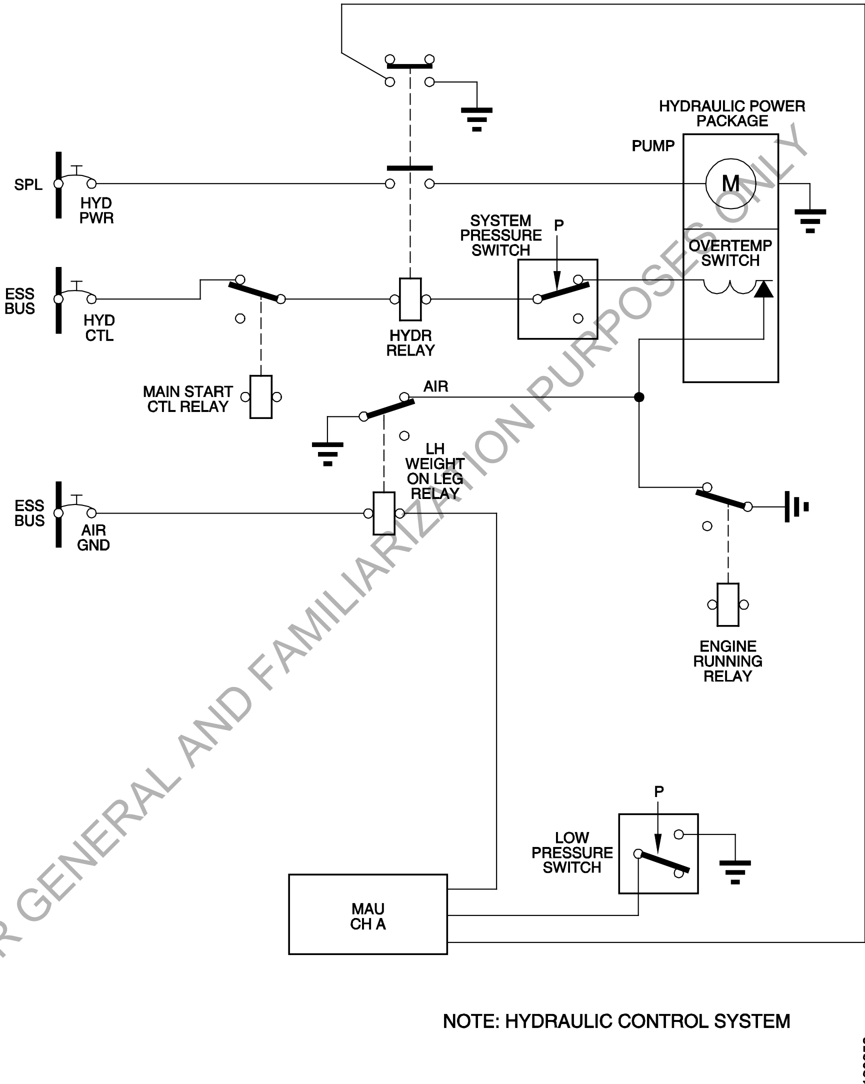

Figure 7-4-1. Landing Gear System
(Sheet 2 of 4)

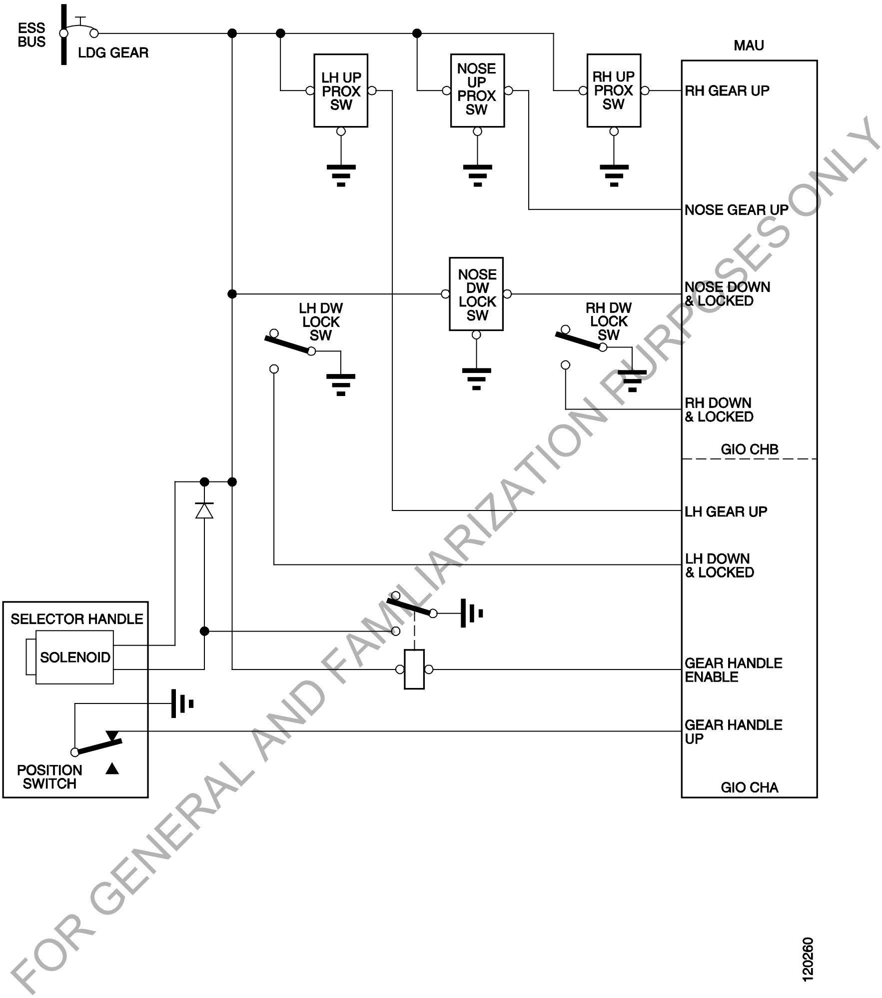

Figure 7-4-1. Landing Gear System
(Sheet 3 of 4)

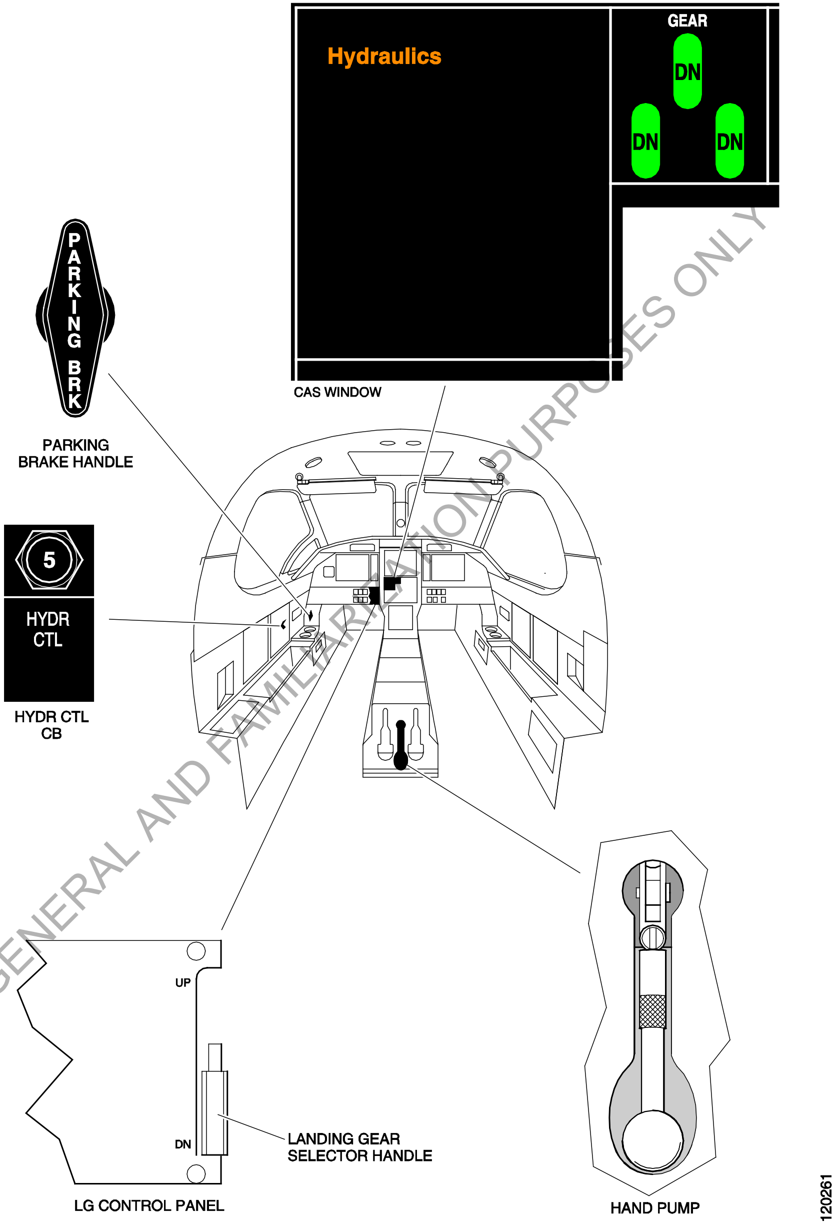

Figure 7-4-1. Landing Gear System
(Sheet 4 of 4)

AIR / GROUND SYSTEM

The aircraft “in air” or “on ground” (AIR/GND) status is determined from a combination of aircraft systems interfaced to the Modular Avionics Unit (MAU):

- LH main gear proximity switch
- RH main gear proximity switch
- Radar Altimeter – altitude
- Calibrated airspeed (ADAHRS computed)

By comparison monitoring of the above systems the MAU determines the AIR/GND status of the aircraft. MAU Channel A outputs a discrete signal to control the LH AIR/GND relays. MAU Channel B outputs a discrete signal to control the RH AIR/GND relays.

The LH AIR/GND signal is sent to the following systems:

- Hydraulics
- Propeller de-ice
- Flaps
- ECS
- LH Stick Pusher Computer
- Flight Time Counter

The RH AIR/GND signal is sent to the following systems:

- RH Stick Pusher Computer
- Weather Radar (Pre SB 34-014)
- Logo Lights (optional system)

If the MAU determines a disparity between the monitors by comparison monitoring, a correct determination of the AIR/GND status is still possible as the suspect (invalid) monitor is disregarded in the determination. When the MAU determines that all monitors disagree it results in an invalid AIR/GND state. If the AIR/GND state is invalid a Air/Ground Fail caution will be shown on the Crew Alerting System (CAS).

When the Air/Ground Fail caution is shown the AIR/GND state defaults to AIR.

A dormant fault in the LH and RH main gear proximity switches is possible as a result of the AIR/GND monitor function of the MAU. To avoid this CAS status alerts will be given for LH WOW Fault, RH WOW Fault or LH + RH WOW Fault when the MAU determines either or both proximity switch inputs are invalid.

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BRAKES

Refer to Figure 7-4-2, Brake System, for system operation.

Aircraft braking is provided by two brake assemblies, one bolted to each main landing gear axle. The brakes are controlled by toe pedals attached to each rudder pedal assembly. The pilot and copilot left toe brakes operate the left brake while the pilot and copilot right toe brakes operate the right brake.

The brake system consists of a brake fluid reservoir, four brake master cylinders, a left and right shuttle valve, a parking brake valve, and two brake assemblies. If the pilot and copilot simultaneously apply pressure to the same side brake pedal, the one applying the greatest pressure will control the braking.

The brake system is separate and independent from the airplane hydraulic system. The brake fluid reservoir is located on the right hand side of the cabin sidewall and incorporates a fluid level indicator.

A separate brake master cylinder, located in the cockpit footwell, is mechanically connected to each toe pedal. There is no mechanical connection between the pilot and copilot brake pedals. Two shuttle valves, a left and a right, are used to select inputs from their respective pilot and copilot brake pedals. Pressing a brake pedal causes the applicable brake master cylinder to force brake fluid through the respective shuttle valve and parking brake valve to the brake assembly.

MSN 545, 1001 – 1230. The seven piston brake assemblies have steel friction surfaces. Each brake assembly incorporates two brake lining wear indicators. As the brake linings wear, the pins will be pulled into the piston housing. When the system is pressurized and the pins are flush with the piston housing, the brake linings must be overhauled.

MSN 1231 - 1942. The six piston brake assemblies have steel friction surfaces and three retractors. The retractors pull the pressure plate back when no hydraulic pressure is applied to the brake assembly. When the system is pressurized and the retractors are flush with the piston housing, the brake linings must be overhauled.

The parking brake valve has two off-center cams that hold open poppet valves whenever the parking brake is released. This allows hydraulic fluid flow through the brake system. When the parking brake is set, the off-center cams are rotated to allow the poppet valves to close. This traps brake fluid under pressure between the parking brake valve and the brake assemblies.

To set the parking brake, pull the PARKING BRK T-handle fully out and rotate to lock, then evenly press both brake pedals. Release pedal pressure and the brakes will remain set. To release the brakes, rotate and push the PARKING BRK T-handle fully in.

WHEELS AND TIRES

The wheels are split-hub type, the main wheels have three fusible plugs which melt when there is too much heat from the brakes. Tubeless tires are installed on the wheels and each wheel has a tire inflation valve and an overinflation safety plug. The main wheels have fairings on the outer hubs which make the wheels aerodynamically smooth when the landing gear is retracted.

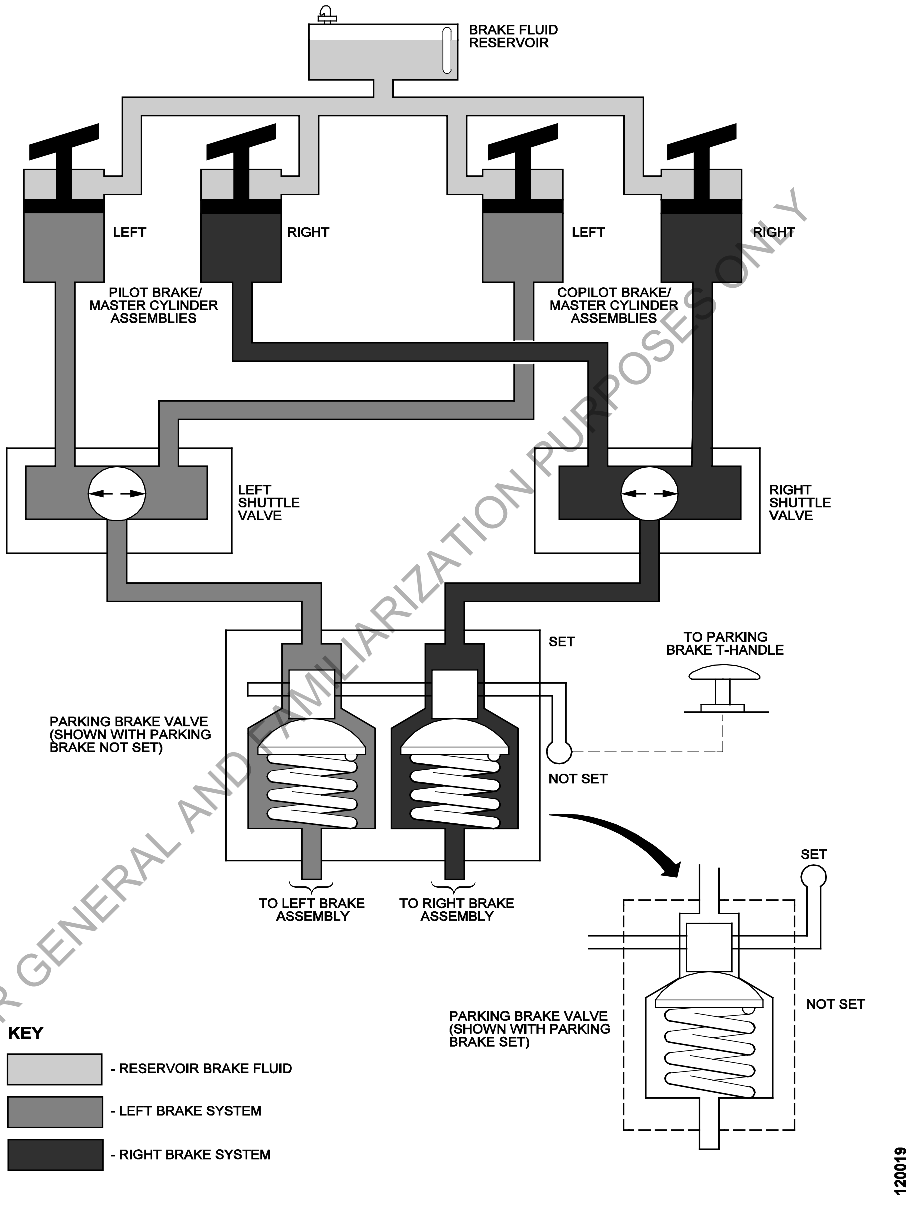

Figure 7-4-2. Brake System

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BAGGAGE COMPARTMENT

A baggage compartment is provided at the rear of the cabin and is accessible during flight. A standard luggage net is secured at twelve attachment points to secure the baggage. An extendible baggage net can be installed instead of the standard net, to secure baggage in front of and in the baggage compartment. The floor attachments at the front of the net can be moved between frames 32 and 34.

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CARGO TIE-DOWNS

Tie-down anchor points fit into the seat rails and lock into place by an over-center lever. Tie-down straps can be secured to these anchor points.

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SEATS/RESTRAINT SYSTEMS

SEATS

The crew seats are adjustable fore and aft and vertically (Refer to Figure 7-7-1). They also have controls for recline, thigh support, back cushion lumbar support, armrests and headrest. The fore and aft and recline control levers are on the rear inboard side of the seats. The vertical adjustment lever and the thigh support control wheel are at the front of the seat cushion. When the thigh support control wheel is turned it raises or lowers the thigh pads. There is a push button at the bottom of each side of the seat back board. When the inboard button is pushed the lumbar support pad can be moved up or down with the aid of a handle. When the outboard button is pushed the lumbar support pad can be moved inwards or outwards by easing or applying body weight to the back cushion. The padded armrests can be moved upwards and inwards to provide free access to get in and out of the seat. They also have a control wheel on the underside which can be used to adjust the height of the armrest. The seat headrest can be adjusted by moving the headrest to the side and rotating it to one of the six lock positions. There is a life vest stowage box installed under the seat.

For the standard passenger seats, two different types of seats are available. Both seat types have a reclining backrest, sliding headrest, and a folding inner armrest. The Type I seats can have a luggage restraint bar installed on the bottom front part of the seat structure. This allows small luggage to be put under the seat.

The executive seats are leather upholstered, with 90° swivel and 3.4 in (86.4 mm) of forward/rear travel. A reclining backrest, sliding headrest, sliding armrest, magazine pocket and a restraint system are fitted. The seat position control is located on the forward edge of the arm. Pulling up on the control handle will allow the seat to be moved to the desired position. Releasing the control handle will lock the seat in position. The control for the back recline is a round push button located in the inner surface of the arm. Depressing the button will allow the seat back angle to be adjusted.

The optional three seat bench comprises three seats installed on a pedestal which goes across the width of the bench. Each seat has a reclining backrest, sliding headrests and a three point restraint system. The left seat has a handle which when moved upwards allows the seat to be moved forwards to make baggage loading easier.

SEAT BELTS AND SHOULDER HARNESSES

Each crew seat is equipped with a four-point restraint system consisting of an adjustable lap belt and a dual-strap inertia reel-type shoulder harness. Each passenger seat is equipped with a three-point restraint system consisting of an adjustable reel-type lap belt and an inertia reel-type shoulder harness.

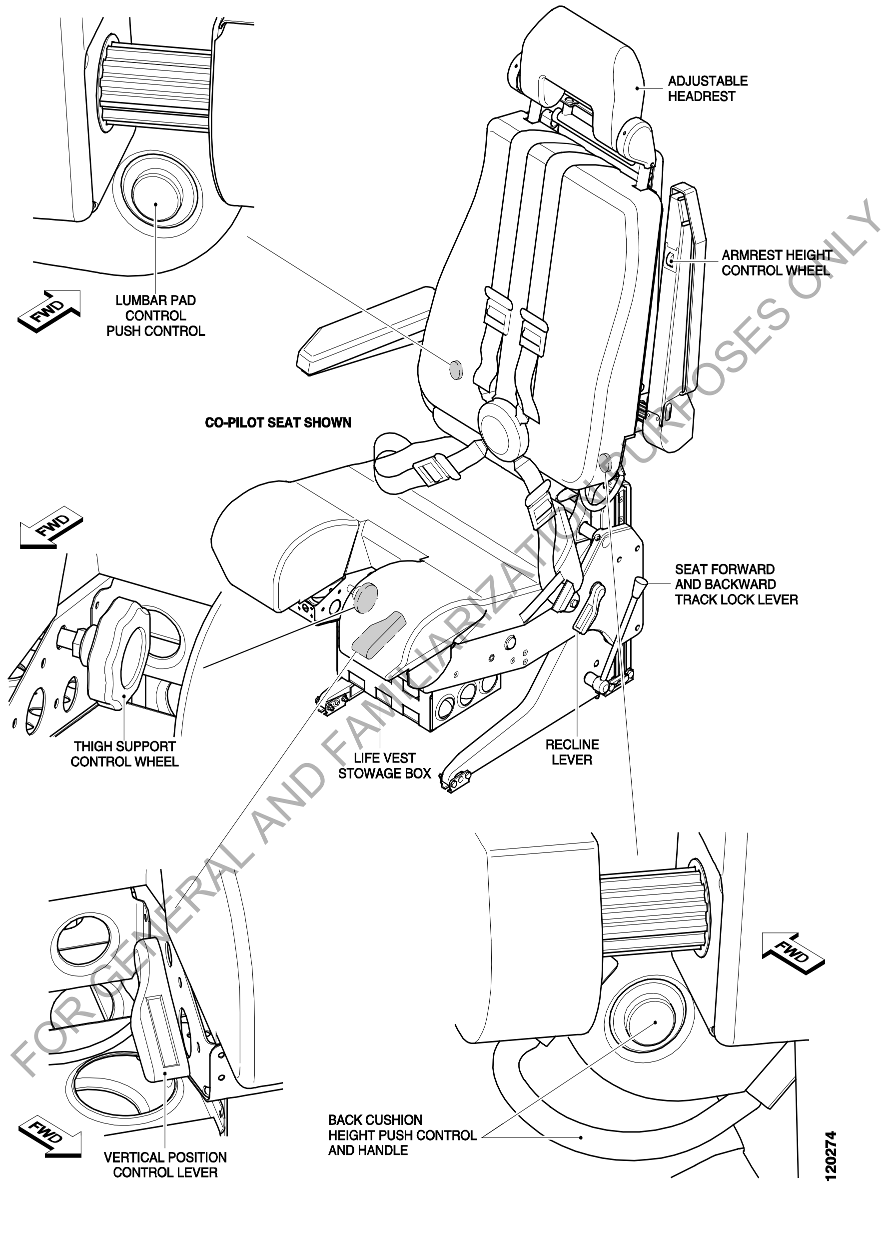

Figure 7-7-1. Crew Seat Controls

DOORS, WINDOWS, AND EXITS

PASSENGER DOOR

The passenger door is located in the front left fuselage, immediately aft of the cockpit, and is 4 ft 5 in (1.35 m) high by 2 ft 0 in (0.61 m) wide. The door can be opened or closed from either side and is secured by six locking pins. These can be checked visually from inside the cabin to verify engagement. The door is hinged at the bottom and has an integral steps/handrail assembly which automatically extends and retracts as the door is opened or closed. A non-inflatable seal attached to the door seals the gap to allow the cabin to pressurize when the door is closed.

MSN 1001 – 1575

To open the door from the outside, pull outward on the aft end of the handle. Rotate the handle clockwise to the vertical position then pull outward on the door. As the door opens, the steps and the handrail will be pulled from the stowed position. Close the door by lifting the door into position, allowing the steps and handrail to fall into the stowed position, and rotating the handle counterclockwise.

MSN 1576 - 1942

To open the door from the outside, push the button on the handle, and pull out the free end of the handle at the right hand side. Then pull outward on the door. As the door opens, the steps and the handrail will be pulled from the stowed position. Close the door by lifting the door into position, allowing the steps and handrail to fall into the stowed position. Then push in the free end of the handle.

To open the door from the inside, lift the latch and rotate the handle clockwise to the open position and push the door open. To close, pull the door closed and allow the steps and handrail to fall into the stowed position before rotating the handle counterclockwise.

The passenger door is an emergency exit and it must be accessible at all times.

The Crew Alerting System (CAS) will show a Passenger Door warning when the door is not properly closed and locked. In the event that the cargo door is also not properly closed and locked the CAS will show a Pax + Cargo Door warning.

CARGO DOOR

The cargo door is located in the aft left fuselage and is 4 ft 4 in (1.32 m) high by 4 ft 5 in (1.35 m) wide. It is secured by locking pins which can be checked visually from outside the airplane to verify engagement. The door is hinged at the top and swings up out of the way to facilitate loading and unloading. A gas cylinder assists in door operation and holds the door in the open position. A non-inflatable seal attached to the door seals the gap to allow the cabin to pressurize when the door is closed.

To open the door from the outside, push the button and pull the handle outward and upward. The gas cylinder will assist in raising the door to the open position. An electrical motor and cable is installed to assist the closure of the cargo door. To operate, press and hold the switch located aft of the cargo door until the door has lowered to the near closed position. Push the door closed and push handle in until flush and the button pops back to the lock position. To open the door from the inside, remove the cover, lift the lever and pull handle to unlock and then push open the door. To close, pull down on the strap to bring the door almost closed and stow the strap. Pull the door closed and push handle down to the lock position.

The power supply to the electrical motor is from the HOT BAT BUS and is disconnected by a microswitch which is operated by the drive mechanism when the door is nearly closed. The door must be manually pushed and locked to the closed position.

The CAS will show a Cargo Door warning when the door is not properly closed and locked. In the event that the passenger door is also not properly closed and locked the CAS will show a Pax + Cargo Door warning.

WINDOWS

A two-piece windshield and two side windows provide cockpit visibility. Both pilot and copilot windshields are laminated twin-layer mineral glass with an embedded polyvinyl butyrol (PVB) layer. The windshield incorporates three electric heating elements for defogging and anti-icing capability. Both side windows are stretched acrylic with inner 2 mm thick double-glazed acrylic windows. A separate direct vision (DV) window, also stretched acrylic, is installed in the left side window. This can be opened to provide pilot visibility/smoke evacuation during emergencies and can be used to provide additional airflow during ground operations.

Windshield heat is controlled by two switches, LH WSHLD and RH WSHLD, both switches are marked HEAVY, LIGHT and OFF. The switches are located on the ICE PROTECTION section of the pilot’s lower right switch panel. The HEAVY and LIGHT positions offer two heat levels and areas to be used as required for defog and anti-ice. The windshield is protected from an overheat condition by a temperature sensor. This sensor will remove current from the windshield heat circuit when the windshield surface temperature is above 60° C.

The cabin has four windows on the left side and five on the right side. All of the windows are stretched acrylic with integral sliding shades.

INDICATION/WARNING

In the event of a failure of a windshield heat system, the Crew Alerting System (CAS) will show a LH Windshield Heat or RH Windshield Heat or LH + RH Windshield Heat caution message.

EMERGENCY EXIT

The overwing emergency exit is located over the right wing and is 2 ft 2 in (0.68 m) high by 1 ft 6 in (0.49 m) wide. This exit contains a window and can be quickly opened from either inside or outside when required. A non-inflatable seal attached to the exit seals the gap to allow the cabin to pressurize when the exit is in place. To open the exit from inside, remove cover and pull handle to release exit locking mechanism and pull inward. To open from the outside, push on the release lever and push exit inward. Refer to Figure 7-8-1, Emergency Exit.

AIRCRAFT SECURITY

To secure the aircraft when parked, install the lock pin in the emergency exit (Refer to Fig. 7-8-1) and lock the cargo and passenger door locks. Lock the service door under the rear fuselage, if a lock is installed.

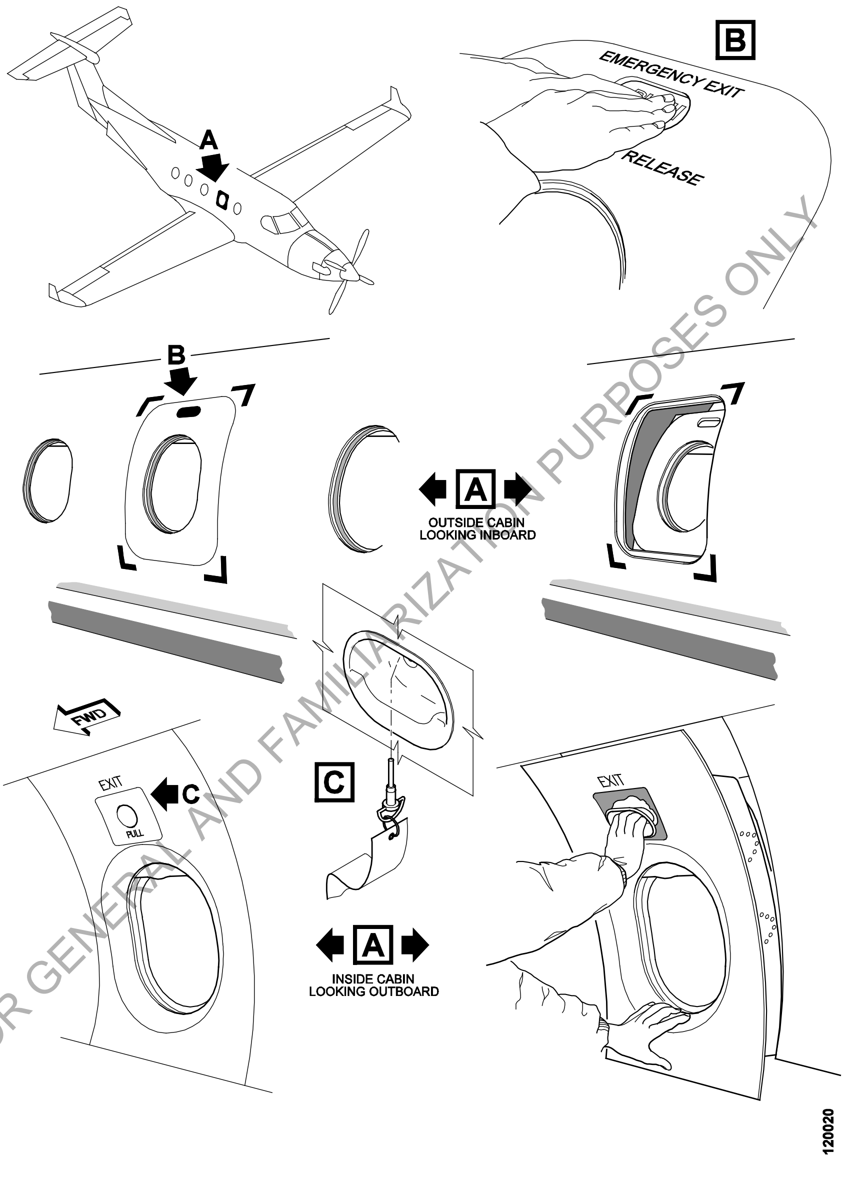

Figure 7-8-1. Emergency Exit

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CONTROL LOCKS

The elevator and ailerons can be secured by placing a control lock through the hole in the collar and control column when the elevator is full down and the ailerons are neutral. For flight the control lock is stowed in a stowage point located on the cockpit left sidewall to the rear of the pilots seat. The rudder is held in position by the mechanical connection with the nose wheel steering.

WARNING

THE CONTROL LOCK MUST BE REMOVED BEFORE TAKEOFF.

CAUTION

MAKE SURE THAT THE RUDDER/NOSE WHEEL IS CENTERED.

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ENGINE

DESCRIPTION AND OPERATION

Refer to Figure 7-10-1, PT6A-67P Engine, for engine configuration.

This airplane is powered by the Pratt & Whitney PT6A-67P, which is a light weight, reverse flow, free turbine engine.

The PT6A-67P engine is based on the existing PT6A-67B with the following modifications incorporated:

- New auxiliary gearbox (AGB) for dual 300A generator installation
- New material for compressor turbine blades (single crystal), new first compressor rotor and all new compressor stators

In addition to the gas generator section, the engine incorporates a power section with the power turbine and propeller reduction gearbox, an integral oil system, and an accessory gearbox for mountings for various accessories.

Air enters the compressor through an annular plenum chamber. The compressor consists of four axial stages and a single centrifugal stage. Stator vanes between each stage of compression diffuse the air, raise its static pressure, and direct it to the next stage of compression. From the centrifugal compressor, air flows through a diffuser tube, then changes direction 180 degrees as it flows into the combustion chamber. A compressor bleed valve is installed on the gas generator case at the 3 o'clock position. It automatically opens to spill interstage compressor air to prevent compressor stall.

The combustion chamber consists of two perforated annular sections bolted together with a large exit duct. Compressed air enters the combustion chamber through the perforations, where it is mixed with fuel and ignited. The rapidly expanding gas is directed through another 180 degree direction change into the turbine.

The turbine consists of a single stage compressor turbine and a two-stage power turbine. As the gas exits the combustion chamber, it is directed onto the compressor turbine, which powers the compressor. From the compressor turbine, the gas is directed to the two-stage power turbine which drives the propeller via the propeller reduction gearbox. Engine Inter Turbine Temperature (ITT) is measured between the compressor and power turbines.

Gas flow is directed into the exhaust duct from the turbine. The exhaust duct has an annular inlet which leads exhaust gas to a bifurcated duct connected to two opposed exhaust ports. The exhaust duct is made from heat resistant nickel alloy metal and incorporates mounting flanges for the exhaust nozzles.

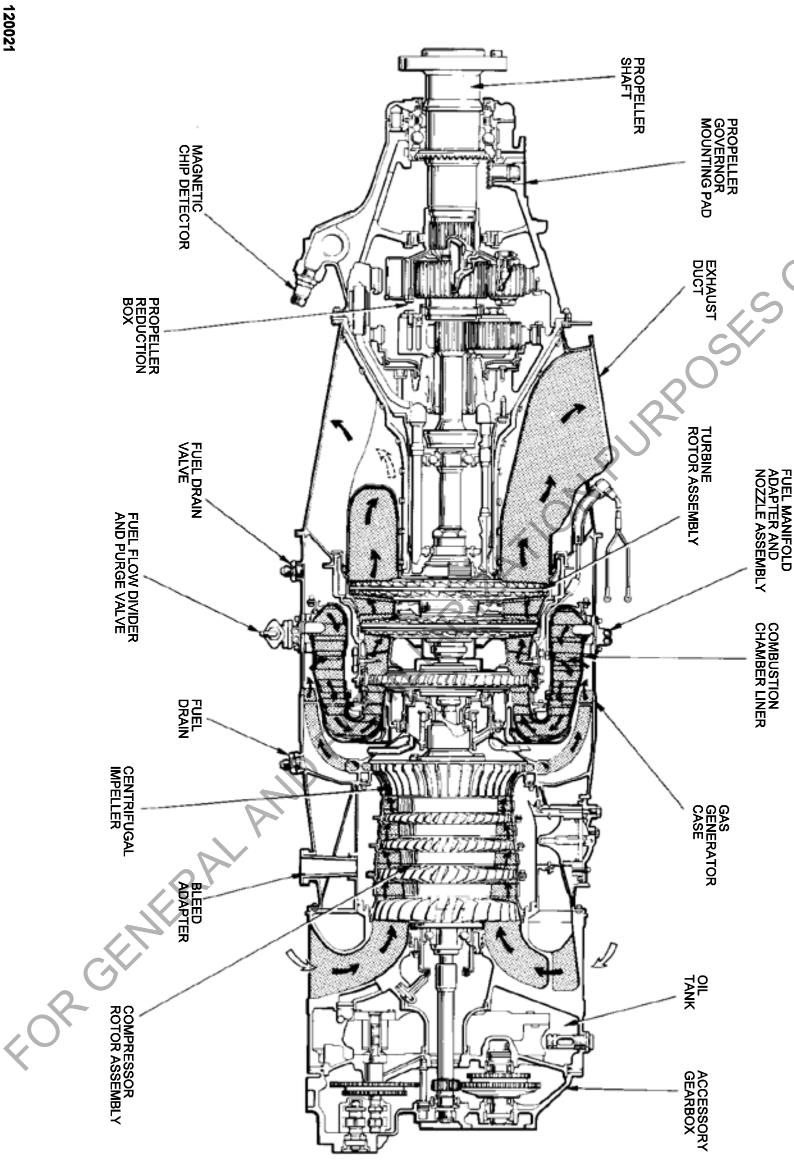

Figure 7-10-1. PT6A-67P Engine

AIR INDUCTION

The air induction system is integrated into the front and rear lower cowlings and comprises of an air inlet and inlet duct, a plenum, and an inertial separator.
The air inlet consists of a crescent shaped metal leading edge through which hot exhaust is passed to prevent ice accumulation. The exhaust gas is extracted from the left hand side exhaust stub by the means of a 1.5 inch diameter pitot probe inserted into the stub itself. It then passes through the lip, consisting of a sealed chamber, before exiting into the right hand stub through a 1.5 inch discharge tube. The probes are connected to the exhaust lip by 1.5 inch diameter metal ducts complete with integral connectors. The inlet duct, which connects the inlet lip to the plenum, consists of a diverging nozzle following the same general shape as the inlet lip.

The plenum consists of a sealed circular metal canister surrounding the engine compressor inlet screen. It is here that the engine draws air to be compressed for combustion and services supply.

INERTIAL SEPARATOR

Refer to Figures 7-10-2, Inertial Separator and 7-10-3, for the control switch and indicator.

The inertial separator is of the `fixed geometry´ design and provides engine induction system protection when operating in icing or FOD conditions. It can be used for takeoff when operating in a FOD environment. It comprises of a fixed No. 2 mesh screen attached to the rear wall of the plenum covering a percentage of the inlet area, a moveable outlet door and electrical actuator situated directly above the oil cooler outlet exit, and a converging by-pass duct.

In normal operations (non icing, non FOD) the outlet door is closed which seals the by-pass and provides the induction air with a single flow path to the plenum and engine through the porous No. 2 screen.

In icing or FOD conditions the actuator is retracted to open the outlet door. This allows a flow path past the plenum to ambient and increases the pressure ratio across the inlet system. The increased pressure ratio has the effect of accelerating heavy particles present in the inlet air, which then go straight past the plenum and into the by-pass duct before exiting through the outlet door. In icing conditions the porous No. 2 screen ices to restrict the flow path of solid particles which can not turn into the plenum and thus further assist in engine protection. However the pressure of the air to the engine, with the inertial separator open, is also reduced with consequent reduction in available engine performance.

The inertial separator outlet door operation is controlled by the ICE PROTECTION INERT SEP switch on the switch panel on the pilot's lower right panel. The switch has two positions OPEN and CLOSED, when the switch is set to the OPEN position the inertial separator door opens and when fully open the INERT SEP advisory will come on in the ICE PROTECTION window of the systems Multi Function Display (MFD). When the door is selected to OPEN but does not reach its selected position, the Crew Alerting System (CAS) will show after 45 seconds an Inertial Separator caution in the CAS window of the systems MFD. When the switch is set to CLOSED the door closes and the INERT SEP advisory message will go off.

After failure of the inertial separator, the aircrew should prepare for departure of icing conditions as soon as possible.

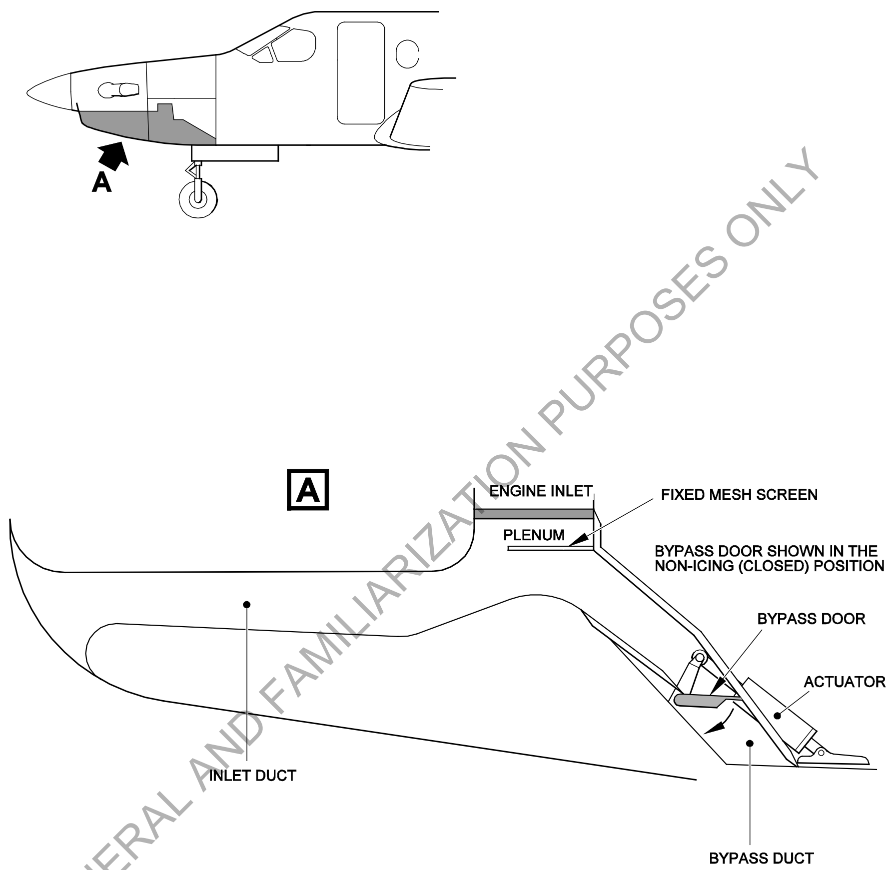

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Figure 7-10-2. Inertial Separator

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CONTROLS

Refer to Figure 7-10-3, Engine Controls and Indications.

Engine power is controlled by POWER CONTROL, CONDITION, and MANUAL OVERRIDE levers located on the center console.

POWER CONTROL LEVER

The POWER CONTROL lever (PCL) selects the required engine power (N_g) and in certain conditions it directly controls the propeller pitch. The PCL has a flight and a ground operating range separated by an idle detent. The flight operating range is forward of the detent. As the PCL is moved forward of the idle detent the minimum propeller pitch (6° to 12°) is directly controlled by the PCL while the propeller is in an underspeed condition during low engine power at a low airplane speed. When the PCL is moved further forward, engine power and airplane speed increase until each are high enough for the propeller to operate in a constant speed mode. In this mode, the Constant Speed Unit (CSU) selects the propeller pitch to maintain a propeller speed of 1700 rpm.

When the PCL is at the idle detent, the gas generator is at idle and the propeller is at minimum pitch. A lifting action to raise the PCL over the detent is required to move the PCL into the ground operating range.

WARNING

DO NOT MOVE THE PCL BELOW THE IDLE DETENT WHEN THE ENGINE IS NOT OPERATING TO PREVENT DAMAGE TO THE CONTROL LINKAGE.

PCL OPERATION AFT OF THE IDLE DETENT IS NOT PERMITTED IN FLIGHT OR WHEN ENGINE OPERATION IS CONTROLLED BY THE MANUAL OVERRIDE LEVER.

Aft of the idle detent is the ground operating range or beta mode. The Nf governor limits the propeller speed to an underspeed condition to give the beta valve full authority in controlling the propeller pitch. The engine power and propeller pitch are directly controlled by the PCL. Initial PCL movement aft of the idle detent adjusts the propeller pitch while the gas generator remains at idle and can be used to control taxi speed. Further aft movement causes the propeller to move into the reverse range followed by an increase in engine power.

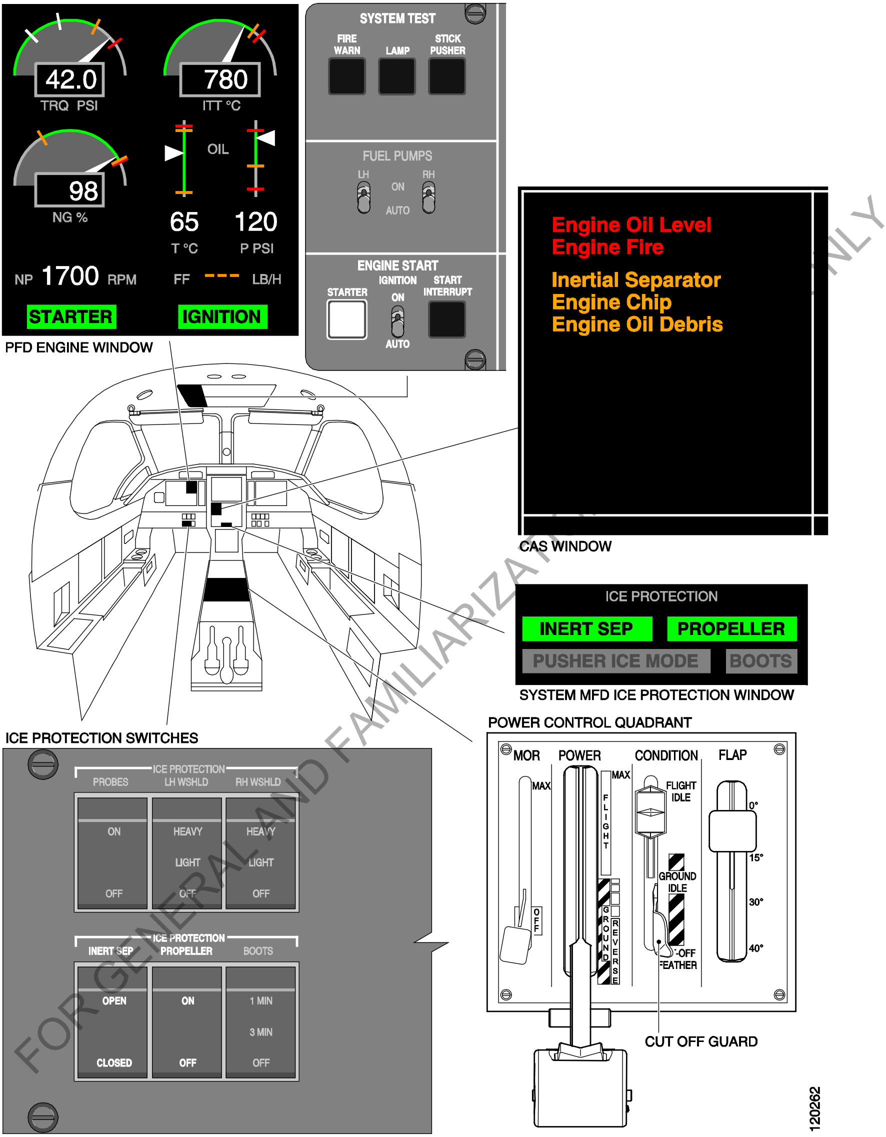

Figure 7-10-3. Engine Controls and Indications

MANUAL OVERRIDE LEVER

Description

The MANUAL OVERRIDE lever (MOR) is located on the center console to the left of PCL. The MOR controls the engine power in case of a pneumatic failure of the engine fuel control or in case of a PCL system failure. The MOR lever is an emergency device and it is possible to exceed engine limits if the MOR lever is operated too fast. However, even if the engine limits have been momentarily exceeded, the MOR will allow the crew to continue safe flight and landing if the Engine Failure in Flight - Partial Power Loss emergency procedure is followed.

The MOR directly operates the fuel metering valve by mechanically compressing the pneumatic bellows (Py pressure) in the FCU. There is a gap between the MOR mechanism and the pneumatic bellows. This gap must first be taken up before the pneumatic bellows start to compress, this results in a dead band when starting to operate the MOR lever. In case of a Py leak, the engine spools down to minimum fuel flow with no response to PCL inputs. Minimum fuel flow is 90 lb/h and results in 35% Ng on the ground to 70% Ng at 30,000 ft. The higher the altitude and the faster the forward speed the longer the engine spool down time to 50% (spool down times of 15 secs are possible). At high altitudes it is possible to achieve full engine power when operating the MOR system. At low altitudes with the MOR lever fully forward the MOR system may not give full engine power (min. 30 psi torque). When the MOR system is in operation the torque limiter, Nf and Ng governors are inoperative.

Operation

During normal engine operation the MOR lever is in the full aft or OFF position. In the case of a possible PCL or pneumatic failure, the PCL should be exercised to check engine response. If not successful the PCL should be set to the idle position and the MOR lever operated slowly forward (at least 4 secs to the mid position) to take up the dead band until the engine responds (fuel flow above 90 lb/h and Ng/ITT stable or increasing), then wait until the engine stabilizes. If the engine stalls and/or ITT reaches 870° C, operate the MOR lever slightly rearward then forward again with an even slower movement. If the engine is allowed to drop below 50% Ng, starter assistance may be required to recover Ng above 50%. Once the engine has stabilized adjust the required power setting with the MOR lever. Observe the engine limitations by making adjustments with the MOR lever. Do not permit the Ng to fall below 65% as ITT may then be exceeded, this will also maintain better engine acceleration. In descent and until touch down adjust Ng to 75% or above. After touch down select cut-off feather to avoid exceeding ITT limits. On the ground with no forward speed it is not possible to recover low Ng with the MOR lever.

WARNING

PCL OPERATION AFT OF THE IDLE DETENT IS NOT PERMITTED WHEN ENGINE OPERATION IS CONTROLLED BY THE MANUAL OVERRIDE LEVER.

CAUTION

THE MOR LEVER MUST BE IN THE OFF POSITION PRIOR TO ENGINE START TO PREVENT A HOT START.

NOTE

During MOR operation the Py pressure has no authority which causes the loss of the torque limiting function and Nf governor operation (no reverse power to be used). Maximum N_g is also not limited.

NOTE

An Engine NG caution will be given on the CAS if the Ng falls below 60%, pushing the STARTER button will not engage the starter at Ng above 50%.

CONDITION LEVER

The Condition Lever has three positions and is used to select the gas generator idle speed, shut down the engine, and feather the propeller. The GROUND IDLE position (G.I.) is for ground operation only. This setting ensures that the propeller speed remains above the prohibited range (350 rpm to 950 rpm) for ambient conditions up to a temperature of approximately 45°C. The FLIGHT IDLE position (F.I.) is selected for flight operation which provides sufficient bleed air flow to maintain cabin pressurization at minimum N_g and to give smooth engine response to PCL movement during approach and landing. The CUT-OFF/FEATHER position mechanically stops the fuel flow to shut down the engine and energizes the overspeed governor solenoid valve, which feathers the propeller at the same time.

To move the Condition Lever from the CUT-OFF position the lever needs to be lifted. Movement from GROUND IDLE to FLIGHT IDLE needs only pressure on the lever towards the new positions to overcome the soft stop. To move the lever from FLIGHT IDLE to GROUND IDLE it has to be lifted to get over the soft stop.

To move the lever from GROUND IDLE to CUT-OFF/FEATHER it has to be lifted again to get over the hard stop. A cut-off guard is installed on the Condition Lever which makes a positive hard stop at the GROUND IDLE position. The hard stop is held in position by a spring. A black guard lever is attached to the hard stop and protrudes from the right side of the Condition Lever. The guard lever must be pushed to the right against the spring pressure to move the hard stop clear of the Condition Lever. The Condition Lever can then be lifted and moved to the CUT-OFF/FEATHER position in the normal way.

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ENGINE FUEL

Refer to Figure 7-10-4, Engine Fuel System, for system configuration. For airplane fuel storage and distribution, refer to Fuel system, this section.

The engine fuel system consists of an oil to fuel heat exchanger, a high pressure engine driven fuel pump, a fuel control unit, a fuel flow transducer, a fuel flow divider and dump valve, and the fuel nozzles.

Fuel is delivered to the fuel/oil heat exchanger from the low pressure engine driven pump. The oil to fuel heat exchanger pre-heats the fuel, to eliminate the chance of ice formation in the fuel, and reduces the oil temperature. The high pressure engine driven fuel pump delivers fuel to the fuel control unit after it passes through the oil to fuel heat exchanger. See Fuel System for more information.

The fuel control unit is controlled by the POWER CONTROL and CONDITION levers during normal operations, and the MANUAL OVERRIDE lever during emergency operation. Fuel flows through the fuel flow transducer on its way to the fuel flow divider and dump valve. The fuel flow transducer converts fuel flow rate into an electrical signal which is then displayed in the engine window of the Primary Flight Display (PFD) and in the Fuel window of the systems MFD.
The fuel flow divider and dump valve serves two functions. First, it divides the fuel between the primary and secondary system. Secondly, it directs air from the purge air accumulator into the fuel manifolds to purge them of unused fuel at engine shutdown. A total of 14 fuel nozzles are used with a primary and secondary spray pattern.

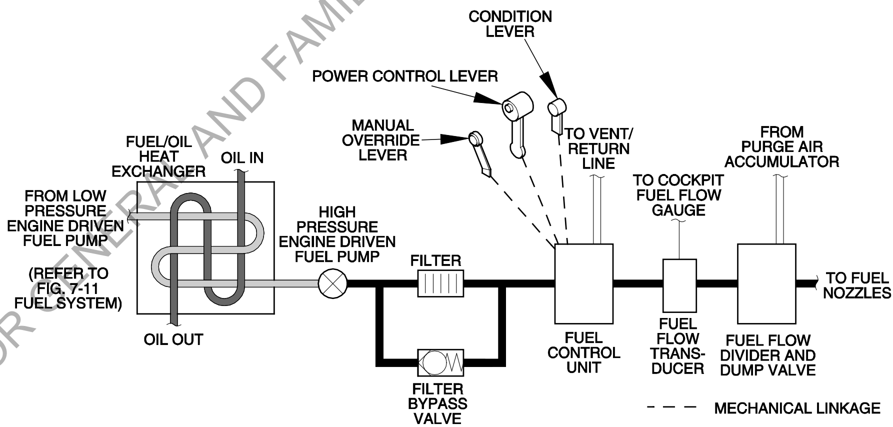

Figure 7-10-4. Engine Fuel System

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OIL

Refer to Figure 7-10-5, Engine Oil System, for system configuration.

The engine oil system consists of pressure, scavenge, and breather systems with the oil tank being an integral part of the engine compressor inlet case. Oil is supplied to the engine bearings, bushings, reduction gears, accessory drives, torquemeter, and propeller governor. Oil is also used to cool the bearings. A filler neck with quantity dipstick and cap are located on top of the accessory gearbox. The quantity dipstick is marked in one US quart increments. A visual sight gauge is provided to determine oil quantity without removing the dipstick. If the oil level is in the green range of the sight gauge there is sufficient oil quantity for flight. If the oil level is below the green range, the oil system needs refilling according to the dipstick markings. If the CAS “Engine Oil Level” comes on, the oil level is not adequate for safe engine operation. It is not recommended to start a flight with the oil level below the green range on the sight glass. Total oil capacity is 3.6 US gal (13.6 liters) while usable oil quantity is 1.5 US gal (5.7 liters). The oil tank incorporates a drain plug.

An engine driven gear type pressure pump provides oil to the engine bearings, torquemeter, propeller bearings and reduction gears, and propeller governor. Oil flows from the integral oil tank, through the pick-up screen, to the oil pump. Oil then goes through a pressure regulating valve which regulates oil pressure to between 90 and 135 psi (6.2 to 9.3 bar). A pressure relief valve opens when pressure exceeds 160 psi (11.0 bar), possibly during cold weather operations. Oil then goes through a cartridge type oil filter assembly, which incorporates a bypass valve and a spring loaded check valve. The bypass valve allows oil to bypass the filter in case the filter becomes clogged, however oil pressure drops to below 90 psi (6.2 bar) when the filter by-pass valve is open. The check valve prevents gravity oil flow into the engine after shutdown and permits the oil filter to be changed without draining the oil tank. Oil is then directed throughout the engine and applicable accessories.

The oil scavenge system incorporates two double element pumps. The oil from the reduction gearbox is pumped directly through the airframe mounted oil cooler. All remaining oil passes through the oil to fuel heat exchanger and, depending on oil temperature, is directed back to the oil tank or through the oil cooler.

When the fuel temperature is low, warm oil flows through the oil to fuel heater. At fuel temperatures above 21° C (70° F) the bypass valve begins to open and at 37° C (98° F) the bypass valve is fully open and the oil bypasses the oil to fuel heater. The scavenge system in the propeller reduction gearbox incorporates a magnetic chip detector that detects foreign matter in the system and causes the “Engine Chip” caution in the CAS window to come on. The chip detector also acts as the propeller reduction gearbox oil drain. A second magnetic chip detector is installed in the accessory gearbox. It is also connected to the CAS “Engine Chip” caution and operates in parallel to the reduction gearbox chip detector.

The breather system allows air from the engine bearing compartments and the propeller reduction and accessory gearboxes to be vented overboard into the right exhaust stub, through the centrifugal breather in the accessory gearbox.

OIL DEBRIS MONITORING (ODM) (IF INSTALLED PRE SB 79-007)

A sensor module is installed in the oil pipeline to the oil cooler. The sensor module detects metal particles above a certain size that pass through it. A signal conditioner connected to the sensor converts a detected metal particle into a pulse signal. The signal conditioner also has automatic Built In Test (BIT). The particle pulse and BIT signals are sent to the power module where they are monitored for correct operation. The power module is installed on the firewall. It receives electrical power from the Essential bus through the ODM circuit breaker. The power module supplies electrical power to the sensor module and the return signals from the sensor to the Monitor Warning System (MWS).

The MWS receives the particle pulse and BIT signals from the ODM power module and counts the particle pulses from the ODM. The MWS calculates the increase of particles over 30 second and 120 second periods. The 30 and 120 second threshold limits are set by the APEX Settings File. When the increase is greater than the defined threshold, the MWS informs the Crew Alerting System (CAS) to show the “Check Oil Debris” status after the aircraft has landed for a 30 second threshold exceedence and to immediately show the “Engine Oil Debris” caution for a 120 second threshold exceedence.

If the BIT signal from the ODM power module gives a fault condition the MWS will set the 120 second particle count to zero and the CAS will show a “ODM Fault” status after the aircraft has landed.

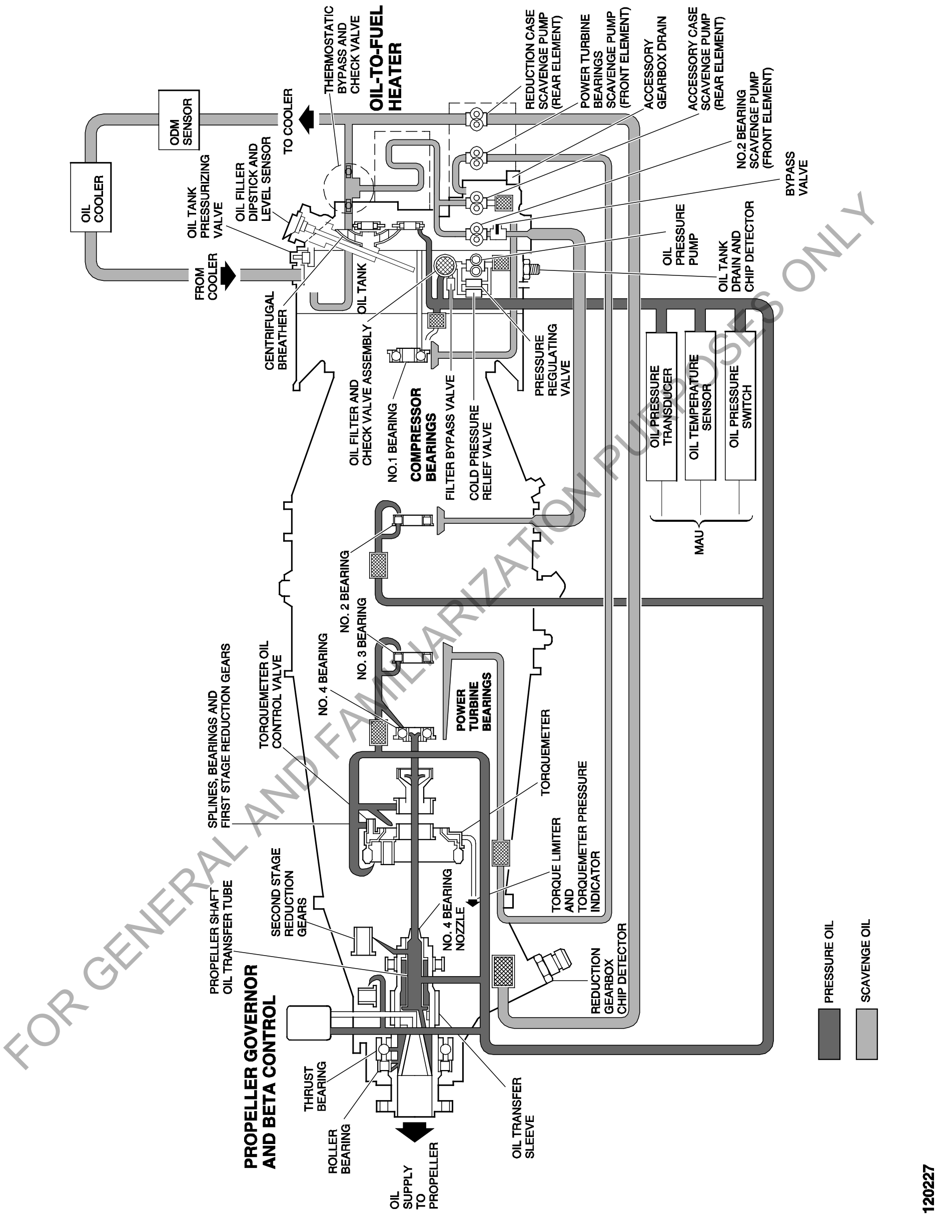

Figure 7-10-5. Engine Oil System

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TORQUE LIMITER

A torque limiter is installed on the engine at the torque transmitter boss on the forward engine case. Within the unit is a sealed bellows connected directly to the torquemeter oil pressure outlet, a chamber connected to the reduction gearbox to provide gearbox static pressure and to a drain port on the thrust bearing cover, a balance beam, and a pneumatic pressure orifice.

Oil pressure proportional to engine torque is applied through cored passages in the reduction gearbox to the sealed bellows in the limiter body. The bellows is mechanically connected to the balance beam and to the controlling spring. With an increase in torque pressure, above the control spring setting, the balance beam adjusts to compensate for this increase and causes the pneumatic pressure orifice to open and bleed off Py air. As Py air pressure is bled off, the fuel flow from the FCU is reduced by closing the metering valve, causing engine speed and hence engine torque to decrease until engine torquemeter pressure is balanced by the torque control spring pressure; at this time the Py pressure orifice close.

The torque limiter should assist the pilot during takeoff. In most cases, it limits the maximum torque to below 44.3 psi (see description below). However, it is the pilot's responsibility to respect all engine operating limitations including torque by reducing engine power.

The torque limiter limits the engine torque to below 44.3 psi at sea level condition. Due to ambient pressure at altitude and interference with the FCU maximum governing speed, maximum torque will not be obtained. For altitudes up to 12,000 feet, engine torque will drop approximately 2.7 psi per 10,000 feet of altitude. For altitudes above 12,000 feet, engine torque will drop approximately 4.5 psi per 10,000 feet of altitude. Above 102% to 104% Ng (maximum Ng limit) the torque will decrease by approximately 2.9 psi. After this point the engine power is limited to maintain 104%.

The maximum torque drop due to altitude has been considered in the static takeoff and balked landing torque charts.

If the maximum torque according to the torque chart is below flat rating (below the torque limiter setting), the torque has to be set manually by the PCL. Torque limiter operation must always be verified to ensure engine limits are respected. During the takeoff and the balked landing the PCL does not need to be retracted unless any limits are exceeded. The torque (if below flat rating) and ITT increases are acceptable.

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STARTING

Starting is provided by a combination starter/generator unit. Starter function is controlled by the STARTER switch in the ENGINE START section of the overhead panel (Ref. Fig. 7-8). After pressing the STARTER switch momentarily, the green STARTER annunciator in the PFD engine window comes on, and the Starting Control Relay is energized and through the Starter Relay energizes the starter. The starter will automatically disengage and the green STARTER annunciator in the PFD goes off, when the engine Ng reaches 50% or 80 seconds after the start sequence. The engagement time is limited to 60 seconds for air starts. A CAS “Starter Engaged” warning will be given in the event of a starter engage signal becomes active without the MAU generating the signal.

The start sequence can be interrupted at any time by pressing the STARTER INTERRUPT switch on overhead panel. When pressed, the ground from the Starter Master Relay causing it to open and remove electrical power from the starter circuit.

Battery 2 provides the electrical power to the starter for starting the engine. Battery 1 provides electrical power to maintain the essential systems during engine start. On ground at either 10% Ng or 10 secs after starter activation, Battery 1 is connected to the starter circuit to further enhance the starter capability. If external power is connected and selected, engine starting will be done with external power.

For improved engine starting with a cold engine (oil temperature below +5° C), set the condition lever to the FLIGHT IDLE position for engine starting as soon as Ng is above 13%. Set to GROUND IDLE when Ng is above 50%. At FLIGHT IDLE more fuel is provided during the start cycle to enhance engine acceleration to idle speed.

It is possible after engine start, under conditions which result in slightly lower than normal engine RPM (Ng), for the propeller RPM (Np) to enter into the cautionary and warning range. Such conditions include running the engine in high ambient temperatures and applying a high electrical load after engine start, such as by high generator current caused by an engine start with low battery voltage or by the automatic operation of the VCCS. This condition can be resolved by either; selecting the flight idle position on the Condition Lever, reducing the electrical load on the system, inhibiting the bleed air flow from the engine, or by reducing the propeller pitch by retarding the PCL aft of the idle detent. Normal procedures should be resumed prior to taxi.

Note: Taxiing in flight idle is not recommended as the continuous application of the brakes, which may be required, could result in flat tires due to blown main wheel fusible plugs.

If the Np does not stabilize above 950 rpm after following the above advice, shut down the engine. A maintenance check of the ground idle setting is required.

For information on the generator function, refer to Electrical System, this section.

IGNITION

Ignition is provided by an ignition exciter and two spark igniter plugs. The ignition exciter is a sealed electronic unit mounted at the engine cowling and is operated by the aircraft 28 VDC system. Two spark igniter plugs, located at the 4 and 9 o'clock positions in the gas generator section, provide the spark to ignite the fuel/air mixture.

Ignition is controlled from the cockpit by the IGNITION switch, located in the ENGINE START section of the overhead panel (Ref. Fig. 7-2-3). The switch has two positions, ON and AUTO. When set to ON, ignition will occur continuously and a green IGNITION annunciator in the engine section of the PFD will come on.

When set to AUTO, ignition will automatically activate, regardless of the PCL position, when the ITT is less than 500° C and the Ng is 10% or more, the green IGNITION annunciator in the engine section of the PFD will come on. Ignition stops 10 seconds after the ITT is more than 500° C and when the Ng is less than 10%.

Ignition should be manually switched ON when operating in heavy precipitation.

ACCESSORIES

Engine accessories comprising the propeller, propeller overspeed governors, and torque limiter are mounted on the front of the engine. The generator 1, starter/generator 2, fuel control unit, high and low pressure fuel pumps, and fuel/oil heat exchanger are mounted on the accessory gearbox.

FIRE DETECTION

The system is composed of a sensor element and a responder. The sensor is a stainless steel capillary tube filled with helium and containing a central hydrogen-charged core which readily releases hydrogen gas when heated above a temperature threshold. The responder houses both the fire pressure switch and the integrity switch consisting of preformed metal diaphragms which snap over center to contact stationary pins under the effect of gas pressure.

Due to generalized temperature increase over the entire length of the sensor, the helium pressure increases and actuates the fire pressure switch triggering the alarm. Alternatively, when the sensor is heated up intensely over a short length, the core material releases hydrogen gas causing a pressure rise and actuates the fire pressure switch. The CAS warning “Engine Fire” red will illuminate. Both the averaging and discrete functions are reversible.

When the sensor tube is cooled, the average gas pressure is lowered and the discrete hydrogen gas returns to the core material. The reduction of internal pressure allows the alarm switch to return to its normal position, opening the electrical alarm switch.

In addition to the pressure activated alarm switch, the integrity switch is held closed by the averaging gas pressure at all temperatures down to -55° C. If a detector should develop a leak, the loss of gas pressure would allow the integrity switch to open activating the system fault caution. The CAS “Fire Detector” amber message will illuminate when the Fire Detection system is inoperative.

System integrity is checked by pressing the FIRE WARN switch in the SYSTEM TEST section of the overhead panel. When pressed, the availability of electrical power and circuit continuity is checked. Proper system function is indicated when both the CAS “Engine Fire” and “Fire Detection” illuminate. If the “Fire Detection” fails to illuminate during the test, the warning circuit is already closed and will not provide proper warning. In addition a backup power supply to the overhead panel is tested when the switch is pressed.

CAUTION

DUE TO THE COMPOSITE CONSTRUCTION OF THE ENGINE COWLING AND THE POSSIBILITY OF TOXIC GASSES, THE AIRPLANE ACS MUST BE SHUTOFF WHEN A FIRE CONDITION IS SUSPECTED.

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ENGINE INDICATIONS, CAUTIONS AND WARNINGS

Refer to Figure 7-10-6, Engine Indicating and to Section 2 for the Engine Operating Limits.

Primary engine indications are shown on the upper right corner of the pilot's Primary Flight Display (PFD) and on the upper left corner of the copilots (PFD) when installed.

The torque, ITT and Ng analog gauges have a 180° dial with a segmented perimeter, a moving pointer and a digital window. The oil gauges have a segmented vertical scale, a moving pointer and a digital window. The propeller speed is shown in a digital window. The engine fuel flow is shown as a digital readout.

Under normal operating conditions the analog gauges have semi-transparent fan that is attached to a moving white pointer and the digital readouts are shown in white on a grey box. On the analog torque gauge, white marks at 15 and 25 psi are placed for better reference during power changes.

If there is missing data or the Modular Avionics Unit (MAU) senses that the data is invalid, the pointer and marks will be removed and an amber X will be shown on the gauge. The digital data will be replaced with amber dashes.

In a parameter caution condition, the analog gauge pointer and the fan segment in the caution range changes to amber and the digital window changes to amber with black text.

In a parameter warning condition, the analog gauge pointer and the fan segment in the warning range changes to red and the digital window changes to red with white text.

The engine indications for caution and warning conditions shown on the PFD have the same time delays as those shown on the CAS. Refer to the engine CAS Warnings and Cautions for details of the time limits.

The Monitor Warning System (MWS) monitors the engine parameters and if caution and warning conditions are reached they will be shown on the CAS and the engine indications will be shown as follows:

PARAMETER/RANGE	CAUTION INDICATION	WARNING INDICATION
Torque Digital range 0 to 70 psi Analog range 0 to 55 psi White marks at 15 and 25 psi Green arc from 0° to 36.95 psi Grey arc from 36.95 psi to max range Amber mark at 36.95 psi		
Red mark at 44.34 psi	Analog range changes to amber from red mark to max range and fan segment from red mark to pointer changes to amber	Analog range changes to red from red mark to max range and fan segment from red mark to pointer changes to red
ITT Digital range 0 to 1200° C Analog range 400 to 1000° C Green arc from 400 to 820° C Grey arc from 820° to max range Amber mark at 820° C		
Red mark at 850° C	Analog range changes to amber from red mark to max range and fan segment from red mark to pointer changes to amber	Analog range changes to red from red mark to max range and fan segment from red mark to pointer changes to red

PARAMETER/RANGE	CAUTION INDICATION	WARNING INDICATION
Np Digital range 0 to 1870 rpm	Black readout in amber box	White readout in red box
Ng Digital range 0 to 120% Analog range 0 to 120% White mark at 13% when starter engaged Grey arc from 0 to 60% Green arc from 60% to 104% Grey arc from 104% to max range		
Amber mark at 60%	Analog range changes to amber from 60% to minimum Ng and fan segment from amber mark to pointer changes to amber	
Amber mark at 103.5%	Analog range between 103.5 and 104% changes to amber	
Red mark at 104 %		Analog range changes to red from red mark to max range

PARAMETER/RANGE	CAUTION INDICATION	WARNING INDICATION
Oil Pressure Digital range 0 to 200 psi Analog range 50 to 150 psi Green segment from 90 to 135 psi Grey segment from 50 to 90 psi Grey segment from 135 to 150 psi		
Amber mark at 90 psi	Analog range pointer changes to amber from 135 psi to max range when oil px above 135 psi Analog range pointer changes to amber from 60 to 90 psi when oil px below 90 psi (after 5 second delay)	
Red mark at 60 and 135 psi		Analog range pointer changes to red from 135 psi to max range when oil px above 135 psi Analog range pointer changes to red from 60 to min range when oil px below 60 psi and Ng is above 72%

PARAMETER/RANGE	CAUTION INDICATION	WARNING INDICATION
Oil Temperature Digital range -45 to 120° C Analog range 0 to 120° C Green segment from 10 to 105°C Grey segment from 0 to 10° C Grey segment from 105 to 120° C		
Amber mark at 10 and 105° C	Analog range pointer changes to amber from 105° C to110° C when oil temp between 105 to 110° C Analog range pointer changes to amber from 10 to min scale when oil temp below 10° C	
Red mark at 110° C		Analog range pointer changes to red from 110° C to max range when oil temp greater than 110° C Analog range pointer changes to red if oil temp remains between 105° C and 110° C for more than 10 minutes Analog range pointer changes to red from 10 to min scale when digital value below -40° C
Fuel Flow Digital range – 0 to 800 lbs/hr		

The Crew Alerting System (CAS) window of the systems MFD displays the following engine warnings and cautions for the engine parameters:

RED WARNING

Engine ITT	850 to 870° C (after 20 seconds), above 870° C. During engine start 870 to 1000° C (after 5 seconds), above 1000° C
Engine Torque	44.34 to 61 psi (after 20 seconds), above 61 psi
Engine Ng	Above 104%
Engine Np	1760 to 1870 rpm (after 20 seconds), above 1870 rpm. Between 350 and 950 on ground and propeller not feathered (after 15 seconds)
Engine Oil Pressure	60 to 90 psi and Ng above 72% (after 20 seconds) and engine running 40 to 60 psi (after 20 seconds) and engine running 135 to 200 psi (after 20 seconds), above 200 psi Below 40 psi (immediately) and engine running
Engine Oil Temperature	105 to 110° C (after 10 minutes), above 110° C, below -40° C

AMBER CAUTION

Engine ITT	850 to 870° C, below 350° C and Np more than 800 rpm and engine not starting. During engine start 870 to 1000° C
Engine Torque	44.34 to 61 psi
Engine Ng	Below 60% (engine running), 103.5 to 104%
Engine Np	Below 1640 rpm (after 5 seconds) and Ng above 90%, 1760 to 1870 rpm. Below 350 to 950 on ground and propeller not feathered (after 15 seconds)
Engine Oil Pressure	40 to 60 psi or 60 to 90 psi and Ng above 72% (after 5 seconds) 135 to 200 psi
Engine Oil Temperature	105 to 110° C, -40 to 10° C (engine running and PCL not at idle)

NOTE: Engine running is defined as Np more than 800 rpm or fuel flow more than 75 lb/min, and the starter is not in auto-start.

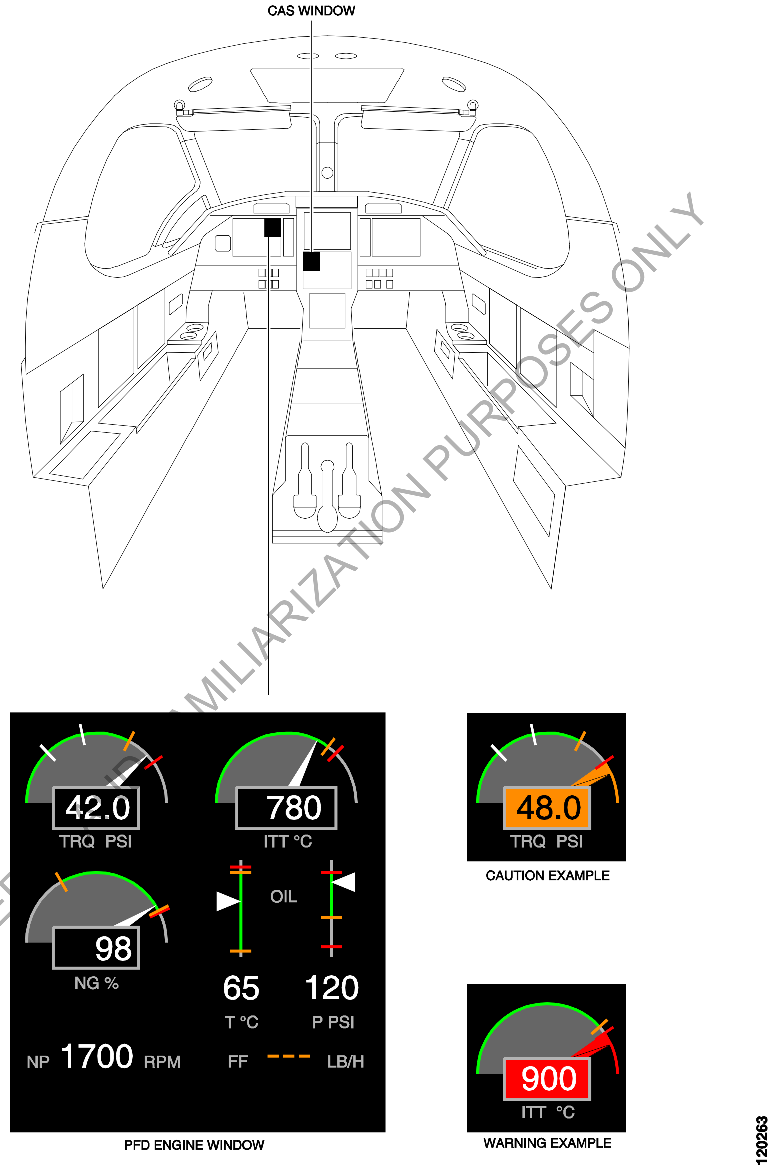

Figure 7-10-6. Engine Indicating

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PROPELLER

GENERAL – AIRCRAFT WITH 4-BLADED PROPELLER

Refer to Figure 7-10-3, Engine Controls and Indications and Figure 7-11-1, 4-Bladed Propeller Pitch Mechanism.

The airplane is equipped with a Hartzell 105 in. (2.67 m), four blade, variable pitch, full feathering propeller which is driven by the engine power turbine through a reduction gearing. The propeller hub and the four propeller blades are made of aluminum. Each blade incorporates an electric de-ice boot. The inner third of the propeller blades are shot peened in order to increase their fatigue life.

GENERAL – AIRCRAFT WITH 5-BLADED PROPELLER

Refer to Figure 7-10-3, Engine Controls and Indications and Figure 7-11-2, 5-Bladed Propeller Pitch Mechanism.

The airplane is equipped with a Hartzell 105 in. (2.67 m), five blade, variable pitch, full feathering propeller which is driven by the engine power turbine through a reduction gearing. The propeller hub is made of aluminum. The five blades are of composite construction. An erosion strip protects the leading edge surface of the blades. Each blade incorporates an electric de-ice boot.

DESCRIPTION

The propeller is powered by the engine through the reduction gearbox. Propeller pitch is adjusted by engine oil pressure regulated through the Propeller Governor/Constant Speed Unit (CSU). Nominal propeller rpm during all phases of operation is 1,700 rpm, except at low power settings at low speeds where there is insufficient energy available to rotate the prop at 1700 rpm.

The pitch change mechanism is mounted on the propeller front hub and consists of a fixed cylinder, a sliding piston, and a feathering spring. The piston is connected to each propeller blade by a fork assembly which engages a cam follower on the blade root. A counterweight is attached to each blade near its root in such a position that when the propeller is rotating the counterweight is transferred to the blade as a force tending to turn the blade to coarse pitch. The feathering spring within the cylinder also tends to move the blades towards coarse pitch and the feather position.

Oil pressure from the engine oil system is boosted to a higher pressure by a pump in the CSU. Oil pressure is then applied to the rear of the sliding piston, overcoming the force of the feathering spring and counterweights, to move the blades towards fine pitch. Thus, the blade angle is set by controlling the pressure of the oil supplied to the propeller.

In case that neither the CSU nor the overspeed governor limit the propeller speed, the Nf governor will limit the engine power to not exceed (Np=109%) 1853 rpm.

Should the CSU governing system fail, the overspeed governor will operate to limit the propeller speed (Np) to 106% (1802 rpm). The overspeed governor incorporates a feathering solenoid valve which is energized when the Condition Lever is moved to the CUT OFF position, causing the blades to feather. Electrical power to enable propeller feathering is supplied from the Essential Bus.

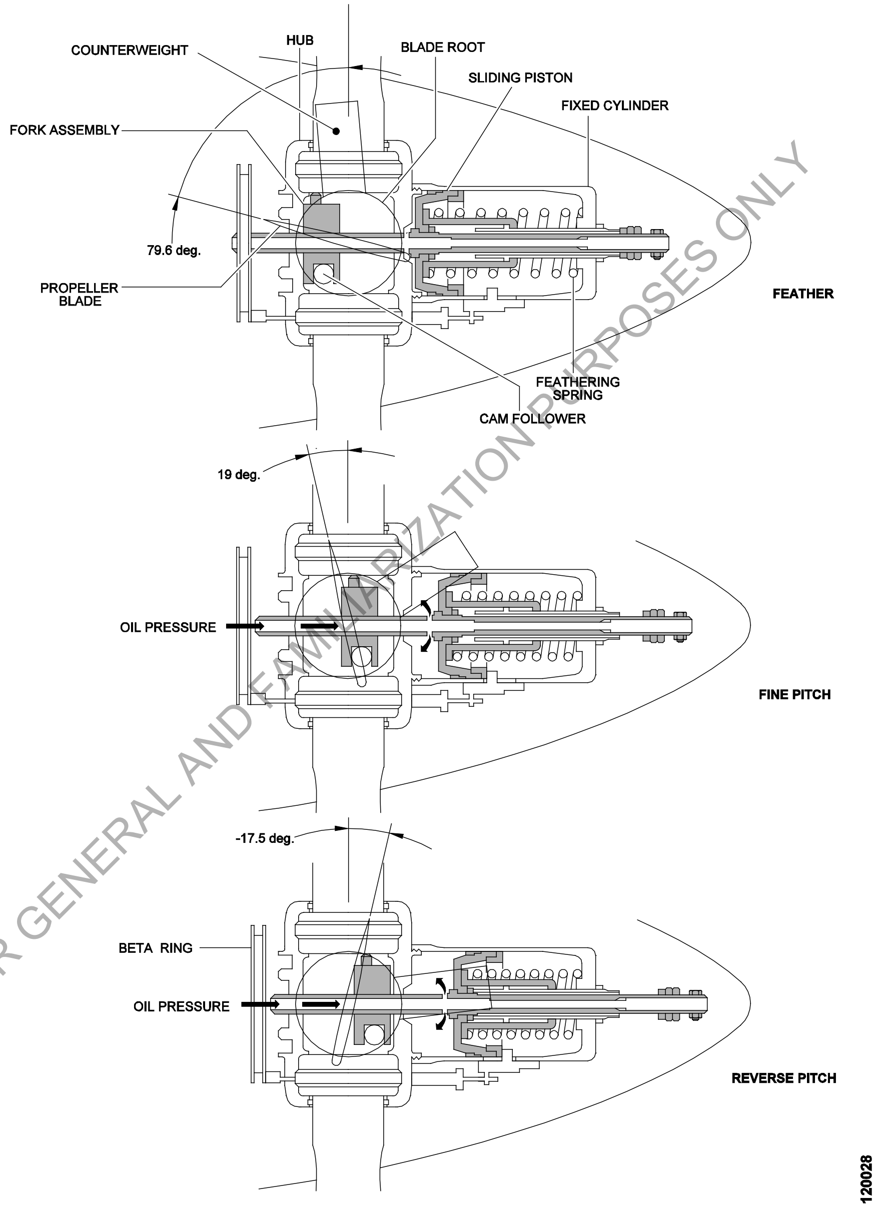

Figure 7-11-1. 4-Bladed Propeller Pitch Mechanism

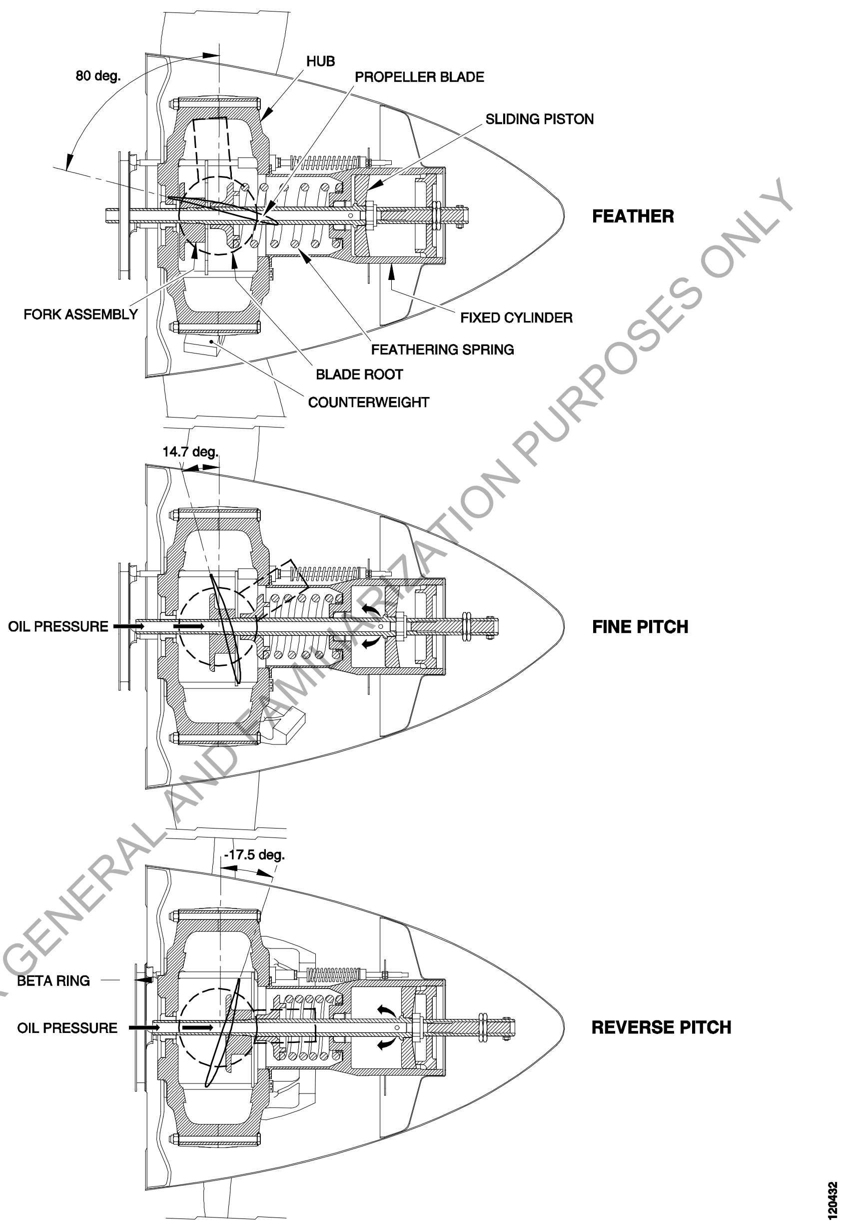

Figure 7-11-2. 5-Bladed Propeller Pitch Mechanism

OPERATION

Refer to Figure 7-11-1 for the 4-bladed Propeller Pitch Mechanism, and Figure 7-11-2 for the 5-bladed Propeller Pitch Mechanism.

In normal operation the propeller unfeathers after the condition lever is moved to Ground Idle and the engine is accelerating to idle Ng during engine start. On the ground at idle power the propeller rotates at approximately 1060 rpm. When power is increased the CSU will control propeller speed at 1700 rpm. In the air, at low speeds and idle power (F.I.) the propeller rpm may drop below 1700 rpm. The propeller feathers automatically when the condition lever is moved to CUT-OFF FEATHER.

The propeller is reversible for operation in the Ground Operating range during ground operations only. To achieve propeller pitch below the low pitch stop, lift up the triggers on either side of the Power Control Lever (PCL) to clear the idle detent and pull aft. As the PCL moves aft, the propeller blade angle decreases to the maximum reverse blade angle of -17.5°.

WARNING

GROUND OPERATION WITH PROPELLER BELOW 950 RPM IS NOT PERMITTED.

PROPELLER DE-ICE – GENERAL

Each propeller blade has an electrically heated boot on the inboard upper and lower leading edge. 28 VDC power supply for the boots is taken directly from the Power Line. It is supplied to the propeller de-ice boots via a slip ring mounted on the rear of the spinner bulkhead and brush block mounted on a bracket on the engine. Protection against the effects of lightning strike is provided by a set of metal oxide varistors (MOV's) mounted on the brush block assembly. The system is selected by the ICE PROTECTION PROPELLER switch on the pilot's lower right panel and the green PROPELLER advisory will come on in the ICE PROTECTION window of the systems MFD. The switch has the positions ON and OFF. When the PROPELLER switch is set to ON, the blades are heated in cycles. A de-ice timer unit selects automatically the appropriate cycle depending on the IOAT.

PROPELLER DE-ICE – TIMER CYCLES

	4-BLADED PROPELLER	**5-BLADED PROPELLER**
	The de-ice timer unit select power alternately to opposite pairs of blades to minimize asymmetric ice shedding	Each boot has an inner zone and outer zone. The de-ice time unit selects power alternately to all blade inner zones followed by all blade outer zone to minimize asymmetric ice shedding
Mode 1 (Warmer than 0 °C)	Timer in stand by	Timer in stand by
Mode 2 (0 °C or colder but not colder than -16 °C) • 45 sec • 45 sec • 90 sec	 Blades 1 and 3 are heated Blades 2 and 4 are heated Blade heating OFF	 All inner zones are heated All outer zones are heated Blade heating OFF
Mode 3 (Colder than -16 °C) • 90 sec • 90 sec	 Blades 1 and 3 are heated Blades 2 and 4 are heated	 All inner zones are heated All outer zones are heated

The above cycles are repeated until the PROPELLER switch is set to OFF.

PROPELLER DE-ICE – IOAT SENSING

IOAT sensing is by a sensor mounted under the left hand wing. This sensor is termed the controller and presents the principal control signal. A second sensor is mounted in an identical position under the right hand wing. This sensor is termed the comparator and allows the control sensor to be checked.

The Propeller De-ice Controller monitors the various system control functions and outputs a fault signal to the MAU for a detected failure; the Crew Alerting System (CAS) shows a caution in the event of detected failures. The following functions are monitored:

- Inhibit input open
- Failure of IOAT sensor (Open or short sensor or unacceptable difference between IOAT control sensor and IOAT comparator sensor)
- Heater supply voltage out of tolerance
- Heater current out of tolerance
- Built in test for internal failure (power supply, oscillator, watchdog etc.).

When the system is on, if the MAU detects a failure, an amber Propeller De-Ice caution is shown on the CAS.

INDICATION/WARNING

The propeller speed is displayed digitally in the engine window on the Primary Flight Display (PFD).

The red Propeller Low Pitch warning will be shown on the CAS when the propeller pitch is less than 6° (minimum pitch in flight) and the aircraft is not on the ground.

Upon selection of the de-ice system the de-ice timer performs a built in test function lasting approximately 20 seconds. A pre-flight test is performed in this manner. The CAS amber Propeller De-Ice caution will be shown if the system electrical load is outside its limits.

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FUEL

GENERAL

Refer to Figure 7-12-1, Fuel System for system schematics and equipment layout.

Fuel is contained in two integral wing tanks and is supplied to the engine in excess of that required for all ground and flight operations. Each wing tank contains drain valves. The transfer and delivery of fuel is achieved using a motive flow jet pump system and two engine driven pumps (low pressure pump and the FCU high pressure pump). Electric booster pumps provide pressure during the engine start sequence, as a standby function when the normal system cannot maintain adequate pressure and are used to balance the fuel level in each wing. Fuel symmetry is maintained automatically by the Fuel Control and Monitoring Unit (FCMU).

Refueling is accomplished using over-wing filler caps. Fuel quantity, fuel flow rate and booster pump operation are shown in the FUEL window of the systems Multi Function Display (MFD). Fuel flow rate is also shown in the engine window of the PFD. Low fuel pressure, low fuel quantity and fault conditions will be shown in the Crew Alerting System (CAS) window. In an emergency, fuel flow to the engine can be stopped by pulling the FUEL EMERG SHUT OFF handle, located at the aft end of the center console, left of the aircraft centerline.

DESCRIPTION

The fuel storage system includes integral wing tanks, fuel drains, refueling ports, and vents. The main fuel tank is between ribs 6 and 16, forward of the rear and main spars. A collector tank is forward of the main spar between ribs 3 and 6. Fuel drains are located in the lower wing-skins and in the fuel service bay (fuel filter and air separator) on the left side of the fuselage, left of the nose wheelwell. These fuel drains allow the removal of water and other contaminants during preflight.

Refueling is accomplished through an overwing filler cap located at the outer, upper section of each wing. Each wing has a usable fuel capacity of 201 US gal (761 liters).

The fuel vent bay allows venting of the fuel system through inward and outward vents located on the lower surface of the outer fuel bay.

A check valve is installed in the motive flow line at each collector tank. The check valves stop fuel flow between the left and right wing tanks.

The distribution system transfers fuel from left and right main tanks to the collector tank in each wing and delivers fuel from the collector tanks to the engine fuel control unit. Within the tanks are electric booster pumps, transfer jet pumps, and delivery jet pumps. From the collector tanks the fuel flows through a fuel filter, maintenance and firewall shutoff valves, an air separator, a low pressure engine driven pump, an oil/fuel heat exchanger, and a high pressure engine driven pump to the fuel control unit.

The tanks in each wing contain four capacitance type fuel quantity probes that are connected to the fuel computer part of the FCMU. The resistance temperature detector type fuel low level sensors in the collector and main tanks are connected to the low level sensing part of the FCMU.

OPERATION

During normal operation with the engine running, fuel is transferred from the wings to the engine by a motive flow system. Fuel under pressure from the low pressure engine driven pump is returned to the wings to provide motive flow through the transfer jet pump and the delivery jet pump. The transfer jet pump transfers fuel from the wing tank to the collector tank. The left and right wing delivery jet pumps transfer fuel to a common manifold. Fuel then flows through the maintenance shutoff valve and the fuel filter. The fuel filter incorporates a bypass valve in case the filter becomes blocked, and a spring loaded drain valve. Fuel is then directed into the air separator. The air separator passes air in the fuel system to the vent return line and incorporates a fuel low pressure switch and a spring loaded drain valve. The fuel then passes through the firewall shutoff valve to the low pressure engine driven fuel pump. The firewall shutoff valve is mechanically connected to the FUEL EMERG SHUT-OFF handle in the cockpit. The low pressure engine driven fuel pump includes a pressure relief valve that maintains a fuel pump outlet pressure of 43.5 psig (3 bar). A bypass valve allows for fuel flow around the low pressure engine driven fuel pump in the event of a fuel pump failure.

An electric booster pump, located within each collector tank, provides fuel pressure during engine start and is used to maintain system pressure and fuel balancing when required. Each booster pump LH and RH is controlled by a two position (ON or AUTO) switch located on the FUEL PUMPS section of the overhead panel. When set to ON, the booster pump will operate continuously. With the switch set to AUTO (the normal operating setting), the booster pump will operate automatically for fuel balancing or whenever the fuel system pressure falls below 2 psig (0.14 bar). The booster pump will shutoff automatically 10 seconds after the fuel system pressure reaches 3.5 psig (0.24 bar). A booster pump is capable of supplying the engine in case the low pressure engine driven pump fails.

The green PUMP captions indicate that the electric booster pumps have been selected to ON, by the overhead panel switches or by the automatic fuel balancing or due to low fuel pressure. The green PUMP captions do not confirm correct pump operation.

Fuel supply greater than engine demand is returned from the fuel control unit to the vent bays.

Refer to Engine Fuel System, this section, for engine fuel supply.

Fuel symmetry is automatically maintained by the FCMU when the FUEL PUMPS switches are set to AUTO. Left and right fuel quantities are monitored to detect fuel asymmetry exceeding 68 lbs and will activate the fuel booster pump in the tank with the higher quantity. Fuel booster pump activation is delayed one minute to avoid pump cycling during flight in turbulence. The fuel booster pump will continue to operate until the left and right fuel levels are sensed to be equal. Automatic activation of the fuel booster pumps will only occur when the condition lever is out of the CUT-OFF position. A fuel imbalance (refueling errors) of up to 267 lbs can be automatically handled by the automatic fuel balance system. In the event of a system failure, the fuel load symmetry can be maintained by manually selecting the FUEL PUMPS switch to ON for the fuel tank with the higher quantity until a balanced fuel condition is restored and then setting the switch to AUTO. Monitor the fuel quantity gauges for fuel symmetry for the remainder of the flight.

Power for the FCMU fuel computer is taken from the ESSENTIAL BUS through the FUEL QTY circuit breaker. Power for the low level sensing part of the FCMU is from the MAIN BUS through the FUEL LOW LEVEL circuit breaker.

INDICATION/WARNING

Fuel quantity and low level sensing data is sent to the MAU from the FCMU. A fuel flow sensor located forward of the engine FCU sends a signal to the MAU to indicate fuel flow. The MAU calculates and displays analog and digital readouts in the FUEL window of the systems MFD. The left and right tank fuel quantities are shown as analog and the total fuel quantity, fuel flow, endurance and fuel used values are shown digitally.

The analog fuel quantity and the digital fuel flow (FF) are real time data displays. The digital fuel quantity (QTY), endurance (END), and fuel used (USED) are calculated value displays. The values are derived from the stored fuel quantity at the time of FUEL RESET (see below) and the integrated fuel flow over time since reset.

The fuel quantity of the left and right wing fuel tanks is shown by white segments on a left and right analog scale in the FUEL window. The scales are marked from 0 to 4 (full) in units of quarters. Left and right booster pump selection is shown by a green PUMP indicator below the respective quantity scale.

The digital total computed left and right fuel tank quantity (QTY) is shown in the FUEL window in lbs (LB). The digital fuel quantity is calculated from the last RESET value, fuel as it is used will then be subtracted from this value. The fuel flow (FF) digital value is shown as pounds fuel used per/hour (LB/H). The endurance display (END) range is the time in hours and minutes the aircraft can fly with the quantity of fuel that is calculated to be in the tanks at the current fuel flow. The digital fuel used (USED) value indicates fuel consumed in lbs (LB) based on fuel flow vs time (FF) of engine operation.

Tolerances of the fuel flow measurement system can lead to a conservative digital value of the measured fuel burn and the remaining fuel quantity. The pilot can on longer flights update the digital fuel quantity indication with the actual fuel value on board, by pressing the FUEL RESET soft key. Fuel reset in flight should only be used when the wings are level, pitch within ±3°, with unaccelerated flight and no turbulence present. Fuel reset will also reset the fuel used to zero.

A FUEL RESET softkey in the FUEL window is used to re-datum the total fuel quantity and fuel used value after each time fuel is added to the wing tanks. These values are stored in non-volatile memory when power is removed. To reset the totalizer, either press the bezel key FUEL RESET or bring focus and use the MF controller. After engine start, verify that the fuel quantity indication increases to the new fuel quantity and the fuel used indication is reset to zero. The FUEL RESET command is disabled if the FCMU computer detects a fault condition.

If a fuel low level indication condition becomes active all segments shown on the analog scale and the fuel scale outline will change to amber and a LH Fuel Low or RH Fuel Low or LH + RH Fuel Low caution will be shown in the CAS window of the systems MFD.

If there is a fuel imbalance of more than 178 lbs, the Fuel Imbalance caution will be shown in the CAS window. The segments of the fuel quantity bar representing the excess fuel on the fuller tank side will change to amber. The booster pump on the fuller tank side will operate automatically to balance the fuel. When on the ground takeoff is prohibited until the fuel is balanced.

If there is missing data or the Modular Avionics Unit (MAU) senses that the analog fuel sensing data is invalid, the analog fuel scales will be removed and an amber X will be shown on the scale. If the fuel flow status data becomes invalid or missing the digital data values will be replaced with amber dashes.

A low fuel pressure condition 2 psi (0.14 bar) will be shown by a Fuel Low Pressure caution in the CAS window.

The CAS window of the systems MFD displays the following cautions for the fuel system:

AMBER CAUTION

Fuel Quantity Fault	The FCMU is unable to determine fuel quantity
LH Fuel Low RH Fuel Low LH + RH Fuel Low	The fuel quantity in left, right or both tank(s) has reached less than 20 US gal (75 liters)
Fuel Pressure Low	The fuel system pressure less than 2 psi (0.14 bar)
Fuel Balance Fault	FCMU automatic fuel balancing is not successful
Fuel Imbalance	A fuel imbalance of more than 178 lbs between LH and RH fuel quantity. Takeoff is prohibited until balanced

The CAS window of the systems MFD displays the following status for the fuel system, on the ground:

WHITE

FCMU Fault	The FCMU has detected an internal fault
Low Lvl Sense Fault	The FCMU has detected a fault with fuel low level sensing

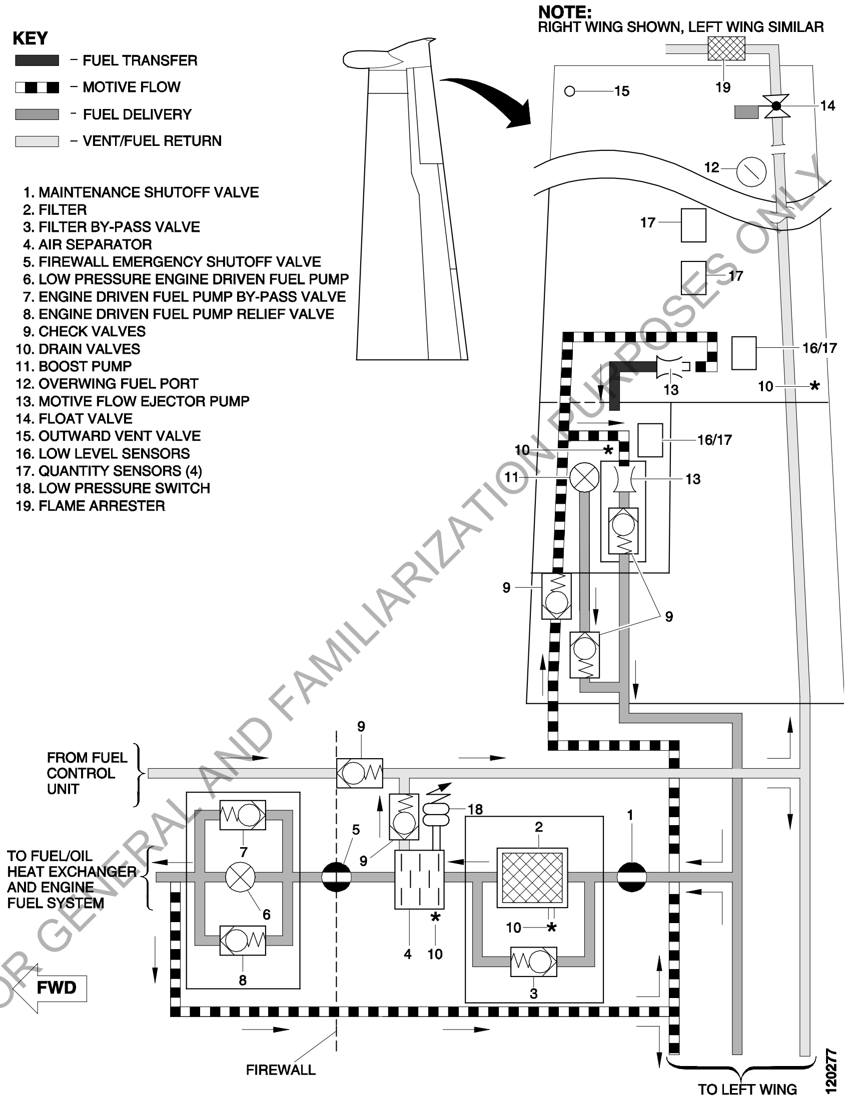

Figure 7-12-1. Fuel System
(Sheet 1 of 5)

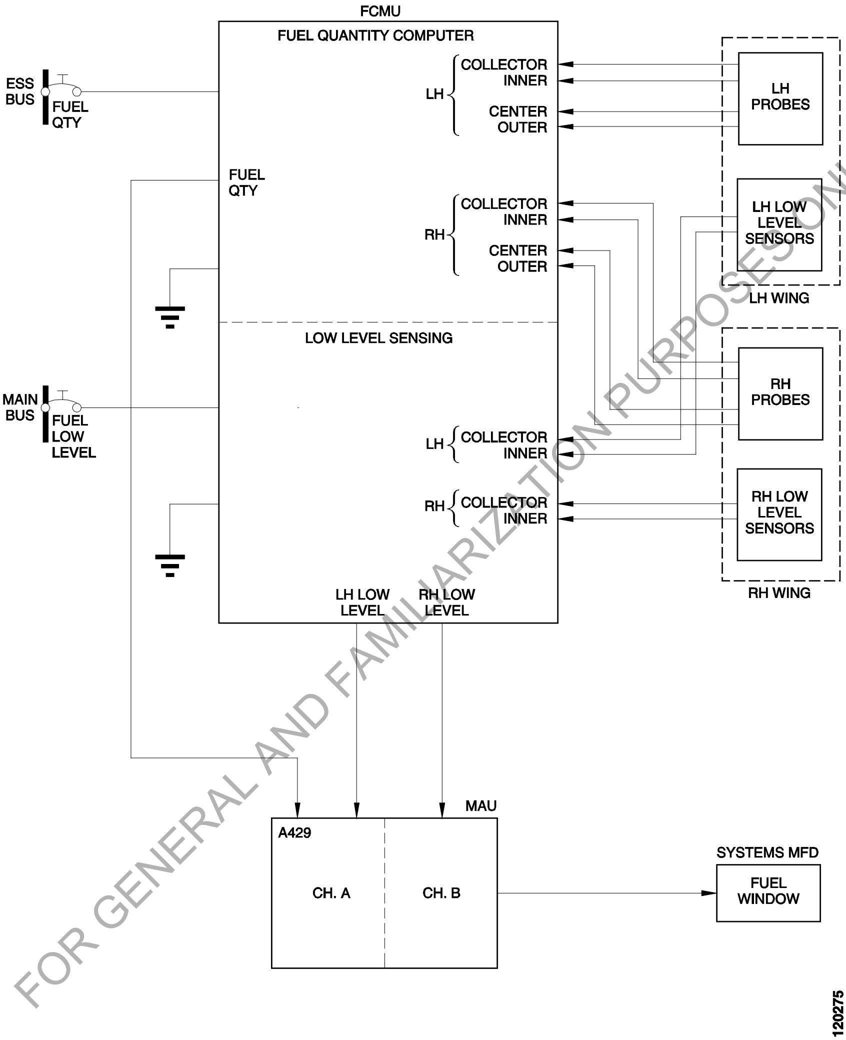

Figure 7-12-1. Fuel System
(Sheet 2 of 5)

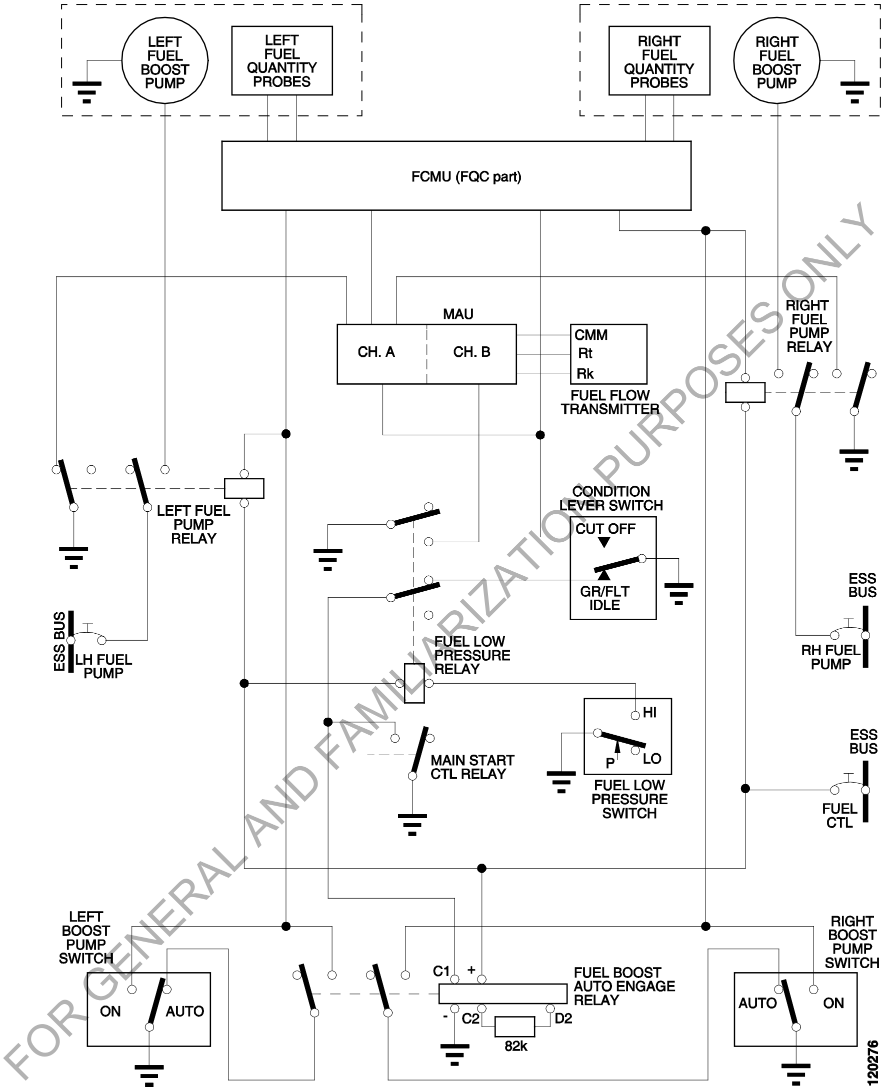

Figure 7-12-1. Fuel System (MSN 545, 1001 - 1270)
(Sheet 3 of 5)

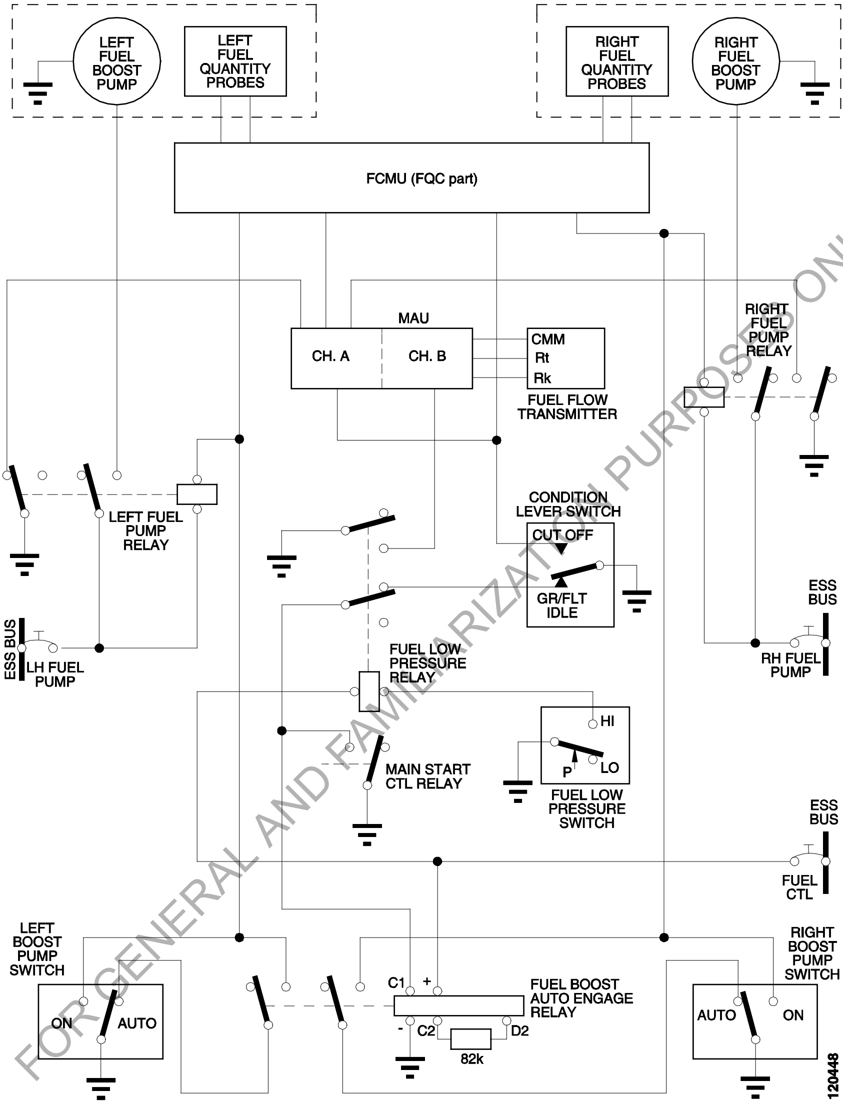

Figure 7-12-1. Fuel System (MSN 1271 - 1942)
(Sheet 4 of 5)

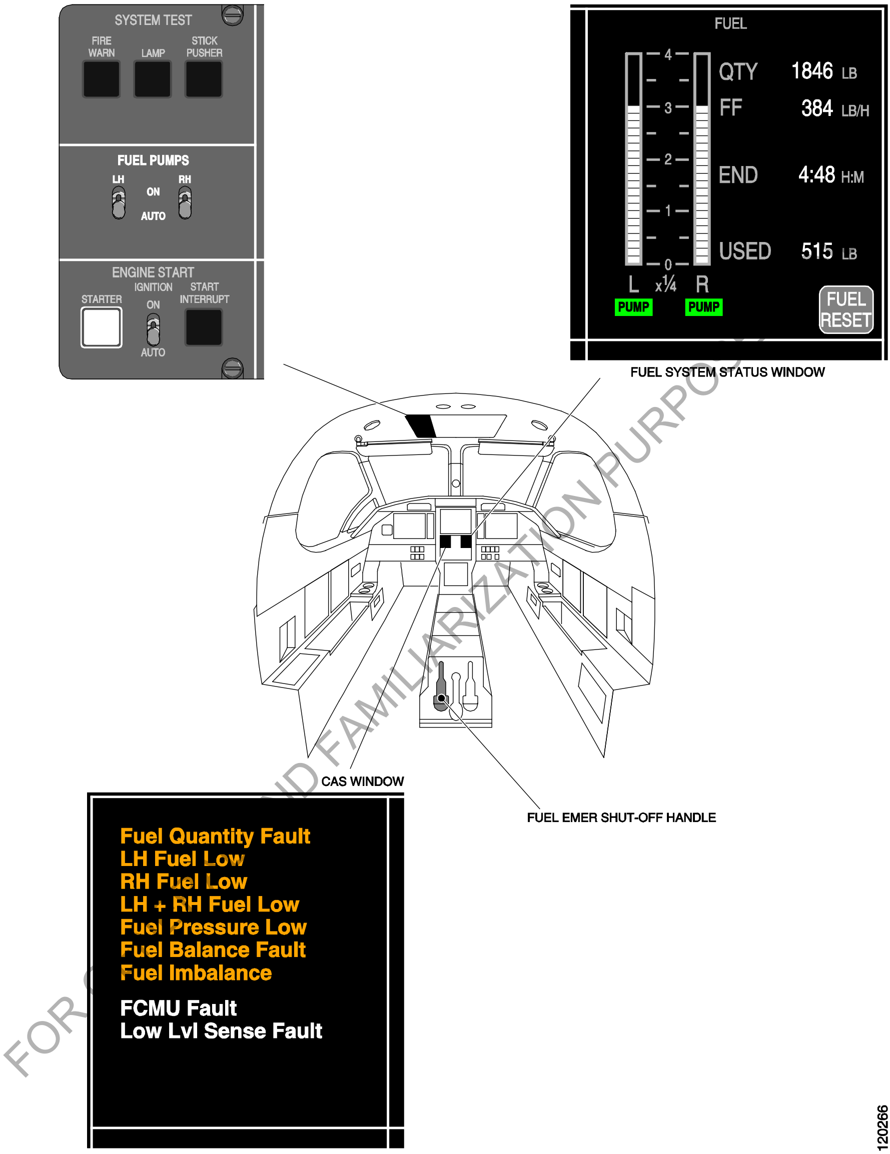

Figure 7-12-1 Fuel System
(Sheet 5 of 5)

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ELECTRICAL

GENERAL

Refer to Figure 7-13-1, Power Generation Distribution System (PGDS) for system schematics and equipment layout.

The PGDS is a dual channel 28 VDC power generation and distribution system, it has the following power sources:

- Generator 1 a 28 V, 300 A generator
- Generator 2 a 28 V, 300 A generator
- Two lead-acid batteries 24 V 42 Ah or two optional nickel-cadmium batteries 24 V 40Ah or two optional heated nickel-cadmium batteries 24 V 44 Ah
- Emergency Power Supply (EPS) a 24 V 5 Ah lead-acid battery unit

Under PGDS normal operating condition (Fig. 7-13-2, Sheet 1) the systems and circuits powered from Generator 1 are designated channel 1 and systems and circuits powered from Generator 2 are designated channel 2. The channels operate independently and the only connection is thru a bus tie in the event of component failures. In the event of component failures, automatic switching and load shedding takes place for continued safe flight and landing under abnormal and emergency conditions.

The PGDS abnormal operating condition is when one generator has failed. High current consumption busses and systems are load shed if a Generator 1 or 2 fails. Refer to Figure 7-13-2, Sheets 2 and 3 which show a Generator 1 and 2 failure.

The PGDS emergency operating condition is when both generators have failed (i.e. engine flame out). Refer to Fig. 7-13-2, Sheet 4 for the busses and high current consumption systems that are load shed.

An external power socket permits DC power to be provided from a ground power unit.

DESCRIPTION

POWER SUPPLIES

When the engine is running, Generator 1 is the primary power source for the Channel 1 Power Line, and the Essential and Avionic 1 Buses. The Standby Bus is powered from the Avionic 1 Bus. If the Avionic 1 Bus is switched OFF, the Standby Bus is powered from the Hot Bat Bus provided the STBY BUS switch is set to on.

Generator 2 is the primary power source for the Channel 2 Secondary Power Line and the Main, Avionic 2, Non-Essential and Cabin Buses. Generator 2 is also the engine starter motor. If the engine STARTER switch is pushed to ON and the engine Ng is less than 50%; the generators are automatically switched OFF.

Should either the Generator 1 or Generator 2 fail, the control relays in the PGDS automatically change and connect the remaining generator and both batteries to the Power and Secondary Power Lines. A caution will be displayed in the Crew Alert System (CAS) window. This is the PGDS abnormal operating condition.

Battery 1 and Battery 2 are installed in the rear fuselage. Each battery has an on/off switch on the Electrical Power Management (EPM) section of the overhead control panel. Battery 2 provides the power for starting the engine. Battery 1 provides power to maintain the essential systems during engine start and on ground supplements Battery 2 for engine starting at either above 10% Ng or after 10sec after the starter is activated. In case of an engine or double generator failure, the batteries will supply the essential electrical systems after automatic load shedding for a maximum range glide and one attempted engine start. This is the PGDS emergency operating condition.

The optional in-flight heated Ni-Cad batteries support an extended range of aircraft operating temperatures, specifically cold weather. Heaters inside the battery case are supplied with 28 VDC when the aircraft electrical system is energized. Battery heater 1 is powered by the GENERATOR 1 BUS, and battery heater 2 is powered by the GENERATOR 2 BUS. The battery heater is capable of maintaining the battery temperature above 4°C at ambient temperatures down to −40°C.

Each generator and battery has a current and a voltage sensor. The Modular Avionics Unit (MAU) monitors the condition of the generators for under and over voltage and the batteries for under and over voltage and over current (discharge), and provides the appropriate cautions. The GDS status is displayed in the ELECTRICAL window and the cautions are displayed in the CAS window. Both windows are on the systems Multi Function Display (MFD) unit. Each generator has a three position control switch on the EPM section of the overhead control panel.

On ground the DC system can be powered by an external power unit which is connected under the rear fuselage left side. When the external power supply is connected to the aircraft, an AVAIL caption to the right of the EXT PWR switch on the overhead panel is illuminated to show that external power is available. To apply external power to the aircraft electrical system, the EXT PWR switch must be selected to EXT PWR. When the EXT PWR switch is set to EXT PWR, an ON caption to the right of the EXT PWR switch is illuminated. With both generators off-line the Bus Tie is closed and ground power is fed to all aircraft busses and both batteries. An External Power Controller (EPC) monitors external power supply and automatically isolates the aircraft systems if the voltage is outside the range 22 to 29.5 VDC. The EPC will disconnect external power if either generator is on-line.

In the event of a total power loss (both generators and batteries) the Emergency Power Supply (EPS) battery will provide sufficient power thru the EPS bus to the backup systems for 30 minutes. Under normal, abnormal and emergency conditions the EPS battery is connected to the Essential Bus to maintain a maximum charge. Following the loss of the Essential Bus the EPS Bus automatically switches to be supplied from the EPS battery. When the aircraft is powered down normally, the EPS switch on the overhead panel must be set to OFF to prevent discharge of the EPS battery.

JUNCTION BOXES

There are two Power Junction Boxes (PJB), one for each generator. Generator 1 PJB is installed on the cockpit lower left wall and Generator 2 PJB is installed on the cockpit lower right wall. They contain the principal contactors, relays and other circuit protection devices. There is a Battery and External Power Junction Box (BEPJB) which contains the components for the batteries, external power functions, hot battery bus and associated circuit breakers. It also contains the necessary components to permit optional nickel cadmium batteries to be installed. The BEPJB is installed in the rear fuselage. There is also a Relay Module Panel (RMP) for power Channel 1 and 2, which contain terminal blocks and relays and are installed under the cabin floor on the left and right sides.

BUS BARS

The Generator 1 and 2 DC power supplies are distributed via a system of BUS BARS on each channel. A bus tie installed in the left PJB is monitored by the MAU and will close when either generator is off-line to allow the remaining generator to provide power to the other channel.

If both generators are off-line (PGDS emergency condition), both batteries are connected in parallel via the bus tie to power the left channel essential busses. The bus tie will open, if an excessive current condition on one channel is sensed, to isolate the left and right channels. A caution is displayed in the CAS window if the bus tie is in the wrong state for the PGDS configuration.

The Hot Battery Bus is powered directly from Battery 1. It supplies power to systems that must remain powered or available when the aircraft is powered down.

The Power Line is the primary source of electrical power with the highest level of integrity. It supplies the Essential and Avionic 1 Buses and power for the flaps, LH windshield de-ice, propeller de-ice and cabin heating.

The Essential Bus has the highest level of integrity and under normal conditions it is powered from Generator 1. It can be supplied with power from either generator or both batteries. This bus will always be powered under normal, abnormal and emergency conditions. There are no relays or contactors controlling the Essential Bus. The Essential Bus voltage is monitored by the MAU and a warning will be displayed in the CAS window if the voltage is outside the limits.

The Avionic 1 Bus has the highest level of integrity and under normal conditions it is powered from Generator 1. It can be supplied with power from either generator or both batteries. This bus will always be powered under normal, abnormal and emergency conditions. A contactor in the left PJB is controlled by the AV 1 BUS switch on the overhead panel. The Avionic 1 Bus voltage is monitored by the MAU and a caution will be displayed in the CAS window if the voltage is outside the limits.

The Secondary Power Line is the source of electrical power with the second highest level of integrity. It supplies the Main, Avionic 2, Non-Essential and Cabin Buses and power for the hydraulics, RH windshield de-ice, VCCS and under floor heating.

The Main Bus has the second highest level of integrity and under normal conditions it is powered from Generator 2. It can be supplied with power from either generator. This bus will always be powered under normal and abnormal conditions. The Main Bus contactor is normally closed and will automatically open under emergency conditions and load shed the Main Bus. The Main Bus voltage is monitored by the MAU and a caution will be displayed in the CAS window if the voltage is outside the limits. The caution is suppressed if both generators are off-line.

The Avionic 2 Bus has the second highest level of integrity and under normal conditions it is powered from Generator 2. It can be supplied with power from either generator. This bus will always be powered under normal and abnormal conditions. A contactor in the right PJB is controlled by the AV 2 BUS switch on the overhead panel. The Avionic 2 Bus voltage is monitored by the MAU and a caution will be displayed in the CAS window if the voltage is outside the limits. The caution is suppressed if both generators are off-line or the AV 2 BUS switch on the overhead control panel is OFF.

The Generator 1 Bus has the third highest level of integrity and under normal and abnormal (Generator 2 off-line) conditions it is powered from Generator 1. When the Generator 1 is off-line the Generator 1 Bus is un-powered. The Generator 1 Bus provides power to non-essential equipment that can be retained in the event of a Generator 2 failure. The Generator 1 Bus voltage is monitored by the MAU and a caution will be displayed in the CAS window if the voltage is outside the limits. The caution is suppressed if Generator 1 is off-line.

The Generator 2 Bus has the third highest level of integrity and under normal and abnormal (Generator 1 off-line) conditions it is powered from Generator 2. When the Generator 2 is off-line the Generator 2 Bus is un-powered. The Generator 2 Bus provides power to non-essential equipment that can be retained in the event of a Generator 1 failure. The Generator 2 Bus voltage is monitored by the MAU and a caution will be displayed in the CAS window if the voltage is outside the limits. The caution is suppressed if Generator 2 is off-line.

The Non Essential Bus has the fourth highest level of integrity and under normal conditions it is powered from Generator 2. When either generator is off-line the Non Essential Bus is un-powered. The Non Essential Bus provides power to equipment that may be shed in the event of a single generator failure. The Non Essential Bus voltage is monitored by the MAU and a caution will be displayed in the CAS window if the voltage is outside the limits. The caution is suppressed if either generator is off-line.

The Cabin Bus has the fourth highest level of integrity and under normal conditions it is powered from Generator 2. When either generator is off-line the Cabin Bus is un-powered. The Cabin Bus provides power for ancillary non-flight related services within the cabin. All these services are shed in the event of a single generator failure. A contactor in the right PJB is controlled by the CABIN BUS switch on the overhead control panel.

The Standby Power Bus provides power to specific avionic equipment to allow the pilot to perform pre-flight planning and ATC communication tasks without the need to power up the aircraft primary busses prematurely. The Standby Power Bus is controlled by the STBY BUS switch on the overhead control panel. When the switch is selected on before engine start an ON indicator illuminates adjacent to the switch. When the Avionic 1 Bus becomes powered the Standby Power Bus ON indicator goes off. During emergency operation if additional load shedding is required the pilot can switch off the AV 1 BUS and retain the Standby Power Bus. The Standby Power Bus voltage is monitored by the MAU and a caution will be displayed in the CAS window if the voltage is outside the limits.

The Emergency Power Supply bus provides power to specific back-up equipment following the loss of all electrical power (both generators and the aircraft batteries).

CIRCUIT BREAKERS

Circuits supplied from the Bus Bars have circuit breakers on color coded panels on the left and right cockpit walls. The bus locations and color coding are as follows:

Panel LH Front	ESSENTIAL BUS cyan
Panel LH Rear	AVIONIC 1 BUS ice blue
	EPS BUS yellow
	STANDBY BUS dove blue
	GENERATOR 1 white
Panel RH Front	MAIN BUS green
	NON ESSENTIAL BUS pink
Panel RH Rear	AVIONIC 2 BUS light green
	CABIN BUS brown
	GENERATOR 2 gray

The circuit breakers for the high current consuming systems FLAP PWR, LH W/SHLD, PROP DE-ICE and CABIN HTG are all installed on the LH PJB. The circuit breakers for the high current consuming systems HYD PWR, RH W/SHLD, U/FLOOR HTR and optional FOOTWARMER are all installed on the RH PJB. The circuit breakers for the VCCS and optional LOGO LT are installed on the BEPJB.

The BUS TIE circuit breaker on the overhead control panel will open automatically if the current through the bus tie in the left PJB exceeds 200 amps. The bus tie in the left PJB can be opened manually and reset, if required, by pulling or pushing the control BUS TIE circuit breaker on the overhead control panel.

CONTROLS AND INDICATORS

Overhead Panel

The electrical system is controlled from the ELECTRICAL POWER MANAGEMENT section of the overhead control panel. The panel has controls for the:

- Avionics busses (AV 1 and AV 2)
- Generators (GEN 1 and GEN 2)
- Batteries (BAT 1 and BAT 2)
- External power (EXT PWR)
- Standby bus (STBY BUS)
- Cabin bus (CABIN BUS)
- Master power (MASTER POWER)
- Emergency Power System (EPS)
- Bus Tie (BUS TIE)

The Power management system is designed to leave the GEN 1, GEN 2, AV 1 BUS, AV 2 BUS and CABIN BUS switches in the on position in normal operations (through power cycles).

The MASTER POWER EMERGENCY OFF switch is guarded to the on position. When the switch is selected off the Generator 1 and 2, Battery 1 and 2 and external power are disconnected from the distribution system. The Standby Power Bus is de-energized. The Hot Battery and Emergency Power busses remain energized.

The GEN 1, GEN 2, BAT 1, BAT 2, AV1 and AV 2 switches are locking type switches. These switches must be pulled out before they can be moved from the on position. The GEN 1 and GEN 2 switches have three positions: ON, OFF and RESET. The reset position is used to allow the generator back on line following a voltage regulator trip.

The EPS switch has three positions: ARM, OFF and TEST. In the ARM position the EPS bus is powered and the red EPS ON indicator illuminates. In the TEST position an EPS battery capacity test is performed and if successful the green TEST indicator illuminates.

The GEN 1, GEN 2, BAT 1 and BAT 2 voltages and amperes indications are shown are in the ELECTRICAL status window of the systems MFD. A positive BAT current indicates battery charging rate. The indications are shown as amber dashes if a sensor reading is out of range.

The MAU provides monitoring of the battery voltage and current. The conditions that will result in a caution output to the CAS are:

- A decrease of battery voltage below 22.0 VDC will give a Battery caution
- An increase of battery current above 60 Amps discharge will give a Battery caution
- An increase of battery voltage above 30.3 VDC will give a Battery caution

Continuous monitoring of the GEN 1 and GEN 2 voltages for close to limit cautions is provided by the MAU. The conditions that will result in a caution output to the CAS are:

- A decrease of generator voltage below 22.0 VDC will give a Generator caution
- A increase of generator voltage above 30.3 VDC will give a Generator caution

OPERATION

CAUTION

FAILURE TO FOLLOW THE CORRECT POWER UP AND POWER DOWN SEQUENCE WILL TRIGGER NUISANCE WARNINGS AND CAUTIONS, DUE TO EQUIPMENT NOT BEING CORRECTLY POWERED UP AND THEREFORE RESULTING IN A FAULT STATUS. ONLY PERFORMING A CORRECT POWER UP CYCLE WILL INITIALISE EQUIPMENT AND SYSTEMS TO A CORRECT STATE.

The correct power up sequence is STBY BUS switch ON, EPS switch test for 5 seconds then ON, BAT 1 and 2 switches ON and EXT PWR switch ON (if available). The correct power down sequence is EXT PWR switch OFF (if ON), STBY BUS switch OFF, EPS switch OFF and BAT 1 and BAT 2 switches OFF. To power up the aircraft expeditiously, the standby bus and the EPS can be switched ON prior to performing the outside check. Before sitting down, the pilot can switch BAT 1 and 2 switches ON, then, once seated and once the relevant checklist items have been performed, the system is ready for engine start.

When the STBY BUS switch on the overhead control panel is set to on, the blue ON indicator illuminates to show power is available from the Hot Battery bus. This allows the pilot to perform pre-flight planning and ATC communication tasks without powering up the whole aircraft. After engine start and the Avionic 1 bus becomes powered the blue ON indicator will go off.

The EPS should be checked prior to flight by moving the EPS switch on the overhead control panel to the TEST position. The green TEST indicator comes on to indicate a serviceable battery. The EPS switch is then set to the ARMED position and the red EPS ON comes on. Once either external power or the batteries are switched on the EPS ON indicator goes off.

Before applying external power make sure the BAT 1 and BAT 2 switches are in the on position. Applying external power to the socket under the rear fuselage left side causes the green AVAIL indicator on the overhead control panel to illuminate. When the EXT PWR switch is set to EXT PWR the blue ON caption is illuminated and the external power is supplied to all busses and both batteries (Bus Tie closed). The external power voltage can be seen on the BAT 1 and BAT 2 indicators. The external power voltage is monitored and the external power supply will be automatically disconnected by the external power controller, if the voltage goes outside the limits. An External Power caution is displayed in the CAS window if ground power is still connected and the aircraft is ready to taxi (i.e. engine running, both generators and both avionic busses are on).

Battery voltages and amperes can be seen on the BAT 1 and BAT 2 status indicators. After engine start and when the generators come on-line the Bus Tie will open (dual channel system) with the Generator 1 powering one channel and Generator 2 powering the other channel. This is the PGDS normal operating condition with all busses available. Disconnecting the external power from the aircraft will cause the overhead control panel green AVAIL indicator to go off.

The output voltages and load of the GEN 1 and GEN 2 and the voltages and load or charging current of BAT 1 and BAT 2 can be observed in the ELECTRICAL status window on the systems MFD.

The generator voltages are monitored by the MAU for under and over voltage conditions. The Generator Control Units (GCU) monitor the generators for over current conditions. The batteries are monitored for under, over voltage and over current conditions by the MAU. If an outside of acceptable limits condition arises the appropriate warnings or cautions are shown in the CAS window.

Failures within the PGDS follow a structured degradation of systems functionality. Should either the Generator 1 or Generator 2 fail, the appropriate control relays within the PGDS automatically reconfigure so that the remaining generator and both batteries are connected in parallel to the Power Line and the Secondary Power Line through the bus tie. A caution will be displayed in the CAS window. This is the PGDS abnormal operating condition and automatic load shedding takes place.

In the event of a dual generator failure the Bus Tie closes and both the batteries supply the Power Line. The Secondary Power Line will also be powered but apart from Hyd Pwr all the distribution busses will be automatically load shed. A warning will be displayed in the CAS window. This is the PGDS emergency condition and automatic load shedding takes place. With the STBY BUS switch on, the Avionic 1 bus can be manually switched off with the AV 1 BUS switch to further reduce the electrical load.

If a battery failure condition is detected and shown in the CAS window the appropriate battery switch must be selected off by the crew to open the battery relay to isolate the failed battery. The position of all other relays and bus ties remain unchanged and there is no degradation of system performance.

Following the loss of generator and battery power to the Essential Bus the EPS battery will provide power to the standby instruments. The red EPS ON indicator on the overhead control panel will come on.

Refer to the Emergency Procedures (Section 3) for further information on emergency procedures.

INDICATION/WARNING

PGDS status indication is displayed in the ELECTRICAL window of the systems MFD. Under normal operating conditions the PGDS readouts are given in white. If an out of limit condition arises the PGDS readout background will change to yellow for a caution or red for a warning together with the relevant CAS caution or warning.

The CAS window on the systems MFD displays the following WARNINGS and CAUTIONS for the PGDS:

RED WARNING

Essential Bus	-	Indicates busbar voltage less than 22 VDC
Generators	-	Indicates both generators are off-line and engine is running
Battery 1 Hot Battery 2 Hot Battery 1 and 2 Hot	}	Indicates battery 1 or 2 or both batteries over temperature (only operative with Ni-cad batteries installed) Accompanied by voice callout "Battery Hot"

AMBER CAUTION

External Power	-	External power connected with both generators on-line and both Avionic busses energized
Generator 1 Off	-	Generator 1 is off-line and engine is running
Generator 2 Off	-	Generator 2 is off-line and engine is running
Bus Tie	-	Indicates Bus Tie is in the incorrect position for the PGDS configuration
Avionics 1 Bus Avionics 2 Bus Avionics 1+2 Bus	}	Indicates Avionics 1 or 2 or both bus voltage is less than 22 VDC
Generator 1 Volts Generator 2 Volts Generator1+2 Volts	}	Indicates Generator 1 or 2 or both voltage is less than 22 VDC or more than 30.3 VDC
Battery 1 Battery 2 Battery 1+2	}	Indicates battery 1 or 2 or both under and over voltage or current discharge condition
Battery 1 Off Battery 2 Off Battery 1+2 Off	}	Indicates battery 1 or 2 or both are off-line
Main Bus Generator 1 Bus Generator 2 Bus Generator 1+2 Bus Standby Bus Non Essential Bus	}	Indicates a busbar voltage is less than 22 VDC

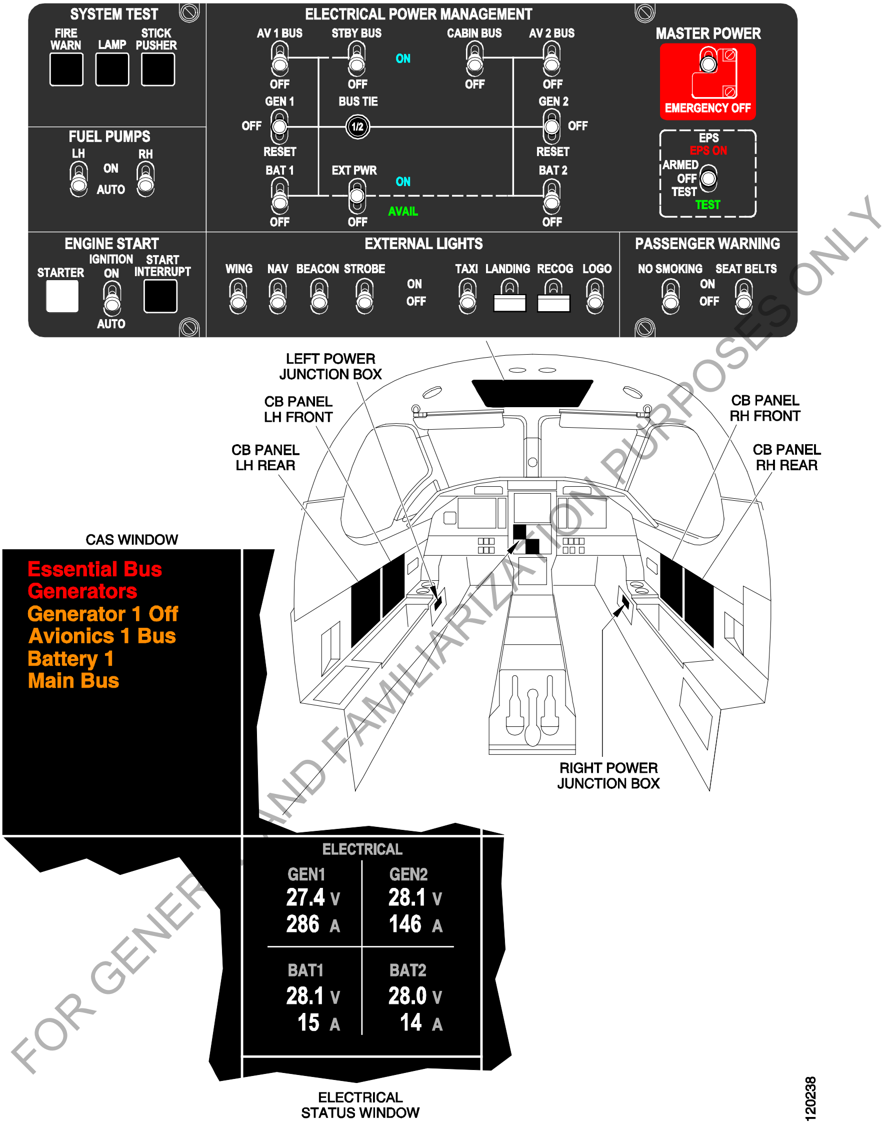

Figure 7-13-1. Power Generation and Distribution System (PGDS) - Controls (Sheet 1 of 4)

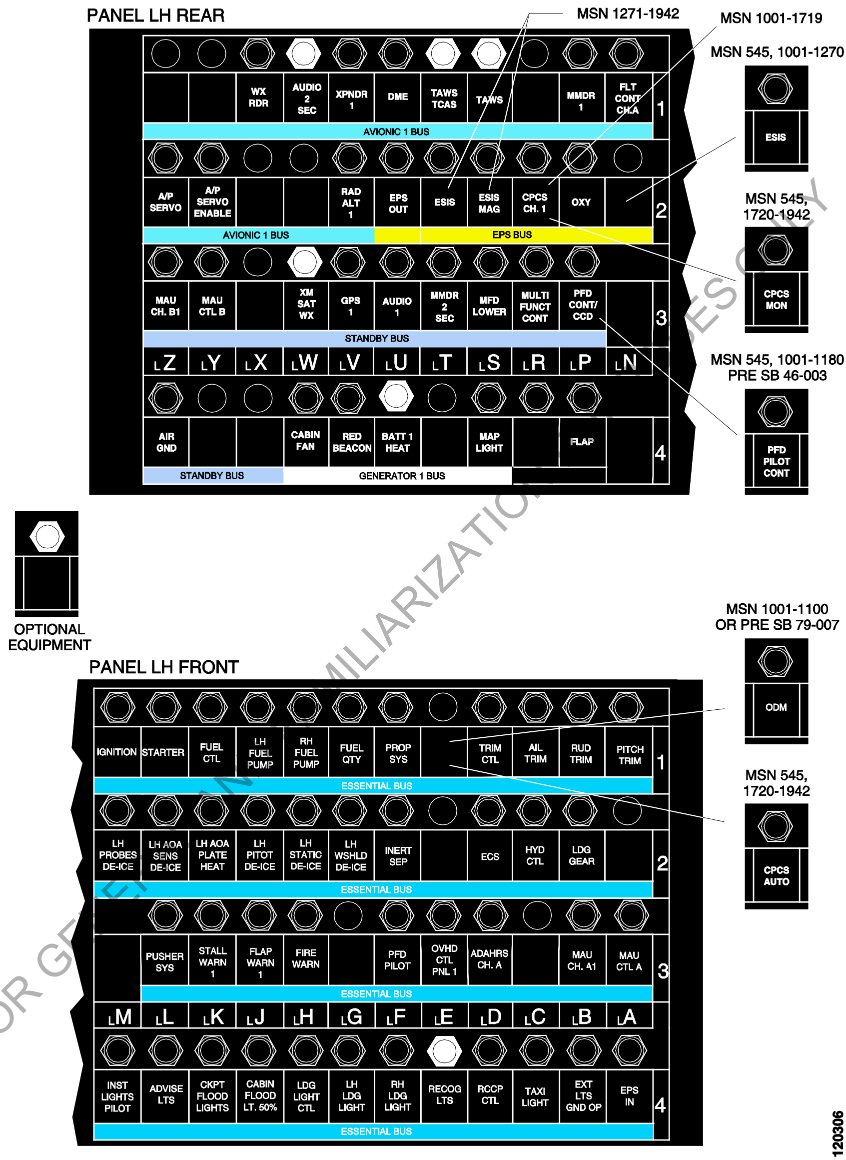

Figure 7-13-1. PGDS LH Circuit Breaker Panels
(Sheet 2 of 4)

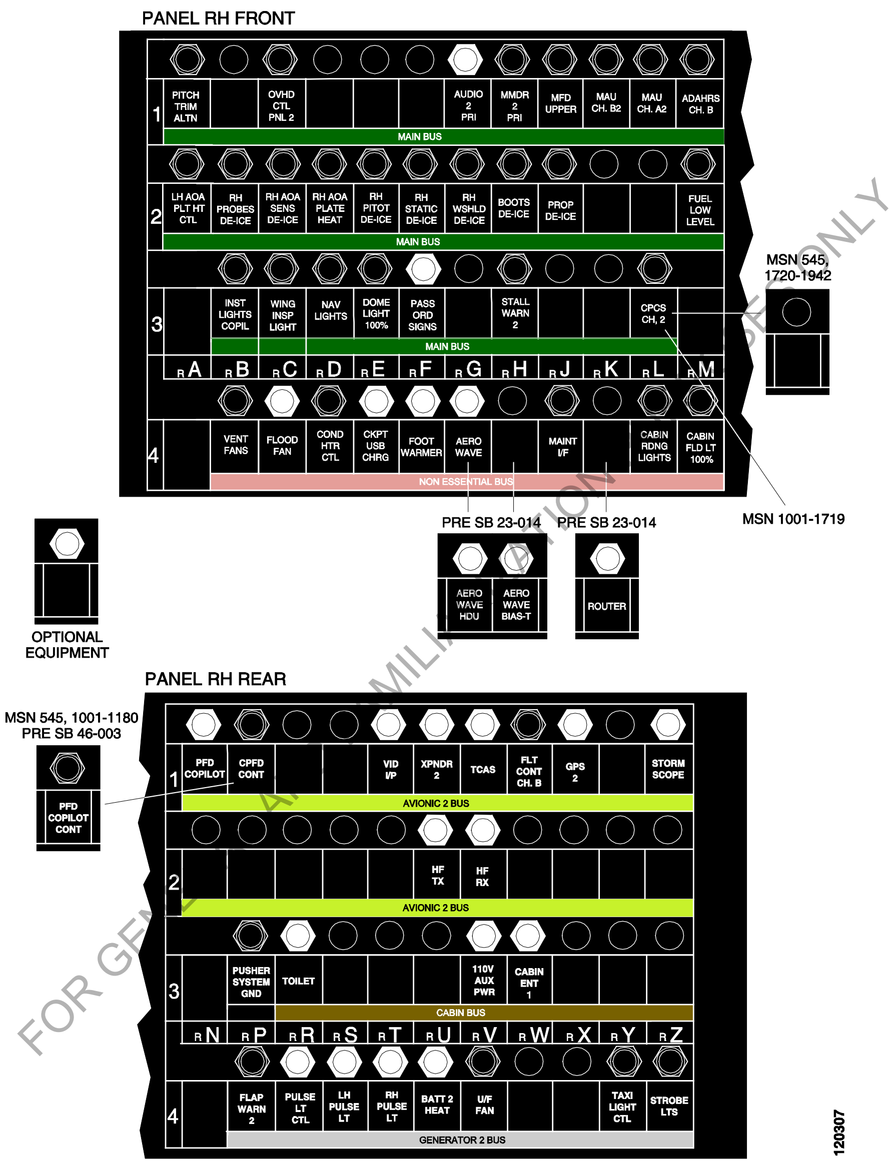

Figure 7-13-1. PGDS - RH Circuit Breaker Panels
(Sheet 3 of 4)

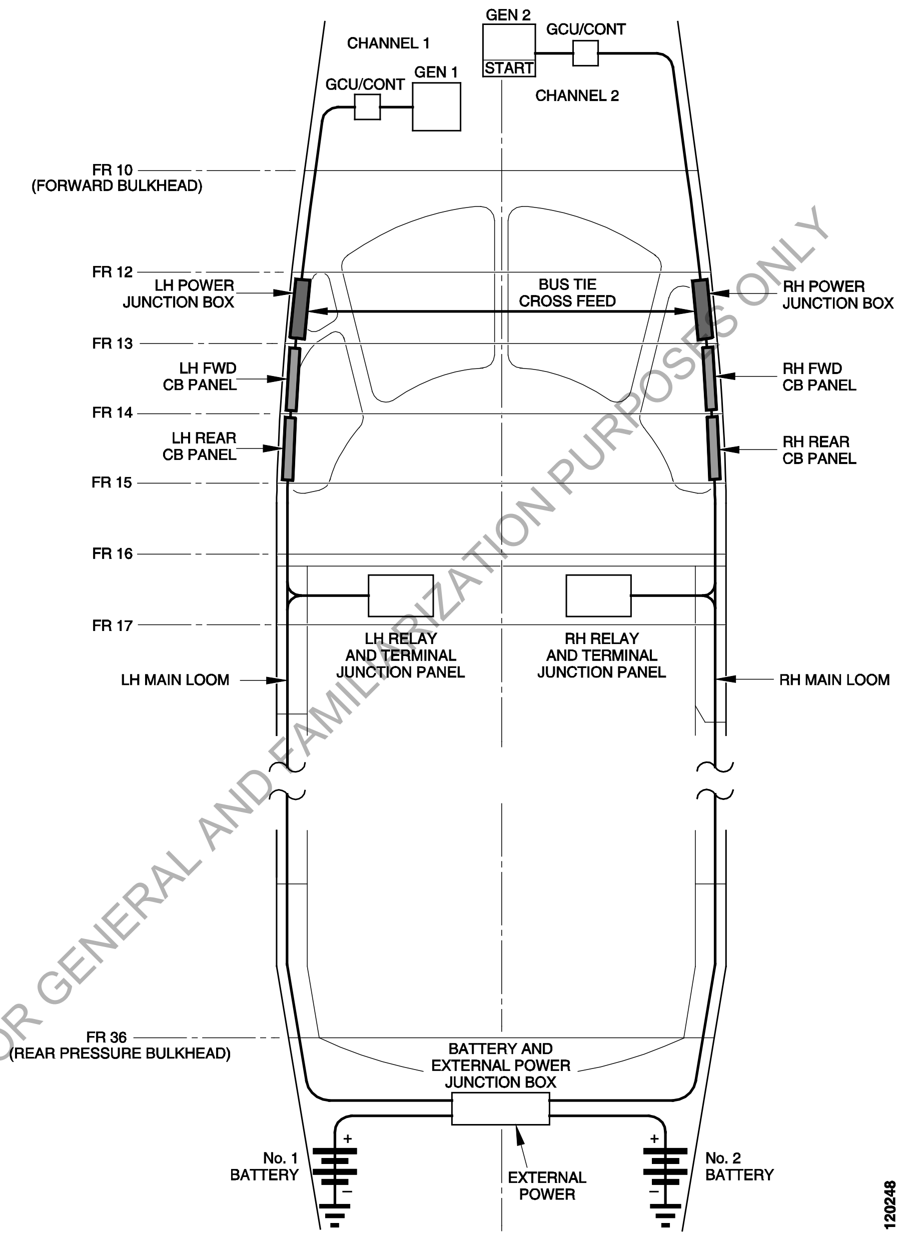

Figure 7-13-1. PGDS - Layout
(Sheet 4 of 4)

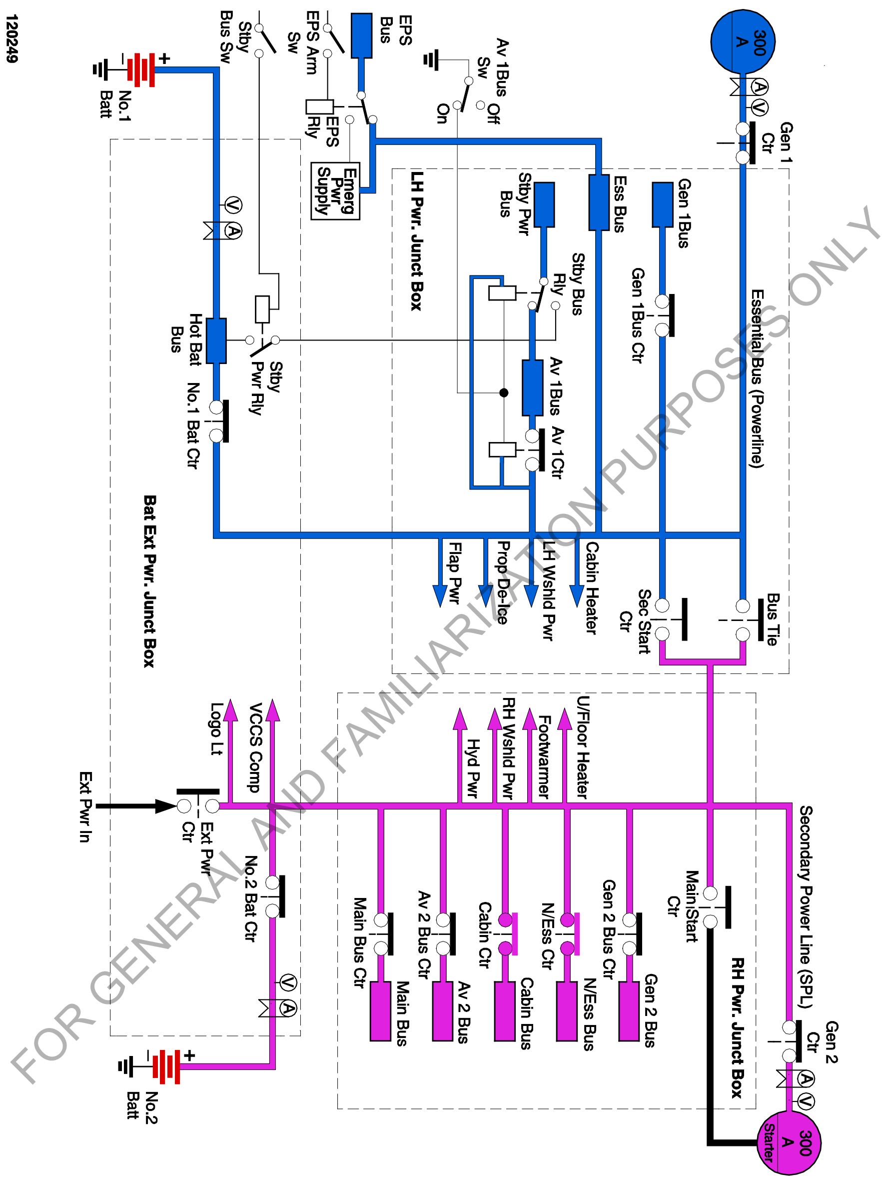

Figure 7-13-2. PGDS Normal Operation Condition – Both Generators On-Line
(Sheet 1 of 4)

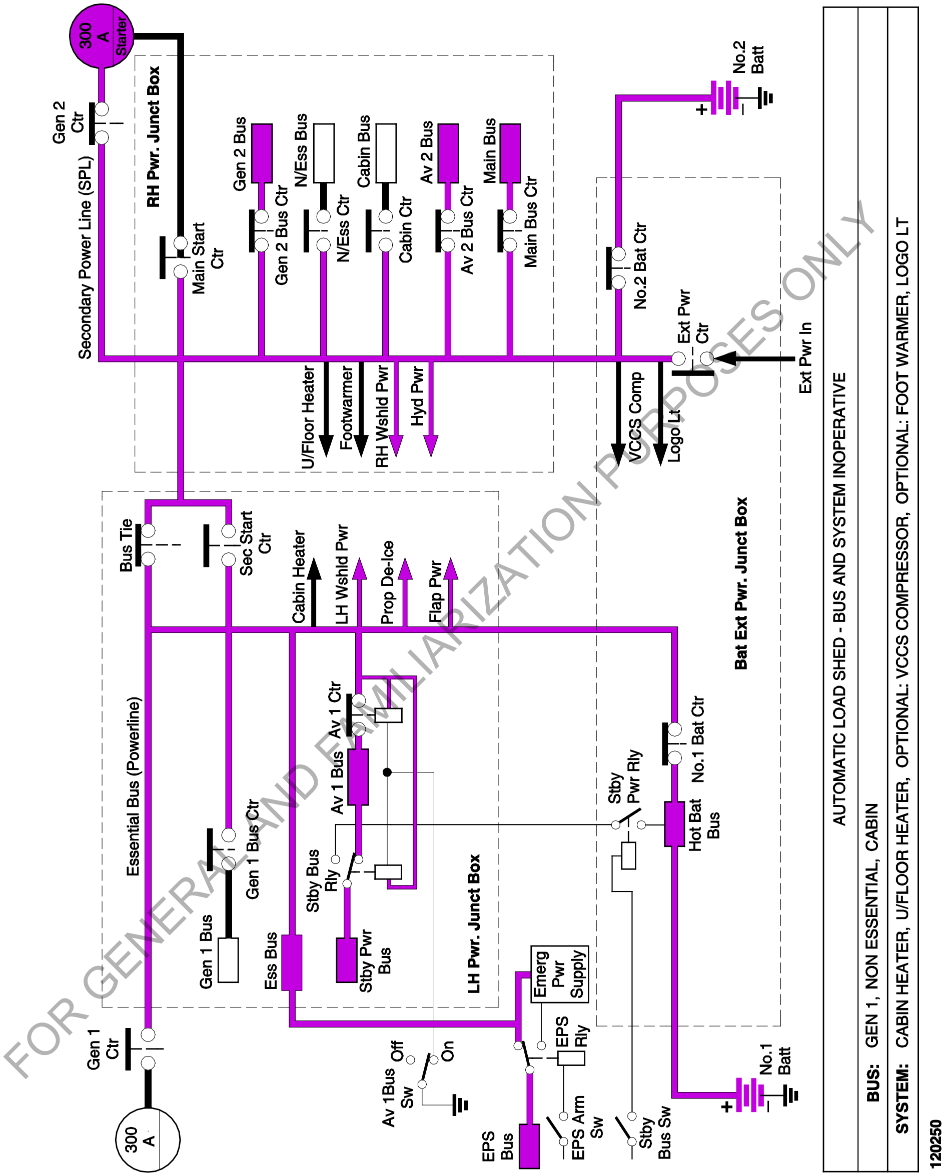

Figure 7-13-2. PGDS Abnormal Operation Condition – Generator 1 Off-Line
(Sheet 2 of 4)

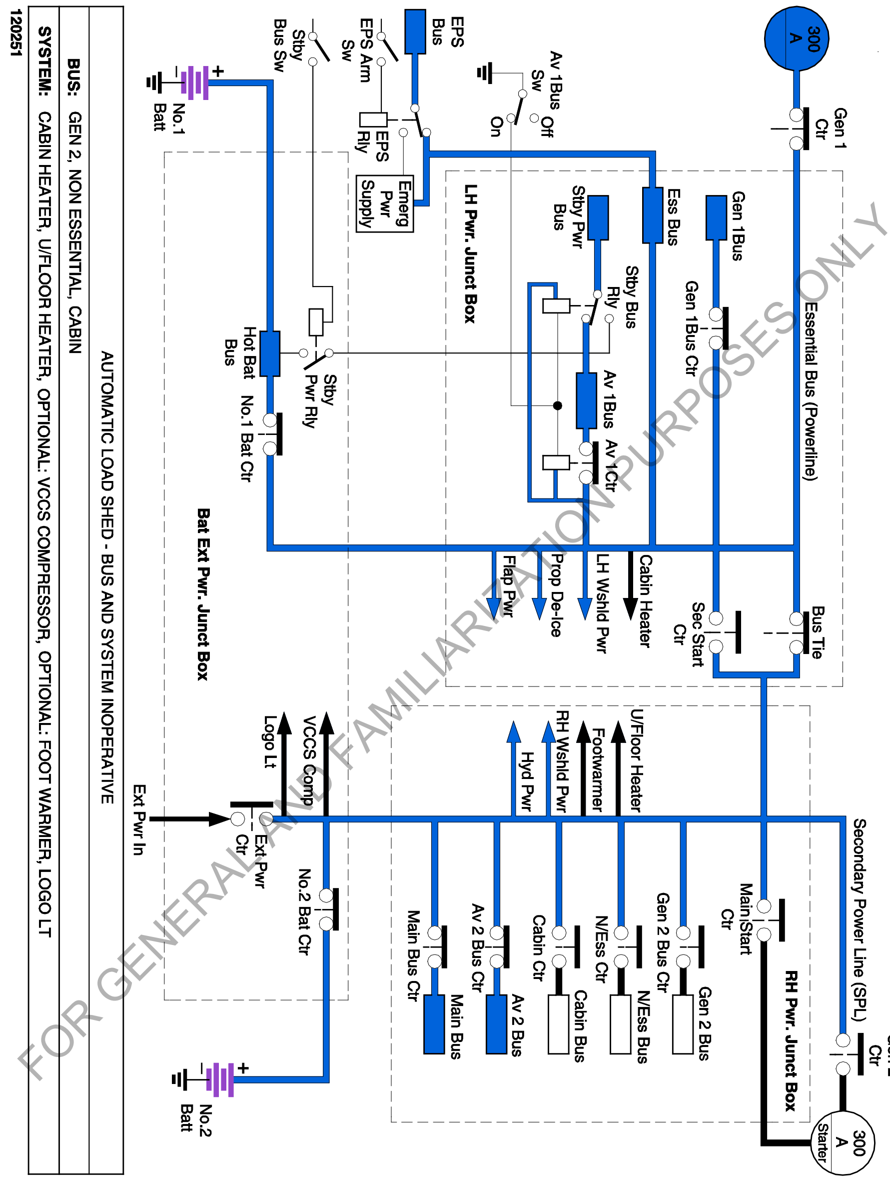

Figure 7-13-2. PGDS Abnormal Operation Condition – Generator 2 Off-Line
(Sheet 3 of 4)

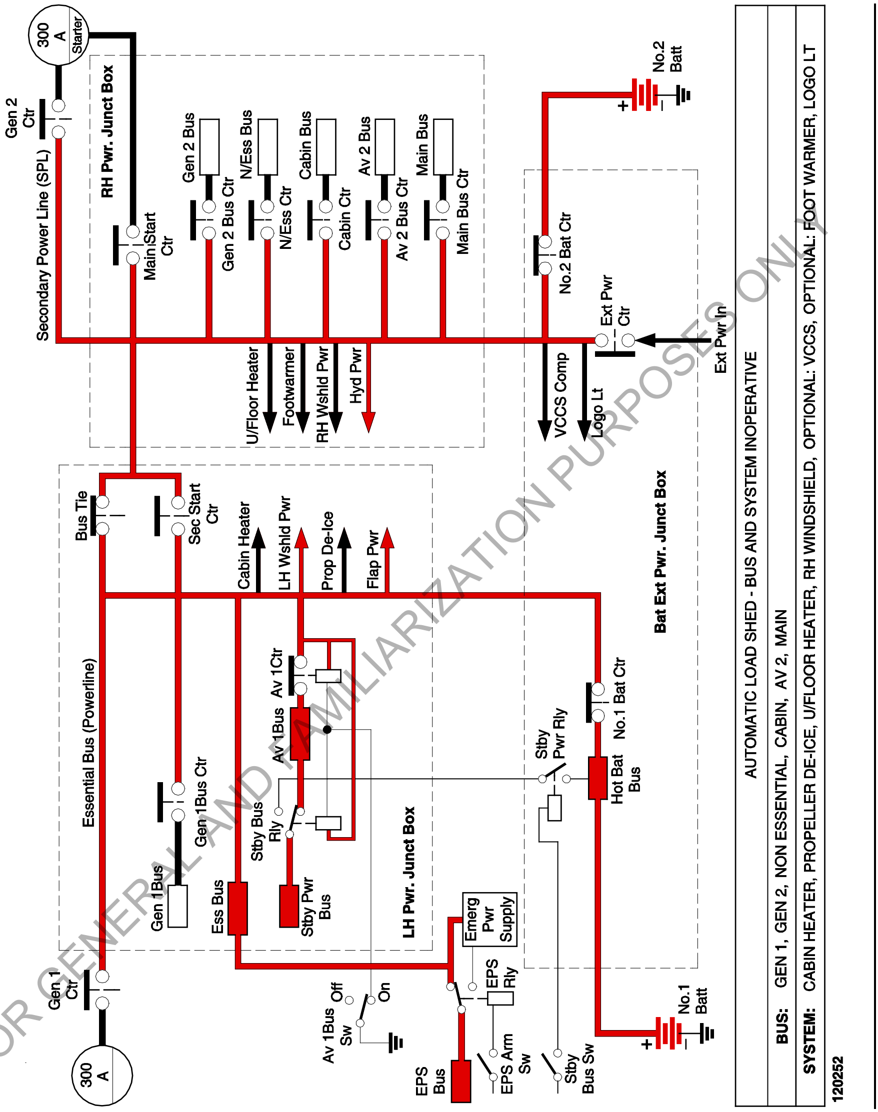

Figure 7-13-2. PGDS Emergency Operation Condition – Both Generators Off-Line (Sheet 4 of 4)

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LIGHTING

INTERIOR

Cockpit lighting consists of internally lit cockpit displays, controllers, switch panels, instrument panel and circuit breaker panel mounted floodlights, map lights, and a dome light.

WITH NO CCD INSTALLED

Cockpit light selection is controlled by switches and rheostats located at the aft end of the center console. Separate brightness control of the pilot, copilot, floodlight and overhead, crossbar and center console panels is provided. There are also cabin light switches for FLOOD 50% or 100% and READING.

WITH CCD INSTALLED

Light selection and brightness is controlled by rotary switches located near the aft end of the center console. The rotary switches control and adjust the brightness of the pilots and copilots cockpit flood lights and lighted panels and also to select night or day brightness of the advisory lights. The cabin flood and reading lights are controlled by a stacked rotary switch.

Separate intensity control of the PFD’s and MFD’s is controlled by rheostats located on the Display Reversionary Control Panel. The overhead dome light can be set to two preset intensities of 50% or 100% brightness. The Master Caution/Master Warning lights are on a fixed dim circuit. The map light switches are on each control wheel and the brightness is controlled by a separate rheostat.

A switch located on the forward edge of the passenger door (accessible when open) will activate a timer for the cockpit overhead panel, dome light and the passenger door light. When this switch is pressed, the overhead panel, passenger door light and 50% dome light will be on for 45 seconds to facilitate night preflight boarding.

For aircraft MSN 1576 - 1942, 50% cabin flood lights and the stair lights (if installed) are also activated by this switch. Cabin flood lights operate for 45 seconds. The stair lights remain active for approximately 4 minutes longer than the other lights.

The passenger door light illuminates the cabin airstairs and the baggage area has an overhead light. The main cabin is equipped with an overhead flood light system that can be set to 50% or 100% brightness as selected by the cockpit switch. Individual reading lights are provided for each passenger seat and are controlled by a switch in the cockpit and by a switch near each seat.

A baggage compartment light is operated by a push switch installed on the bulkhead trim adjacent to the cargo door. The light stays on for five minutes when the switch is pushed. For continued lighting the switch must be pushed again.

EXTERIOR

Exterior lighting consists of a navigation light and strobe light on each wing tip, a white position light on the tail (MSN 1451 - 1942: a combined ACL, navigation and tail light on each wing replaces the tail position light), a landing light on each main landing gear, a taxi light on the nose landing gear and a wing inspection light mounted in the left fuselage forward of the passenger door. These lights are controlled by switches located on the EXTERNAL LIGHTS section of the overhead panel.

Red flashing beacon lights are installed on the top of the horizontal stabilizer fairing and on the lower center fuselage. They give recognition during ground operation and additional anti-collision protection in flight. The lights are controlled by a BEACON switch located on the EXTERNAL LIGHTS section of the overhead panel.

RECOGNITION LIGHTS

Optional recognition lights and power supply units are installed in the left and right forward outer flap fairings. They provide forward illumination during taxiing and enhance the conspicuity of the aircraft in the traffic pattern or en-route. The lights are controlled by a RECOG switch located on the EXTERNAL LIGHTS section of the overhead panel. Aircraft MSN 1451 - 1942 replace the external power supply units with a central Power Supply Unit, which is mounted in the avionics bay.

Optional pulse recognition lights are installed in the left and right forward outer flap fairings. They provide forward illumination during taxiing and enhance the conspicuity of the aircraft in the traffic pattern or enroute. The lights can be on continuously or when set to pulse the lights illuminate alternately left and right approximately 45 times per minute. Power for the light control unit is supplied from the generator 2 bus through the PULSE LT CTL circuit breaker.
If the aircraft has an optional Collision Avoidance System installed, the pulse recognition lights are activated automatically when:

- The strobe lights are ON
- A Traffic Alert signal is received by the Collision Avoidance System.

The recognition lights will operate in Pulse Mode while the Traffic Alert is present. Once the alert is no longer active, the pulse recognition lights will revert to the previously selected mode.

LOGO LIGHTS

Optional logo lights can be installed under each side of the horizontal stabilizer. They provide illumination of the vertical stabilizer to show the owner’s logo. The lights are controlled by a LOGO switch located on the EXTERNAL LIGHTS section of the overhead panel. Power for the lights is supplied from the Battery and External Power Junction Box (BEPJB) through the LOGO LIGHTS circuit breaker. The BEPJB is installed in the rear fuselage. Each logo light has two filaments. On the ground with battery power, external power or one generator on line, only one filament in each light is illuminated. When both generators are on-line all four filaments will illuminate. If either generator fails in flight, all filaments are automatically switched off.

ENVIRONMENTAL CONTROL SYSTEM

GENERAL

Refer to Figure 7-15-1, Environmental Control System, for system layout.

The Environmental Control System (ECS) comprises:

- Air Cycle System (ACS)
- Auxiliary heaters
- Vapor Cycle Cooling System (VCCS), including Vent Fans and Flood Fan (optional)
- Vent Fans (if VCCS not installed)

The Air Cycle System (ACS) takes engine bleed air, reduces its temperature to that desired, and delivers it to the cabin air distribution system for pressurization and ventilation. The air cycle system cools a portion of the bleed air and then mixes it with hot bleed air to provide the correct temperature. A firewall shutoff valve can be closed to prevent contaminated air from entering the cabin in the event of an engine compartment fire.

One of the two auxiliary electrical heaters (cabin heater) is used to supplement the air cycle system during prolonged low temperature operations such as cruise at high altitude. The other heater (underfloor heater) heats the under floor avionic and electrical equipment. Both heaters can also be used for pre-heating the cabin and under floor equipment on the ground when external power is connected.

The Vapor Cycle Cooling System (VCCS) (when installed) is designed to operate on the ground from a 28 VDC ground power unit or aircraft electrical power when both generators are on. The electric motor driven system provides a means of pre-cooling the cockpit and cabin areas prior to and during passenger boarding, providing comfort prior to engine start. The system will automatically be controlled during ground operations and in flight, based on temperature demand setting. It removes a large percentage of the moisture as well as dust and pollen particles from the cabin air. If the VCCS is not installed the two vent fans remain installed. The vent fans provide additional air circulation to the cockpit and cabin.

All environment control systems are controlled by an integrated ECS controller and temperature selections can be made and seen by the pilot on the systems Multi Function Display (MFD) ENVIRONMENT status window.

ACS DESCRIPTION

The Air Cycle System (ACS) consists of a flow control venturi, a heat exchanger, a cooling turbine, a temperature control valve, a water separator, high pressure shutoff valve, a primary shutoff valve, an air flow control valve and associated non return valves and control sensors.

The flow control venturi is sized to regulate flow and pressure.

The heat exchanger is an aluminum single pass, crossflow, plate and fin unit. The unit includes one charge air tap to assist the injection of water into the heat exchanger coolant intake. The evaporation of the water on contact with the heat exchanger surface increases the efficiency of the unit.

The cooling turbine is a ball bearing turbo fan and consists of a radial turbine in a stainless steel assembly coupled to an axial flow fan. The turbine casing incorporates a containment ring.

The Temperature Control Valve (TCV) is three ported consisting of one inlet and two outlets and driven by a 28 VDC actuator. The valve body and rotating drum are aluminum. The actuator has gearing, limit switches, and magnetic brake to control the motor.

The water separator consists of an aluminum shell containing a coalescor and its support. The coalescor collects moisture from the passing air and forms large droplets which then enter a swirl section, where they are removed by centrifugal force. The separator has a spring loaded poppet valve which allows air to bypass the unit in the event of the coalescor becoming blocked.

The high pressure shutoff valve is solenoid operated and allows automatic selection between P3 and P2.5 compressor stages depending on flight condition to maintain the pressure schedule required for cabin pressurization.

A Firewall Shutoff Valve enables isolation of the system in emergency conditions such as an engine fire. Operation of the Firewall Shutoff Valve also opens a ram air scoop on the right fuselage underside which introduces ambient ventilation air through the distribution system. This is used in the event of smoke in the cockpit or cabin.

CAUTION

DUE TO THE COMPOSITE CONSTRUCTION OF THE ENGINE COWLING AND THE POSSIBILITY OF TOXIC GASES, THE AIRPLANE ACS MUST BE SHUTOFF WHEN A FIRE CONDITION IS SUSPECTED.

The air Flow Control Valve (FCV) at the cockpit outlet of the plenum chamber directs the ACS air to the cockpit and/or to the cabin, depending on the cockpit and cabin temperature settings.

Temperature data from the sensors in the cockpit and cabin is sent to the integrated ECS Controller. The integrated ECS Controller also receives signals from the control valves and duct temperature sensors.

The ACS has an ACS BLEED AIR switch on the switch panel located on the co-pilots lower left panel. The switch has the positions AUTO and INHIBIT.

ACS OPERATION

During engine start (ECS switches in AUTO position) the Primary Shutoff Valve (PSOV) is automatically kept closed (no bleed air) and the auxiliary heaters and VCCS are inhibited. When the engine Ng reaches 62% the PSOV opens and bleed air becomes available.

Air is drawn from the P2.5 and P3 compressor bleed ports on the engine casing. This consists of a single port in the case of the P2.5 connection and two diametrically opposed ports for the P3 connections. The bleed air will be taken exclusively from the P2.5 port during normal operation. However, when the engine is at idle there is insufficient pressure to maintain cabin pressurization. When the P2.5 bleed air pressure falls below a specific value, a pressure sensor in the bleed air ducting opens the high pressure shutoff valve. This creates a back pressure on the non-return valve at the P2.5 port and closes the valve to shut off the P2.5 bleed. The bleed air then passes through the Primary Shutoff Valve and the Flow control venturi, which is sized to regulate the bleed air flow rate and pressure.

The air then passes on to the Temperature Control Valve (TCV). At the TCV the bleed air splits where variable amounts are either supplied to the Heat Exchanger or to a mix point downstream of the Cooling Turbine.

The heat exchanger is cooled by ambient air drawn from a NACA intake in the airplane skin. Cooling airflow is provided by the Heat Exchanger Cooling Fan located downstream of the heat exchanger.

From the heat exchanger, the bleed air is passed to the Cooling Turbine. As the bleed air passes through the Cooling Turbine, its pressure is reduced to delivery pressure and its temperature is, in many cases, close to 0°C. The energy extracted from the bleed air is used to power the Heat Exchanger Coolant Fan which is mechanically linked to the turbine by a shaft.

The duct downstream of the turbine is the mixing duct where the now-cooled turbine exhaust air is mixed with un-cooled bleed air directed from the other port of the TCV. The mixing proportions are controlled by the TCV. The TCV is an electrically operated three port valve with one inlet and two outlet ports. Depending on the selected temperature the TCV modulates to either pass air through or bypass the Heat Exchanger and Cooling Turbine. The TCV operation is controlled by the ECS Controller. The TCV will move to allow more bleed air to bypass the Cooling Turbine if the cabin temperature is less than desired. Conversely it will move to pass more air through the Heat Exchanger and Cooling Turbine if the temperature is greater than desired.

The temperature of the duct downstream is monitored by a temperature sensor and will limit the movement of the TCV as required to keep the duct temperature within the maximum and minimum temperature limits.

From the mixing duct the conditioned air passes through a water separator. Moisture is removed from the conditioned air and drawn to the heat exchanger and sprayed into the heat exchanger intake. The conditioned air passes through the Firewall Shutoff Valve and the non-return valves to the cabin for distribution. The non-return valves prevent sudden depressurization in the event of a loss of cabin air supply.

The air enters a small plenum where it is distributed to the cabin and through the Flow Control Valve (FCV) controlled by the ECS Controller to the cockpit. Cockpit air is directed to outlets at the crews feet and adjustable outlets adjacent to the instrument panel. Air to the cabin is introduced through fixed outlets placed at floor level along both sides of the cabin.

The integrated ECS Controller adjusts the position of the TCV and FCV to give the warm/cold air mix for the system default temperature of 21° C, or that set by the pilot, for the cockpit and cabin.

For a takeoff at limited power (hot and high) the ACS BLEED AIR switch can be set to INHIBIT and after takeoff the ACS BLEED AIR switch can then be set to AUTO.

The ACS will automatically shut down when the engine Ng is less than 62%.

Refer to ECS Operation for further information on the operation and for the control of the ACS.

AUXILIARY HEATING DESCRIPTION

The system comprises two 28 VDC heating units each equipped with a 75 mm mixed flow fan. Each unit is cylindrical in form and contains two heating elements producing 1.625 kW/unit. The system therefore produces 3.25kW in addition to that of the air cycle system. The units are situated under the cabin floor, one is dedicated to heating the cabin and the other to heating the under floor avionics bay. The cabin heater is supplied 28 VDC power from the powerline (left Power Junction Box) and the under floor heater is supplied from the secondary powerline (right Power Junction Box).

The under floor heater is located between frames 21 and 22. The fan scavenges its air supply from the general under floor zone, through a wire mesh inlet grill, and passes it over the heating element where its temperature is raised. The air is then distributed along the length of the under floor avionics bay by way of a longitudinal distribution duct.

The cabin heater is located between frames 29 and 30. The fan draws its air supply from the cabin, through a grill in the rear floor step. The heated air is then ducted directly to the ECS distribution duct in the right cabin sidewall and augments the ACS airflow. The airflow created by the cabin heater is effective in equalizing the temperature throughout the cabin.

Both heater units are equipped with an internal thermal protection system, which isolates the heater when the element temperature overheats. In the event of an over heat, the fans continue to run and the relevant CABIN HTR circuit breaker (located on the left PJB) or U/F HEATER HTR circuit breaker (located on the right PJB) will trip. The heater will remain isolated until the temperature falls within the heater allowing the circuit breaker to be reset by the pilot.

The power for the heater element circuits is interrupted when the hydraulic pump or cooling system (VCCS) is operating. The under floor fan continues to run, the cabin fan is inhibited. This minimizes generator accessory loads during continuous normal operation and prevents generator overload.

The heating capacity of the system is reduced while the engine is operating at P3 bleed in flight. The cabin heater and fan are inhibited while airborne and P3 bleed is extracted, the under floor heater and fan remain operating. While on the ground (WOW valid) the cabin heater and fan continue to operate when P3 is extracted. During engine start and for 10 seconds following engine start both heaters and fans are inhibited.

The function of the power inhibits are fully automatic and require no pilot input. Thermal protection, once tripped, will require pilot action to reset.

There is an ELECTRICAL HEAT/COOL switch on the switch panel located on the co-pilots lower left panel. The switch has the positions AUTO and INHIBIT.

AUXILIARY HEATING OPERATION

When the system is in operation the under floor fan runs continuously and the heater element is switched on when the under floor sensor reads below + 5°C and is switched off above + 11°C. The cabin fan runs continuously when the cabin heater is in operation as demanded by the ECS Controller. The cabin heater function is to automatically supplement the ACS cabin heating supply during prolonged low temperature operations such as cruise at high altitude.

Refer to ECS Operation for the control and operation of the auxiliary heating system.

VCCS DESCRIPTION

A refrigerant gas is the media which absorbs heat and rejects heat from the cabin air. By continuous recirculation of cabin air, heat is absorbed in the evaporator modules and transferred to the outside through the system condenser.

The system is provided with safety interlock devices to prevent component damage and/or excessive power drain from the aircraft electrical system. The evaporator modules are equipped to prevent coil icing at all ambient conditions.

Cabin temperature control is by varying the airflow through each evaporator module rather than cycling the refrigerant compressor. If required the airflow can be reduced by the flight crew. The cabin is cooled by air ducted from the two evaporators (vent fans) located just forward of the aft pressure bulkhead and exhausted through individual vents down the left and right sides of the cabin overhead panel. A third evaporator (flood fan), located between the other two, exhausts air directly into the cabin.

The cockpit is cooled by individual outlets located in the overhead panel. These outlets receive air ducted from the two evaporators (vent fans) in the cabin.

There are ELECTRICAL HEAT/COOL, FANS VENT and FLOOD switches on the switch panel located on the co-pilots lower left panel. The ELECTRICAL HEAT/COOL and FANS FLOOD switches have the positions AUTO and INHIBIT. The FANS VENT switch has the positions AUTO and LOW.

VCCS OPERATION

When the system is activated, an electric motor drives the compressor at constant speed and capacity which compresses the refrigerant gas to high pressure. The hot, high pressure gas then passes through the condenser coil where it is cooled and condensed into a warm liquid at constant pressure. The heat removed from the fluid is exhausted overboard through a vent in the right rear tail section aft of the pressure bulkhead. The warm liquid from the condenser is then routed into a receiver-dryer container where the liquid and any remaining gas are separated and any moisture in the liquid is absorbed. The warm dry, high quality liquid is then routed to the evaporator module expansion valve where the high pressure liquid is expanded to a low pressure. The large expansion process creates a super cool liquid which passes through the evaporator coil and absorbs heat from the warm cabin air. The cooled air is returned to the cabin. The gas, now warm, is returned to the compressor to repeat the cycle.

Moisture removed from the cabin air by each evaporator drains into a small holding tank below the rear baggage floor panel. The water is held in the tank until the cabin differential pressure is low enough for the tank outlet valve to open allowing the water to drain overboard.

The VCCS is controlled by the integrated ECS Controller and the operation is based on defined hysteresis band between the sensed cockpit/cabin temperatures and those set by the pilot. When the selected cabin temperature demands the cabin to be cooled the ECS Controller will select the appropriate fan speed and the VCCS on. For a small difference between the sensed and selected temperatures the vent fans will be set to low. For a larger difference the vent fans will be set to high and for a large temperature difference the flood fan will also come on. If desired the pilot can set the FANS – VENT switch to LOW or the FLOOD switch to INHIBIT at any time to reduce noise and airflow.

The vent fans blow cool air into the left and right overhead ducts. Individual outlets in the overhead panel are adjustable for local temperature control at each seat location. The center flood fan blows cool air directly into the cabin.

When the VCCS is operating, the GEN 2 DC Indication will increase by approximately 80 amps for compressor and evaporator fans operation.

Refer to ECS Operation for the control and operation of the VCCS.

ECS OPERATION

The normal operation of the ECS is with all the switches in the AUTO position and with the adjustable air outlets open at the overhead and side positions. The ECS Controller then automatically controls the cockpit and cabin air temperatures as set by the pilot on the systems MFD ENVIRONMENT status window. The cockpit and cabin temperatures can be set with Multi Function Controller or by the bezel buttons. If the Multi Function Controller is used, press the arrow keys on the controller to bring the window into focus, then use the joystick to position the cursor on the CKPT or CAB temperature slider bar. Turn the Multi joystick knob to move the slider bar left to a colder or right to a warmer position. The other method of temperature adjustment is by pressing the bezel button adjacent to the CKPT TEMP or CAB TEMP soft key which then displays the up/down arrow legends. Press the adjacent up or down bezel button to move the slider bar left to a colder or right to a warmer position. Due to the system design only a temperature difference of up to a maximum of 5°C between the cabin and cockpit can be set. After more than 5°C movement of one slider bar the other slider bar will also move in the same direction. Temperature selection can be from full heating (both slider bars fully right) (ACS air to maximum allowable temperature and auxiliary heater on, VCCS and fans off) to full cooling (both slider bars fully left) (ACS air to minimum allowable temperature and auxiliary heater off, VCCS and fans on). The actual cockpit, cabin and underfloor (optional) temperature readings are displayed at the bottom left of ENVIRONMENT status window.

After temperature adjustments have been made with the temperature slider bar, allow the system to stabilize for a few minutes and adopt the new setting. During descent, the system has a tendency to overheat the cockpit slowly, therefore the recirculation fans should be allowed to blow fresh air out of the overhead outlets into the cockpit. If the system is unable to reach the preselected temperature values, the aircraft could be operating in high ISA deviation temperatures outside the system performance capabilities or one of the system components may have failed.

The ECS Controller receives data signals from the:

- ACS TCV and FCV position, duct temperature conditions
- auxiliary heater power supplies and thermal safety switch position
- VCCS compressor motor and the vent and flood fan positions
- temperature sensors in the cockpit, cabin and underfloor

The ECS Controller sends and receives status signals to and from the Modular Avionics Unit (MAU) for the control switches and systems MFD ENVIRONMENT status and Crew Alert System (CAS) windows. It will also send a caution signal to the CAS window in the event of an ACS fault.

In the auto mode the ECS Controller adjusts the position of the ACS TCV and FCV to give the warm/cold air mix for the cockpit/cabin temperatures set on the ENVIRONMENT status window. If additional heating is required the cabin auxiliary heater and fan will be automatically selected on. If additional cooling is required the VCCS and fans will be automatically selected on.

The ECS Controller monitors the cabin underfloor temperature and will automatically select the underfloor heater on and off as necessary.

The VENT FANS can be selected from AUTO to LOW at any time with the ELECTRICAL HEAT/COOL in the AUTO mode. THE ACS BLEED AIR, ELECTRICAL HEAT/COOL and FLOOD FAN can be selected off by setting the switches to INHIBIT.

The auxiliary heaters and VCCS can be operated in an ECS Ground Mode for pre-heating or cooling the aircraft before engine start. With the aircraft on ground and the engine not running, and with a 28 VDC external power supply connected and powered on the ECS Ground Mode can be entered by changing the CKPT or CAB TEMP selection with the Multi Function Controller or by pressing the bezel buttons adjacent to the soft keys on the ENVIRONMENT status window.

INDICATION/WARNING

Cockpit, cabin and underfloor (with optional cold weather kit) air temperatures are displayed in the ENVIRONMENT window of the systems MFD.

The CAS window on the systems MFD displays the following Cautions for the ECS:

“ACS Low Inflow” caution will illuminate when:

- The ACS is automatically shutdown. Overpressure and overtemperature switches are installed to monitor the ACS system. If pressures greater than 40 psi are sensed in the bleed air line downstream of the flow control venturi, temperatures greater than 290°C in the bleed line upstream of the Primary Shutoff Valve, temperatures greater than 105°C are sensed in the air line downstream of the water separator, or if the Firewall Shutoff Valve is closed, the ACS will automatically shutdown.

- The CPCS is not able to achieve the required cabin pressure (due to ACS switched to INHIBIT, or insufficient ACS airflow, or excessive cabin air leakage) the Cabin Pressure Control Unit will detect a “ACS Low Inflow”.

“ECS Fault” caution will illuminate when the ECS Controller has detected a critical fault or if the ECS Controller has lost data communication with the MAU

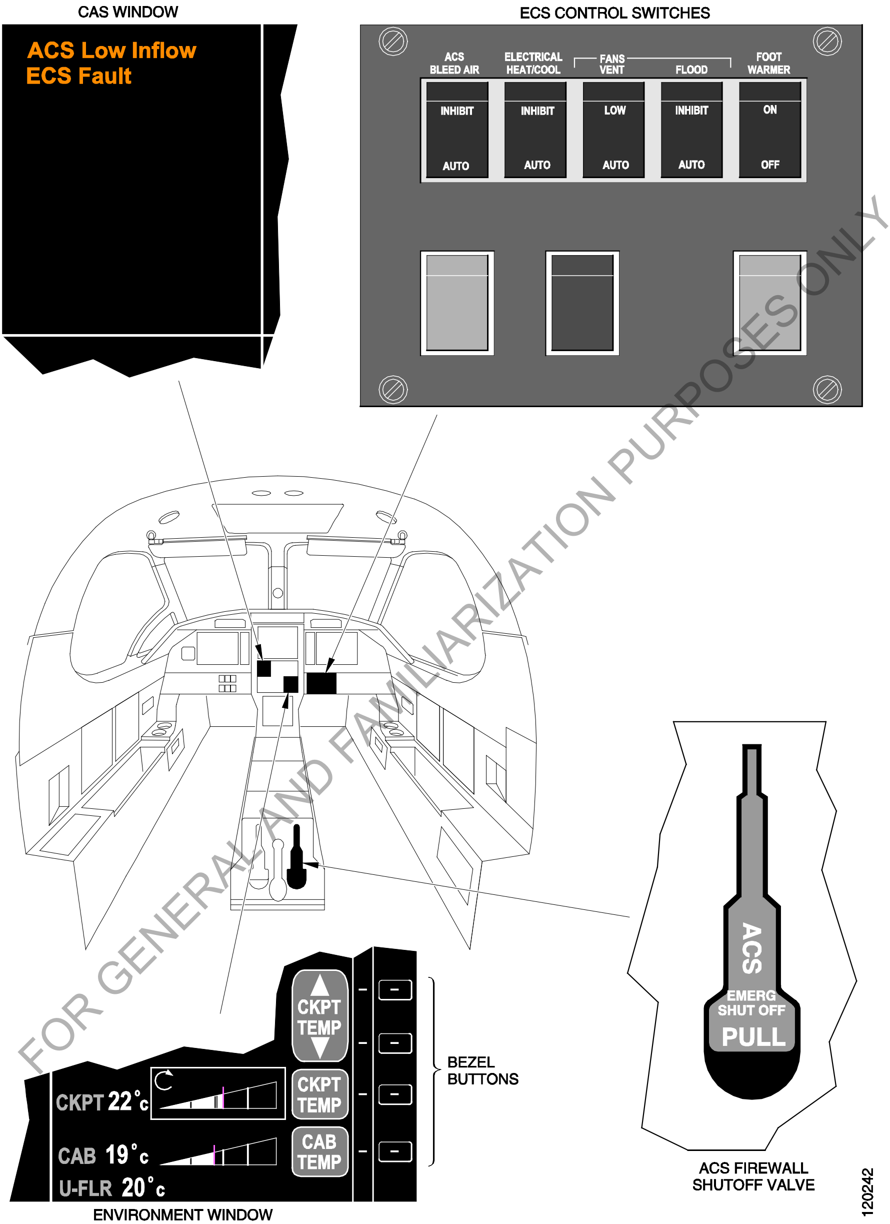

Figure 7-15-1. ECS - Controls and Indications
(Sheet 1 of 4)

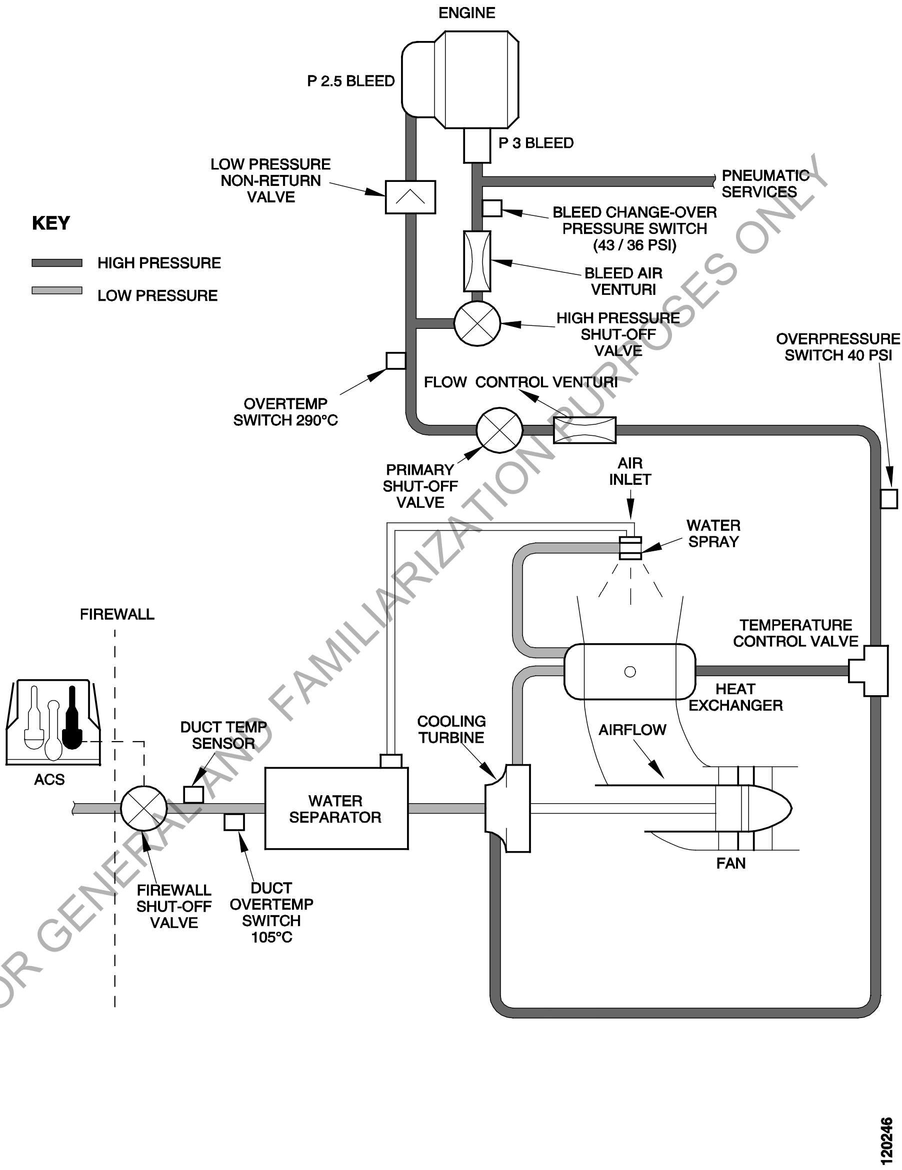

Figure 7-15-1. ECS - Air Cycle System (ACS)
(Sheet 2 of 4)

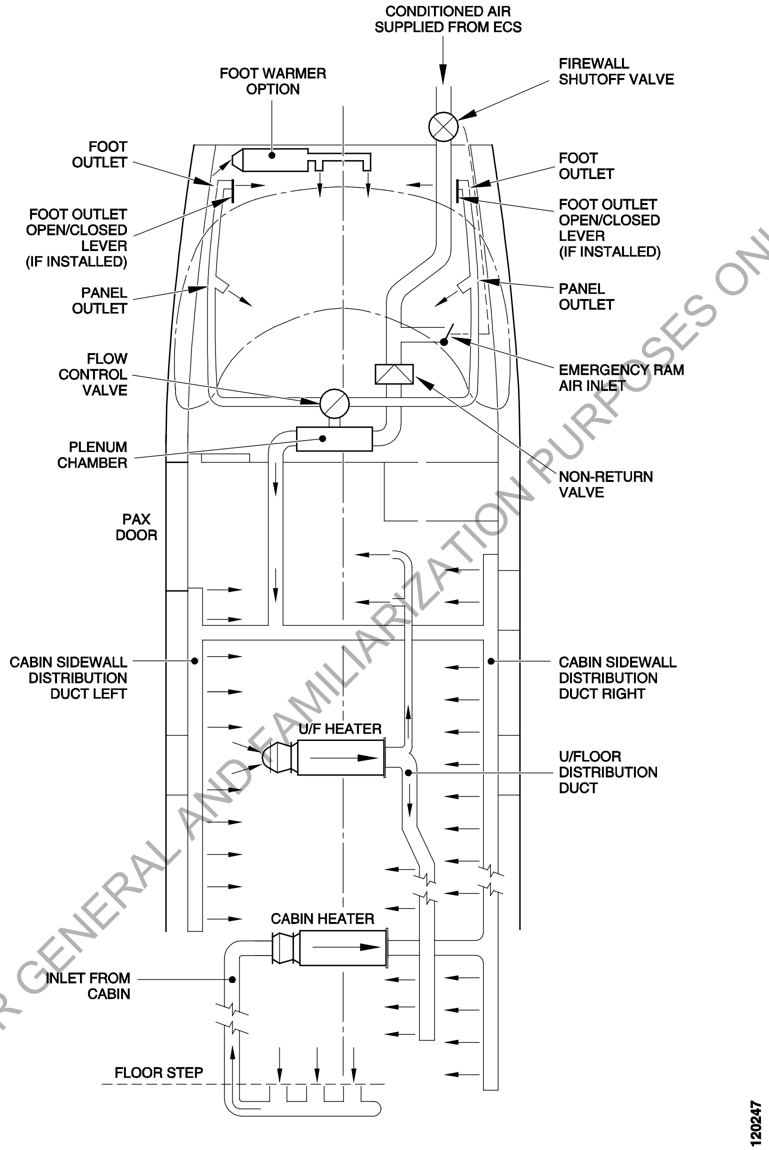

Figure 7-15-1. ECS - Auxiliary Heaters and Distribution Ducting
(Sheet 3 of 4)

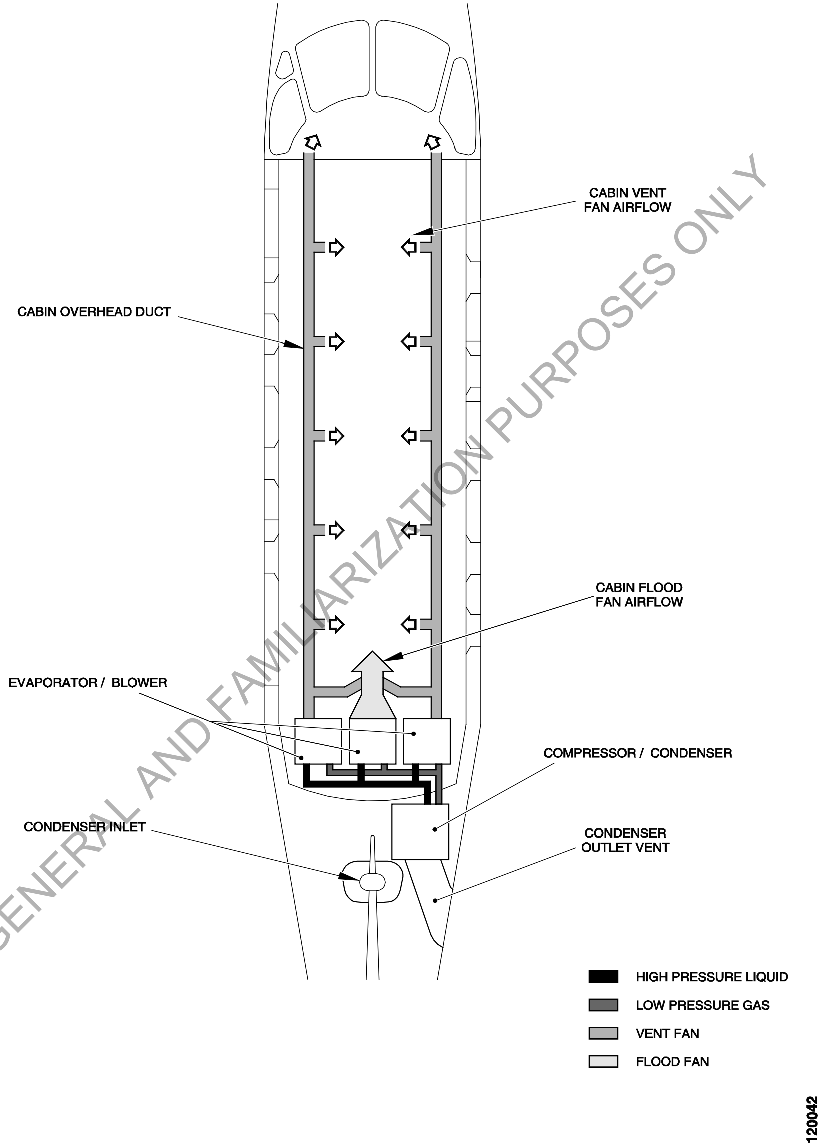

Figure 7-15-1. ECS - Vapor Cycle Cooling System (VCCS)
(Sheet 4 of 4)

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FOOT WARMER SYSTEM (OPTIONAL)

DESCRIPTION

The foot warmer system (when installed) comprises a 28 VDC 1kW heater installed forward above the cockpit floor. Ducting connects the heater to foot outlets at the pilot and copilot position. A FOOT WARMER switch is installed on the switch panel located on the co-pilot's lower left panel. It has the positions ON and OFF. Power is supplied from the secondary powerline to the heater relay and from the non essential bus through the FOOT WARMER circuit breaker to the switch.

OPERATION

The foot warmer system operates from the aircraft electrical power or from external power. When the FOOT WARMER switch is set to ON, 28 VDC is supplied to the heater relay. The relay is energized and the heater and fan operates. The heated air is sent by the fan to the pilot and copilot foot outlets. If the temperature of the heater becomes too high the thermal protection switch operates and de-energizes the heater relay.

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CABIN PRESSURE CONTROL SYSTEM

GENERAL

Refer to Figure 7-17-1, Cabin Pressure Control system, for controls and functional diagram.

The Cabin Pressure Control system (CPCS) comprises:

- A dual channel Cabin Pressure Control Unit (CPCU) (MSN 1001 - 1719)
- A dual channel Cabin Pressure Electronic Control and Monitoring Unit (ECMU) (MSN 545, 1721 - 1942)
- An electrically driven Outflow Valve (OFV)
- A pneumatic Safety Pressure Relief Valve (PRV)
- Two Negative Pressure Relief Valves (NPRV)

The systems Multi Function Display (MFD) has an ENVIRONMENT status window that allows the pilot to monitor and control the CPCS. Manual control of the CPCS functions for emergency operation are provided on the CPCS switch panel located on the co-pilots lower left panel.

The CPCU/ECMU controls the rate of exhaust of the air that the Air Cycle System (ACS) supplies as conditioned air to the cockpit and cabin. It keeps cabin air pressure within safe and comfortable limits for the passengers and crew, and the aircraft structure.

Operation of the CPCS is fully automatic during normal operation. A semi automatic mode called ‘Low Cabin’ is available, whereby the pilot can use Landing Field Elevation (LFE) as the target cabin altitude. The CPCS will then maintain the selected cabin altitude (as LFE) up to a maximum pressure differential of 5.75 psi.

DESCRIPTION

The CPCU/ECMU is a dual channel controller and is installed in the under floor pressurized area. The CPCU/ECMU channels sense cabin pressure and receive aircraft pressure altitude and rate of climb data from the Modular Avionics Unit (MAU). The cabin altitude, cabin rate of climb and cabin rate of descent and differential pressure are all automatically controlled by the CPCU/ECMU controlling the exhaust airflow from the outflow valve. The cabin internal pressures and airflow rates are controlled within limitations for safe and comfortable flight. A “Low Cabin” mode can be used for more comfort (cabin at lower pressure altitude) for flight up to intermediate cruise levels. Also, panoramic flights (frequent altitude changes) will be more comfortable using the “Low Cab” mode, due to a constant rather than continuously adjusting cabin pressure.

For MSN 1001 - 1719: The CPCU will automatically switch from one channel to the other in the event of a detected fault. One channel of the CPCU is supplied with 28 VDC from the Main Bus and the other channel is supplied from the EPS bus.

For MSN 545, 1721 - 1942: In the event of a detected fault in the AUTO channel, a CPCS FAULT caution will be annunciated and the pilot must switch the EMCU to the MANUAL channel. The AUTO channel of the ECMU is supplied with 28 VDC from the ESS Bus and the MANUAL channel is supplied from the EPS bus.

The Outflow Valve (OFV) has a circular butterfly plate that rotates in the valve body. The butterfly valve is operated by an actuator assembly which has two electrical motors and a gearbox. Each electrical motor is connected to and controlled by one of the two channels in the CPCU/ECMU. The OFV is installed on the cabin forward pressure bulkhead and exhausts air out through louvers in the equipment bay doors.

The Pressure Relief Valve (PRV) is a pneumatic poppet type control valve. The PRV contains a positive pressure relief metering section that senses differential pressure between the cabin and atmosphere. If the differential pressure exceeds the relief set point the valve will open to regulate the cabin to atmosphere differential pressure to below the maximum value. The PRV also has a negative pressure relief function and will open to allow atmosphere air to enter the cabin to prevent the atmosphere to cabin differential pressure from exceeding a given limit. The PRV is pneumatically actuated and is completely independent of the OFV and CPCU/ECMU.

The two Negative Pressure Relief Valves (NPRV) are non-return valves and are located in the rear pressure bulkhead. In case of negative pressure conditions they provide a second means to relieve cabin pressure.

The CPCS switch panel is located on the copilots lower left panel for control of the system. There is a guarded SYSTEM MODE switch with the positions AUTO and MANUAL, and a MANUAL CONTROL switch with the positions DESCENT and CLIMB.

There is also a guarded CABIN PRESSURE switch with the positions AUTO and DUMP. In case of emergency the switch can be selected to DUMP.

When the CPCS SYSTEM MODE switch is in the AUTO position, the ENVIRONMENT window on the systems Multi Function Display (MFD) will show a digital display for cabin altitude, differential cabin pressure, cabin altitude rate of change and Landing Field Elevation (LFE). The LFE can be automatically provided when the destination airport had been entered in the Flight Management System and the field elevation for the destination airport is in the data base. The pilot can manually enter the LFE and/or switch to a “low cabin” fixed cabin pressure sub-mode (Refer to Sect 4. CPCS Low Cab Mode Operation). When the CPCS SYSTEM MODE switch is selected to MANUAL no information associated with LFE will be displayed.

If the Landing Field Elevation (LFE) data to the CPCS becomes unavailable or invalid (e.g. due to an FMS failure or a MAU interface error), the CPCS uses the default LFE of 10000 ft to determine the target cabin altitude. Therefore, the flight crew must manually re-select the LFE early enough to prevent over or under pressurization. Alternatively, the CPCS SYSTEM MODE switch may be selected to MANUAL for manual control of the cabin altitude.

In the event of a CPCS malfunction, warning and caution messages will be shown in the CAS window of the system Multi Function Display.

OPERATION

The CPCS automatically controls the cabin pressure to:

- Depressurize the cabin on the ground to allow for door opening and crew/passenger entry and exit
- Pre-pressurize the cabin during takeoff and landing to prevent pressure bump excursions
- Control the cabin altitude and rate of change during flight for passenger comfort
- Prevent the cabin to atmosphere differential pressure limit being exceeded and the cabin altitude from exceeding 10,000 feet for normal operation
- Close the OFV to provide an automatic altitude limiting function if the cabin exceeds:
  - 14,500 ft (MSN 1001 - 1719), or
  - 14,800 ft (MSN 545, 1721 - 1942),

The normal mode of operation is with the switches in the AUTO position. The CPCS Controller then, using data from the Modular Avionics Unit (MAU), automatically controls the cabin air exhaust to optimize the cabin pressure comfort.

During climb the cabin pressure is controlled depending on aircraft altitude. During descent, the cabin pressure is controlled depending on aircraft altitude, rate and LFE.

The following table helps to understand the targeted cabin pressure altitudes for the automatic controlled scheduling in climb and descent mode:

A/C Altitude (ft)	Climb, Target Cabin Alt (in Flight)	Descent, Target Cabin Alt (in Flight)
30000	10000	10000
29000	9770	9770
28000	9074	9074
27000	8452	8452
26000	7890	7890
25000	7379	7379
24000	6908	6908
23000	6470	6470
22000	6060	6060
21000	5676	5676
20000	5315	5070
19000	4969	4447
18000	4633	3813
17000	4306	3170
16000	3989	2518
15000	3680	1857
14000	3379	1190
13000	3087	512
12000	2802	-175
11000	2523	-868
10000	2252	-1300
9000	1988	-1300
8000	1729	-1300
7000	1477	-1300
6000	1230	-1300
5000	989	-1300
4000	752	-1300
3000	520	-1300
2000	293	-1300
1000	69	-1300
0	-150	-1300
-2000	-2000	-2000

NOTE

The table shows the target values throughout the full operating range. For takeoff and landings, different control routines are followed to match the appropriate field elevation.

If the aircraft descends more than 1,300 ft (from previous stable altitude), the CPCS goes into so called descent mode, for which the cabin is controlled towards the ELEV pressure altitude. If the aircraft climbs more than 1,300 ft, (from previous stable altitude), the CPCS goes into so called climb mode, for which the cabin is controlled depending on aircraft altitude.

Before flight the pilot enters the Landing Field in the Flight Management System (FMS) and barometric correction on the Primary Flight Display (PFD), this information is then sent via the MAU to the CPCS. The Airport Identifier and Landing Field Elevation will be shown with an FMS ELEV legend in the ENVIRONMENT window. The CPCS also receives data from the MAU ref aircraft altitude, weight on wheels, takeoff power and doors closed. Ground mode Built in Test (BIT) is continuously running on the ground to make sure the system is ready to perform control for the next flight. On ground the OFV is controlled to full open.

If Landing Field information is not available from the FMS, the Landing Field Elevation (LFE) can be set manually via the Multi Function Controller or by the bezel button adjacent to the ELEV soft key on the systems MFD ENVIRONMENT status window. The LFE will be shown with an ELEV legend in the ENVIRONMENT window. If incorrect data is entered a DATA MISMATCH legend will be shown.

The Multi Function Controller or the bezel button adjacent to the CAB MODE soft key can be used to select Low Cab mode. The green LOW CAB annunciator will be shown in the ENVIRONMENT window. The CPCS will control the cabin pressure to the selected pressure altitude (LFE) as long as the max Δ px (5.75 psid) is not exceeded.

During takeoff with ACS inflow air present, the OFV is moved to a more closed position and then changes its position to control the cabin pressure rate of change.

In case of an aborted take-off the cabin will be automatically depressurized.

During climb the cabin altitude is scheduled to achieve 10,000 feet when the aircraft reaches 30,000 feet.

If a takeoff occurs at an airfield greater than 10,000 feet, the cabin is commanded to 10,000 feet or below just after takeoff at a fast rate so that the cabin altitude reaches 10,000 feet prior to the aircraft exceeding 25,000 feet. This is High Airfield Operation and the green HI FIELD annunciator will be shown in the ENVIRONMENT window until the aircraft climbs to above 25,000 feet.

When the aircraft reaches its cruising altitude and levels off, after a short period of time the commanded cabin pressure is held to a constant value for maximum stability. The CPCS has an automatic altitude limiting function that closes the OFV if the cabin pressure exceeds 14,500 feet (MSN 1001 - 1719) or 14,800 feet (MSN 545, 1721 - 1942).

During descent the cabin altitude is commanded towards the landing field elevation, limited by the differential pressure. If the landing field elevation exceeds 10,000 feet the cabin altitude is limited to 10,000 feet until the aircraft descends through 25,000 feet. The green HI FIELD annunciator will come on when descending through 25,000 feet and will remain on. On the ground, above 10,000 feet, the green HI FIELD annunciator will also come on.

A landing is made with slight differential pressure to reduce cabin pressure transients just before and during touchdown. Once landed the OFV is slowly moved to the open position to fully depressurize the cabin as the aircraft is taxiing.

The actual cabin altitude, cabin altitude rate of change and cabin to atmosphere differential pressure is displayed in the ENVIRONMENT window of the systems Multi Function Display (MFD). In the event of system malfunctions the CPCU/ECMU will send warnings and caution alerts to the Crew Alerting system (CAS). Procedures to clear CPCS CAS messages are given in Section 3.

The cabin pressurized warning monitor in the Monitor Warning System continually monitors the cabin pressure when the aircraft is on the ground. If the cabin does become pressurized on the ground or does not depressurize on landing with the SYSTEM MODE switch selected to MANUAL, the monitor warning function will give a CAB PRESS alert on the PFD and an aural “Cabin” message. Pilot actions required in this event are given in Section 3.

In an emergency manual control can be selected by setting the SYSTEM MODE switch to the MANUAL position. This disables the automatic mode completely and an amber CPCS MANUAL CTRL status message will be shown at the top of the ENVIRONMENT window of the systems MFD. The MANUAL CONTROL CLIMB DESCENT switch becomes active. This switch is spring loaded to the center position, and can be held to the CLIMB or DESCENT position which then sends a signal to both CPCU/ECMU channels and OFV drive motors to close or open the OFV. There will be a time delay between the switch operation and the change to the cabin altitude. Therefore, when setting a certain cabin altitude by use of the CLIMB/DESCENT switch, the switch should be pushed intermittently and cabin altitude monitored in order to avoid over or under shoots. Once the CLIMB/DESCENT switch is released, no open or close command is given to the OFV. The CPCU/ECMU altitude limit function will override the manual control by closing the outflow valve once the cabin altitude exceeds 14,500 feet (MSN 1001 - 1719) or 14,800 feet (MSN 545, 1721 - 1942).

Selection of the CABIN PRESSURE switch to the DUMP position will command the OFV to the fully open position with the effect of fully depressurizing the aircraft. DUMP will override the CPCU/ECMU altitude limit function and will open the outflow valve at any cabin altitude.

If the Passenger oxygen control valve selector is set to AUTO, the CPCS will automatically select the passenger oxygen system on at a cabin altitude of 13,500 feet (or at a higher set point for high airfield operations). With the passenger oxygen system pressurized the green PAX OXY annunciator will be shown in the ENVIRONMENT window of the systems MFD.

INDICATION/WARNING

Indications of the actual cabin altitude, cabin altitude rate of change and cabin to atmosphere differential pressure are displayed in the ENVIRONMENT window of the systems MFD. Under normal operating conditions the CPCS indications are given in white. If a cabin altitude or cabin pressure out of limits condition arises the CPCS indication will change to yellow for a caution or red for a warning condition with the relevant CAS caution or warning.

The Crew Alerting System (CAS) window of the systems MFD displays the following warnings and cautions for the CPCS:

RED WARNING

Cabin Pressure	Cabin pressure differential exceeds 6.35 psi or drops below -0.25 psi
Cabin Altitude	Cabin altitude is above 10,500 feet or above 14,200 feet in High Airfield Operation For MSN 545, 1721 - 1942: Secondary backup warning provided by the avionics based on ECMU input detects a cabin altitude above 14,800 feet

AMBER CAUTION

Cabin Pressure	For MSN 1001 - 1719: Cabin pressure differential is less than -0.15 psi or greater than 6.0 psi For MSN 545, 1721 - 1942: Cabin pressure differential is greater than 6.0 psi
ACS Low Inflow	Low airflow into cabin, or excessive cabin air leakage (OFV closed in the air, cabin altitude rate error more than 250 ft/min) (generated by the MAU)
CPCS Fault	For MSN 1001 - 1719: Both channels in CPCS controller have failed. Automatic control no longer available For MSN 545, 1721 - 1942: ECMU AUTO channel has failed. Automatic control no longer available

WHITE INFO

For MSN 1001 - 1719: CPCS Fault	On ground, maintenance message that one channel in CPCS has failed

The ENVIRONMENT window of the systems MFD displays the following annunciations when:

HI FIELD	Ground or Landing	The CPCS detects the aircraft is on the ground above 10,000 feet and the CPCS is in Ground or Landing mode
	Climb	Takeoff from airfield greater than 10,000 ft and aircraft altitude less than 25,000 ft and the CPCS is in Climb mode
	Descent	Selected landing field elevation is more than 10,000 ft and aircraft altitude less than 25,000 ft and the CPCS is in Descent mode
PAX OXY		Passenger oxygen system is pressurized
LOW CAB		Low cabin mode has been selected

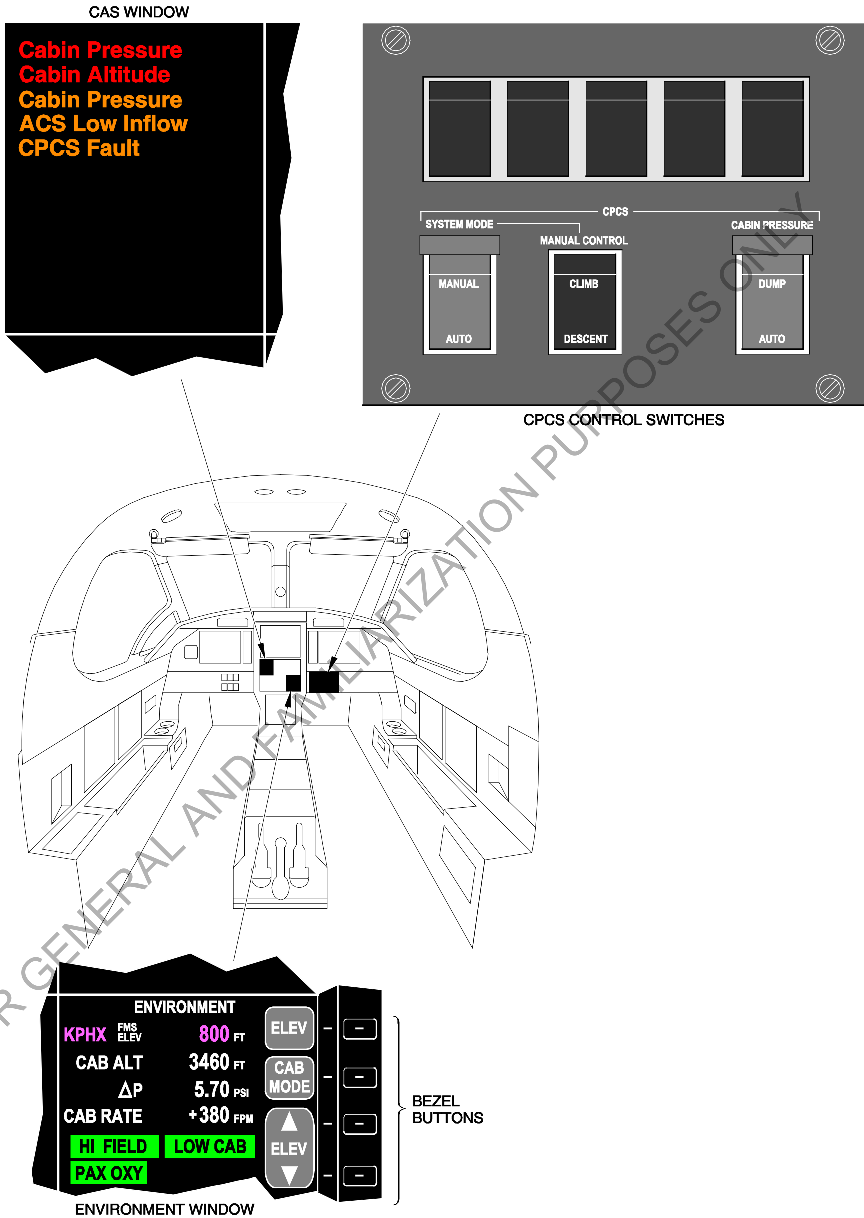

Figure 7-17-1. CPCS - Controls and Indications
(Sheet 1 of 3)

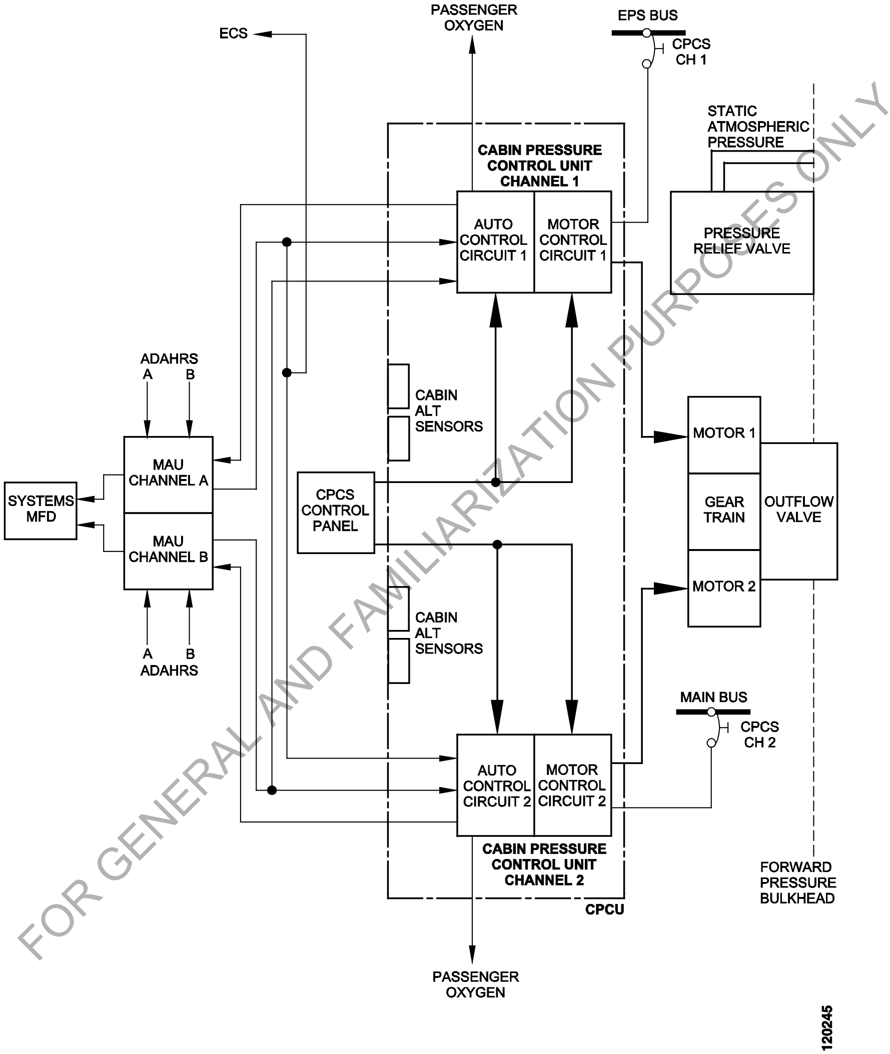

Figure 7-17-1. CPCS - Functional Diagram (MSN 1001 - 1719)
(Sheet 2 of 3)

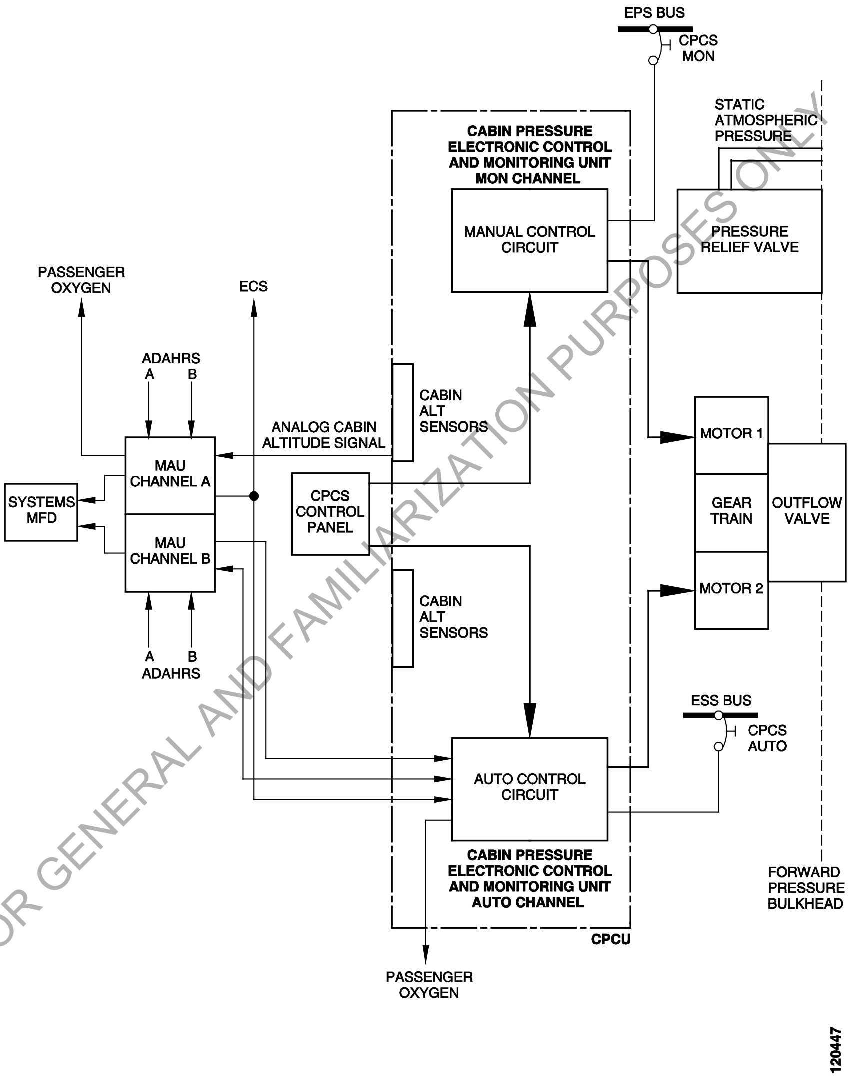

Figure 7-17-1. CPCS - Functional Diagram (MSN 545, 1721 - 1942)
(Sheet 3 of 3)

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OXYGEN SYSTEM

GENERAL

The aircraft is equipped with an emergency oxygen system for use by the crew and passengers in the event of contaminated air being introduced into the cabin or a loss of pressurization with a rapid descent to lower altitudes.

The pilot and copilot masks are supplied with quick-donning diluter-demand masks which are permanently connected to outlets in the cockpit sidewalls.

A constant flow mask is provided at each passenger seat location in the cabin. In the Corporate Commuter interior configuration the nine masks must be connected to the bayonet outlets in the cabin sidewall before flight by the flight crew for flights above 10,000 ft. In the executive interior configuration the masks (the number is dependent on the interior variation) are located in boxes in the arm rests and are permanently connected for all flights. No connection action is required by the flight crew or passengers.

DESCRIPTION

An oxygen cylinder, made of composite material, is located in an external compartment in the right side of the fuselage forward of the main wing (outside the pressure area) from which the oxygen system is serviced and replenished (Refer to Section 8 for servicing instructions).

Attached to the cylinder head is an isolation valve to permit cylinder removal and installation. The valve is connected by a push pull cable to a handle in the cockpit allowing the system to be isolated while the aircraft is on the ground. The valve is connected to the aircraft supply, ground charging valve, the contents pressure gauges and the over-pressure relief valve.

Two gauges are provided, one in the service bay and one on the left cockpit side panel forward of the Test Panel. Overpressure protection is provided by a relief valve in the form of a green rupture disc located in the fuselage skin above the service bay door. This disc is designed to rupture at 2775 +50/-0 psi, discharging the cylinder contents overboard. Disc integrity is checked during the preflight inspection. If found ruptured and the contents pressure gauge indicates zero, proper maintenance must be performed on the system before flights above 10,000 ft altitude.

When filled, the storage cylinder should be charged to 1841 psi (126.9 bar) at 20° C, with a minimum pressure of 265 psi (18.3 bar) for proper flow to the masks. A pressure reducing valve, adjacent to the oxygen cylinder reduces the oxygen pressure to a nominal 70 psi, prior to entering the cabin. This is for safety reasons and to avoid excessive flow through the masks.

Two crew full-face masks of the diluter demand type are located in boxes on the front of the cockpit bulkhead behind each crew member. They are permanently connected to outlets in the cockpit sidewalls. Each mask which is of the diluter-demand type, is equipped with a microphone and an ON/OFF - AIRMIX/100% selector valve. Oxygen is provided to the crew masks at all times regardless of the PASSENGER OXYGEN selector position. Each mask has a PRESS TO TEST button and a flow indicator that shows when proper pressure is supplied to the mask. Turning the PRESS TO TEST button counterclockwise to the emergency position will supply 100% oxygen at a slight overpressure.

The main OXYGEN lever is mounted to the right of the center console. It is connected by a push pull cable to the isolation valve on the cylinder head. While the aircraft is on ground the lever is normally in the OFF position isolating the cylinder from the system and preventing prolonged leakage from the crew masks. Before engine start and as the first action associated with the oxygen system, the lever should be moved to the ON position.

The PASSENGER OXYGEN selector, located in the left cockpit sidewall, has three positions to control the operation of the passenger distribution system. The OFF position stops the flow to the passenger outlets. The ON position permits flow to the passenger masks. The AUTO position will permit automatic pressurization of the passenger oxygen system when the Cabin Pressure Control System (CPCS) senses a cabin altitude above 13,500 feet +/- 500 feet or when in HI FIELD mode the cabin altitude is sensed above takeoff/landing field elevation +2000 ft or 14,500 +/- 500 ft.

In the Corporate Commuter configuration the passenger constant flow oxygen masks are stored under or near each seat position. For flights below 10,000 ft altitude the masks need not be connected to the outlets in the lower cabin sidewalls. In the event of an emergency requiring oxygen use, the passengers are instructed to connect the mask bayonet type connector to the outlets themselves. For flights above 10,000 ft altitude the mask must be connected to the outlets by the flight crew before flight. When disconnected, the outlets are spring loaded closed to prevent oxygen leakage.

In the executive interior configuration the passenger constant flow oxygen masks are stowed under covers placarded OXYGEN MASK INSIDE in the cabin sidewall armrests. The masks are permanently connected to the outlets irrespective of the type of operation and flight altitude. The mask stowage compartments are located near to the seats. The masks have a red tape band which must positioned to show from the cover in the direction accessible to the seat occupant. A placard PULL TAPE FOR OXYGEN MASK is attached to the armrest near each oxygen mask cover. An oxygen mask is installed in the lavatory. The mask is connected to the passenger oxygen system and is stowed in a box attached to the top of the lavatory sidewall. A visible red tape band is pulled to release the oxygen mask.

In aircraft with an optional three seat bench installed, an oxygen mask is stowed below each seat behind a cover in the front pedestal of the bench seat. A red tape band attached to the mask shows from the panel and assists in the removal of the mask, in the event of it being required for use.

OPERATION

WARNING

TO PREVENT POSSIBLE FREEZING AND MALFUNCTIONING OF SYSTEM, MAKE SURE THAT SYSTEM IS ONLY SERVICED WITH APPROVED, AVIATION GRADE OXYGEN.

TO PREVENT POSSIBLE EXPLOSION AND/OR FIRE, MAKE SURE ALL OIL AND GREASE IS KEPT AWAY FROM OXYGEN SYSTEM COMPONENTS.

SMOKING IS STRICTLY PROHIBITED ANY TIME OXYGEN IS IN USE.

OILY, FATTY OR GREASY SUBSTANCES, INCLUDING SOAPS, LIPSTICK, AFTER SHAVE LOTION, MAKE-UP ARE CAPABLE OF SPONTANEOUS COMBUSTION ON CONTACT WITH OXYGEN.

CAUTION

PILOTS WHO FLY AT HIGH ALTITUDE MUST BE AWARE OF THE PHYSIOLOGICAL PROBLEMS ASSOCIATED WITH PROLONGED FLIGHTS AT SUCH ALTITUDES. DEHYDRATION AND THE SLOW ONSET OF HYPOXIA MAY BE NOTICED IN THE PASSENGERS.

PASSENGER COMFORT MAY BE INCREASED BY AN OCCASIONAL INTAKE OF FLUIDS. PROLONGED HIGH ALTITUDE FLIGHTS REQUIRE WARM CLOTHING AND MONITORING OF THE CABIN TEMPERATURE AND THE PHYSICAL STATE OF THE CREW AND PASSENGERS.

Normal system operation is with the three-position PASSENGER OXYGEN selector in the AUTO position, to provide oxygen immediately in the event of a depressurization. The crew will then don their own masks and order the passengers to don their masks. The masks in an executive interior aircraft can easily be removed from their stowage by pulling the red tape band showing from the cover marked OXYGEN MASK INSIDE. Oxygen availability to the cabin is verified by the oxygen pressure switch activating the PAX OXY annunciator in the ENVIRONMENT window of the systems MFD.

The ON position will be selected by the pilot, in the event of smoke or fumes being present in the cabin, and also to test the passengers masks on the ground before passenger boarding. The OFF position will be selected if the aircraft is being flown without passengers or is taken out of service for an extended time in order to conserve oxygen.

NOTE

When a full oxygen supply is stored, it will supply two crew and nine passengers for a minimum of ten minutes, in which time a descent from 30,000 ft to 10,000 ft is performed. Refer to the Oxygen Duration Chart in Section 4 to determine the minimum oxygen supply required for the number of occupants when operating at less than full oxygen pressure.

As the oxygen system is an emergency system, normal usage will consist only of periodic mask testing (both crew and passengers masks require testing) and of checking, and topping up, if necessary, the storage cylinder.

INDICATION / WARNING

Oxygen system pressure is indicated on a gauge on the left cockpit sidewall forward of the Test Panel. The PAX OXY annunciator will show in the ENVIRONMENT window of the systems MFD when oxygen pressure is supplied to the passenger masks (Refer to the Cabin Pressure Control System section for more information).

LARGER CAPACITY OXYGEN SYSTEM (OPTIONAL)

REAR LEFT SIDE

The system has a 1965 liter gaseous oxygen cylinder installed in the top left side of the rear fuselage compartment, behind the rear pressure bulkhead. The large cylinder replaces the standard smaller oxygen cylinder. The cylinder head isolation valve is secured in the open position. System shut off, when the aircraft is on the ground, is by a rotary valve connected to the cable from the oxygen shut-off handle on the center console. The rotary valve is installed between frames 16 and 17 on the right side of the fuselage. A pressure transducer installed near the oxygen cylinder sends a pressure signal to the pressure gauge on the left side of the cockpit. The oxygen replenishment point comprising a charging valve and a system pressure gauge is installed at the bottom of the rear fuselage compartment. The system overpressure protection burst disc indicator is installed on the left side of the rear fuselage.

System controls and operation are the same as for the standard system. The system with full oxygen pressure will meet the Canadian Operational CAR 605.31 and CAR 605.32 requirements. Refer to the Oxygen Duration Chart in Section 4 to determine the minimum oxygen supply required for the number of occupants when operating at less than full oxygen pressure.

REAR RIGHT SIDE

The right side larger capacity oxygen system has the same operation and components as the left side. The following components have a different location. The oxygen cylinder is installed in the top right side of the rear fuselage compartment. The oxygen replenishment point comprising a charging valve and a system pressure gauge is installed at the bottom right of the rear fuselage compartment. The system overpressure protection burst disc indicator is installed on the right side of the rear fuselage.

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COCKPIT ARRANGEMENT

GENERAL

Refer to Figure 7-19-1, for the Cockpit Layout.

The cockpit avionics suite is based on a four Display Unit layout (the fourth DU is optional), arranged in a T configuration. All of the cockpit controls, switches, and displays are readily accessible to the pilot for single pilot operation. There is an overhead control panel which contains the switches for electrical power management and various systems. The sidewalls contain the circuit breaker panels. The center console contains the controls and switches.

DESCRIPTION

The overhead panel has ELECTRICAL POWER MANAGEMENT, SYSTEM TEST, FUEL PUMPS, ENGINE START, EXTERNAL LIGHTS and PASSENGER WARNING sections. These sections are fully described in their associated systems descriptions within this section.

The left Display Unit (DU) is the pilots Primary Flight Display (PFD), the center upper DU is the Situation Awareness Multi Function Display (MFD), the lower MFD is the systems MFD and the right optional DU is the copilot PFD. The two MFD's can be swapped (systems on the upper MFD and the Situation Awareness on the lower MFD).To the left of the pilots PFD is the clock (if installed) and Electronic Standby Instrument System (ESIS), the main function of which is to display altitude, attitude and airspeed in the event of a total failure of the primary avionic system. The clock (if installed) is powered directly from the Hot Battery bus (**pre SB 31-015 or pre SB 31-016**) or the Standby Bus (**post SB 31-015 or post SB 31-016**). To the right side of the pilots PFD (and to the left of the copilots PFD if installed) are the PFD and Radio control panels. Above the pilots PFD is the No. 1 Audio/Marker panel. Above the copilots PFD (if installed) is the No. 2 Audio/Marker panel (if installed). Above the center upper MFD is the Flight Guidance Control Panel and below the lower MFD is the MF Controller and Display Reversion Control panel. A parking brake handle is located forward of the left bottom side panel below the instrument panel.

The lower right panel on the pilot's side contains switches for the ice protection systems and the landing gear selector. An optional ADAHRS Heading Override push switch can be installed on the right side of the pilot's lower left panel. The lower left panel on the copilot's side contains the ACS and pressurization control switches.

The center console contains the ELT switch, the trim and flap interrupt and alternate stab trim switches, and the engine power controls and flap lever. Further aft are the cockpit and cabin lighting controls. At the top rear of the center console there is a flat area where the Cursor Control Device (CCD) can be installed. The ACS and fuel firewall shutoff valve controls and the emergency landing gear handpump can be found on the aft vertical surface of the console. On the forward right side of the console there is a main OXYGEN lever.

On the rear left sidewall there is a panel which contains the flight time counter, oxygen pressure gauge, MIC SELECT, AURAL WARN inhibit and EMERG COM 1 switches. When the optional 110 VAC power outlet system is installed the ON/OFF switch is also located on the panel. At the rear of the panel are the pilot MIC, PHONE and the active noise reduction headset connections. Located in a recess at the rear of the left sidewall is the PASSENGER OXYGEN selector, and oxygen and mic connections for the crew oxygen mask. Above this area there is a storage point for the control wheel lock. On the lower left sidewall a removal panel gives access to the document stowage area and also provides storage for the Primus Apex software CD’s. Further forward a map light is installed above the two circuit breaker panels in the sidewall. There is provision for document stowage and a cup holder built into the sidewall panel. At the top of the forward left sidewall there is hand/mic in a stowage area. Below the hand/mic stowage area is the optional dual USB charging port (factory option or Post SB 25-044). Lower down there is a recess in the sidewall to give access to the circuit breakers on the left Power Junction Box (PJB).

The right sidewall is similarly equipped but without the control wheel lock, oxygen pressure gauge and control valve. The similar panel at the rear only has the MIC SELECT switch and the copilot MIC, PHONE and the active noise reduction headset connections. When the optional 110 VAC power outlet system is installed a 110 VAC power outlet is installed on the panel. There are two small removal panels on the right sidewall, they are used by maintenance for access to the brakes reservoir and the ground maintenance panel.

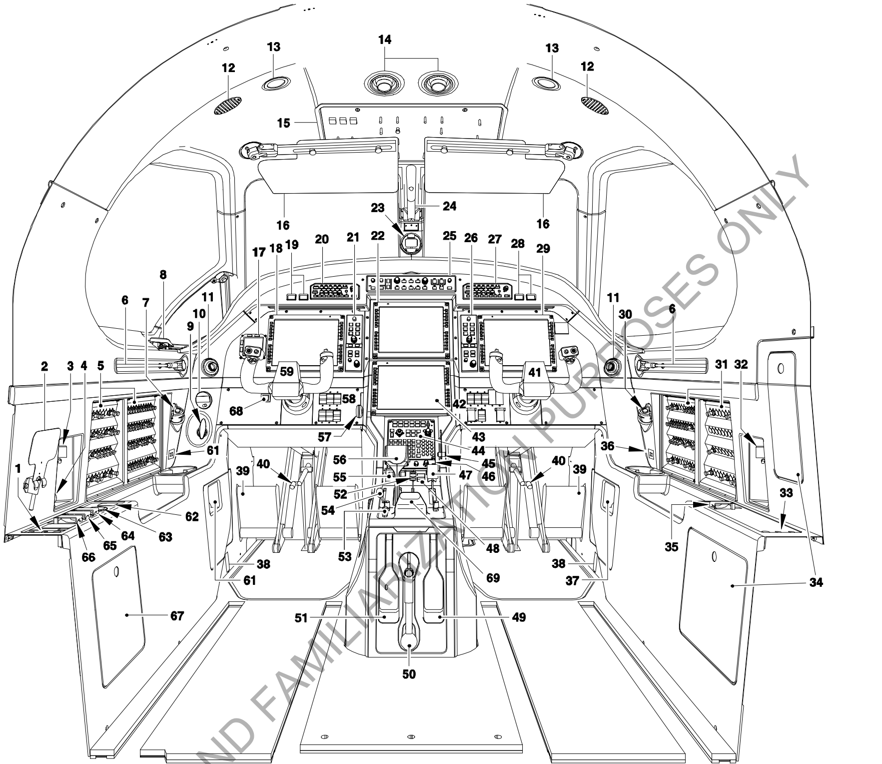
Adjustable air conditioning outlets are positioned on the head liner, the sidewalls and at foot level. These outlets should be kept open to allow the environmental control system to regulate the temperature in the cockpit.

Divider walls are installed behind the pilot and copilot seats and a curtain or door fits between the walls to form a division between the cockpit and cabin.

On the forward side of each divider there are stowage cups for the pilot and copilot oxygen masks.

Smoke goggles (if equipped) enclosed in a stowage are provided for the pilot and copilot. They are located on the forward side of the cabin divider, behind the pilot seat. Instructions for donning the smoke goggles are shown on Figure 7-19-1 - Sheet 2.

A fire extinguisher is located on the forward side of the cabin divider behind the copilot seat.

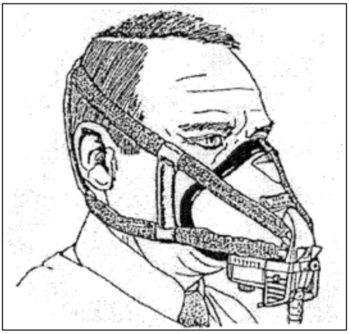


1. HEADSET MIG/PHONE JACKS
2. CONTROL LOCK
3. MASK OXYGEN/MIG JACKS
4. PASSENGER OXYGEN SELECTOR
5. LEFT SIDEWALL CB PANELS
6. UTILITY LIGHT
7. HAND MICROPHONE
8. DIRECT VISION (DV) WINDOW
9. PARKING BRAKE HANDLE
10. CLOCK
11. ECS SIDE AIR OUTLET
12. LOUDSPEAKER
13. DOME LIGHT
14. AIR VENTS
15. OVERHEAD ELECTRICAL CTRL PANEL
16. SUNVISOR
17. EMERG. STANDBY INSTR. SYS (ESIS)
18. PRIMARY FLIGHT DISPLAY (PFD)
19. MASTER CAUTION & WARNING LIGHTS
20. AUDIO/MARKER PANEL
21. PFD & RADIO CONTROL PANEL
22. SITUATION AWARENESS MFD
23. MAGNETIC COMPASS
24. GRAB HANDLE
25. AFCS CONTROL PANEL
26. CO PILOT PFD & RADIO CTRL PANEL
27. CO PILOT AUDIO/MARKER PANEL
28. MASTER CAUTION & WARNING LIGHTS
29. CO PILOT PFD
30. CO PILOT HAND MICROPHONE
31. RIGHT SIDEWALL CB PANELS
32. CO PILOT MASK OXYGEN/MIG JACKS
33. CO PILOT HEADSET MIC/PHONE JACKS
34. MAINTENANCE PANELS
35. CO PILOT MASK MIC/COMMS SWITCH
36. DUAL USB PORT (OPTIONAL)
37. RH POWER JUNCTION BOX
38. FOOT AIR OUTLETS SELECTOR LEVER
39. RUDDER PEDALS
40. RUDDER PEDAL ADJUSTMENT HANDLE
41. CONTOL WHEEL
42. ACS & CPCS CONTROL SWITCHES
43. SYSTEMS MFD
44. MULTI FUNCTION CONTROLLER
45. MAIN OXYGEN LEVER
46. DISPLAY REVERSIONARY CONTROL PANEL
47. FLAP SELECTOR
48. FLAP TRIM INTERRUPT, ALT STAB TRIM SWITCHES
49. ACS FIREWALL SHUTOFF CONTROL
50. EMERGENCY LANDING GEAR HANDPUMP
51. FUEL FIREWALL SHUTOFF CONTROL
52. CONDITION LEVER
53. COCKPIT/CABIN LIGHTING CONTROLS
54. MANUAL OVERRIDE FUEL CONTROL
55. ELT REMOTE CONTROL PANEL
56. POWER CONTROL LEVER
57. LANDING GEAR HANDLE
58. ICE PROTECTION SWITCHES
59. CONTROL WHEEL
60. LH POWER JUNCTION BOX
61. DUAL USB PORT (OPTIONAL)
62. FLIGHT TIME COUNTER
63. OXYGEN PRESSURE INDICATOR
64. MASK MIC/COMMS SWITCH
65. AURAL INHIBIT SWITCH
66. EMERG FREQ/NORM SWITCH
67. CD STOWAGE BOX
68. HDG/TRK OVERRIDE SWITCH (OPTIONAL)
69. CURSOR CONTROL DEVICE

120308

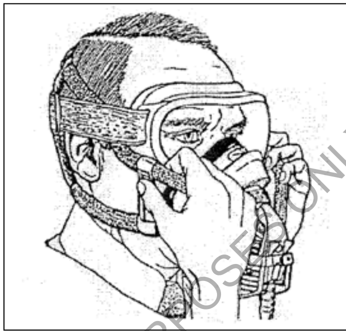
Figure 7-19-1. Cockpit - Layout
(Sheet 1 of 2)

1



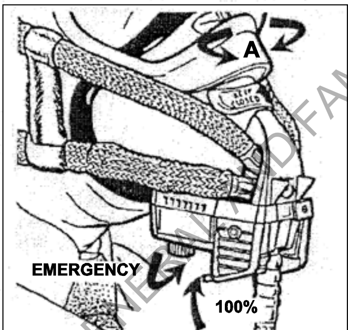
PUT MASK-REGULATOR ON HEAD.
Readjust eye-glasses, if necessary.

2



PLACE SMOKE GOGGLES ON HEAD
Readjust headband tension if necessary.
Pull upper tube of harness and reposition it over the lower side of goggles frame.
Push goggles downwards.

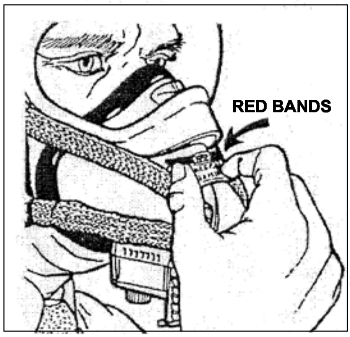
3



SET REGULATOR CONTROLS ON "100%" AND "EMERGENCY".
Depress "100%" rocker. Turn "EMERGENCY" knob counter-clockwise

Adjust goggles nose bridge shape to fit tightly against mask shell by pressing each side of the bridge inward (see Detail A)

4



OPEN VENT VALVE,
so that red bands are visible.

120343

Figure 7-19-1. Cockpit - Donning of Smoke Goggles
(Sheet 2 of 2)

PITOT STATIC SYSTEMS

GENERAL

Dual pitot and static systems provide dynamic and static pressure to the Air Data Attitude Heading Reference System (ADAHRS) and the Emergency Standby Instrument System (ESIS).

Refer to the Pitot and Static Systems Schematic Fig 7-20-1.

DESCRIPTION

A heated pitot head is installed on the bottom of the left and right wings.

The pitot pressure sensed by the left (No. 1) pitot system is carried through lines within the wing and fuselage to the ADAHRS Channel A. The No. 1 pitot system can be drained by a valve located in the left bottom wing root.

The pitot pressure sensed by the right (No. 2) pitot system is carried through lines within the wing and fuselage to the ADAHRS Channel B. The No. 2 pitot system also supplies pitot pressure to the ESIS. The No. 2 pitot system can be drained by a valve located in the right bottom wing root.

Two dual heated static ports are installed, one each side of the rear fuselage aft of the rear pressure bulkhead. Two pickups are used, one on each side are used for each static system. The two pickups balance out the differences in static pressure caused by slight side slips or skids.

The static pressure sensed by the forward left and rear right static ports is carried through lines within the fuselage to the ADAHRS Channel A. The static pressure sensed by the forward right and rear left static ports is carried through lines within the fuselage to the ADAHRS Channel B and to the ESIS. The static line of each static system can be drained by a valve located inside the rear fuselage, aft of the rear pressure bulkhead.

If one or more of the pitot static systems malfunction, they should be checked for dirt, leaks or moisture. The holes in the sensors for pitot and static pressures must be fully open and free from blockage. Blocked sensor holes will give erratic or zero readings to the ADAHRS.

The heaters for the pitot heads and static ports are controlled by the PROBES switch on the ICE PROTECTION panel, installed on the pilots lower right panel. Electrical power for left pitot and static port heating is supplied through the LH PITOT DE-ICE and LH STATIC DE-ICE circuit breakers on the Essential Bus. Electrical power for right pitot and static port heating is supplied through the RH PITOT DE-ICE and RH STATIC DE-ICE circuit breakers on the Main Bus.

INDICATION / WARNING

The Crew Alerting system (CAS) window of the systems Multi Function Display (MFD) displays the following Cautions for the pitot and static systems:

AMBER CAUTION

Probes Off	Indicates the ice protection probes switch is set to off and OAT < 10° C
Pitot 1 Heat Pitot 2 Heat Pitot 1 + 2 Heat	Indicates No. 1 system, No. 2 system or both systems pitot head heater failure
Static Heat	Indicates one or both static port heater failure

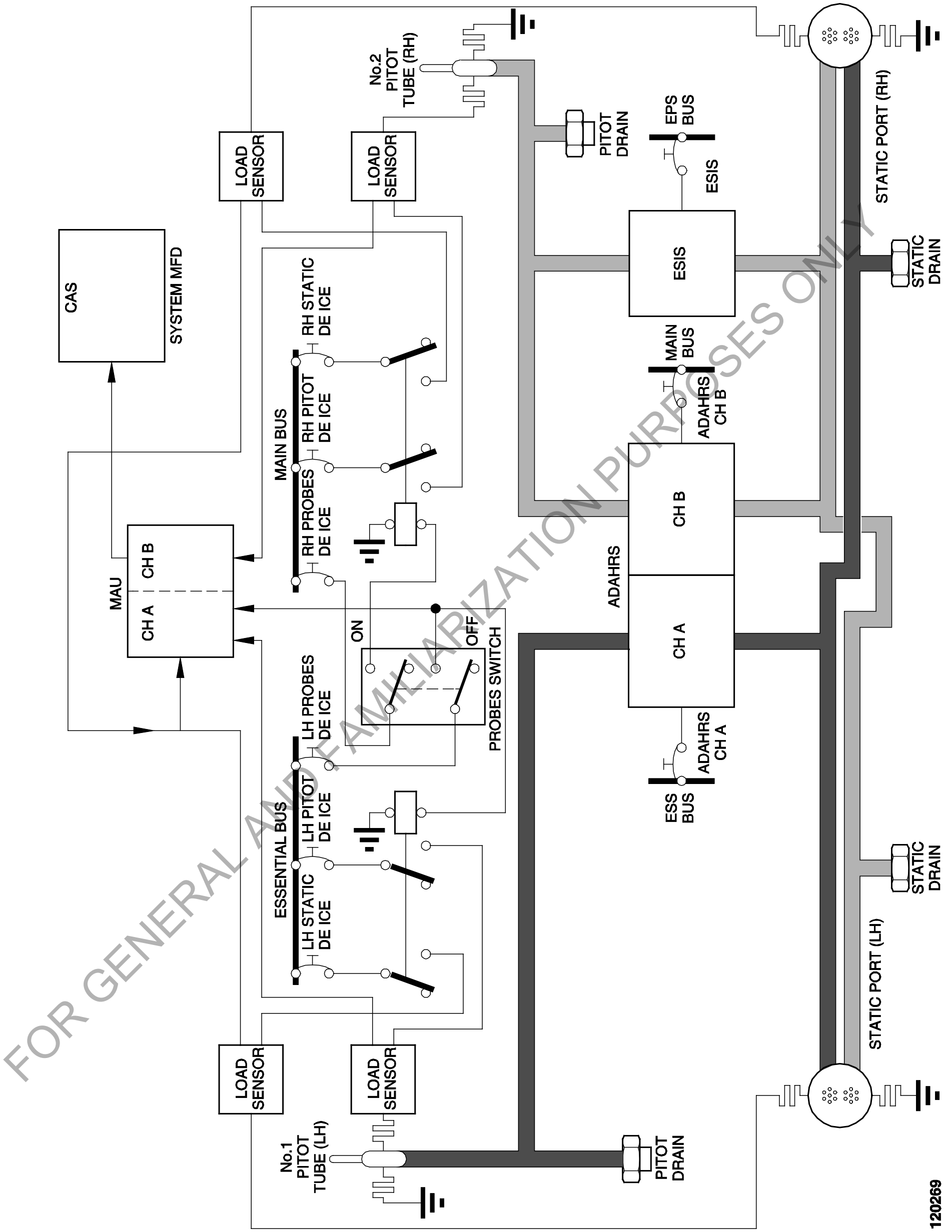


Figure 7-19. Pitot and Static Systems

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STALL WARNING / STICK PUSHER SYSTEM

GENERAL

The airplane is equipped with a stick shaker-pusher system to improve aircraft handling in the low speed flight regime by preventing the airplane from inadvertently entering a stall condition. The stick shaker-pusher system contains two Angle-of-Attack (AOA) sensors, two computers, a single stick shaker and a single stick pusher. The two computers are connected in such a way that either computer can, independently, provide stall warning (stick shaker and stall warning) but both computers are required to actuate the stick pusher.

DESCRIPTION

Refer to Figure 7-21-1, Stall Warning/Stick Pusher System, for system operation.

The left and right hand Stick Pusher Computers are each provided power from the Essential and Main bus. Each computer receives inputs from its respective AOA vane and AIR/GND relay. Both computers receive inputs from the engine torque, flap position, and self test. From these various inputs, each computer independently determines the "Defined Angle of Attack" for stall warning (stall warning and stick shaker activation), stick pusher activation, and stick pusher disengagement following an actual push. A digital serial output, from the left and right computers, provide data to the Modular Avionics Unit (MAU) for the Fast/Slow pointer on the Attitude Direction Indicator (ADI) or the Dynamic Speed Bug (DSB) (Primus APEX Build 8 or higher) on the airspeed tape of the Primary Flight Display(s) (PFD's). It is also used for the display of the Low Speed Awareness Indication adjacent to the Air Speed Tape.

The stick pusher, shaker, the Flight Alerting System (FAS) visual "Stall" and aural "Stall" warnings are disabled on the ground through the AIR/GND inputs, except for the self test function. The stick pusher is inhibited for 5 seconds after lift-off. The shaker and the stall warning are operative immediately after lift-off.

The stick pusher actuator has a built-in g-switch which inhibits the stick-pusher when the airplane's normal acceleration becomes less than 0.5 g. The output torque of the stick-pusher actuator is electronically-limited to have a force of 60 to 65 lbf on the control wheel. A slip-clutch on the stick-pusher capstan allows control on the elevator with a force of 85 to 90 lbf on the control wheel, in the event of stick-pusher jam. The force on the control wheel is defined when the longitudinal control is pulled to 3/4 of its travel. This allows the pilot or copilot to override the stick-pusher in the instance of an inadvertent operation.

Each outboard control wheel horn is equipped with a PUSHER INTR push switch providing a means to quickly disengage the stick pusher actuator in the event of an inadvertent operation.

When operated in pusher Ice Mode (to provide protection in icing conditions), all the shaker and pusher actuating points measured by the angle of attack vanes are reduced by 8°. The pusher Ice Mode is set when the propeller de-icing system is switched ON and the inertial separator is set to OPEN. When both pusher computers are set in Ice Mode, a green PUSHER ICE MODE advisory is shown in the ICE PROTECTION window of the systems MFD. If only one computer is set in Ice Mode, or if no computer is set in Ice Mode while conditions for ice mode are present, the amber PUSHER caution is activated.

The system is provided with a self test function that can be activated at any time by pressing and holding the STICK PUSHER switch located on the SYSTEM TEST section of the overhead panel. The green PUSHER ICE MODE advisory is illuminated during the self test after the pusher is first activated. The amber Pusher caution on the CAS will remain illuminated until the self test is passed.

After engine start on the ground, the CAS Pusher caution will illuminate until the system test has been successfully tested. The test must be done before takeoff. The engine must be operating at a minimum of 5 psi torque, the flaps set to 15°, then press and hold the STICK PUSHER switch to initiate the test. If the test switch is pressed and the test sequence does not occur and/or the CAS Pusher caution remains illuminated, the system has failed the self test and further flight before maintenance is not approved. If the test switch is pressed without the engine operating above 5 psi torque and the flaps are not set to 15°, the PUSHER annunciator will remain illuminated, the “Stall” warning and the test sequence will not occur.

The system function may be tested in the air anytime the engine is operating with the flaps at any setting. Press and hold the test switch and observe the following sequence; PUSHER ICE MODE advisory, “Stall” warning with stick shaker for 2 seconds followed by a 1 second pause, and “Stall” warning with stick shaker for 2 seconds. The pusher will not activate when the system is tested in flight. If the test switch is pushed and the test sequence does not occur and/or the CAS PUSHER caution remains illuminated, the system has failed the self test.

WARNING

STALLS MUST BE AVOIDED WHEN THE STICK PUSHER IS INOPERATIVE. EXCESSIVE WING DROP AND ALTITUDE LOSS MAY RESULT DURING STALL WITH FLAPS DOWN AND/OR WHEN POWER IS APPLIED.

The AOA vanes and mounting plates are electrically heated by internal heating elements. AOA vane and mounting plate heat is controlled by the PROBES switch located on the ICE PROTECTION switch panel. Refer to Figure 7-21-1, Stall Warning/Stick Pusher System for system schematic.

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OPERATION

The vane attached to the AOA probe aligns itself with the relative airflow. As it moves, it positions a wiper unit in the probe. This wiper unit adjusts the electrical output to its respective pusher computer. As the airplane approaches the artificial stall (5 to 10 knots before pusher actuator), the stick shaker and the “Stall” warning will activate when one of the AOA pusher computers senses the defined angle of attack for stall warning/stick shaker activation. If the “Stall” warnings are ignored and the approach to stall is continued, the stick pusher will activate when both AOA pusher computers sense the defined angle of attack for stick pusher activation. The stick shaker and “Stall” warning remain active during pusher operation.

Pusher operation will be stopped when either AOA computer senses an angle of attack lower than the angle of attack required to active the pusher or when the airplane acceleration is less than 0.5 g.

If an inadvertent operation of the stick pusher occurs, push the PUSHER INTR switch on the control wheel outer horn to quickly disengage the stick pusher actuator.

Activation of the stick shaker disengages the autopilot if engaged, in order to give full authority to a possible stick pusher activation. The autopilot can be manually reconnected after the angle of attack is reduced and the stick shaker has ceased operation.

WARNING

IF ACCELERATED STALLS ARE PERFORMED IN THE LANDING CONFIGURATION WITH HIGH POWER AND SIDESLIP, A RAPID PITCH-DOWN MAY RESULT WITH AN ALTITUDE LOSS OF UP TO 500 FEET.

INDICATION / WARNING

A digital serial output, from the left and right hand computers, provide data to the Modular Avionics Unit (MAU) for the Monitor Warning System (MWS), the Fast/Slow pointer (or the Dynamic Speed Bug (Primus APEX Build 8 or higher)) on the PFD ADI and Low Speed Awareness indication on the PFD ASI.

The stick pusher system has an internal-fault monitoring system which will signal the MAU to make the CAS amber Pusher caution when one of the following events occur:

- a built-in test failure
- a push signal from only one computer that is longer than 3 seconds
- no output torque during a push
- if either of the pilot or copilot DISC switches is pressed
- if the aircraft normal acceleration is below 0.5 g for longer than 3 seconds
- disparity between WOW inputs

A malfunction in either pusher computer initiates an amber Pusher caution to be shown on the CAS. This warns the pilot about a system malfunction and the pusher becoming inoperative.

The stick shaker and “Stall” warning devices may still be operational if the stick pusher is inoperative.

The CAS will show an amber AOA De Ice caution when a malfunction is sensed in the AOA vane or mounting plate heater circuits (current sensing).

The PUSHER ICE MODE advisory in the ICE PROTECTION window of the systems MFD will show when the propeller de-ice system is set ON and the inertial separator is set OPEN. In the Ice Mode, the shaker and pusher activation points are coming 8° earlier than in the normal mode and the FAST/SLOW pointer is set for a 15° flap landing.

If the Flap Control and Warning Unit (FCWU) detects a flap asymmetry, it:

- sends a Flap caution to the MAU for display on the CAS.
- sends a signal to the stick pusher computer
- sends the flap position to the stick pusher computer

The stick pusher computer checks the flap position and flap asymmetry and if greater than 2° for 10 seconds or more, sends a Pusher caution to the MAU for display on the CAS and goes into pusher safe mode. The MAU also signals the CAS to display the cyan Pusher Safe Mode advisory. When in safe mode, the stall warning trigger thresholds operate at the 0° flap position settings irrespective of the flap position.

The Fast/Slow pointer (Primus APEX Build 6 or 7) or the Dynamic Speed Bug (Primus APEX Build 8 or higher) and the Low Speed Awareness indication are based on the left flap position. As a result of setting 0° flap position when there is suspected asymmetry, the stick shaker and stick pusher will operate at higher airspeeds than would be normal for the actual flap position, but these higher airspeeds will not be reflected in the PFD indications. The difference between the PFD indications to the actual activation speeds varies with power and flap angle and can be as much as 5 KIAS faster. To allow for this, on approach the pilot must make use of the fast diamond on the Fast/Slow pointer or apply a 10 KIAS margin above the Dynamic Speed Bug.

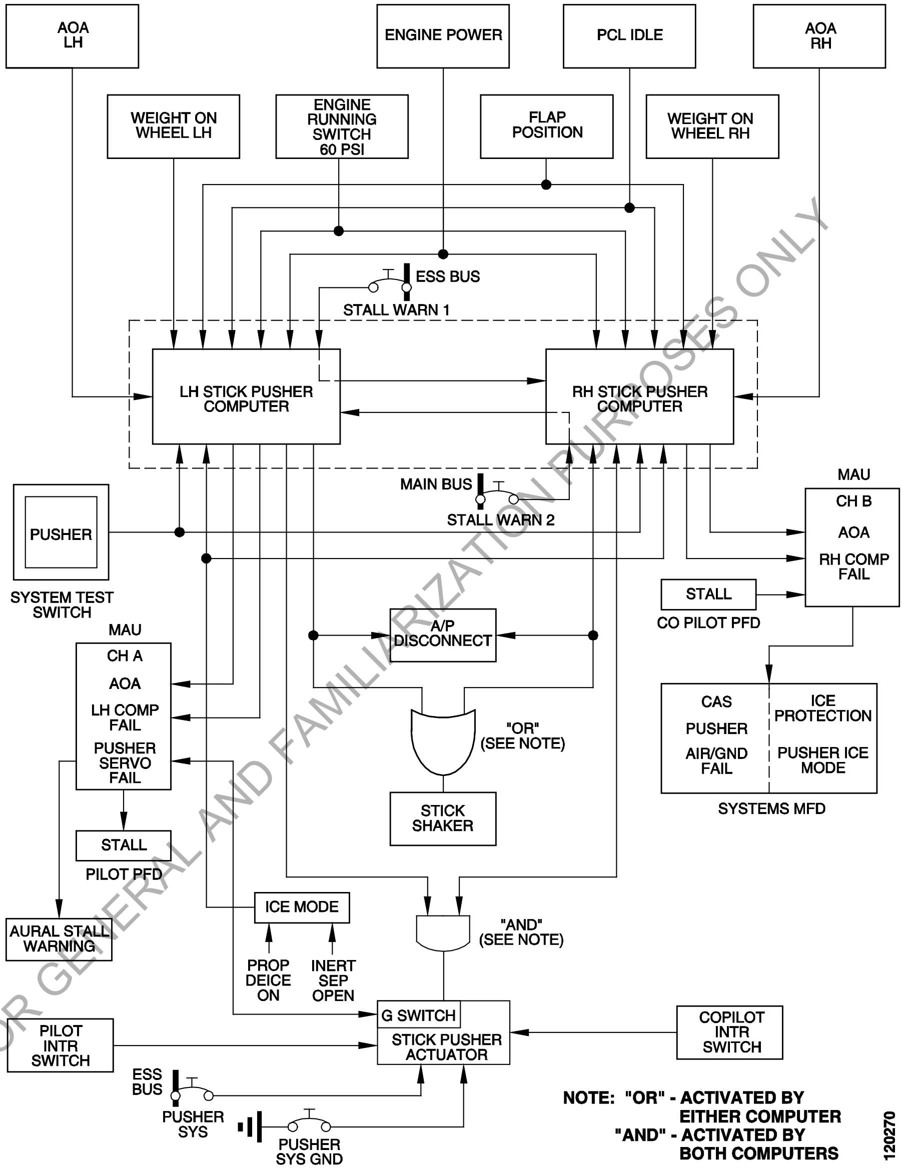

Figure 7-21-1. Stall Warning/Stick Pusher System
(Sheet 1 of 3)

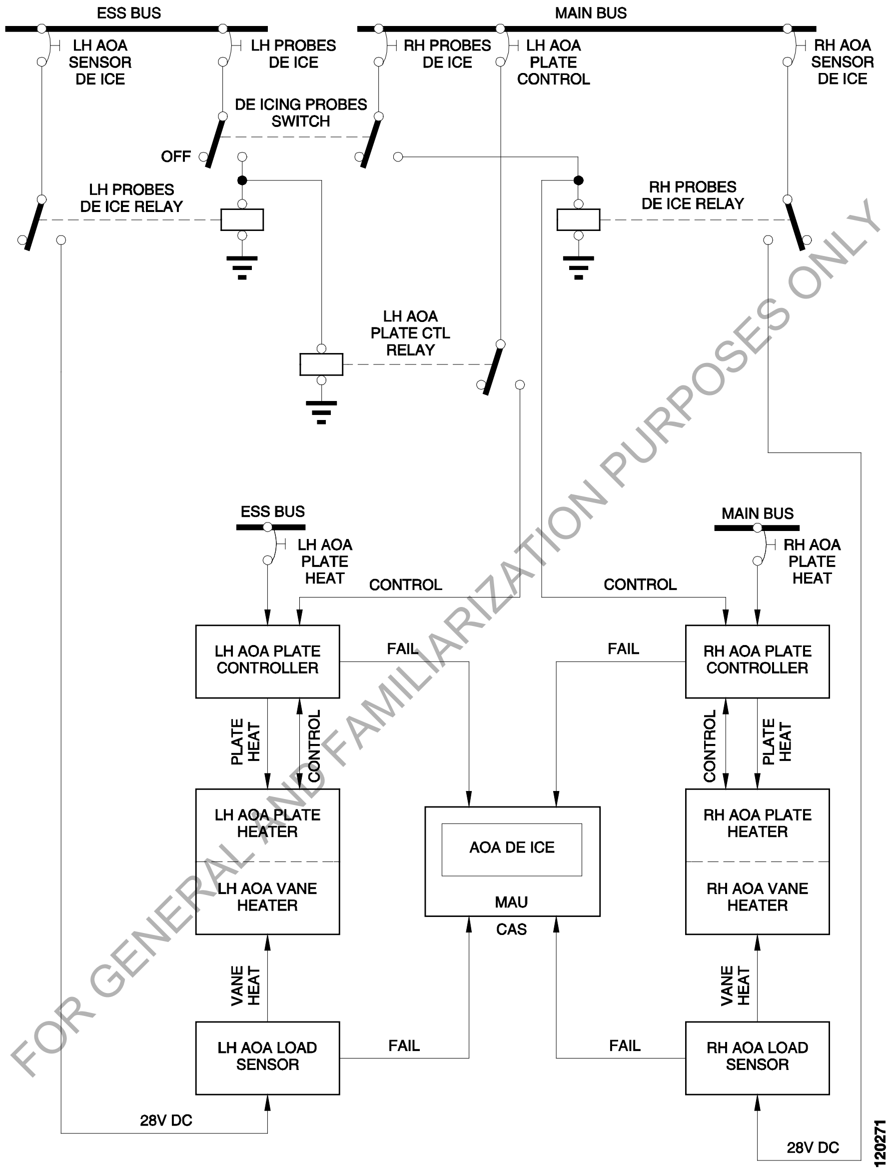

Figure 7-21-1. Stall Warning/Stick Pusher System
(Sheet 2 of 3)

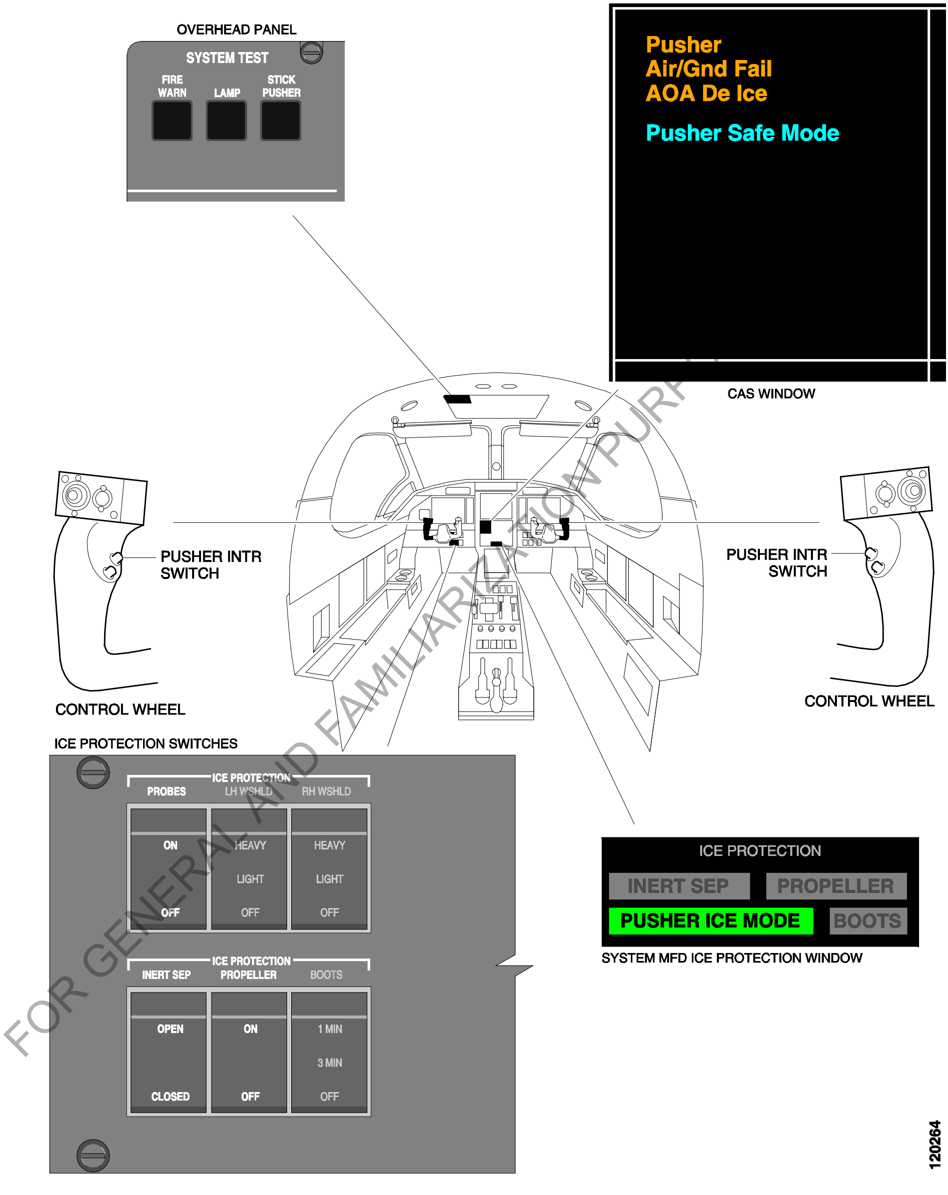

Figure 7-21-1. Stall Warning/Stick Pusher System
(Sheet 3 of 3)

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AIRFOIL DEICE SYSTEM

GENERAL

Inflatable neoprene boots are installed on the leading edges of the wings and horizontal tail surfaces. Their purpose is to inflate and dispense any ice which may accrete on their surface during flight in atmospheric icing conditions. When not in use, the boots have a vacuum applied to prevent partial inflation while in flight.

DESCRIPTION

The airplane is equipped with inflatable pneumatic deicing boots fixed to the leading edges of the wings (two boots per wing- inboard and outboard) and the horizontal stabilizer. Air bled from the 3rd stage of the engine compressor section, is routed to the regulator-reliever valve of nominal 14 psi regulating pressure, then through a water separator to the ejector flow control valves. These valves, which are solenoid-operated, port air pressure to the deicing boots in a prescribed sequence: - first to the horizontal stabilizer deicer, then to the lower portion of the inboard wing deicers, the upper portion, the lower portion of the outboard wing deicers, and finally the upper portion. Progression through this sequence is controlled by an electronic Timer/controller and monitored by low pressure sensing switches in each line, which are linked to the Modular Avionics Unit (MAU).

When pressure is not being applied to the deicer boots a small airflow is allowed to pass through the ejector valves to impose a vacuum in the lines to the deicing boots. This provides a negative air pressure at the boots ensuring the airfoil contour is maintained.

The pneumatic deice boot consists of a smooth neoprene and fabric blanket containing small spanwise deicer tubes. Each wing deicer has two air connections - one for the tubes on the lower surface and one for the tubes on the upper surface. The smaller boots on the horizontal stabilizer have one connection only.

The water separator is located upstream of the ejector control valves. Its function is to remove any condensation from the system and consists simply of a set of vanes which introduce a rotational swirl to the air that removes entrained water through centrifugal forces. A drain connection is fitted to the bottom of the housing to vent the moisture overboard.

The pressure-reliever valve consists of a spring and poppet valve which, at the required pressure, will open to allow air to pass from the inlet to the outlet port. The nominal regulating pressure is 14 psi. It also has an integral relief valve relieving at 18 psi.

OPERATION

Refer to Figure 7-22-1, Deicing System.

In the off mode the system applies a continuous vacuum to the pneumatic de-ice boots while the engine is running. The system is initiated by setting the switch labeled BOOTS on the ICE PROTECTION switch panel. The switch can be set to 3 MIN or 1 MIN and a green advisory BOOTS advisory is shown in the ICE PROTECTION window of the systems Multi Function Display (MFD).

MSN 1001 thru 1751 Pre SB 30-013:
When activated the timer actuates each ejector flow control valve (EFCV) in the prescribed sequence, for eight seconds. The time to inflate and deflate all of the de-icer units is thus 40 seconds. There is then a dwell period of 20 seconds (if the `one minute cycle´ has been selected) or of 140 seconds (if the `three minute cycle´ has been selected) before the next inflation sequence is started. If the control system is de-activated during a de-icing cycle, the cycle will be completed before system shut-down.

MSN 1001 thru 1751 Post SB 30-013 and MSN 1752 - 1942:
When activated the timer will start the de-icing cycle with a dwell period of 20 seconds (independent of which cycle has been selected), in order to allow the pilot to de-activate the system in case of inadvertent activation outside the operating limits of the pneumatic de-ice boots. The timer then actuates each ejector flow control valve (EFCV) in the prescribed sequence, for eight seconds. The time to inflate and deflate all of the de-icer units is thus 40 seconds. If the 'one minute cycle' has been selected the de-icing cycle is repeated immediately, if the 'three minute cycle' has been selected there is another 120 seconds dwell period before the de-icing cylce is repeated. If the control system is de-activated during the initial 20 seconds dwell period, the system will immediately be shut-down without inflating the boots.

Pressurization of each de-icer will cause the pressure switch to close, indicating proper operation. If there is a failure, the MAU will make the ICE PROTECTION green BOOTS advisory go off and an amber De Ice Boots caution will be shown on the Crew Alerting System (CAS). Operation of the wing boots can also be observed directly during ground checkout or from the airplane cabin. At night the left wing and boot operation can be observed using the wing inspection light. If the control system is de-activated during a de-icing cycle, the cycle will be completed prior to system shut-down.

CAUTION

OPERATION OF THE PNEUMATIC WING DEICE SYSTEM IN AMBIENT TEMPERATURES BELOW -40° C OR ABOVE 40° C MAY CAUSE PERMANENT DAMAGE TO THE DEICER BOOTS.

INDICATION / WARNING

Primus APEX Build 10 or higher. If the OAT is outside the allowed limits of the wing de-ice system, the CAS caution Boots TEMP Limit is shown and an aural gong will sound to indicate that the pneumatic de-icer boots must be switched OFF to prevent damage to the pneumatic de-icer boots.

Primus APEX Build 10 or higher. In icing conditions, the flaps are not allowed to be extended more than 15 degrees, or if the de-icer boots have failed, the flaps are not allowed to be extended. If the flap limits are exceeded, the CAS caution Flaps EXT Limit is shown and an aural gong will sound.

With the BOOTS switch in the 3 MIN or 1 MIN position a green advisory is shown in the ICE PROTECTION window to show the system is set to on and working correctly. Should the inflation pressure at the individual pressure switches not reach the nominal filling pressure of 11 psi during the inflation sequence or an incorrect timing sequence, the MAU will make the CAS show an amber De Ice Boots caution and the green advisory goes off in the MFD ICE PROTECTION window.

After failure of the pneumatic de-icing boots, the aircrew should prepare for departure of icing conditions as soon as possible.

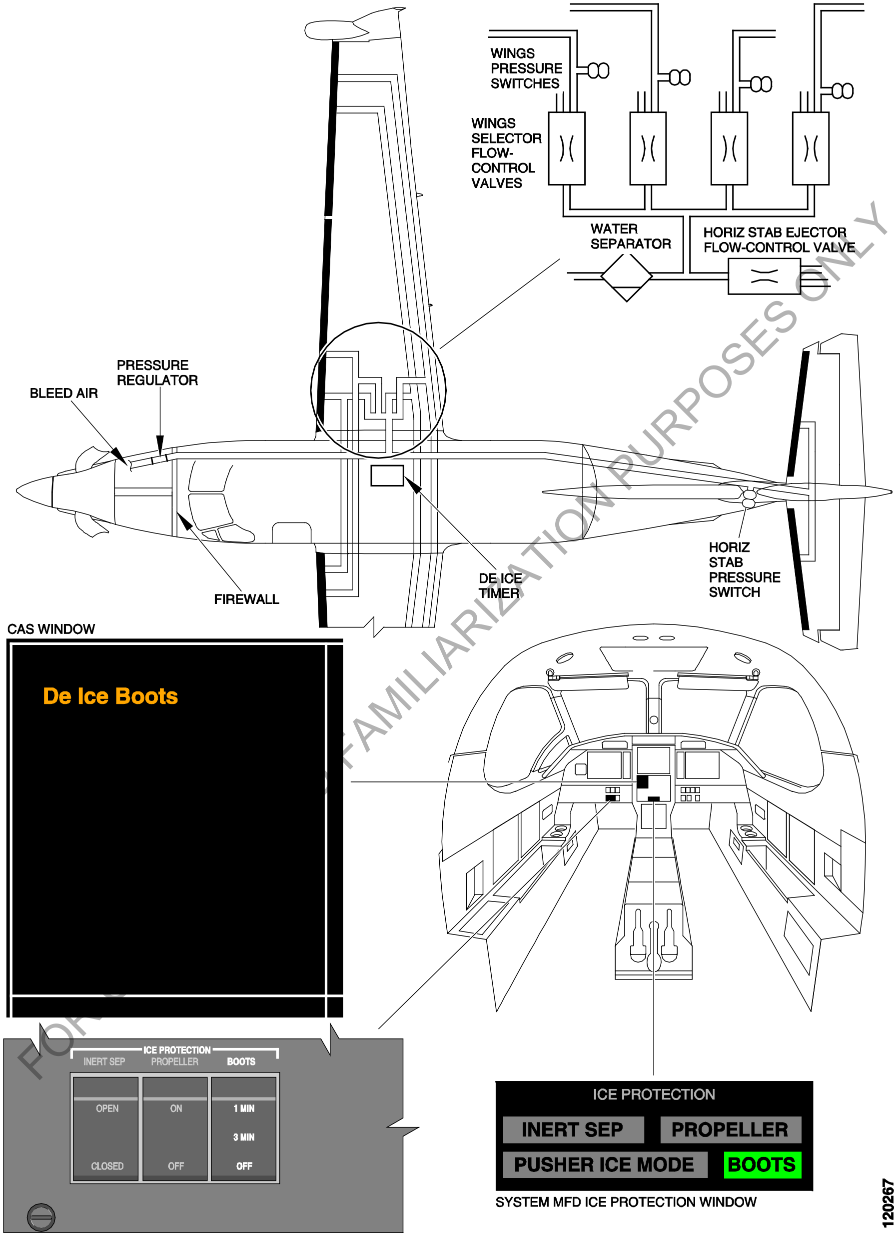

Figure 7-22-1. Deicing System
(Sheet 1 of 4)

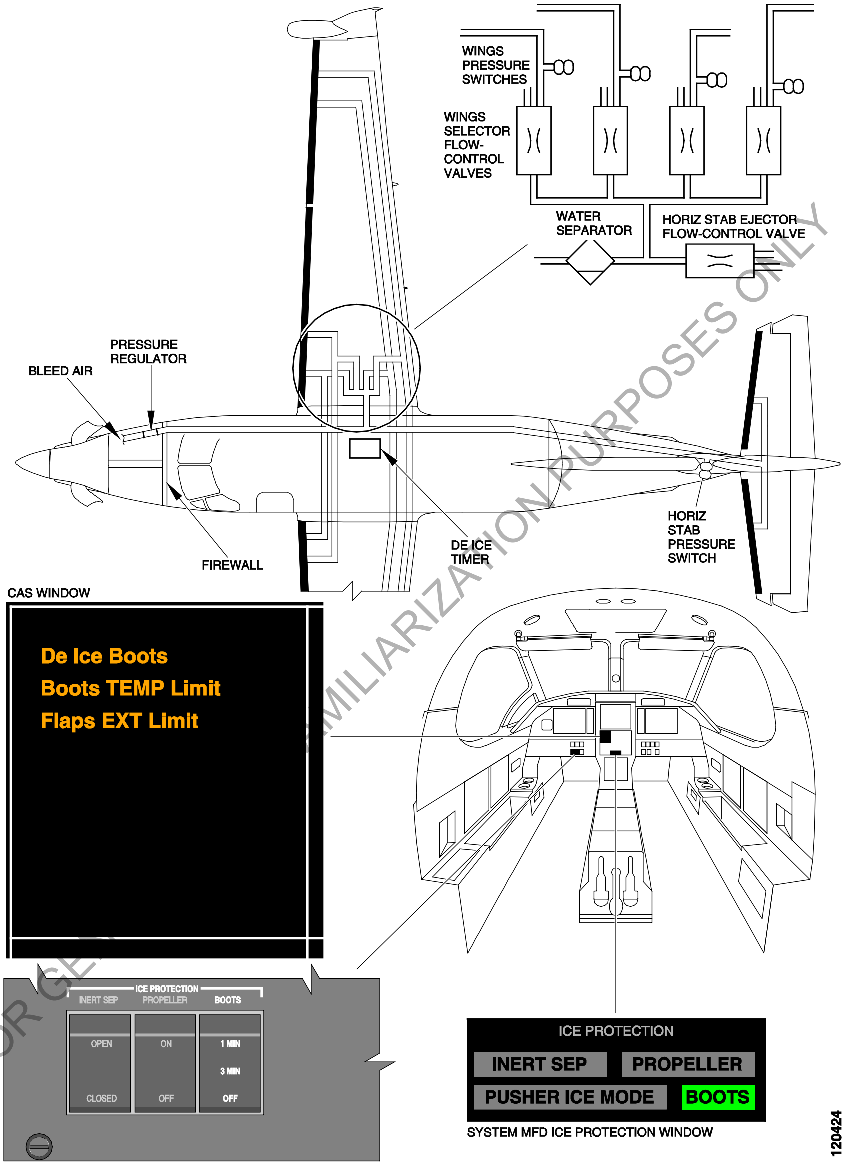

Figure 7-22-1. Deicing System – Primus APEX Build 10 or higher
(Sheet 2 of 4)

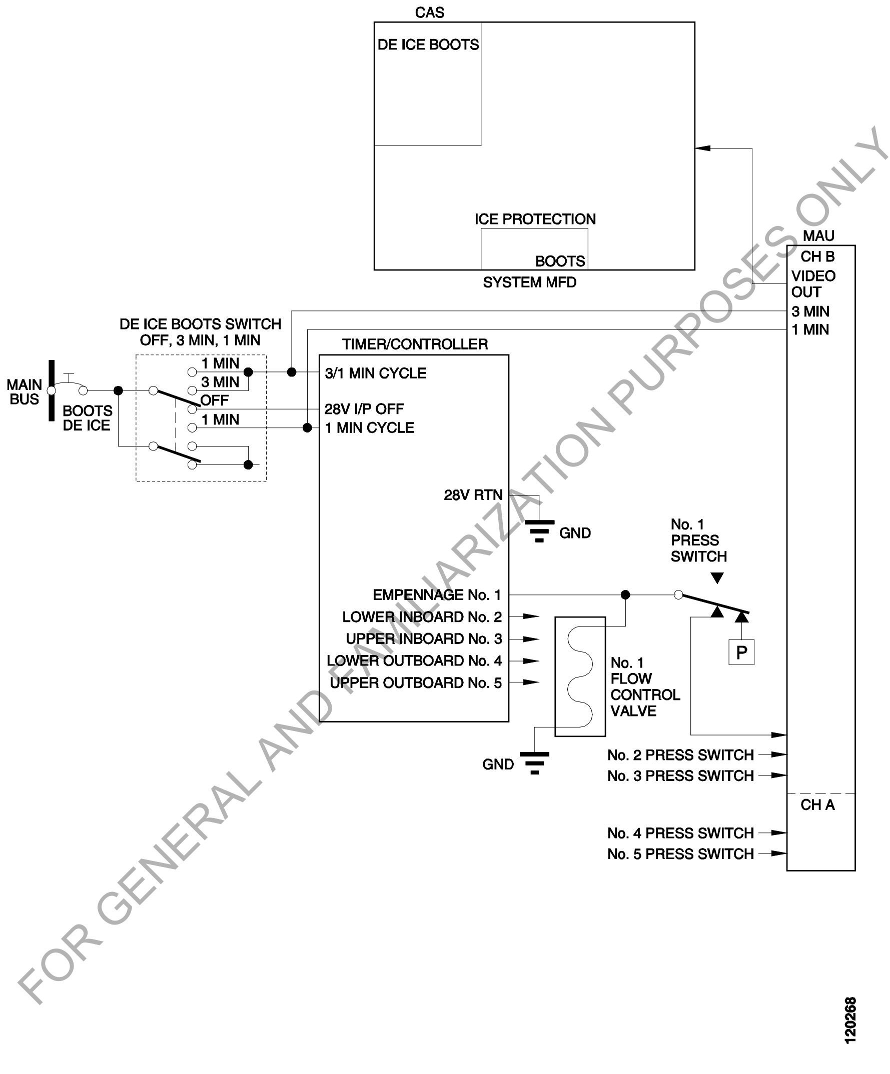

Figure 7-22-1. Deicing System (MSN 1001 thru 1751 Pre SB 30-013)
(Sheet 3 of 4)

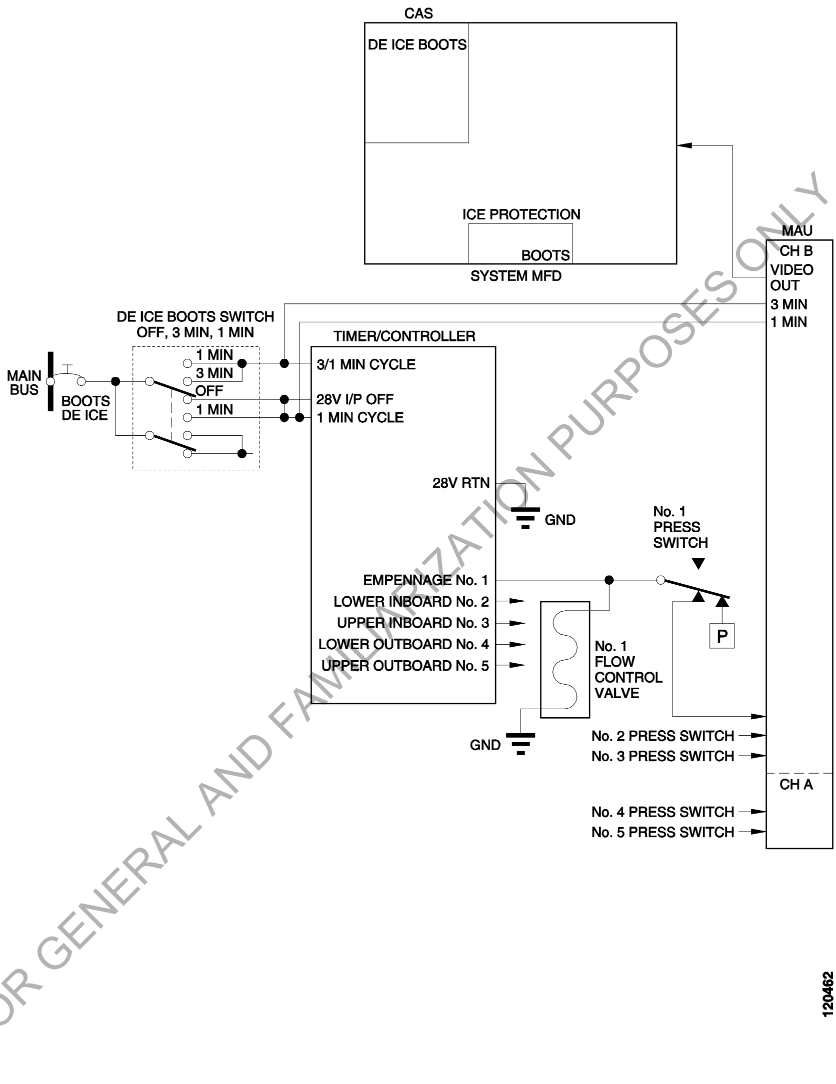

Figure 7-22-1. Deicing System (MSN 1001 thru 1751 Post SB 30-013 and MSN 1752 - 1942) (Sheet 4 of 4)

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COMFORT FEATURES

GENERAL

Extra comfort for the pilot and copilot can be provided by optional equipment installed at build. For colder climates a foot warmer system can be installed, refer to the Foot Warmer system description and operation for more information. Active Noise Reducing (ANR) headsets are installed in the place of normal headsets. Power for the ANR function is provided from the aircraft communications power supplies.

Passenger comfort is provided for by an ACS and a pressurization system. Additional comfort can be provided with the vapor cycle cooling system (when installed). The fans installed at the rear of the cabin can be used to increase the general air circulation around the cabin. The switches for the fans are on the copilots lower left panel.

An optional 110 VAC power outlet system can be installed to give the facility to operate portable electronic equipment in the cockpit and cabin. Four power outlets are provided, one on the cockpit rear right switch panel, one on the left cabin sidewall and two on the right cabin sidewall. A 110 VAC POWER ON/OFF switch is installed on the cockpit left rear switch panel. Electrical power to the 110 VAC static inverter is supplied through the 110 VAC AUX PWR circuit breaker on the CABIN BUS. The maximum power output for the system is 500 Watt.

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CABIN FEATURES

GENERAL

The PC-12 has a large cabin that offers a flexible interior configuration for passenger and cargo loading. There are two basic cabin configurations, a Corporate Commuter and an Executive interior. Variations to the two basic configurations are continually being developed, refer to Section 2 for the variations that have been approved. See Section 6 for passenger seat locations, combi conversions and cargo loading information.

Divider walls are installed behind the pilot and copilot seats and a curtain or door fits between the walls to form a division between the cockpit and cabin.

A fire extinguisher is located on the forward side of the cabin divider behind the copilot seat. Full operating instructions are given on the side of the extinguisher.

CORPORATE COMMUTER INTERIOR

The standard Corporate Commuter Interior consists of two crew seats plus seating for up to nine passengers. The baggage compartment is situated at the rear of the cabin and a baggage net must be installed at frame 34 when baggage is stowed. Optional luggage restraint bars can be installed on the passenger seats to permit the stowage of small items under the seat. An optional coat hanger can be installed in the baggage compartment.

EXECUTIVE INTERIOR

The standard executive interior aircraft consists of two crew seats plus executive seating for six passengers. The two forward passenger seats 1 and 2 face rearwards and the remainder face forwards. Extra passenger seating can be provided by using a combination of executive and standard passenger seats or a three seat bench. Refer to Section 2 Maximum Passenger Seating Limits for the various executive interiors that are approved and Section 6 Interior Configurations for more information. The three seat bench interior provides a larger area for baggage stowage which is then secured with the larger baggage net. An optional bulkhead and curtain assembly can be installed at frame 32 in front of the larger baggage net.

The baggage compartment is situated at the rear of the cabin and a baggage net must be installed at frame 34 when baggage is stowed. A coat hanger is installed in the baggage compartment.

Folding tables installed in the cabin sidewalls extend between the seats. Ashtrays, cupholders, table and overhead lighting switches are provided in the sidewall armrests adjacent to each seat. Individual reading lights and air outlets are installed in the headliner panel above each seat position.

A toilet compartment is installed in the front right hand side of the aircraft. The forward wall of the toilet compartment forms the cabin divider. Left and right storage cabinets are installed, the left cabinet fits against a small divider behind the passenger door and the right cabinet fits against the toilet compartment rear wall.

Passenger information no smoking/fasten seat belt illuminated signs are installed on the rear of the toilet compartment and above the baggage compartment. The signs are turned on and off by the pilot using the switches installed on the electrical overhead panel.

Various optional interior upgrade packages are available, contact Pilatus for further information and the determination any modification work required.

COMBI/CARGO INTERIOR

A Combi or a full cargo interior can be made by the removal of passenger seats from both the Corporate Commuter and Executive Interior aircraft. Cargo net attachment points are installed in the cabin walls at frame positions 24 and 27. Baggage net attachment points are installed at frame 34. Cargo restraining nets can be installed at the attachment points and allow lightweight cargo to be loaded without being secured with tie-down straps. A cargo securing kit contains the necessary items for the securing of heavyweight cargo.

EMERGENCY LOCATOR TRANSMITTER

KANNAD 406 ELT (AIRCRAFT MSN 1001 TO 1520)

DESCRIPTION

An Emergency Locator Transmitter (ELT) 406 AF is installed in the rear fuselage. It is connected to an antenna which is installed on the top of the fuselage below the dorsal fairing and has a battery pack that must be replaced after a specified time. The ELT will transmit on the international distress frequencies of 121.5, 243.0 and 406 MHz. The ELT unit has a switch with the positions ARM, OFF and ON.

A smart connector is installed in the ELT wiring harness. The smart connector is programmed with the aircraft identity data. If there is a change to the aircraft identity the smart connector must be re-programmed at an approved service center.

An optional navigation interface module can be installed adjacent to the ELT in the rear fuselage. It has a 28 VDC power supply from the Hot Battery Bus, receives aircraft position information from the GPS through the modular avionics unit and is connected to the ELT. The interface module also has an ON/OFF switch and an indicator.

There is an ELT remote control panel installed on the center console. The panel has a guarded switch with the positions ON, ARMED and RESET/TEST and an indicator light.

OPERATION

The ELT is installed in the aircraft with the switch at the ARM position, this also makes the remote control panel active. For flight the remote control switch must be in the ARMED guarded position. In the ARMED mode, the ELT is automatically operated at a specified g force by an internal g switch.The ELT will continuously transmit at 121.5 and 243.0 MHz for up to 48 hours and it will also transmit a digital message at 406 MHz every 50 seconds for the first 24 hours. With the optional navigation interface module installed the aircraft position is also transmitted as part of the digital message at 406 MHz.

In an emergency, the remote switch can be selected to ON. The ELT will then immediately start the distress signal transmission. The red indicator will come on.

In the case of accidental transmission, the ELT can be reset by either selecting the guarded remote switch to RESET or the switch on the ELT unit to OFF.

The remote switch TEST position is used to check the battery voltage and transmission power of the ELT for maintenance purposes.

KANNAD INTEGRA ELT AND ENAV UNIT (AIRCRAFT MSN 1521 - 1942)

DESCRIPTION

An Emergency Locator Transmitter (ELT) 406.037 is installed in the rear fuselage. It is connected to an antenna, which is installed on the top of the fuselage below the dorsal fairing, and has a battery pack that must be replaced after a specified time. The ELT will transmit on the international distress frequencies of 121.5 and 406.037 MHz. The ELT unit has a switch with the positions ARM, OFF and ON.

The ELT is loaded with unique aircraft identity data to aid the search and rescue services. The unique aircraft identity data is loaded during installation by using a programming Dongle. If there is a change to the aircraft identity, the programming Dongle and ELT must be re-loaded with the unique aircraft identity data by an approved service center.

The ELT connects to the eNAV unit which is located on the same universal mounting bracket within the rear fuselage. The eNAV unit receives aircraft position information from the GPS through the Modular Avionics Unit and provides it to the ELT for use within the 406.037 MHz data transmission. The eNAV is powered by a 28 VDC power supply sourced from the Hot Battery Bus. The ELT has a built in GPS to provide greater accuracy and an integral antenna in case of disconnection or damage to the external antenna.

There is an ELT remote control panel installed on the center console. The panel has a guarded switch with the positions ON, ARMED and RESET/TEST and an indicator light.

OPERATION

The ELT is installed in the aircraft with the switch at the ARM position, this also makes the remote control panel active. For flight the remote control switch must be in the ARMED guarded position. In the ARMED mode the ELT is automatically operated at a specified g force by an internal g switch. The ELT will continuously transmit on the 121.5 MHz homing frequency for over 100 hours and will also transmit a digital message on the 406.037 MHz frequency every 50 seconds for the first 24 hours. The aircraft position is transmitted as part of the 406.037 MHz digital message.

Once the ELT is activated the internal GPS will attempt to acquire a valid position. If the built-in GPS acquires a valid position, the 406.037 MHz message will contain the true position of the built-in GPS in the next transmission. If the built-in GPS does not acquire a valid position, the message will contain the true position of the external GPS sourced from the eNAV unit. If neither the built-in GPS or the external GPS acquire a valid position the message will contain the default value (GPS position not valid). To avoid consumption the built-in GPS is not powered when the ELT switch is in the ARM position.

In an emergency, the remote switch can be selected to ON. The ELT will then immediately start the distress signal transmission. The red indicator will come on.

In the case of accidental transmission, the ELT can be reset by either selecting the guarded remote switch to RESET or the switch on the ELT unit to OFF.

The remote switch TEST position is used to check the battery voltage and transmission power of the ELT for maintenance purposes.

LOW FREQUENCY UNDERWATER LOCATOR BEACON (ULB) (IF INSTALLED)

DESCRIPTION

A low frequency ULB (DK180) is installed in the rear fuselage near the ELT.

The ULB is a battery operated underwater acoustic pulse generator that is activated when the water switch end is immersed in either fresh or salt water.

The ULB is capable of functioning up to depths of 20,000 feet (6096 meters) and can be detected at a range of 7 to 12 NM (13 to 22 km) (depending on ambient noise levels).

OPERATION

When activated, the ULB will transmit at 8.80 kHz every 10 seconds for at least 90 days.

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PRIMUS APEX - AVIONICS INSTALLATION GENERAL

The aircraft is equipped with a Primus APEX 'glass cockpit' modular avionics system interconnected via various data buses. The APEX architecture design is configured to allow system options, system enhancements and feature upgrades via software. The integrated design approach facilitates a consistent display format across the cockpit display units, display controllers and provides a seamless operation for the pilot(s).

The Primus Apex Software and all parts thereof installed in the aircraft are the subject matter of various Honeywell proprietary rights. The Software License Agreement covers the aircraft owner/operator for the usage of the software installed in the aircraft and any updates, but only the functionality the customer has paid for. In accepting this License, Honeywell hereby grants the aircraft owner/operator a non-exclusive license to use one electronic copy of the Software, solely in conjunction with the installed avionics equipment, to operate the specific aircraft identified at the time this License was granted to the owner/operator. Any other uses, copying or distribution of the Software without prior written approval are strictly prohibited. Honeywell retains all title and interest in and to the Software.

The APEX system performs the following aircraft functions:

- Electronic Display System and Graphics Generation Function
- Configuration Management System (CMS)
- Automatic Flight Control System (AFCS)
- Flight Management System (FMS)
- Audio Control
- Monitor Warning Function (MWF) including Crew Alerting System (CAS)
- Data acquisition function
- Maintenance function
- Electronic Checklist and Charts (optional)

The APEX system interfaces with the following stand alone equipment:

- Air Data Attitude Heading Reference System (ADAHRS)
- Multi Mode Digital Radios (MMDR)
- Weather Radar System (Wx)
- Radar Altimeter System
- Global Positioning System (GPS)
- Mode S Transponder
- Stormscope (optional)
- Terrain Awareness and Warning System (TAWS) (optional)
- Traffic Collision Avoidance System (TCAS) (optional)
- Distance Measuring Equipment (DME)
- Other aircraft systems

MSN 1001 – 1270. An Electronic Standby Instrument System (ESIS) is installed and displays altitude, attitude and airspeed. The ESIS is independent of the Primus Apex system.

MSN 1271 - 1942. An Electronic Standby Instrument System (ESIS) is installed and displays altitude, attitude, airspeed and magnetic heading. The ESIS is independent of the Primus Apex system.

Figure 7-26-1 Sheet 1 shows a schematic of the APEX Equipment Bus Bar Distribution. The bus bar colors are shown similar to the colors on the cockpit circuit breaker panels.

Figure 7-26-1 Sheet 2 shows the APEX Equipment Antenna Locations for MSN 1001 - 1575.

Figure 7-26-1 Sheet 3 shows the APEX Equipment Antenna Locations for MSN 1576 - 1942.

Refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E – Pilot Guide for complete information on the description and operation of the APEX System.

ACRONYMS AND ABBREVIATIONS

The acronyms and abbreviations used in the Avionics Installation description are:

ACMS	Aircraft Condition Monitoring System
ACS	Air Cycle System
ADAHRS	Air Data and Attitude Heading Reference System
ADC	Air Data Computer
ADF	Automatic Direction Finder
ADI	Attitude Direction Indictor
ADMS	Aircraft Diagnostic and Maintenance System
AFCS	Automatic Flight Control System
AGM	Advanced Graphics Module
AHRS	Attitude Heading Reference System
AIRMET	Airman’s Meteorological Advisories
AP	Autopilot
APM	Aircraft Personality Module
ASCB	Avionics Standard Communications Bus
BIT	Built-in Test
BARO	Barometric
CAN	Controller Area Network
CAS	Crew Alerting System
CAT	Clear Air Turbulence
CCD	Cursor Control Device
CKLST	Checklist (electronic)
CMC	Central Maintenance Computer
CMS	Configuration Management System
CONUS	Continental United States
CPCS	Cabin Pressure Control System
DB	Database
DEOS	Digital Engine Operating System
DME	Distance Measuring Equipment
DRCP	Display Reversion Control Panel
DU	Display Unit
ECS	Environmental Control System
EGPWS	Enhanced Ground Proximity Warning System
ESIS	Electronic Standby Instrument System
FAF	Final Approach Fix

FAS	Flight Alerting System
FC	Flight Controller
FD	Flight Director
FGP	Flight Guidance Panel
FMS	Flight Management System
FMW	Flight Management Window
FPLN	Flight Plan
GA	Go Around
GFP	Graphical Flight Planning
GGF	Graphics Generation Function
GNSSU	Global Navigation Sensor system Unit
GPS	Global Positioning System
GS	Glideslope
HDG	Heading
HSI	Horizontal Situation Indicator
INAV	Interactive Navigation
LAN	Local Area Network
LCD	Liquid Crystal Display
LPV	Localizer Performance with Vertical guidance
LSS	Lightning Sensor System
MAU	Modular Avionics Unit
METAR	Aviation Routine Weather Report
MFC	Multi Function Controller
MFD	Multi Function Display
MW	Monitor Warning (miscompare condition)
MWF	Monitor Warning Function
NEXRAD	Next Generation Radar
NIC	Network Interface Controller
PDC	Pre Departure Clearance
PFD	Primary Flight Display
POF	Phase of Flight
PSA	Pre Selected Altitude
RVSM	Reduced Vertical Separation Minimum
SBAS	Satellite Based Augmentation System
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Information
STAR	Standard Terminal Arrival Route
SSEC	Static Source Error Correction
TA	Traffic Advisory
TAF	Aviation Terminal Area Forecast

TAS	Traffic Advisory System
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Collision Avoidance System
TCS	Touch Control Steering
TFR	Temporary Flight Restriction
TRK	Track
VGP	Vertical Glidepath
VNAV	Vertical Navigation
VSD	Vertical Situation Display
WAAS	Wide Area Augmentation System
WPT	Waypoint
Wx	Weather Radar
XPDR	Transponder
XM	Weather Satellite Receiver
YD	Yaw Damper

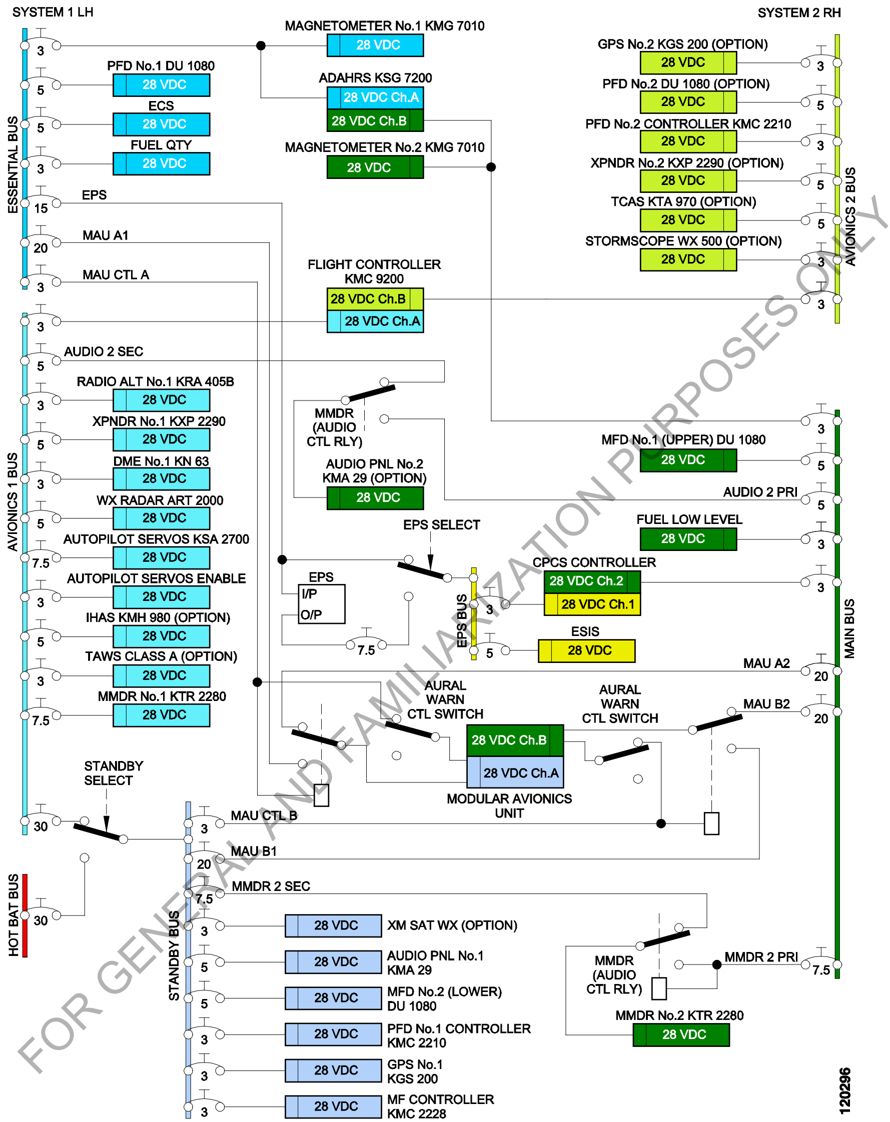


Figure 7-26-1. APEX Equipment - Bus Bar Distribution
(Sheet 1 of 3)

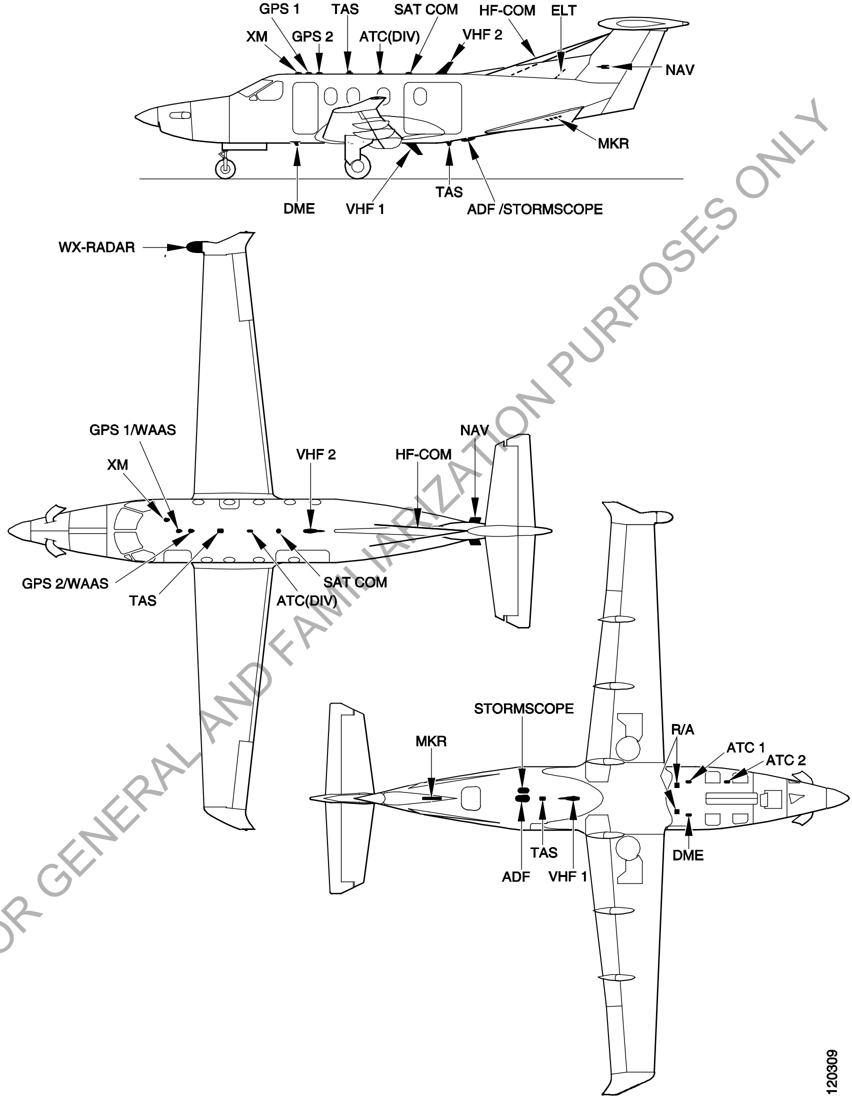


Figure 7-26-1. APEX Equipment – Antenna Locations (MSN 1001 – 1575)
(Sheet 2 of 3)

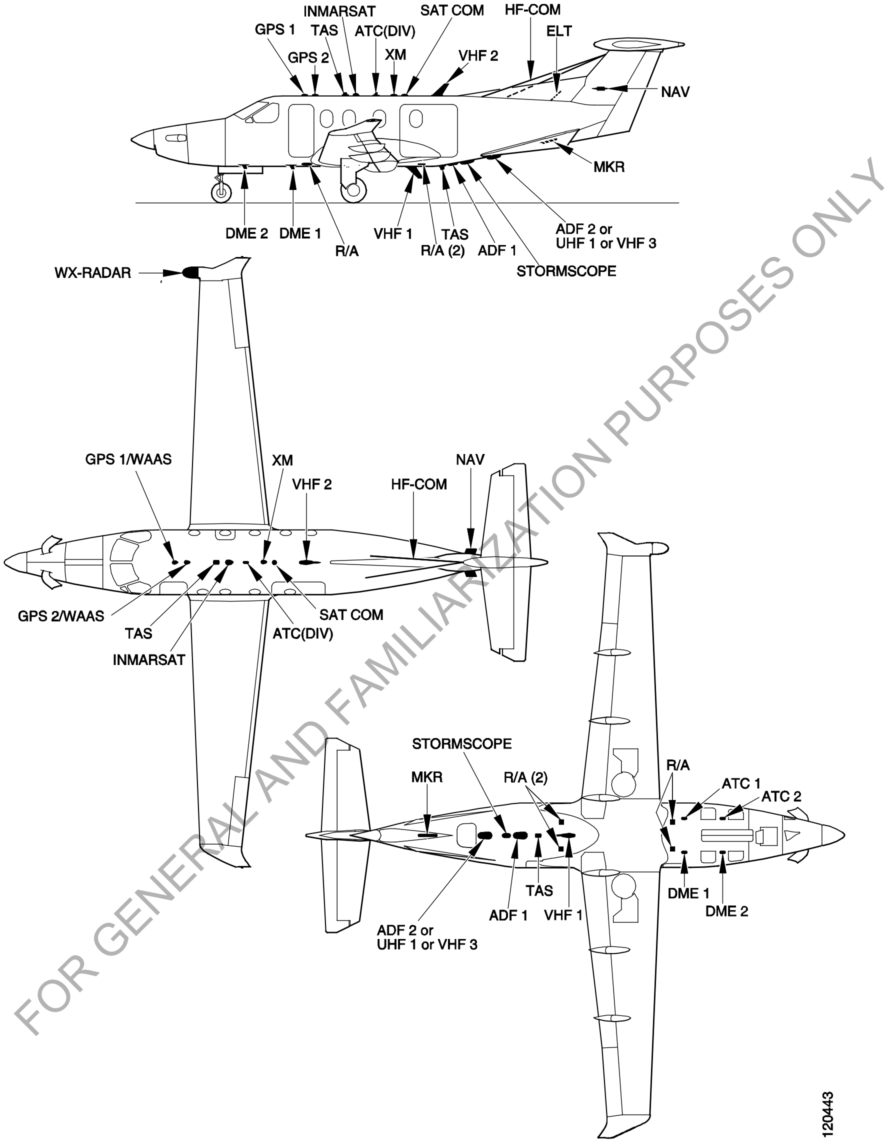


Figure 7-26-1. APEX Equipment – Antenna Locations (MSN 1576 - 1942)
(Sheet 3 of 3)

PRIMUS APEX

GENERAL

Refer to Figure 7-27-1, for APEX, MAU, displays and controls.

The Primus APEX system is implemented using standard concepts and modular components installed in a Modular Avionics Unit (MAU). Communication via the system components hosted in the MAU comprises a high integrity bus network called Avionics Standard Communication Bus (ASCB). Single channel APEX equipment is powered by a single circuit breaker and dual channel APEX equipment is powered by two circuit breakers connected independently to each channel of the equipment and powered from different aircraft electrical bus bars.

DESCRIPTION

The MAU installed under the cabin floor consists of a cabinet/chassis containing a backplane circuit card assembly, cooling fans and 12 user module slots that host a variety of line replaceable modules. The MAU cabinet is divided into two channels (A and B), each channel is electrically isolated from the other with its own power supply module, Network Interface Controller (NIC) module and data communications backplane. The dual channel architecture of the MAU allows system functions to be distributed between channels. The modules are field replaceable and field loadable with software. The user modules communicate to the Avionics Standard Data Bus (ASCB) via the NIC modules.

The ASCB consists of two independent busses, the left and right busses correspond to pilot and copilot side primary data. Each NIC in the system reads and writes to the on-side primary bus and reads from the cross-side primary bus.

The aircraft wiring interface to the MAU is segregated into systems, MAU Channel A to system 1 (left side aircraft wiring) and MAU Channel B to system 2 (right side aircraft wiring).

The communication mechanism that LRU’s in the APEX system use to communicate is called the Virtual Backplane. The Virtual Backplane comprises an Avionics Standard Communication Bus (ASCB) and the software and hardware mechanisms within the LRU’s that communicate on ASCB. LRU’s connected to ASCB use a common interface bus control module called a Network Interface Controller (NIC). The NIC provides a high integrity method for an LRU to interface with the ASCB.

A Local Area Network (LAN) provides a general purpose method of transferring data to any LRU in the APEX system. Typical use of the LAN is on-ground data transfer (software installation) and maintenance data transfer. The LAN is connected to each channel of the MAU, the MF Controller and the maintenance panel.

The following line replaceable modules are installed in the MAU cabinet:

- Power Supply (PS) module. A power supply module is dedicated to each channel of the MAU. Either power supply can operate both of the MAU cabinet cooling fans. MAU channel A power supply module will normally be powered from the Essential Bus, following the loss of the essential bus power input, channel A would revert to being powered from the Main Bus. MAU channel B power supply module will normally be powered from the Standby Bus, following the loss of the Standby Bus power input, channel B would revert to being powered from the Main Bus. The module contains no processing or backplane communication capability
- The Network Interface Controller (NIC) module provides a gateway for the MAU modules to access ASCB and the LAN. Two NIC modules are installed, one for each channel of the MAU
- The Aircraft Personality Module (APM) is a memory storage device connected directly to the MAU NIC module. Two APM's are installed, one for each channel of the MAU. They contain APEX configuration data typically, System Identifier, Aircraft Type, Aircraft Serial Number, Installed Configuration Options and System settings.
- The Advanced Graphics Module (AGM) is a single channel module and one is installed for each channel of the MAU. The AGM performs general purpose processing as well as display processing and graphics generation. The Configuration Management System (CMS), charts function and maintenance functions (CMC, ACMS) are also hosted on the AGM module. AGM1 (MAU channel A) drives the Pilot PFD and Upper MFD and AGM2 (MAU channel B) drives the Copilot PFD and Lower MFD. A repeater capability will allow the Pilot PFD to be displayed on the Copilot PFD (and vice-versa) in the event of a single AGM failure. The display controllers, MF controller and Display Reversion Control Panel (DRCP) are interfaced with the AGM's. AGM integrity is monitored by the Monitor Warning Function (MWF) which verifies that the data selected by the AGM for display generation has integrity
- The Generic I/O (GIO) Module is a dual channel module, each module channel is connected to a different MAU backplane (channel A and B). The GIO module translates aircraft I/O data onto and off ASCB via the MAU's backplane
- The Custom I/O (CSIO) Module is a dual channel module, each module channel is connected to a different MAU backplane (channel A and B). The CSIO module also translates aircraft I/O data onto and off ASCB similar to the GIO module, but is more specialized to meet specific aircraft interface requirements
- The Actuator I/O Processor (AIOP) Module is a single channel module and one is installed for each channel of the MAU. The AIOP module is principally associated with the Automatic Flight Control System (AFCS). The Flight Management System (FMS) is hosted on AIOP b and the optional second FMS is hosted on AIOP a.

OPERATION

All the MAU modules use an operating system called Digital Engine Operating System (DEOS). The system provides time and space partitioning that allows functions of mixed criticality levels to coexist on the same processing platform and isolates application software from the underlying hardware used in many of the modules and units. Software objects that reside in DEOS are:

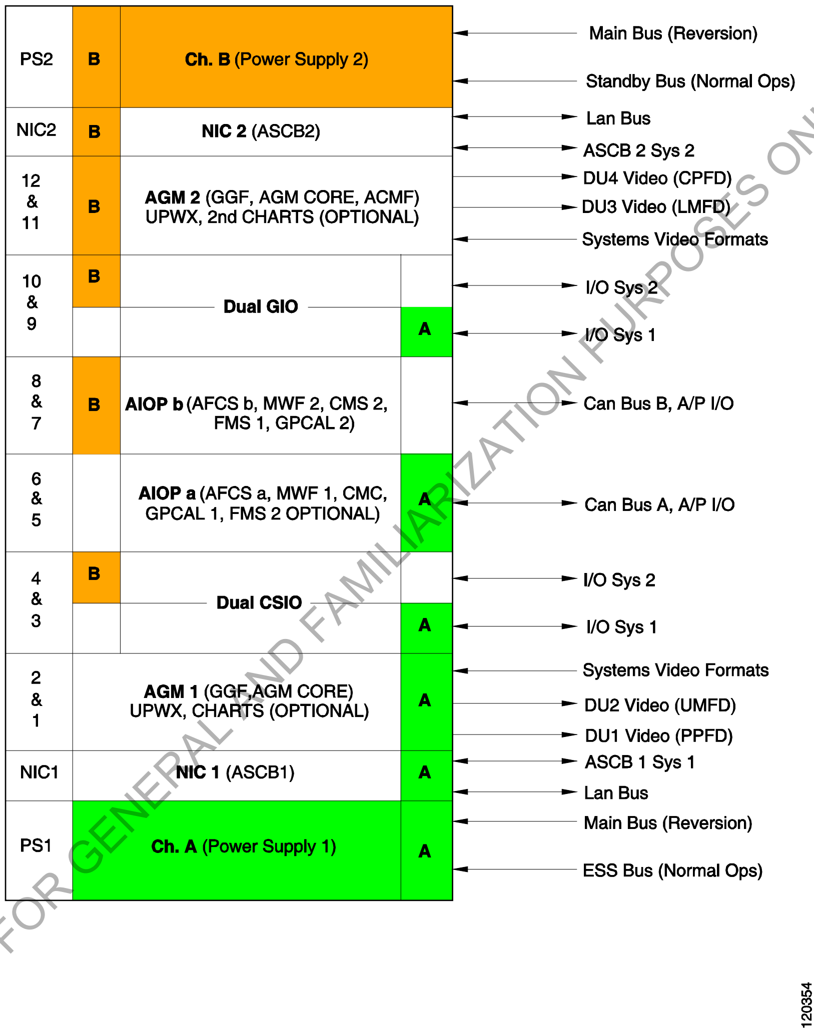
- Threads – that perform a sequence of executions that are time partitioned
- Process – a collection of threads and data that are space partitioned
- Application – a collection of one or more related processes
- Core Software – software that provides all the support functions for the hardware and application
- Boot Software – factory loaded software used to initialize the module and allow software loading

The APEX operational software for the MAU will be installed for each specific aircraft during production and subsequently in the field for requisite software updates. APEX operational software will be distributed typically on a CD-ROM. Data loading from the CD-ROM is accomplished by using a PC laptop connected to the APEX system installed on the aircraft via a LAN connector on the aircraft Maintenance Panel.

The System Configuration and Data Loading window is a page selection on the systems MFD multi-function window. The Data Loading window is only available when on the ground.

The SYS CONFIG window displays configuration information for all installed software/data bases, including the Top Level System Part Number for the APEX System.

When the Data Loading window is displayed the multi function controller joystick control is used to select one of the four selections to start the Data Load process.



Note 1: Build 6 – CMC is on AGM 1.
Note 2: Build 7 – ACMF is on AGM 1.

Figure 7-27-1. APEX Build 8 or higher – MAU Configuration
(Sheet 1 of 3)

DISPLAY AND WINDOW CONFIGURATION

The APEX Avionics suite is based on a four Display Unit (DU) layout arranged in a T configuration to provide the pilot with quick easy access to avionic operations. The DUs are numbered:

- DU 1 is the pilot's PFD
- DU 2 is the upper MFD (default format is Situation Awareness Display MFD)
- DU 3 is the lower MFD (default format is Systems Display MFD)
- DU 4 is the copilot's PFD (when installed)

The DUs do not contain any flight operational software and are driven by the AGM's installed in the MAU. DUs 1 and 2 are driven by AGM1 and DUs 3 and 4 are driven by AGM2. The DU area of display is divided into 1/6th sections. These sections can be combined into larger sections to generate the required display functionality. These sections of the displays are referred to as windows.

Each DU has a default display/functionality configuration. The functionality is displayed using a 1/6th or 2/3rd window. The default window configurations are shown in Figure 7-26. By utilizing the full area of display in the various configuration windows, multiple system operations/functionalities can be shown on a DU at the same time. Each window operates independently of the other windows. The only window size that can be changed is the waypoint list window in the Situation MFD. With the waypoint list window in focus pressing the MF controller PAGE button changes the display to a 1/3rd window. Selecting FMW returns the 1/3rd window to a 1/6th window.

Window navigation comes under four areas:

- Window entry
- Window focus
- Page operation
- DU focus

Build 6 - Entry and operation on the interactive windows, which are the Radio window on the PFD's and windows co-located to bezel buttons on the MFD's, is by controllers and the DU bezel buttons.

Build 7 and higher - Entry and operation on the interactive windows, which are the Radio and HSI windows on the PFD's and windows co-located to bezel buttons on the MFD's, is by controllers and the DU bezel buttons.

There is a PFD controller which only operates on the PFD and an MF controller which operates on the PFD's and the MFD's. The PFD controllers are installed on the inboard side of the PFD's and the MF controller is installed in the center console.

The PFD controller push button controls for normal window navigation are:

DME	shortcut key to the DME detail window on the radio window
DETAIL	calls up a secondary window related to the current active window providing additional details related to the selected item
PFD	allows PFD control to be transferred to the other PFD in the event of a controller failure, when in operation PFD Cross Control annunciations are displayed in amber along the bottom right side of the ADI

Refer to the PFD section for a description of the controller controls for the PFD ADI/HSI displays and the Communication and Navigation - Controls section for the RADIO controls.

The MF controller contains shortcut control keys, window navigation/cursor movement/menu controls and keypad controls as follows:

Arrow keys Build 6	four arrowed keys (up, down, left and right) move window focus in the indicated direction to the next interactive window
Build 7 and higher	four arrowed keys (up, down, left and right) move window focus to the respective display
Joystick/Knob Build 6	controls cursor focus within a window allowing operation control from selectable item to item. Depending on the data field, a concentric knob can control the item that has cursor focus or a value can be entered via the alphanumeric keypad
Build 7 and higher	controls cursor focus within a display allowing operation control from selectable item to item. Depending on the data field, a concentric knob can control the item that has cursor focus or a value can be entered via the alphanumeric keypad
ENT button	adjacent to the joystick, acknowledges the entry of data
PAGE button	displays menu of possible pages that can be selected in this window
MFD swap button	switches the Situation Awareness and Systems MFD's. All window navigation operations as presented will also be switched
DETAIL button	calls up a secondary window related to the current active window providing additional details related to the selected item
Keypad	alpha numeric push buttons provide direct data entry into an active data field controlled by the MF controller cursor

DEL button	to delete the last character entered on the active data field as highlighted by the MF controller cursor
CLR button	to erase the value of a data entry field on the active data field as highlighted by the MF controller cursor. Can be used to reset the fuel quantity
ENT button	adjacent to the keypad, same function as the joystick ENT button, must be used to acknowledge data after it has been entered or changed using the keypad
Data Load	a slot for a Secure Digital (SD) data card for the downloading of databases for FMS navigation and Charts from an SD card and the uploading of ACMS trend data to an SD card. Annunciator illuminates for SD card activity. The Electronic Checklist and .Terrain Server (Green Disk) Database shall not be loaded using the SD card loading functionality. A maintenance laptop configured with Remote Terminal and DLS shall be used instead. Refer to Pilatus Pilot Guide Document No. 02313 Revision 1
CKLST button	displays the Electronic Checklist (if installed) in the lower left window of the Systems MFD
CHART VIDEO button	displays charts and Video (if installed) on the Systems MFD

Refer to the relevant system for a description of the remainder of the MF controller buttons.

For each interactive window there are adjacent bezel buttons on the outer edge of the DU. The operational bezel buttons have an adjacent soft key, pressing a bezel button without a soft key will have no effect. The bezel buttons are used for toggle operations and selections within a window without having to bring window focus (via the MF controller) to the area.

Window focus is only obtainable using the MF controller or Cursor Control Device (if installed), pressing a bezel button does not bring window focus to a window. The Map window is the default window focus except in composite mode. Only one window can be in focus across the displays. When focus is obtained a cyan border will be shown around the window.
Build 6- After an inactive period of 30 seconds the window focus border will be removed and returned to the Map window. When there is no window focus present a press of any of the arrow keys on the MF controller will highlight the focus border on the Map window.
Build 7 and higher - After an inactive period of 60 seconds the window focus will return to the Map window. When focus is brought to a new display the cursor will bloom for approximately 10 seconds.

When window focus is brought to a window that has data entry fields a cursor colored cyan will be placed on the first data entry field. The MF Controller joystick can then be used to position the cursor onto a required data entry field. At power up the cursor is placed in the upper left corner of the default Map window.

Page operation is accomplished by pressing the PAGE button on the MF controller when in an active window. A menu listing the available pages for the window will be displayed. Use the joystick (focus) to make a selection and then press the ENT key on the MF controller to display a new window. Pressing the PAGE button again or after 30 seconds of display the page menu is removed. There are two types of menus:

- Page menus - to access pages of functions contained in the same window
- Functionality menus - to show selection headings that remain the same regardless of the current mode of operation

All menus once selected have cursor snapping, whereby the cursor snaps to the first item in the menu and to the subsequent items with joystick operation. When a keyboard or an MF controller entry is made the cursor is caged inside the data field until the entry is completed by pressing the ENT key or clearing the entry with the CLR or DEL keys. If an MF controller short cut key is pressed or the cursor time out period is reached the entry is considered not finished and reverts to the previous value.

The MF controller has short cut keys which can be used to quickly access functionality on the windows. Pressing a shortcut key moves the window focus to the window containing the requested functionality and places the cursor on the item.

The shortcut keys on the MF controller when pressed moves the window focus and places the cursor as follows:

- COM - to the COM 1 field on the PFD RADIOS window
- NAV - to the NAV 1 field on the PFD RADIOS window
- XPDR - to the XPDR field on the PFD RADIOS window

Pressing the INFO shortcut key activates the WPT window (if not displayed) and transfers cursor focus to the waypoint information display box.

Pressing the DIR TO shortcut key opens the FMW (if not opened), activates the direct-to-page, and sets the cursor focus to the DIR field for subsequent entry of a direct-to-waypoint into the flight plan.

A Cursor Control Device (CCD) can be installed on the top rear of the center console. It provides the crew with a more ergonomic means for controlling the cursor movement on the MFD's. The CCD is connected to a Control Unit which provides the interface between the CCD and the Primus APEX Modular Avionics Unit (MAU). The Control Unit is powered through the Pilot PFD CONT/CCD circuit breaker from the Standby Bus and therefore the CCD can be used for preflight functions (engine not running). The CCD will continue to provide the same functionality as the MFC joystick related controls, in the event of an MFC joystick failure. The CCD has a trackball to select focus and drop down menus, and a scroll wheel. The scroll wheel can be pressed sideways (left) to operate the page function.
Build 6 - There are enter push buttons on the left and right sides of the CCD.
Build 7 and higher – On the left side of the CCD is an Enter pushbutton, on the right side a Focus pushbutton. The Focus pushbutton swaps display focus between the installed displays in a counterclockwise direction.

The Display Units each have a power supply from a different power bus. The pilots DU is powered from the Essential Bus, The upper MFD is powered by the Main Bus, the lower MFD is powered by the Standby Bus and the copilots DU (when installed) is powered by the Avionic 2 bus.

DISPLAY REVERSION

The display system is capable of reverting the Display Units (DU) and Advance Graphics Module 1 and 2 (AGM) by pilot operation in the event of a display or AGM failure condition. A Display Reversion Control panel is installed on the center console below the MF controller.

The control panel has potentiometers for the PILOTS PFD, UPPER MFD, LOWER MFD and CO-PILOTS PFD (when installed). The potentiometers are used to adjust the individual DU brightness and to switch the displays to OFF/REV. The copilots PFD has only the OFF position. At the OFF/REV position the DU goes blank and the display is moved to another display. In a reversion scenario (e.g. Copilot PFD displayed on Pilot PFD) the navigation information displayed will be based on the Nav sensor selected on the source display. In some cases the PFD will go into a composite mode. The PFD composite format shows the ADI/HSI, up to twelve CAS messages, Systems Summary and Radio windows.

The PILOTS PFD and CO-PILOTS PFD (when installed) controls also have a rotating switch that can be used to select from the NORM position to the other AGM in the event of a primary AGM drive failure indicated by a red X displayed across the DU.

In the event of a Multi Function Display (MFD) failure, the Situation Awareness or the Systems data can be switched to the remaining MFD by pressing the MFD swap button on the MF Controller. The only limitation is that the Charts can only be accessed on the upper MFD.

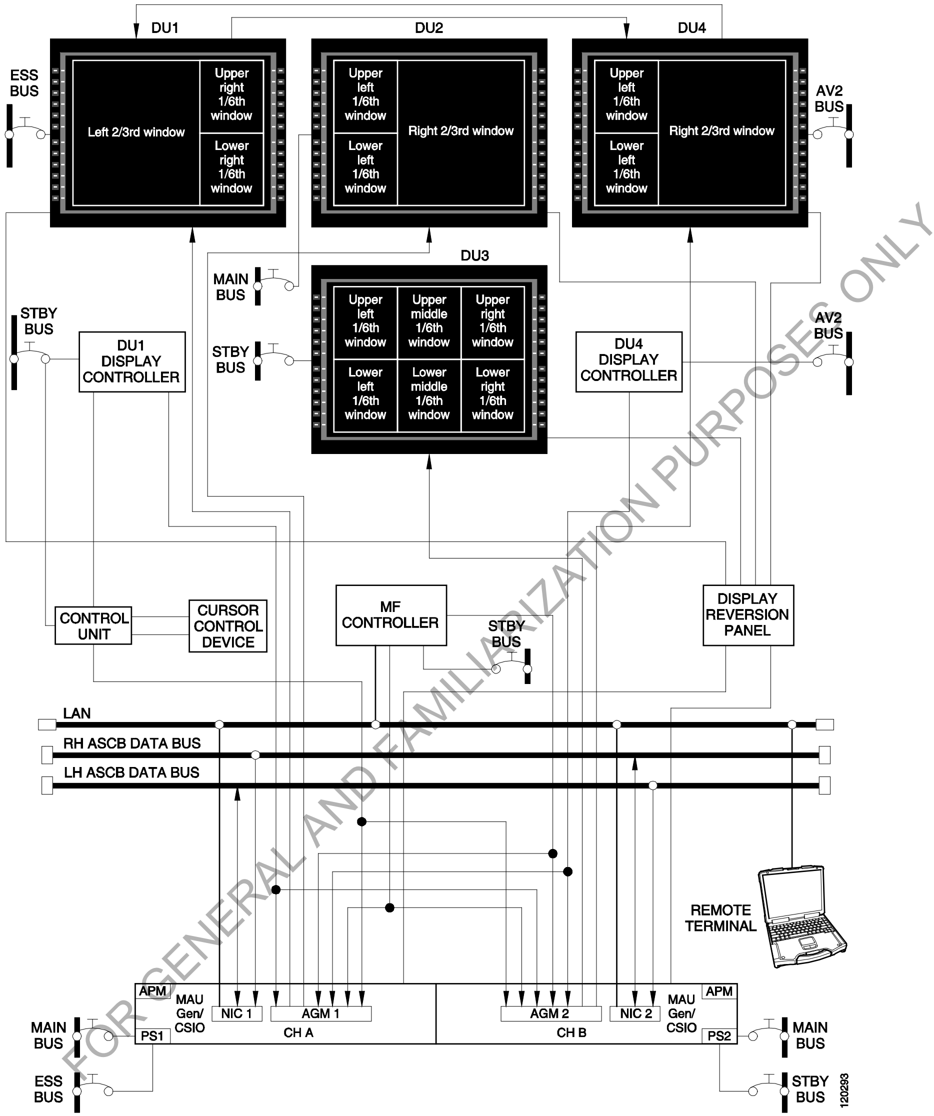


Figure 7-27-1. APEX – Displays (CCD Installed)
(Sheet 2 of 3)

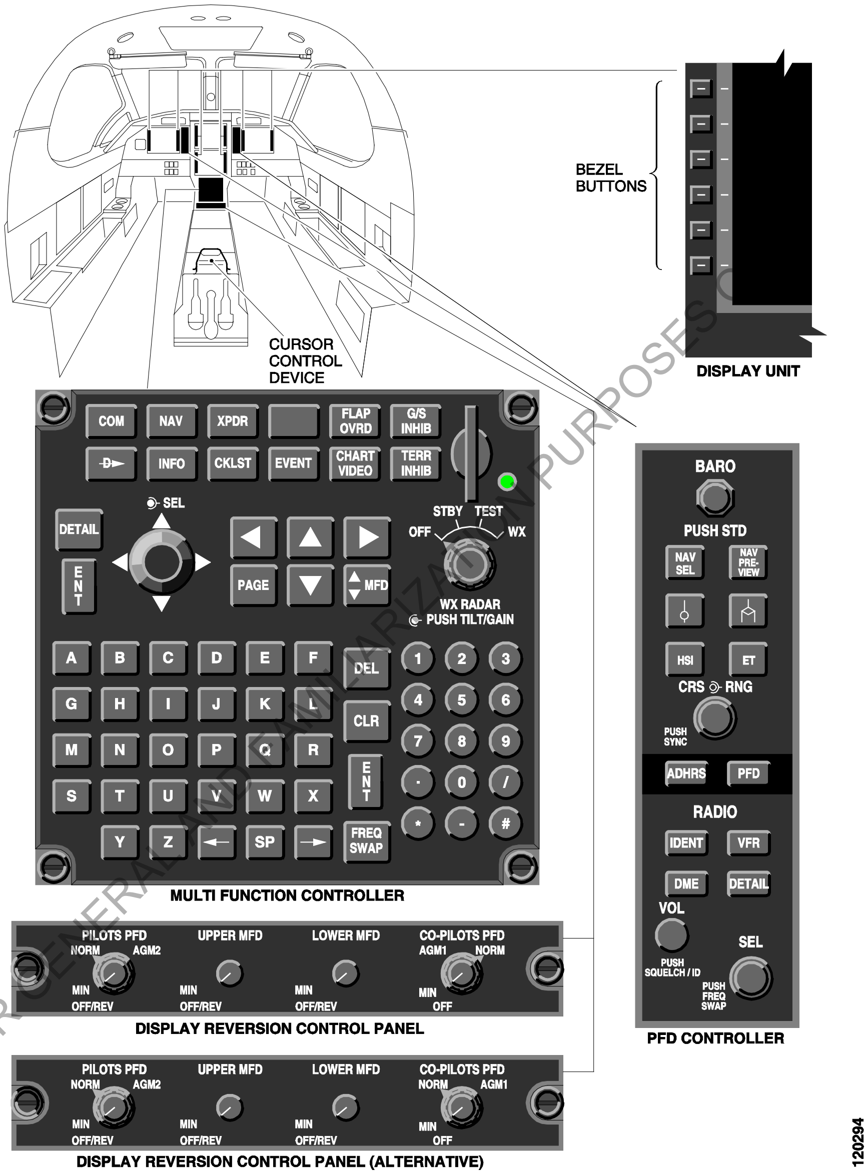


Figure 7-27-1. APEX – Controls
(Sheet 3 of 3)

PRIMARY FLIGHT DISPLAY

Refer to Figure 7-27-2 General.
Refer to Figure 7-27-3 Differences APEX Build 8 and higher.
Refer to Figure 7-27-4 Differences APEX Build 10 and higher.

The Primary Flight Display (PFD) provides all the essential flight data to the pilot. The PFD displays attitude, heading, airspeed and altitude in the left 2/3rd window. The right upper 1/6th window displays the engine indicators and the right lower 1/6th window displays the radio controls, refer to the Engine and Communication and Navigation sections for a description of these windows. A second optional PFD can be installed for the copilot, the window layout on this PFD is shown in a mirror image.

In normal operation the PFD receives air data, heading inputs for flight guidance, radio navigation or FMS data and engine instrument data. The PFD is divided into the following display areas:

- Flight Mode Annunciators (FMA)
- Attitude Director Indicator (ADI)
- Airspeed
- Altitude
- Vertical Speed
- Horizontal Situation Indicator (HSI) Displays and Annunciators
- Radio Management
- Engine Instruments

Attitude information is displayed on an electronic Attitude Director Indicator (ADI) and heading and course information on an electronic Horizontal Situation Indicator (HSI).

Primus APEX Build 8 or higher operational software changes the display information as follows:

- All blue over brown (ADI and HSI are merged)
- Expanded pitch scale (10° pitch up, 10° pitch down)
- Green pitch and roll symbol (gull wing or flying wedge)
- Dynamic Speed Bug (DSB)

  The Dynamic Speed Bug (DSB) replaces the Fast/Slow display. It is shown as a green chevron on the right side of the airspeed tape when the calibrated airspeed is 45 knots or more and the aircraft status is in-air. The DSB is removed when the aircraft is on the ground and below 45 knots for more than 5 seconds. Based on angle of attack information, the DSB indicates 1.3 V_S referenced to the airspeed tape.

Primus APEX Build 10 or higher operational software changes the display information as follows:

- Display of UTC/Z time on the PFD
- Removal of wind display on ground and consistency color changes

The T/O and LDG V-speeds are entered from the FMW. All V-speed entries are limited from 30 to 200 knots with the exception of VT that is limited from 30 to VMO knots. Only entered V-speeds will be displayed. The ADI T/O V-speeds are displayed in the lower portion of the airspeed tape, if the aircraft is "on ground" and below 45 knots. The ADI T/O V-speed bugs are displayed on the airspeed tape while the Indicated Airspeed is less than the highest V-speed (VX, VR and VY) plus 10 knots. The ADI Landing/Approach bugs are displayed while airborne and the indicated Airspeed transitions to less than the highest V-speed (VT, VREF and VGA) plus 40 knots. 5 seconds after landing the T/O V-speeds are displayed on the airspeed tape or in the preview window if speed is below 45 knots. After an electrical power cycle the V-speeds have to be reprogrammed for the next flight.

The Avionics window on the systems MFD provides the pilot with the capability to configure some display options on the ADI and HSI, and to utilize the FMS custom database feature.

The displayed data is compared by the comparison monitors and if data is determined to be invalid or miscompare, warning, caution and miscompare annunciations are shown on the PFD. The warning annunciators are shown in white on a red box or a red cross over the symbol or tape. Some miscompare annunciators are shown in white on a red box and some are shown in black on an amber box. The NO TAKEOFF and ATT FAIL annunciators are shown in the same location on the ADI. Refer to Figure 7-27-2 Sheets 1 thru 5 for annunciator detail.

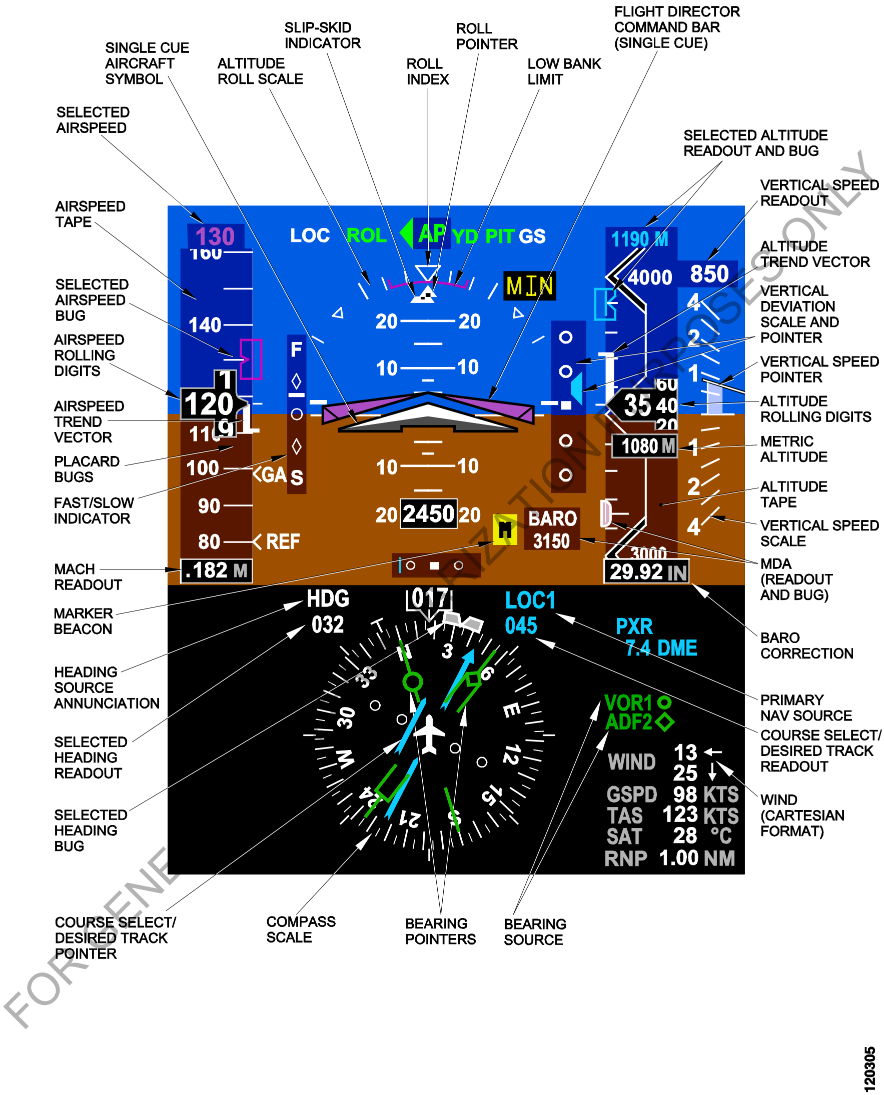
The following displays can be overlaid on the HSI in the partial compass (ARC) mode:

- Traffic
- Weather Radar
- Lightning (optional)
- Terrain from TAWS (optional)

The PFD controller contains the controls for ADI/HSI:

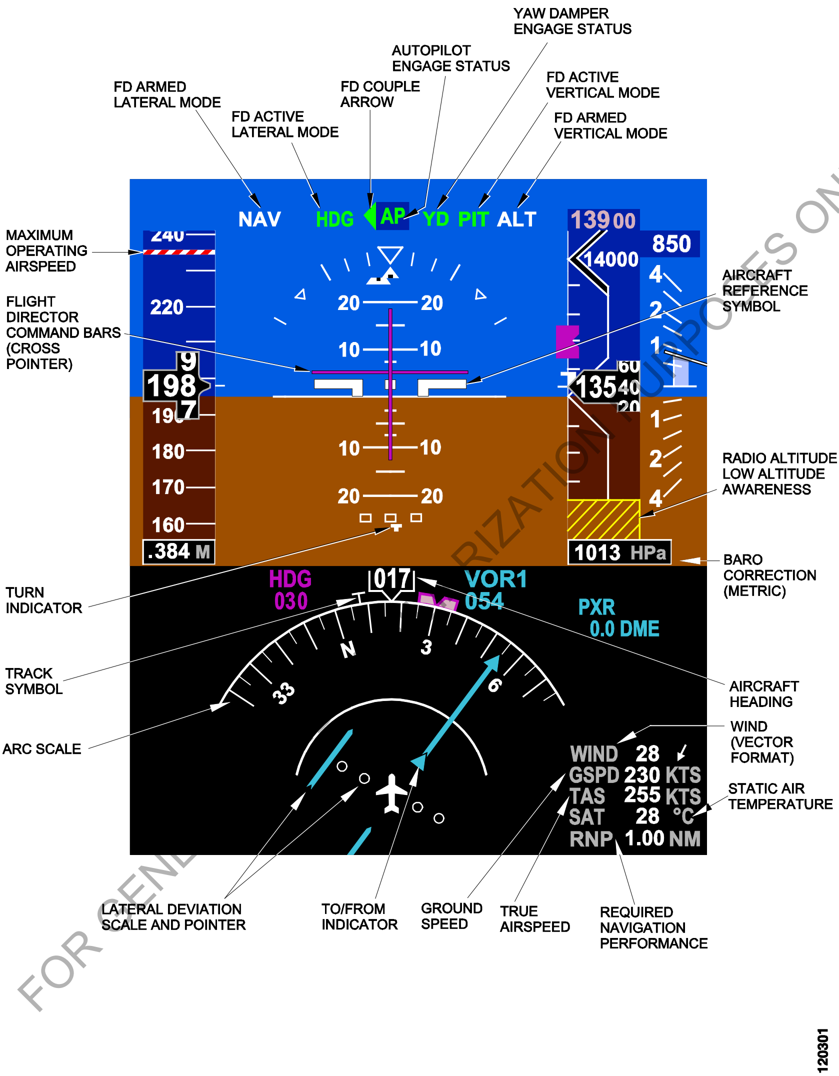
BARO	rotary click knob for the setting of the current barometric pressure value for display on the PFD altitude window for the selected ADAHRS channel. Clockwise rotation increments and counter clockwise decrements the barometric correction value
PUSH STD	push button to set the current barometric pressure value to standard pressure
NAV SEL	push button to cycle through the navigation sources shown on the HSI display
NAV PRE-VIEW	push button to activate and cycle through available navigation sensors when FMS is the active sensor
O (circle)	push button to cycle through the No. 1 sources of navigation bearing to be displayed on HSI as a circle pointer (single pointer)
◊ (diamond)	push button to cycle through the No. 2 sources of navigation bearing to be displayed on HSI as a diamond pointer (double pointer)
HSI	push button to alternate HSI display between compass and arc formats
ET	push button to activate and control an elapsed timer displayed on PFD
CRS/RNG	dual rotary click knob, inner for control of the desired VOR/LOC course to be flown and the selected navigation sensor shown on the HSI. Outer for control of the range display on the HSI
PUSH SYNC	push button to cause a synchronization of the selected course to the current VOR bearing, if a VOR is the selected navigation sensor

Refer to the Honeywell Primus APEX Integrated Avionics System for the Pilatus PC-12 NG – Pilot Guide for complete information on the description and operation of the PFD.



Note: YD indication – Build 7 and higher.
Fast/Slow Indicator – Build 6 and 7.

Figure 7-27-2. Typical APEX ADI HSI Display – HSI Rose
(Sheet 1 of 5)



Note: YD indication – Build 7 and higher.

Figure 7-27-2. Typical APEX ADI HSI Display – HSI Arc
(Sheet 2 of 5)

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Note: YD indication – Build 7 and higher.

Figure 7-27-2. Typical APEX ADI HSI Display – Failed Indications
(Sheet 3 of 5)

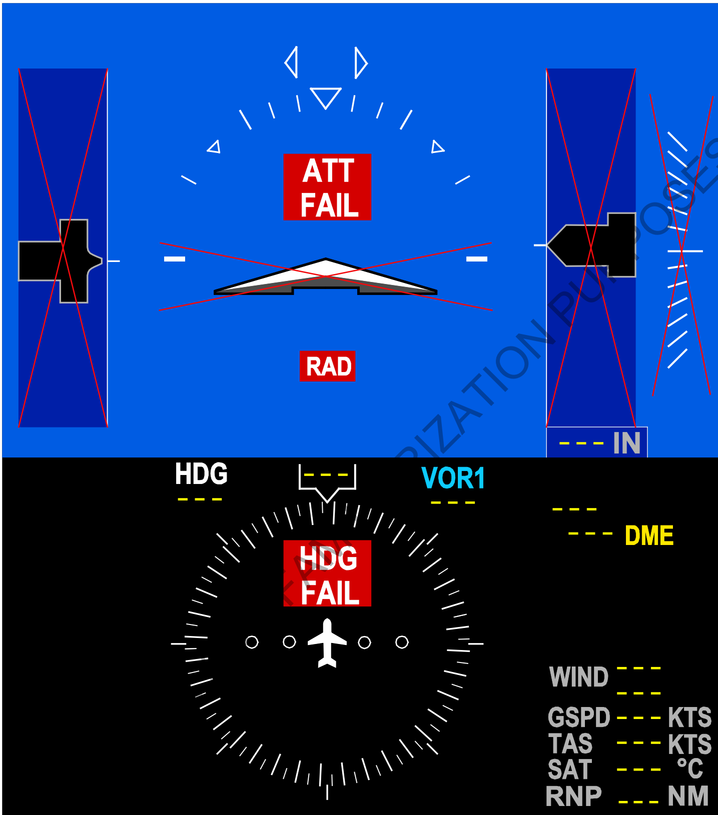

Figure 7-27-2. Typical APEX ADI HSI Display – All Failures
(Sheet 4 of 5)

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Figure 7-27-2. Typical APEX ADI HSI Display – Miscompare Annunciations
(Sheet 5 of 5)

120392

Figure 7-27-3. APEX Build 8 and higher ADI HSI Display

Figure 7-27-4. APEX Build 10 and higher ADI HSI Display – On ground

Refer to the Honeywell Primus APEX Integrated Avionics System for the Pilatus PC-12 NG – Pilot Guide for complete information on the description and operation of the PFD.

SITUATION AWARENESS MULTI FUNCTION DISPLAY

The upper MFD default display is used for situation awareness formats with various other system displays in dedicated windows. The bezel buttons on the sides of the MFD are used to select formats and control various systems. Refer to the Flight Management System section and the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12NG – Pilot Guide for complete information on the description and operation of the MFD.

SYSTEMS MULTI FUNCTION DISPLAY

Refer to Figure 7-27-5.

The lower MFD default display is used for the aircraft systems displays and control and for the display of CAS messages. The MFD display is divided into six windows with the two center windows further sub divided. Refer to the relevant aircraft system section for further information on the content of systems MFD windows, apart from the lower left window which displays the following menus:

CKLST	If no valid database is installed, the window will display (optional) Checklist Unavailable. If installed, displays an electronic Normal Procedures Checklist as a menu line item.
SENSORS	Sensor Type selections provide a hierarchical view of the navigation status to the pilot. The highest levels contain summary information and the lower levels contain more sensor specific details. The pull down menu contains selection of the Performance, FMS and GPS pages
WX/LX/TAWS	The Weather, Lightning and Terrain set up pages can be accessed from their individual tabs
AVIONICS	The avionics window gives the capability to configure the following display options on the ADI and HSI from the PFD tab: - Barometric correction imperial or metric - Metric altitude enable or disenable - Wind format X-Y or vector - Heading display magnetic or true - Baro synchronization enable or disable

The following display option is controlled from the FCS tab

Flight Director command cue s-cue or cross pointer

The Custom DB tab is used for managing the FMS custom database

SCMS/DL	Only available on the ground. The Configuration Management Systems page displays configuration information for all installed software/databases and is used for return to service type operations. The DATA LOAD page displays data loading status information for uploading and downloading files to and from the SD card slot in the MF Controller
SUMMARY	Cannot be selected manually, automatically displays a summary page of the systems when charts are displayed on the Systems MFD. No control of any aircraft system is possible through the Systems Summary window

INDICATION / WARNING

The Crew Alerting System (CAS) window on the systems MFD will show the following Caution and Advisory messages for the APEX core system status:

AMBER CAUTION

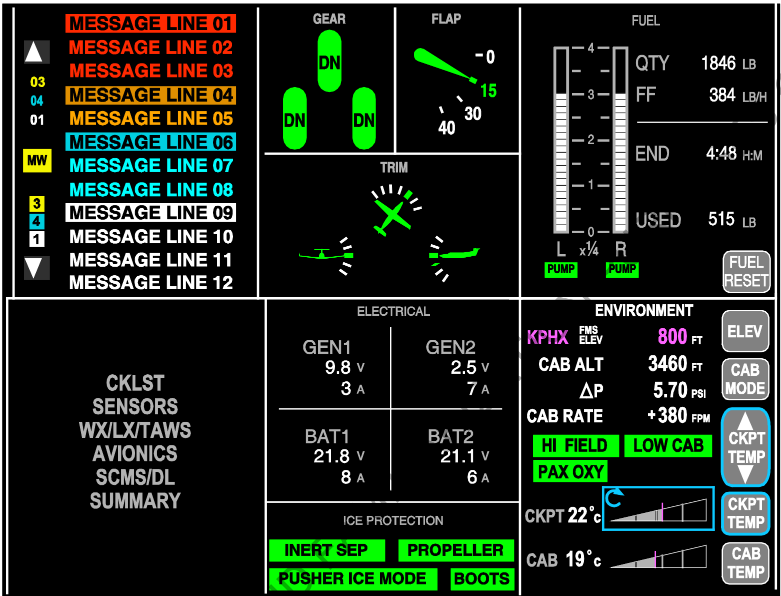
MAU A Fail MAU B Fail	Indicates Channel A or B of Modular Avionics Unit is failed
Check DU 1 Check DU 2 Check DU 3 Check DU 4 Check DU 1+2 Check DU 1+3 Check DU 1+4 Check DU 2+3 Check DU 2+4 Check DU 3+4 Check DU 1+2+3 Check DU 1+2+4 Check DU 1+3+4 Check DU 2+3+4 Check DU 1+2+3+4	Indicates that there is a problem with either a Display Unit, the fiber channel between the AGM and Display Unit or a Display Unit connector
DU 1 Overheat DU 2 Overheat DU 3 Overheat DU 4 Overheat DU 1+2 Overheat DU 1+3 Overheat DU 1+4 Overheat DU 2+3 Overheat DU 2+4 Overheat DU 3+4 Overheat DU 1+2+3 Overheat DU 1+2+4 Overheat DU 1+3+4 Overheat DU 2+3+4 Overheat DU 1+2+3+4 Overheat	Indicates one or two or three or four (if installed) Display Units have overheated
Check Pilot PFD	Indicates pilots PFD wrap monitor failed
Check Copilot PFD	Indicates copilots PFD wrap monitor failed
Check Engine Display	Indicates pilot and copilot engine displays wrap monitor failed
LH PFD CTLR Fail	Indicates Pilot’s PFD Controller has failed (on ground only)
RH PFD CTLR Fail	Indicates Copilot’s PFD Controller has failed (on ground only)
LH+RH PFD CTLR Fail	Indicates Pilot’s and Copilot’s PFD Controllers have failed (on ground only)
ASCB Fail	Indicates Avionics Standard Data Bus has failed

AMBER CAUTION (CON'T)

APM 1 Fail APM 2 Fail APM 1+2 Fail	Indicates No.1, No. 2 or both Aircraft Personality Modules have failed (on ground only)
CMS 1+2 Fail	Indicates No.1 and No. 2 Configuration Management System has failed (on ground only)
System Config Fail	Indicates System Configuration Monitor detects a HW or SW configuration error (on ground only)
Validate Config	Indicates System Configuration Monitor detects a system part number change (on ground only)
APM Miscompare	Indicates Aircraft Personality Modules disagree over installed systems configuration (on ground only)

CYAN ADVISORY

1: AIOP A Module Fail 2: AIOP B Module Fail	Indicates Actuator I/O Module Ch A or B has failed in the Modular Avionics Unit
1: CSIO A Fail 2: CSIO B Fail 3: CSIO A+B Fail	Indicates Custom I/O Module Ch A or B has failed in the Modular Avionics Unit
1: MAU A Overheat 2: MAU B Overheat 3: MAU A+B Overheat	Indicates Modular Avionics Unit Channel A or B or both channels have overheated
MAU Fan Fail	Indicates a Modular Avionics Unit cooling fan has failed
1: GIO A Fail 2: GIO B Fail 3: GIO A+B Fail	Indicates Generic I/O Module Ch A or B or both have failed in the Modular Avionics Unit
1: AGM 1 fail 2: AGM 2 fail	Indicates Advanced Graphics Module Ch A or B has failed in the Modular Avionics Unit
MF CTLR Fail	Indicates Multi Function Controller has failed
LH PFD CTLR Fail	Indicates Pilot's PFD Controller has failed
RH PFD CTLR Fail	Indicates Copilot's PFD Controller has failed
LH+RH PFD CTLR Fail	Indicates Pilot's and Copilot's PFD Controllers have failed
CMS 1 Fail	Indicates Configuration Management System 1 has failed
CMS 2 Fail	Indicates Configuration Management System 2 has failed



7-27-5. Systems Multi Function Display

PRIMUS APEX - ATTITUDE AND HEADING

GENERAL

Refer to Figure 7-28-1.

The Attitude and Heading system comprises:

- Air Data and Attitude Heading Reference System (ADAHRS)
- Electronic Standby Instrument system (ESIS)
- Standby Magnetic Compass (if installed).

AIR DATA AND ATTITUDE HEADING REFERENCE SYSTEM (ADAHRS)

GENERAL

The aircraft is equipped with one dual channel Air Data and Attitude Heading Reference System (ADAHRS). Each channel has a separate power supply, Channel A from the Essential bus and Channel B from the Main Bus. The system provides primary attitude, heading and air data parameters from each channel to the Modular Avionics Unit (MAU). This ensures that a single component failure will not affect both channels.

DESCRIPTION

Each channel of the ADAHRS contains a solid-state micro-electromechanical systems (MEMS) technology sensor block, which contains three rate sensors and three accelerometers in an orthogonal triad configuration. The triad in Channel B is skewed relative to Channel A. Each channel has an interface for an Outside Air Temperature (OAT) probe, a magnetometer and two isolated absolute pressure sensors (one for pitot and one for static pressure). Channel A receives inputs from the No. 1 pitot/static, magnetometer and temperature probe. Channel B receives inputs from the No. 2 pitot/static, magnetometer and temperature probe. Each channel also has a Central Processing Unit (CPU). The ADAHRS is installed under the cabin floor between frames 25 and 26.

During normal operation the pilots PFD receives ADAHRS source data from the No. 1 pitot/static system (left side sensors) and ADAHRS Channel A. The copilot PFD (when installed) receives ADAHRS source data from the No. 2 pitot/static system (right side sensors) and ADAHRS Channel B. The controllers for the pilot and copilot Primary Flight Display (PFD) have an ADHRS button, which can be used to change the PFD ADAHRS source channel. ADAHRS source annunciations will be shown in amber in the lower left region of PFD ADI window when the same source has been selected on both pilot and copilot PFDs.

The ADAHRS also receives data from the GPS sensor, in the single GPS installation the data signal is connected to both ADAHRS channels. In an optional dual GPS installation, the GPS 1 data signal is connected to the ADAHRS channel A and the GPS 2 data signal is connected to the ADAHRS channel B (Post SB 34-017 and MSN 1101 - 1942).

OPERATION

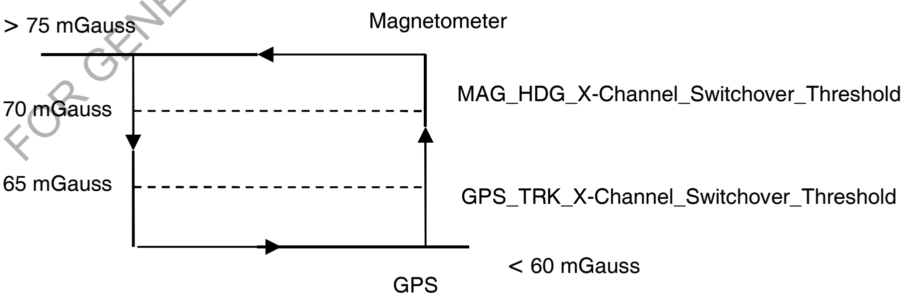
Each ADAHRS channel CPU receives air data, temperature and heading information from that channel's sensor block and passes it to the other channel, both CPU's compare the data to verify sensor integrity. Verified AHRS and air data information is sent to each channel of the MAU for the APEX system.

If the data from a sensor does not pass the verification check the data is discarded and not used. A fault signal will be sent to the MAU and a caution will be shown on the CAS. In this case the ADHRS button on the PFD Controller for the failed side can be pressed to change the ADAHRS source channel to the opposite side.

HIGH AND LOW LATITUDE OPERATIONS

The ADAHRS automatically provides calculated magnetic track, when the measured horizontal magnetic field strength is less than 60 mGauss but still within the coverage of the Magnetic Variation look up table of the FMS, and true track when operating outside this coverage. When true track is displayed, the airplane symbol on the INAV and Charts display is removed. When flying from true track zone into magnetic track zone, magnetic mode needs to be manually selected on the Avionics window. The Weather Radar, Stormscope and TCAS data is always shown relative to the aircraft's nose and is therefore not corrected for Drift Angle in Track Mode.

The coverage of the Magnetic Variation look up table can be seen in the Figure 7-25, Sheet 1. If desired, the crew can also manually select a true North reference before the automatic switch from mag to track occurs. As soon as the measured horizontal magnetic field strength is more than 75 mGauss, the system automatically switches back to the MAG HDG. This hysteresis can be seen in the figure below.



HORIZONTAL MAGNETIC FIELD STRENGTH

On the ground in geographical latitudes where the measured horizontal magnetic field strength is less than 60 mGauss and the aircraft ground speed is less than 9 kts neither heading from the ADAHRS, nor track from the GPS is provided. Therefore heading flags (HDG FAIL) are shown on the HSI and (HDG) on the INAV. During the initial take-off roll track output is provided and the heading flags are removed.

With the optional HDG/TRK Override switch installed (ref. Figure 7-19-1), the pilot can manually force the system into a magnetic HDG or GPS-TRK mode, independent from the implemented automatic switching.

OPTIONAL HDG/TRK OVERRIDE SWITCH

An optional HDG/TRK Override switch can be installed on the right side of the pilot's lower left panel. It is a three position rocker type switch with the positions GPS TRK / AUTO / MAG HDG. The switch gives the pilot the ability to select either GPS Track or Magnetic Heading as directional indication on the HSI, independent of the implemented automatic switching.

With the switch in AUTO (normal position) the measured magnetic HDG is shown on the HSI as long as the measured horizontal magnetic field strength is at least 60 mGauss. If the measured horizontal magnetic field strength becomes less than 60 mGauss the system automatically switches to track reversion mode and GPS-TRK will be indicated on the HSI. In this case the pilot should manually switch to TRK on the AFCS panel. The system automatically switches back to the MAG HDG as soon as the measured horizontal magnetic field strength is more than 75 mGauss (hysteresis).

If the HDG/TRK Override switch is in the GPS TRK position, the system is forced to indicate GPS-Track on the HSI. In this case two different readings are possible on the HSI either magnetic track or true track. If the magnetic variation look up table of the FMS is valid the HSI reading will be magnetic track (MAG TRK) and a CAS caution message "HSI is MAG TRK" will be shown. If the magnetic variation look up table is not valid the HSI reading will be true track (TRU TRK) and a CAS caution message "HSI is TRU TRK" will be shown.

If the HDG/TRK Override switch is in the MAG HDG position, the system is forced to indicate magnetic heading on the HSI. With a measured horizontal magnetic field strength of less than 60 mGauss this may lead to HDG comparator flags and the magnetic heading on the HSI may show inaccurate or unstable readings.

Refer to Pilatus Pilot Guide Document No. 02336 for more information on the operation of the HDG/TRK override switch. The guide can be found at: www.pilatus-aircraft.com -> Menu -> Customer Support -> MyPilatus Customer Portal.

INDICATION / WARNING

The Crew Alerting system (CAS) window of the systems Multi Function Display (MFD) displays the following Cautions and Advisory messages for the ADAHRS status:

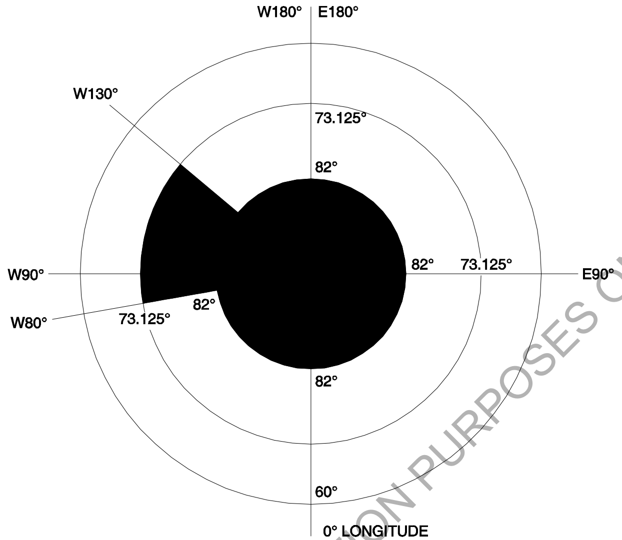
AMBER CAUTION

ADC A fail	Loss of altitude and airspeed data from ADAHRS Channel A
ADC B Fail	Loss of altitude and airspeed data from ADAHRS Channel B
ADC A+B Fail	Loss of altitude and airspeed data from ADAHRS Channel A and B
AHRS A fail	Loss of attitude and heading data from ADAHRS Channel A
AHRS B Fail	Loss of attitude and heading data from ADAHRS Channel B
AHRS A+B Fail	Loss of attitude and heading data from ADAHRS Channel A and B
HSI is MAG TRK (Build 6)	HSI is referenced to a magnetic track
HSI is TRU TRK (Build 6)	HSI is referenced to a true track
HSI 1 is MAG TRK (Build 7 and higher)	HSI 1 is referenced to a magnetic track
HSI 1 is TRU TRK (Build 7 and higher)	HSI 1 is referenced to a true track
HSI 2 is MAG TRK (Build 7 and higher)	HSI 2 is referenced to a magnetic track
HSI 2 is TRU TRK (Build 7 and higher)	HSI 2 is referenced to a true track
HSI 1 + 2 is MAG TRK (Build 7 and higher)	HSI 1 and 2 is referenced to a magnetic track
HSI 1 + 2 is TRU TRK (Build 7 and higher)	HSI 1 and 2 is referenced to a true track

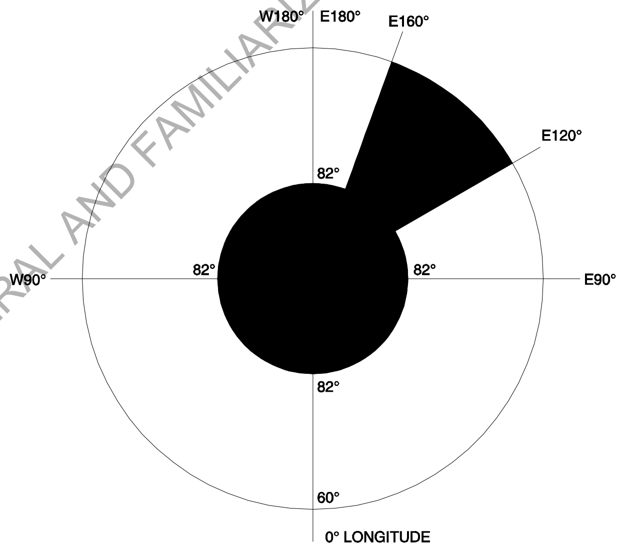
CYAN ADVISORY

LH OAT Fail	Loss of total and static air temperature from ADAHRS Channel A
RH OAT Fail	Loss of total and static air temperature from ADAHRS Channel B
LH+RH OAT Fail	Loss of total and static air temperature from ADAHRS Channel A and B

Refer to the Pitot Static Systems, Section 7-20 for the pitot and static systems cautions.



Polar Cut Out Region North



Polar Cut Out Region South

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Figure 7-28-1. Attitude and Heading – Polar Regions
(Sheet 1 of 3)

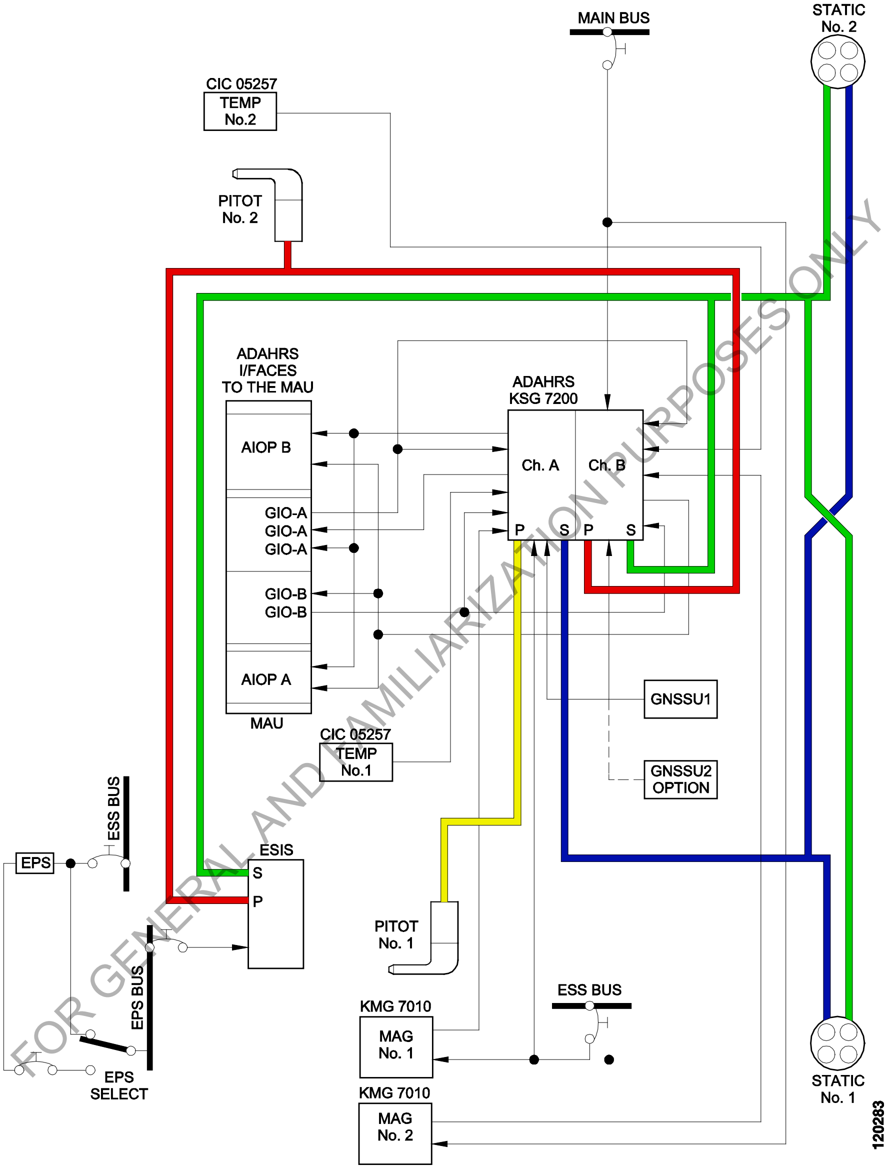

Figure 7-28-1. Attitude and Heading (MSN 1001 thru 1270 pre SB 34-042) – Schematic (Sheet 2 of 3)

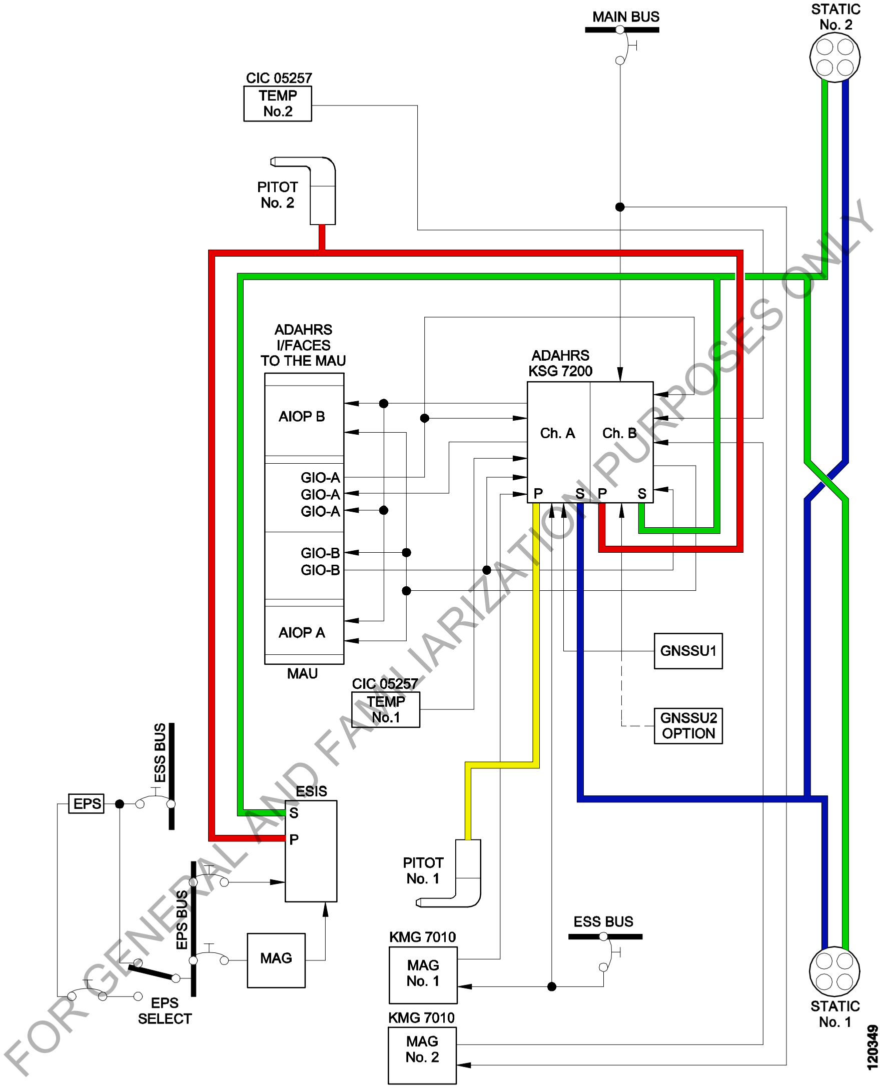

Figure 7-28-1. Attitude and Heading (MSN 1001 thru 1270 post SB 34-042)
(MSN 1271 - 1942) – Schematic
(Sheet 3 of 3)

ELECTRONIC STANDBY INSTRUMENT SYSTEM (ESIS) (MSN 1001 THRU 1270 PRE SB 34-042)

GENERAL

Refer to Figure 7-28-1, Attitude and Heading, for system schematic.

The Electronic Standby Instrument System (ESIS) provides displays for attitude, altitude and airspeed in case of primary display failure. The ESIS is installed on the left instrument panel.

The ESIS contains electronic inertial and pressure sensors and electronic processors which calculate and display attitude, skid/slip, altitude, airspeed, VMO, and Mach number. Electrical power is supplied from the Emergency Power Supply (EPS) busbar. Static and pitot pressure inputs to the ESIS come from the right hand No. 2 pitot/static system.

DESCRIPTION

The ESIS internal inertial sensors compute and display the attitude (pitch and roll) and skid/slip, altitude and airspeed on an active LCD matrix color display screen.

Internal pressure sensors measure the total and static pressure to compute and display altitude, indicated airspeed corrected for static source error correction (SSEC), VMO and Mach number.

A CAGE pushbutton, when depressed for more than 1 second, initiates the caging function, which will cage the attitude display initially to zero and then to the actual attitude. This is used to cancel errors induced in the attitude display following unusual aircraft maneuvering or an upset. The CAGE warning flag will appear on the LCD and is maintained during 10 seconds after the release of the button. The CAGE function must only be used in stabilized flight conditions (fuselage and wings leveled, airspeed constant).

NOTE

The CAGE push button does not correspond to the fast erect function on electro-mechanical horizons. The CAGE button has to be used when an attitude discrepancy (more than 4 degrees) between the ESIS and PFD is detected by the pilot. The CAGE function can only be used in straight and level, unaccelerated flight path.

A rotary BARO control on the front panel is used to select the required barometric pressure setting and a STD pushbutton resets the barometric setting to the standard QNE value.

Two pushbuttons “+” and “-“ adjust the ESIS display brightness.

The ESIS uses airspeed data to switch between ground/flight conditions automatically.

OPERATION

Power off

The ESIS is not operational and the display is blank.

Power on

Refer to Figure 7-28-2, for ESIS displays of Maintenance Page 1, Typical Operational and Fault Flags.

The ESIS initiates a self check to test the integrity of the system. For ten seconds after power on, the display shows Maintenance Page 1 with the unit part and serial numbers, aircraft type, configuration, operating hours and self check OK/FAIL status. If the self check is OK, the system then initiates an aligning phase for the inertial sensors. The aligning phase takes approximately 90 seconds to complete, during which the display shows airspeed, altitude, barometric pressure and Mach data and a white ALIGNING flag. When alignment is complete, the ESIS display shows pitch and roll attitude and skid/slip in place of the ALIGNING flag. If the ALIGNING phase is not satisfactory the display shows a red ATT flag.

If the self test is not satisfactory, or there is an error, the ESIS display shows only a white OUT OF ORDER flag and fault code.

INDICATION/WARNING

The ESIS continuously monitors its hardware, software and computed data. If there are faults with the data, or CAGE is selected, the ESI will display appropriate fault flags (and record fault codes for maintenance use) to warn that the parameter is not useable:

- Red ATT flag for pitch or roll attitude faults or aligning faults
- Red ALT flag for altitude faults
- Red IAS flag for airspeed faults
- Amber CAGE flag for CAGE selected
- Amber SSEC flag for static source error correction faults

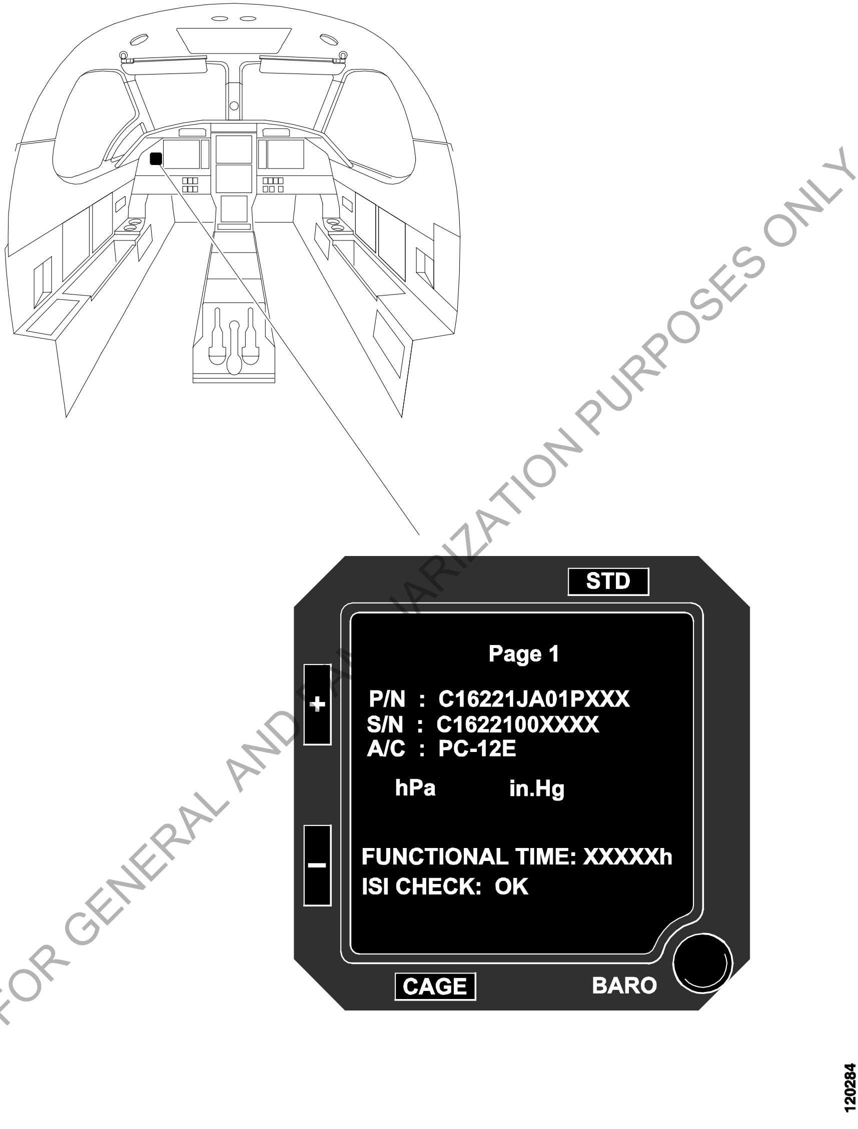

Figure 7-28-2. ESIS (MSN 1001 thru 1270 pre SB 34-042) - Maintenance Page 1 Display (Sheet 1 of 3)

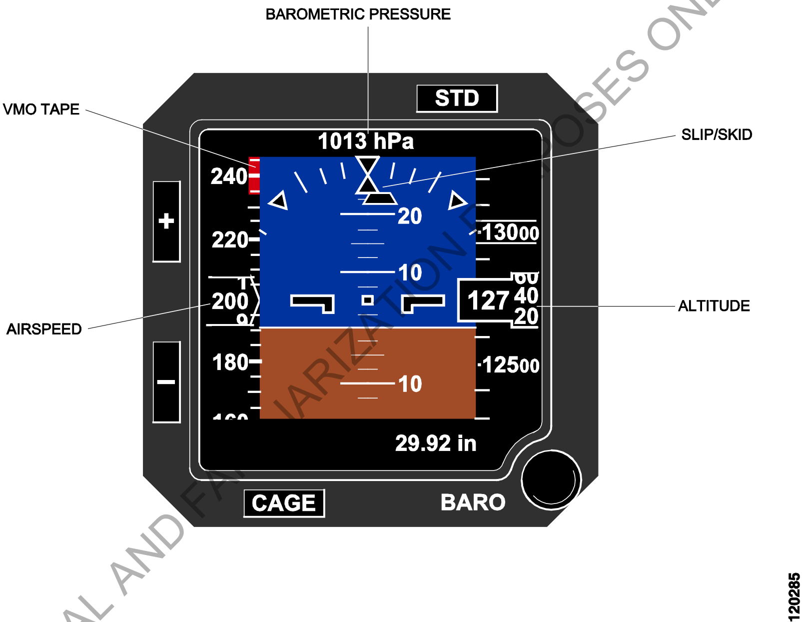

Figure 7-28-2. ESIS (MSN 1001 thru 1270 pre SB 34-042) - Typical Operational Display (Sheet 2 of 3)

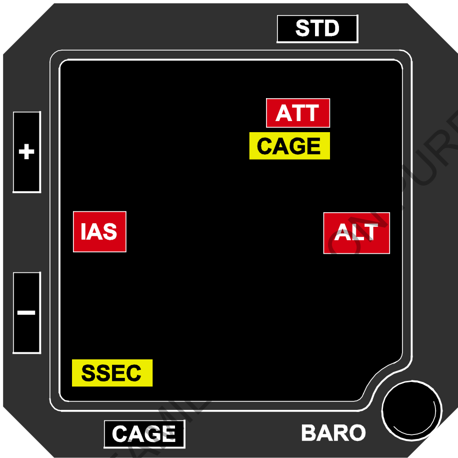

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Figure 7-28-2. ESIS (MSN 1001 thru 1270 pre SB 34-042) - Fault Flags Display (Sheet 3 of 3)

ELECTRONIC STANDBY INSTRUMENT SYSTEM (ESIS) (MSN 1001 THRU 1270 POST SB 34-042) (MSN 1271 - 1942)

GENERAL

Refer to Figure 7-28-1, Attitude and Heading, for system schematic.

The Electronic Standby Instrument System (ESIS) provides displays for attitude, altitude and airspeed in case of primary display failure. It is also a Standby Magnetic Direction Indicator that gives an alternate source for magnetic heading. The ESIS is independent of the Primus APEX system and is installed on the left instrument panel.

The ESIS contains electronic inertial and pressure sensors and electronic processors which calculate and display attitude, skid/slip, altitude, airspeed, and VMO. Electrical power is supplied from the Emergency Power Supply (EPS) busbar. Static and pitot pressure inputs to the ESIS come from the right hand No. 2 pitot/static system. The heading display is from a separate magnetometer installed in the right wing.

DESCRIPTION

The ESIS internal inertial sensors compute and display the attitude (pitch and roll), skid/slip and altitude on an active LCD matrix color display screen.

Internal pressure sensors measure the total and static pressure to compute and display altitude, indicated airspeed corrected for static source error correction (SSEC) and VMO. The ESIS also displays magnetic heading from a separate magnetometer.

If a failure is detected by the ESIS in its system, the display of the corresponding data is removed from the screen and it is replaced by either a failure message (“Attitude Fail”) or by a red cross.

The ESIS uses four bezel keys and an in-flight menu accessed through the bezel keys to control of the ESIS. The four bezel keys are marked “M”, “S”, “-” and “+” and are backlit using white light.

The function of the bezel keys is context driven .i.e. depends on the menu displayed on the ESIS.

In addition, an ambient light sensor is provided on the ESIS bezel. The ambient light sensor is used by ESIS to automatically control the display brightness based on the intensity of the ambient light and the brightness value set by the pilot (with the menu).

There are five menu screens available on the ESIS:

- Brightness control menu
- Re-Alignment menu
- System Status menu
- Barometric setting menu
- Barometric unit selection menu.

NOTE

The System Status menu is available for only three minutes from system power up. The pilot should check the System Status within this time period to ensure no fault in ESIS.

The display brightness is controlled by selecting the bright control menu screen and using the “+” and “-” keys to increase or decrease the brightness.
The menu to select re-alignment is activated by pressing the “M” button twice if no menu is displayed or once if the brightness control menu is displayed. When the re-alignment menu is displayed, the alignment is initiated by pressing the “S” button.

NOTE

Realignment is done when an attitude discrepancy (more than 4 degrees) between the ESIS and PFD is detected by the pilot. The realignment function can only be used in straight and level, unaccelerated flight.

The barometric setting can be shown in hectopascal or inches of mercury based on the unit selected. When no menu is displayed on the ESIS, pressing the “+” or the “-” button on the ESIS will increase or decrease the barometric setting and also activate the barometric setting menu.
The unit for the barometric selection can be selected as either hectopascal or inches of mercury or mb. When no menu is displayed on the ESIS, the barometric unit selection menu can be displayed by pressing the “M” button 4 times.

The ESIS uses airspeed data to switch between ground/flight conditions automatically.

NOTE

In the following two regions the ESIS heading information is not reliable (no message will be shown):

1. North of 65 deg north latitude between longitude 75 deg west and 120 deg west (Northern Canada)

2. South of 55 deg south latitude between longitude 120 deg east and 165 deg east (Region south of Australia and New Zealand)

OPERATION

Power off

The ESIS is not operational and the display is blank.

Power on

Refer to Figure 7-28-3, for ESIS displays.

The ESIS initiates a self-check to test the integrity of the system. For fifteen seconds after power on, the display shows the System Identification page with the company logo, software and firmware version displayed If the self-check is successful, the system then initiates an aligning phase for the inertial sensors. Within three minutes from power on the alignment phase is complete. During alignment the display shows airspeed, altitude, barometric pressure and an ALIGNING flag. When alignment is complete, the ESIS display shows pitch, roll, heading and skid/slip. If the ALIGNING phase is not satisfactory the display shows a red ATTITUDE FAIL flag.

INDICATION/WARNING

When the ESIS detects a failure during built in test (BIT), it displays the message in the status page (accessed through the menu options) of the ESIS. The faults displayed are “Processor fail”, “Memory fail”, “Supply Fail”, “Sensor Fail” and “Mag fail”.

In addition to the built in test failures, monitoring system faults are also displayed on the status page (accessed through the menu options). The fault displays are “Calibration Req.”, “Install Req.”, “Mag Swing Req.”, “SSEC Data Fail” and “”Vmo Data Fail” messages.

NOTE

Messages appearing with dim grey text preceded with a dash are messages that were detected before the latest application of power. Older messages continue to be shown for up to four power cycles after the failure was first detected.

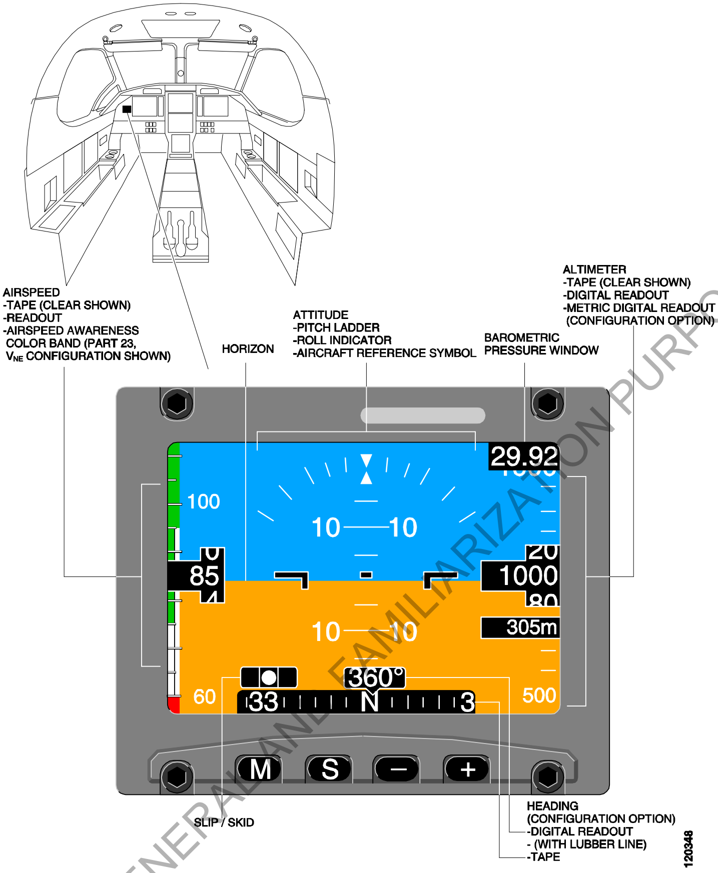
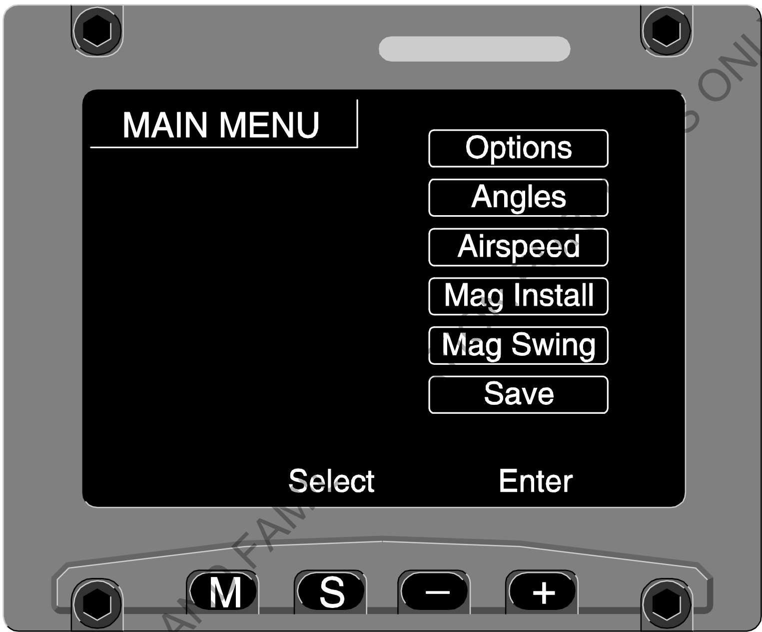
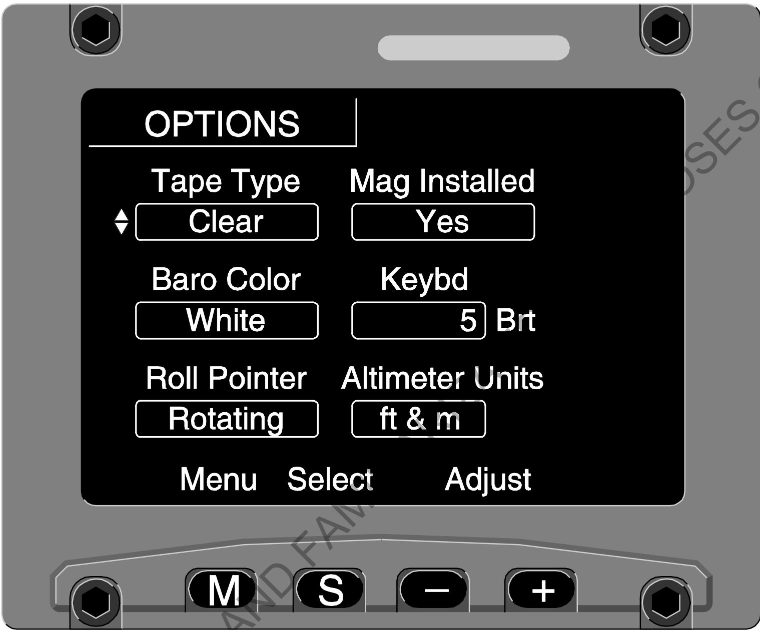


Figure 7-28-3. ESIS (MSN 1001 thru 1270 post SB 34-042)
(MSN 1271 - 1942) - Typical Operational Display
(Sheet 1 of 5)



12-B-342640-A-S4080-00006-A-01-1

Figure 7-28-3. ESIS (MSN 1001 thru 1270 post SB 34-042)
(MSN 1271 - 1942) – Main Menu Display
(Sheet 2 of 5)

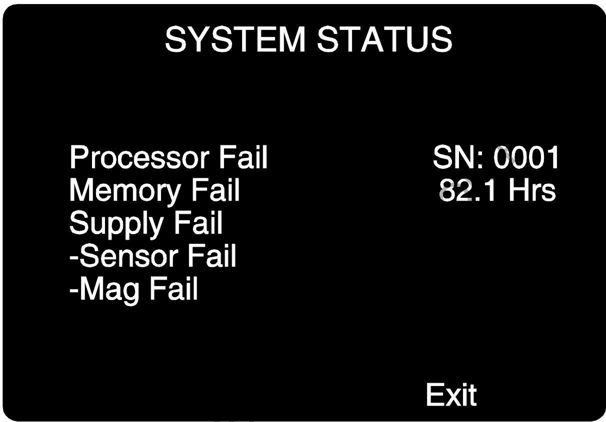


12-B-342640-A-S4080-00011-A-01-1

Figure 7-28-3. ESIS (MSN 1001 thru 1270 post SB 34-042)
(MSN 1271 - 1942) – Options Menu Display
(Sheet 3 of 5)

12-B-342640-A-S4080-00008-A-01-1

Figure 7-28-3. ESIS (MSN 1001 thru 1270 post SB 34-042)
(MSN 1271 - 1942) – Attitude Fail Display
(Sheet 4 of 5)



12-B-342640-A-S4080-00009-A-01-1

Figure 7-28-3. ESIS (MSN 1001 thru 1270 post SB 34-042)
(MSN 1271 - 1942) – System Status Display
(Sheet 5 of 5)

STANDBY MAGNETIC COMPASS (IF INSTALLED)

A standby magnetic compass (E2B) is installed on the center post between the windshields. The compass is a self-contained unit that shows aircraft magnetic heading.

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PRIMUS APEX - COMMUNICATION AND NAVIGATION

GENERAL

Refer to Figure 7-29-1, APEX Communication and Navigation - Schematic

The communication and navigation part of the Primus APEX comprises:

- Two Honeywell KTR 2280 or KTR 2280A Multi Mode Digital Radio (MMDR) integrated transceivers
- KMA 29 Audio Control Panel
- KN-63 Distance Measuring Equipment
- KXP 2290 Transponder
- Global Positioning System

MULTI MODE DIGITAL RADIO TRANSCEIVER (MMDR)

Multi Mode Digital Radio (MMDR) integrated transceivers are installed behind the pilots Primary Flight Display (PFD) and upper Multi Function Display (MFD). Power supplies to the MMDR's are from the Avionic 1 bus for MMDR No. 1 and from the Main bus for MMDR No. 2. The No. 2 MMDR also has a power supply from the Standby bus to permit radio communication without the avionic systems being powered up. The COM 2 system utilizes the upper antenna primarily for ground communications and the COM 1 system utilizes the lower antenna for airborne communications.

The MMDR is a combined VHF communications and navigation transceiver and forms part of the APEX system. The MMDR receives inputs in ARINC 429 format and outputs in ARINC 429 and analogue formats. The navigation section of the MMDR contains VOR, LOC and GS functions. The VHF communications section contains four receivers available for COM and ADF functions and one transmitter. Primary controls for the MMDR are on the Multi Function Controller and the PFD Control Panel, with display of the selected information on the PFD. An EMERG COM 1 transfer to 121.5 MHz switch is installed on the cockpit rear left switch panel. A transfer switch is installed on the PCL and is used to interchange the active and standby frequencies that are set on the COM 1 display.

The optional ADF function will tune frequencies from 200 to 1799 kHz and 2180 to 2189 kHz. If no ADF equipment is installed it is still possible to select the ADF bearing pointers. The ADF pointer label will be displayed but no bearing pointers will be shown.

Build 10 and higher:
The KTR 2280A MMDR provides a morse code decoding capability which automatically decodes the morse code identifier of a (VOR, LOC) station. If available, the morse code identifier is shown to the left of the morse code annunciatior (ID).

RADIO TUNING WINDOWS

The radio tuning window is on the bottom right of the pilots PFD and bottom left of the copilots PFD (when installed). Each radio tuning window is divided into sub-windows which show the installed receivers in the following format COM1, COM2, NAV1, NAV2, optional ADF and XPDR. To make selections the radio sub-window must be activated by pressing the adjacent bezel button. If the DETAIL button on either the PFD Controller or the MF Controller is pressed a detail window will be shown and the different equipment modes can be selected by pressing the associated soft key for more than one second.

STUCK MIC is displayed in amber between the squelch inhibit and Transmit/Receive annunciator if a transmit button is pushed for 32 seconds or more. When the STUCK MIC annunciator shows, the selected radio stops transmitting immediately.
When it is necessary to make a radio transmission for more than 32 seconds, momentarily release the transmit button. This resets the stuck microphone protection timer, after which another 32 seconds of transmission are available.

CONTROLS AND DISPLAYS

Refer to Figure 7-29-1, Apex Communication and Navigation - Controls and Displays.

PFD bezel buttons	see APEX System Description and Operation

Control Panel PFD, Radio Segment:

IDENT pushbutton	activates XPDR identification response mode, independent of cursor position
VFR pushbutton	alternates between active transponder code and configured VFR code, independent of cursor position
DETAIL pushbutton	activates a secondary radio window/page to allow option or mode selections for the related radio system. Push the button again to revert to the selected radio tuning page
VOL rotary control	adjusts the radio volume level (COM, NAV, ADF if installed)
SEL rotary control	dual rotary controls to tune radio frequency and transponder codes
PUSH FREQ SWAP	toggles the active frequency to the standby (preset) frequency and vice versa
PUSH SQUELCH / ID	squelch inhibit when the cursor is focused on a COM radio, Morse code filter when the cursor is focused on a NAV radio

Multi Function Controller, radio controls

Joystick	See APEX System section	
COM pushbutton	puts window focus on the pilot MMDR window and cursor focus on the last selected COM 1 or COM 2 ready for direct keypad data entry	
NAV pushbutton	puts window focus on the pilot MMDR window and cursor focus on the NAV 1 field ready for direct keypad data entry	
XPDR pushbutton	puts window focus on the pilot MMDR window and cursor focus on the XPDR field ready for direct keypad data entry	
FREQ SWAP	swaps the active and standby (preset) VHF NAV or VHF COM frequencies for the radio indicated by the cursor in the Radio window when KF controller has window focus	
Com 1 Norm/Emerg Switch	Norm	normal radio tuning controls are enabled
Emer Freq	VHF COM 1 active frequency is set to 121.50 MHz. The previous active frequency is moved to the standby frequency window	

Frequency Transfer Switch (FTS)	a Frequency Transfer switch on the Power Control Lever allows the pilot to transfer COM 1 between the active frequency and the standby frequency

VHF Communication Control and Display

Refer to Figure 7-29-2, VHF COM Display and Detail Page.

Active Frequency	shows the frequency currently in use
Standby Frequency	shows the frequency currently on standby
Transmit Receive annunciator	shows transmit or receive mode
Squelch Inhibit annunciator	shows that squelch has been deselected
Volume Control Scale	shows the range of available volume adjustment
Volume Control Indication	shows the current volume setting against the volume scale

VHF Navigation Control and Display

Refer to Figure 7-29-3, VHF NAV Display and Detail Page.

Active Frequency	shows the frequency currently in use
Preset Frequency	shows the frequency currently on standby
VOR Bearing	shows the bearing of the selected beacon
Morse ID Annunciator	shows the navigation identification filter is OFF
DME association	shows DME Hold is selected
Volume Control scale	shows the range of available volume adjustment

ADF Control and Display (if installed)

Refer to Figure 7-29-4, ADF Display and Detail Page.

ADF Frequency	shows the frequency of the selected station (shows amber dashes when the frequency is missing)
ADF Mode	shows the selected mode (will not be shown if the mode data is missing or invalid)

Transponder (XPDR) Control and Display

Refer to Figure 7-29-5, Transponder Display and Detail Page.

ATC Code	shows the transponder code that is set (shows amber dashes if the code is missing or invalid
Aircraft flight level	shows the aircraft flight level rounded to the nearest 100 feet (replaced by amber dashes when the ATC code is missing)
Air/Ground Mode	shows GND when the aircraft status is on the ground
ATC selectable mode	shows the selected XPDR mode (STBY, ON or ALT)
ATC active mode	shows the XPDR mode that is in use (not displayed when the ATC code data is missing or invalid)
Ident annunciator	shows IDT when identification is activated
Reply annunciator	shows a reply from the XPDR to interrogation

AUDIO CONTROL PANEL

The KMA 29 audio control panel provides audio system control for the crew and passengers. The panel also provides an interface to the Passenger Address (PA) system and aural warning system. A marker beacon receiver is also included in the panel.

The audio control panel is used to make audio selections for all audio communications to and from the crew. The audio control panel receives inputs from all audio communication channels and aural warnings. Audio outputs from the panel are to the flight compartment speaker and crew headsets. The audio outputs to the crew headsets are in stereo. There is a PTT switch on each control wheel left yoke and on the hand microphones.

The audio control panel is installed above the pilots PFD and an optional second audio control panel can be installed above the copilots PFD. Momentary push-buttons are used to select one of the COM transceivers for the pilot and copilot position, which allows radio transmission. Pressing a button turns on the associated receiver and the green LED. The pilot can identify which receivers are selected by noting which LED's are on. In the Split Mode, the pilot has the ability to transmit on one COM, while the copilot can transmit on another COM. A fail-safe mode connects the pilot headphone and microphone to COM 1 if there is a power failure or the power switch is set to EMG/OFF position (for the correct operation of headsets capable of stereo operation, the headset must be set to stereo mode). For the intercom system there is a push button mode switch and a small volume control knob for crew intercom volume and a large knob for the passenger intercom volume. The AUX button selects the entertainment audio.

A marker beacon receiver provides the necessary marker beacon signals to the Primary Flight Display (PFD) and audio indications for an Instrument Landing system (ILS). The MKR push button when selected allows the MKR SENS button to be used to set either high or low sensitivity or mute the marker beacon audio by pressing the MUTE button. The marker beacon can be tested by pressing and holding the MKR MUTE/TEST button on the pilots panel for five seconds. The pilots audio panel is connected to the marker beacon receiver and the copilots audio panel (if installed) receives marker beacon information via the pilots audio panel.

DUAL KMA 29 OPERATION

When two KMA 29 audio panels are installed, both have access to the communications transceivers. When both panels have selected the same transmitter, the KMA 29 designated as the pilot position has priority.

Indication arrows above the microphone selectors indicate which side has selected the radio for transmit. Offside radio indication is user selectable. When the offside indication is off, only the mic select arrow for the KMA 29 position is active. When on, the pilot can see which radio the copilot has selected for transmit, and vice versa, by noting which of the arrows is illuminated.

To toggle the offside transmit selection indication, press the right side of the SPLIT button three times within one and a half seconds. When the mode is activated, the NAV 1 indicator blinks once. When the mode is toggles off, the NAV 1 indicator blinks twice. This mode remains in effect until changes by the user, including power cycles.

AUDIO PANEL CONTROLS

Refer to Figure 7-29-1, for the Audio Panel Controls.

SPKR/PA	Speaker /Passenger Address rocker switch. Toggles between the following selections: ON LED illuminated. All selected audio will come over cockpit speaker (headset audio is always on) OFF LED illuminated. No audio over cockpit speaker LED illuminated. Pilot can transmit through microphone to cabin speaker PA
COM MIC	Microphone input selector buttons
SPLIT	Split Mode button (only used on single audio panel installations) allows pilot and copilot to transmit and receive on different coms
CREW/PAX ICS VOL	Crew/Passenger Intercom system volume knob. Inner knob for crew intercom
PUSH EMG/OFF	Power on and emergency/off switch. Pilot and copilot microphones connected to COM 1
ICS	Intercom System toggle switch. Toggles between ISO (isolated), ALL and CREW
COM AUDIO	Com Audio selector buttons
NAV, ADF (if installed), DME	Navigation Radio Audio selector buttons
AUX	Entertainment audio select button
MKR	Marker button. When pressed (LED illuminated) audio indicator enabled
MKR SENS	Marker Beacon sensitivity button. Alternates between HI and LOW
MKR MUTE/TEST	Marker Beacon Mute/Test button. When pressed and released, marker beacon audio is muted for that beacon. When pressed for five seconds marker beacon discretes go high for one second in order to test the marker beacon. The marker annunciations are shown on the PFD. The TEST function on the optional second copilot audio control panel is inoperative.

DISTANCE MEASURING EQUIPMENT (DME)

A KN-63 DME transceiver is installed under the cabin floor. Power supply to the DME is from the Avionic 1 bus. The transceiver transmits a signal to a ground station and calculates the time between the transmitted signal and the reply signal from the ground station. It uses the data to give the distance from a ground station, the groundspeed and the time-to-station. The maximum range of the DME transceiver is 389 nautical miles. The transceiver has 200 different channels. The transmitter processes signals between 1025 MHz and 1150 MHz and the receiver processes signals between 962 MHz and 1213 MHz.

The DME detail window can be shown in the radio tuning window by pressing the DME button on the PFD Controller. An alternative means of accessing the DME window is through the Go To DME Detail soft key in the NAV detail window. The DME detail window contains soft keys DME PAIR to select the association of the DME to NAV 1 or NAV 2 and DME HOLD to select DME hold ON or OFF. When the DME hold is selected to ON an H adjacent to the DME distance is displayed on the PFD HSI display.

TRANSPONDER (XPDR)

A Mode S Transponder KXP 2290 is installed behind the pilots PFD and is a single channel unit controlled by the PFD Controller. Power supply to the transponder is from the Avionic 1 Bus. The transponder provides both Air Traffic Control Radar Beacon System (ATCRBS) and Mode-S capabilities, including diversity and data link enhancements. The transponder can be installed in non-diversity and diversity versions. With the diversity version an upper and lower ATC antennas are installed. An optional second transponder can be installed. The XPDR detail window can be shown in the radio tuning window by pressing the adjacent bezel button or XPDR button on MF Controller and then pressing the DETAIL button on either the PFD or MF Controller. The detail window of the transponder contains soft keys for the selection of XPDR MODE and VFR CODE. A dual transponder installation will also have a XPDR SEL soft key for active transponder selection. The non selected transponder will be in a standby mode. With a dual transponder installation, the selection of XPDR2 as the active XPDR mode is not retained after a power cycle. After an electrical power the ATC Active Mode reverts to STBY.

GLOBAL NAVIGATION SATELLITE SENSOR UNIT (GNSSU)

General:

Either one or two GNSSUs (2nd GNSSU is a Factory Option) can be installed in the aircraft, behind the systems MFD. Power supply to GNSSU 1 is from the Standby Bus, to GNSSU 2 from the Avionic 2 Bus. Both GNSSUs process satellite data to determine aircraft position, velocity and time. Both GNSSUs are certified of tracking the U.S. Global Position System (GPS). Tracking of any other Global Navigation Satellite Systems (GNSS), e.g. Galileo, is not certified yet. Both GNSSUs calculate and output navigation data, satellite measure data, Receiver Autonomous Integrity Monitoring (RAIM) and Predictive RAIM (PRAIM). Both GNSSUs also manage Sign Status Matrix (SSM), satellite status and perform BITE. The processed output data of both GNSSUs is sent to the CSIO module within the MAU for further use by the rest of the avionics system. An Apex maintenance function interfaces with both GNSSUs. The installed GNSSUs may either be Satellite Based Augmentation System (SBAS) capable or Non- SBAS-capable.

The GPS data page can be accessed from the SENSOR page. The SENSOR page can be accessed with the systems MFD lower left window in focus and selecting the SENSORS page menu.

Refer to “Honeywell Primus Apex Integrated Avionics System for the PC-12E – Pilot Guide” for complete information on the description and operation of the communication and navigation equipment.

Non-SBAS capable GNSSU:

MSN 545 and MSN 1001 to 1230: pre SB 34-020, pre SB 34-026 or pre SB 34-032;
MSN 1181 to 1230 without SBAS/LPV Factory Option installed and pre SB 34-026 or pre SB 34-032.

SBAS capable GNSSU:

The aircraft can be equipped with two different types of SBAS capable GNSSUs.

a) HG 2021
MSN 545 and MSN 1001 to 1230: post SB 34-020 or
MSN 1181 to 1230 with SBAS/LPV Factory Option installed and pre SB 34-026 /34-032.

b) KSG200 (new)
MSN 545 and MSN 1001 to 1230: post SB 34-026, SB 34-032 or
MSN 1231 - 1942.

The SBAS capable GNSSUs provide GNSS position corrected by the SBAS providing improved accuracy and integrity. The SBAS capable GNSSUs are certified for interoperability with the signals-in-space provided by the U.S. Wide Area Augmentation System (WAAS) and other SBAS providers, e.g. operate both within SBAS and outside SBAS coverage area. Within the SBAS coverage area, the SBAS capable GNSSUs are able to determine the vertical and horizontal guidance information sufficient for Localizer Performance with Vertical Guidance (LPV) precision approaches.

SBAS/LPV Factory Option:

The basic concept of the LPV functionality is Area Navigation (RNAV) using Instrument Landing System (ILS) control laws. In order to enable the SBAS/LPV Factory Option an SBAS capable GNSSU must be installed. Operational information of LPV is given in Section 9 Supplements.

.INDICATION / WARNING

The Crew Alerting system (CAS) window of the systems Multi Function Display (MFD) displays the following Cautions and Advisory messages for the communication and navigation equipment status:

AMBER CAUTION

MMDR 1 Fail	Multi Mode Digital Radio No. 1 has failed
MMDR 2 Fail	Multi Mode Digital Radio No. 2 has failed
MMDR 1+2 Fail	Multi Mode Digital Radios No. 1 and 2 have failed
MMDR 1 Overheat	Multi Mode Digital Radio No. 1 has overheated
MMDR 2 Overheat	Multi Mode Digital Radio No. 2 has overheated
MMDR 1+2 Overheat	Multi Mode Digital Radios No. 1 and 2 have overheated
DME 1 Fail	Distance Measuring Equipment No. 1 has failed
XPDR 1 Fail	Transponder No. 1 failed
XPDR 2 Fail	Transponder No. 2 failed (only if optional second XPDR installed)
XPDR 1+2 Fail	Transponder No. 1 and 2 failed (only if two XPDR's installed)

CYAN ADVISORY

GPS 1 Fail	Global Positioning system No. 1 failed
GPS 2 FAIL	GPS No. 2 failed (only if optional second GPS installed)
GPS 1+2 Fail	GPS 1 and 2 failed (only if two GPS's installed)
No Alt Reporting	In flight and XPDR is not selected to ALT or TA mode

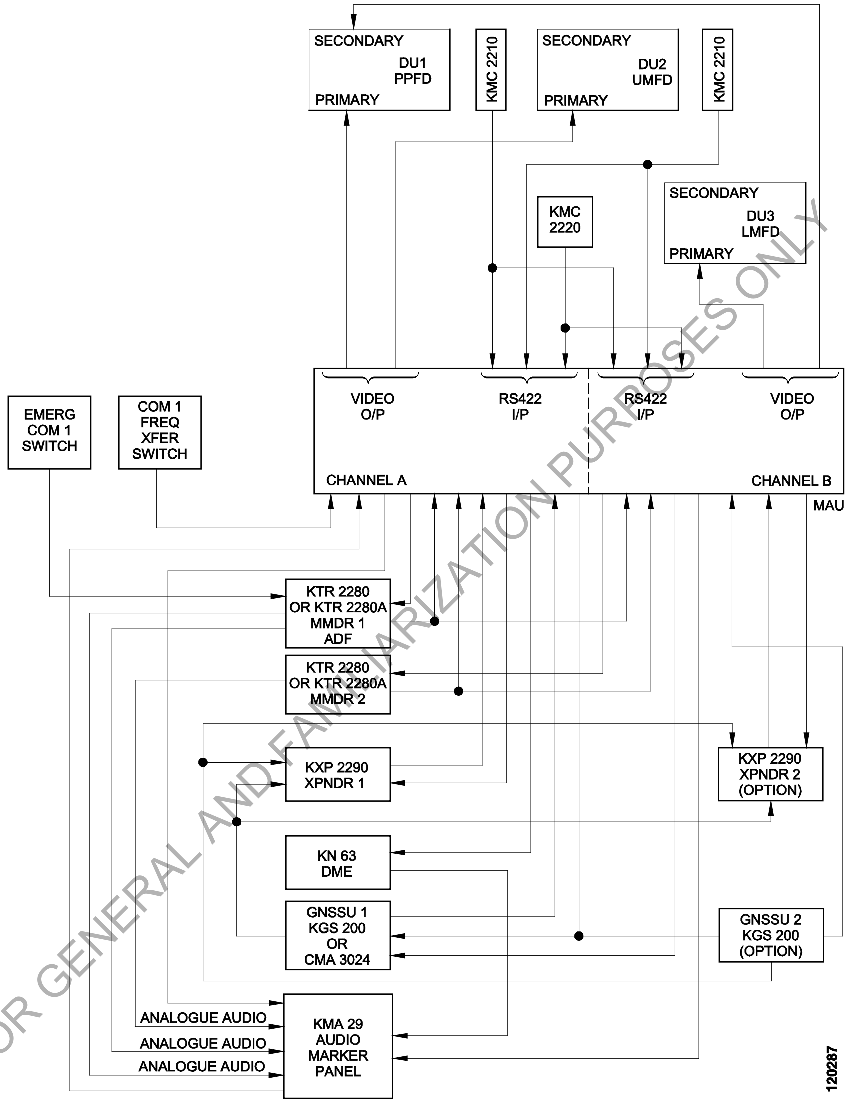


Figure 7-29-1. APEX Communication and Navigation – Schematic
(Sheet 1 of 2)

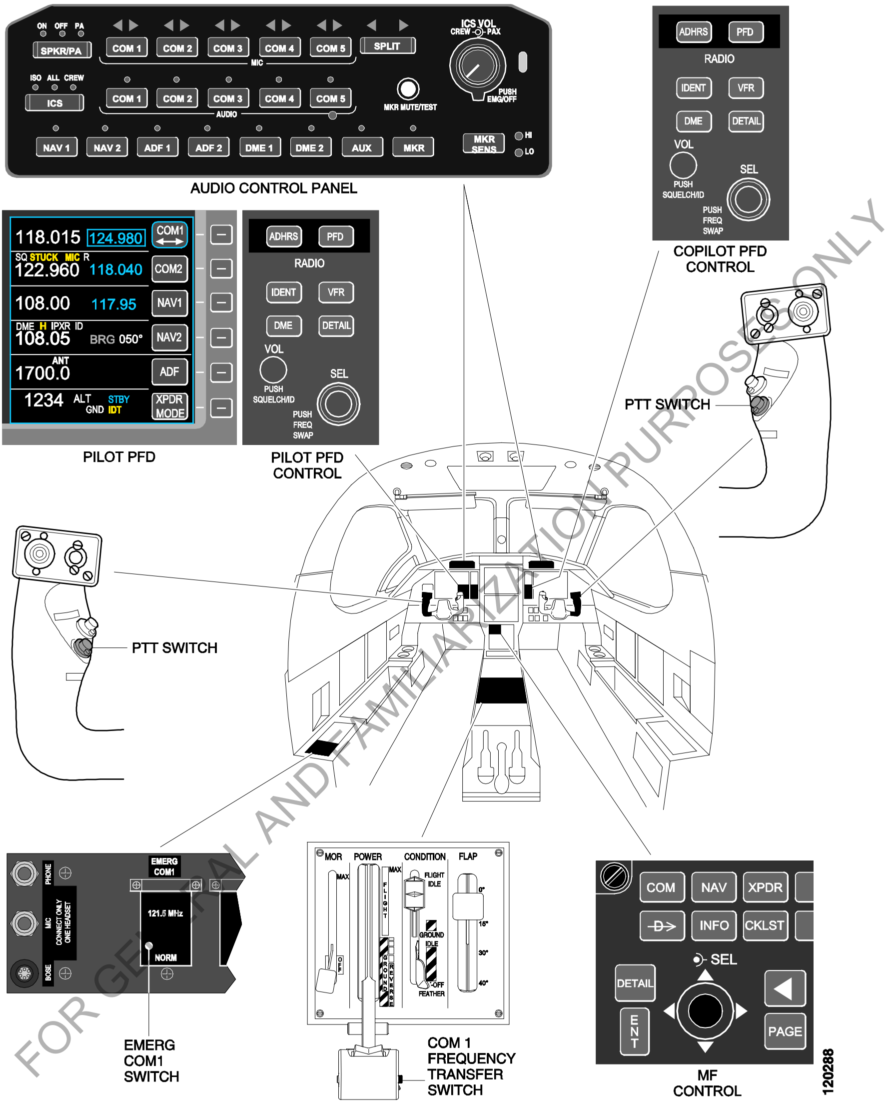


Figure 7-29-1. APEX Communication and Navigation - Controls and Displays
(Sheet 2 of 2)

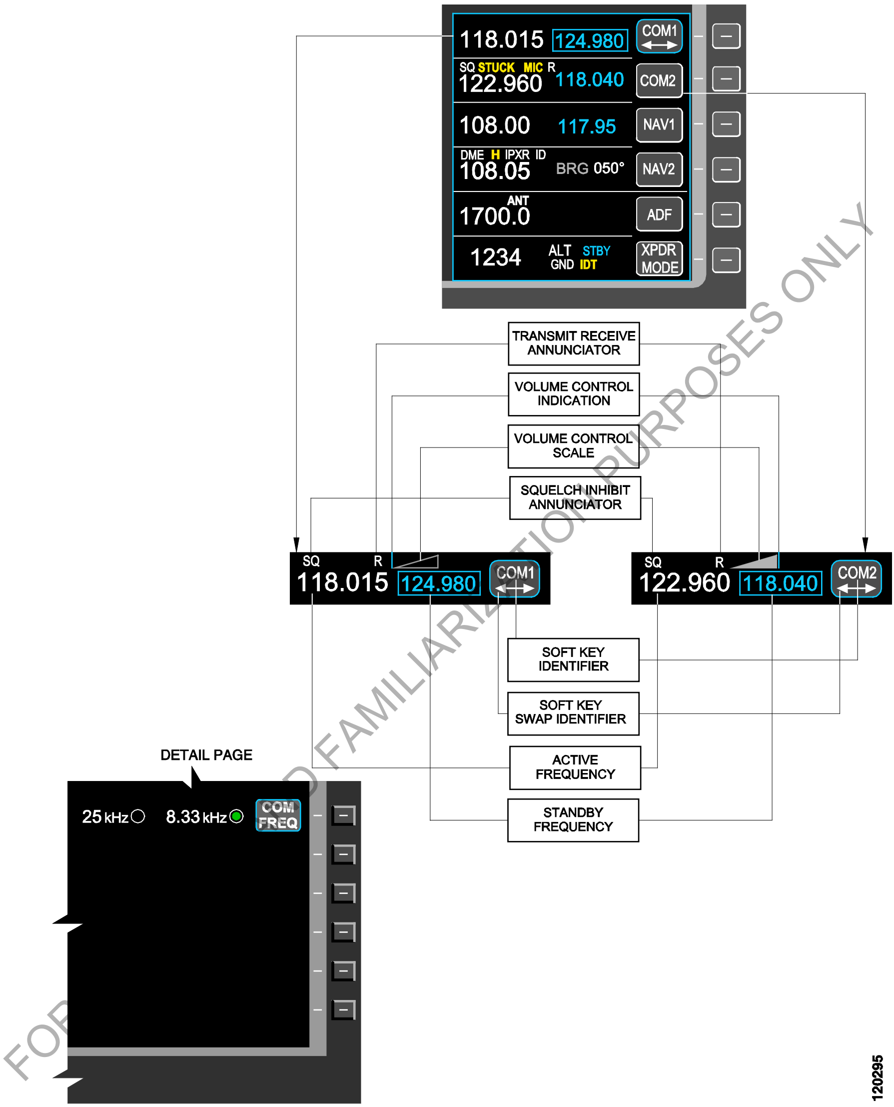


Figure 7-29-2. VHF Com Display and Detail Page

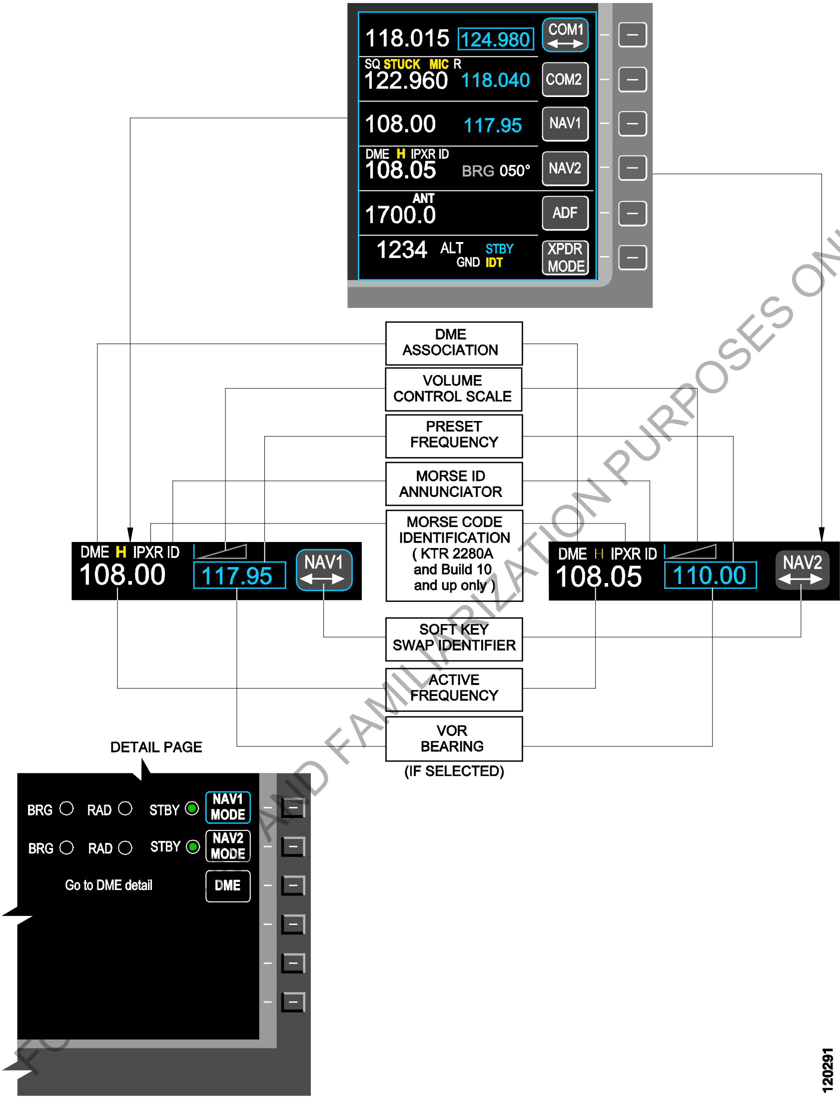


Figure 7-29-3. VHF Nav Display and Detail Page

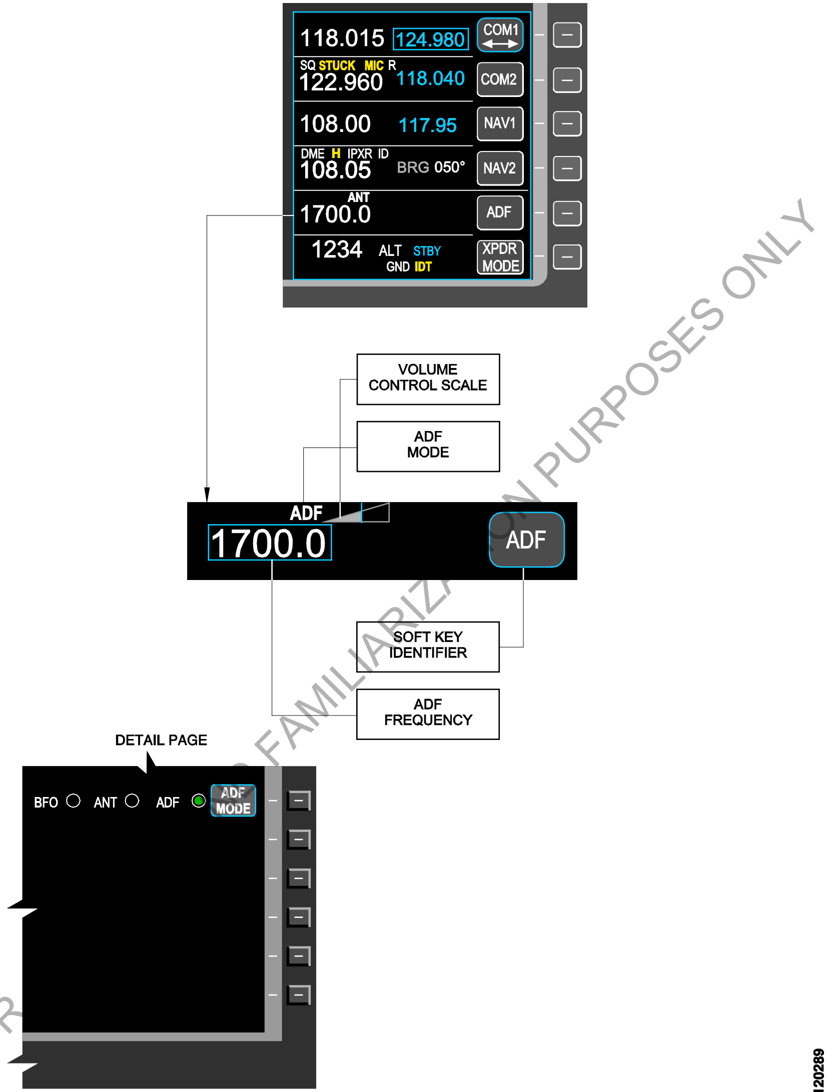
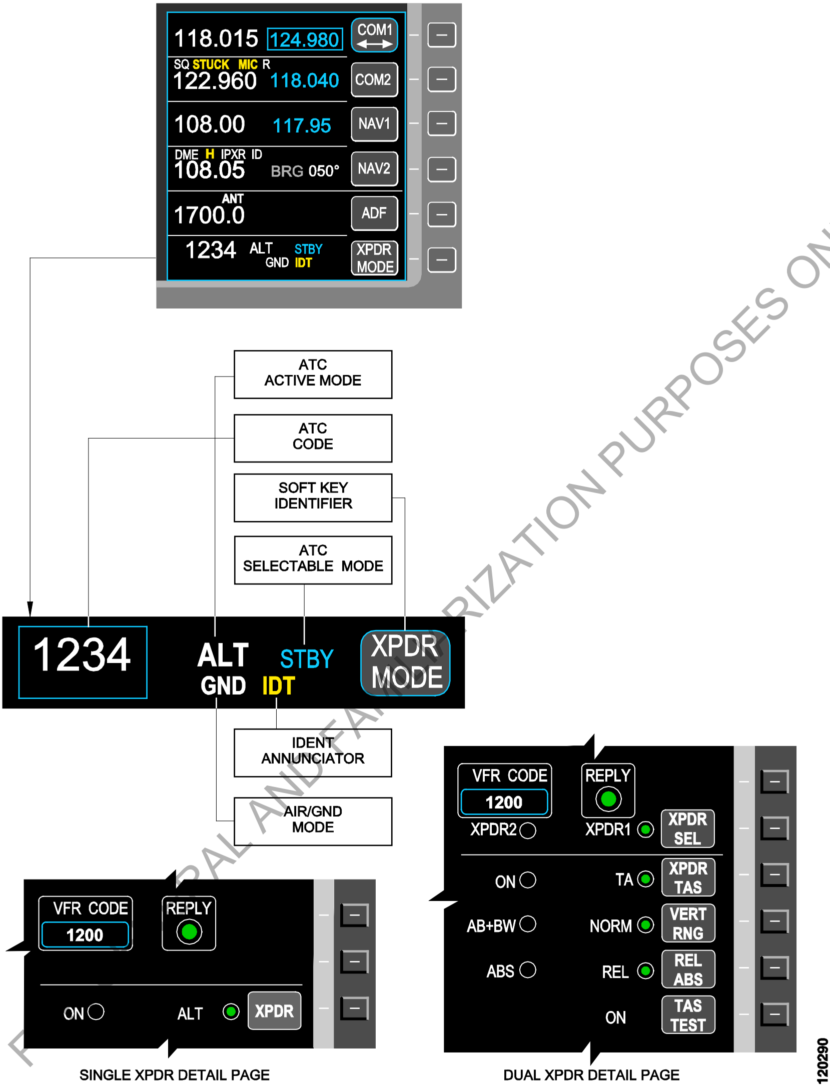
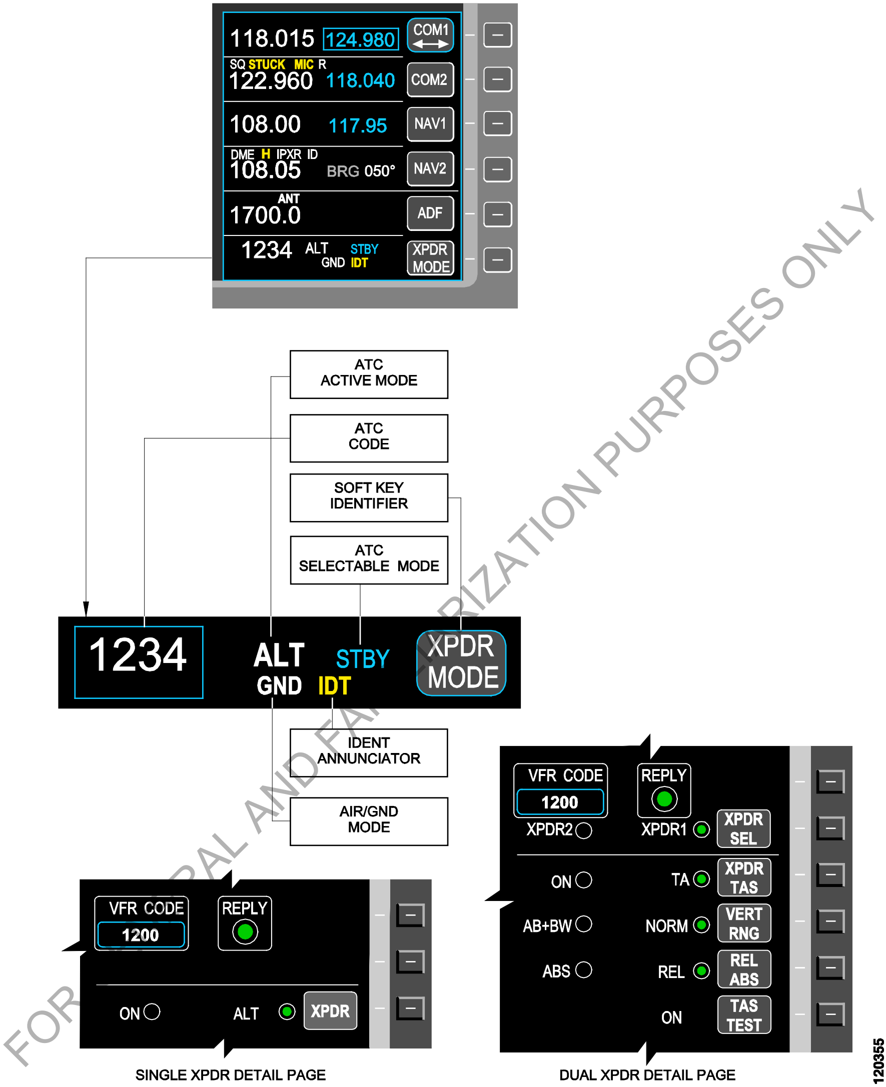


Figure 7-29-4. ADF (if installed) Display and Detail Page



7-29-5. Transponder Display and Detail Page (Build 6)



7-29-6. Transponder Display and Detail Page (Build 7 and higher)

HF COMMUNICATIONS SYSTEM

GENERAL

The KHF 1050 High Frequency (HF) communication system gives long range voice communication in remote areas. Additionally the system enables the operator to communicate using the Maritime Radiotelephone Network to contact marine operators.

The HF system operates in the High Frequency Short Wave Band from 2.000 Mhz up to 29.999 Mhz in tuning steps of 1.0 Mhz.

The HF system comprises:

- a PS440 Control Unit
- a KRX1053 Receiver/Exciter
- a KPA1052 Power Amplifier
- a KAC1052 Antenna Coupler
- an RF antenna

The power supply to the HF system is 28 VDC through the HF TX and HF RX circuit breakers on the AVIONIC 2 BUS circuit breaker panel.

DESCRIPTION

The Control Unit is installed on the pilots lower left panel. It provides the controls for operation of the HF system. For a description of the controls on the Control Unit, refer to the KHF 1050 Pilot’s Guide. Voice and audio signals are interfaced to the pilot’s Audio Control Panel COM 3 push buttons.

The Receiver/Exciter is installed under the cabin floor between frames 33 and 34. The Receiver/Exciter provides the circuitry for RF receive and transmit functions. It generates a low power RF signal to excite the Power Amplifier when in transmit mode and demodulates the received RF signal to generate the required audio output in the receive mode. It also controls the audio interface and control switching for the Power Amplifier and Antenna Coupler.

The Power Amplifier is installed under the cabin floor between frames 31 and 32. Its main functions are to excite the low power RF signal from the Receiver/Exciter to a high energy signal which is then fed to Antenna Coupler and in the receive mode it passes the RF signal from the Antenna Coupler to the Receiver/Exciter. Excessive RF signal amplification protection is provided.

The Antenna Coupler is installed in the upper rear fuselage between frames 37 and 38. It contains the main matching circuitry to match the 50 Ohm exciter signal to the various impedances of the antenna. The Antenna Coupler contains a Non Volatile Memory (NVM) to store the best impedance value for each previously tuned frequency to reduce tuning time. The Antenna Coupler is pressurized with nitrogen to reduce the possibility of arcing. Low pressure warnings are given on the Control Unit and if the Nitrogen pressure becomes too low the Antenna Coupler output power will be limited.

The RF Antenna is installed on the top of the rear fuselage. It is routed in a V shape from the Antenna Coupler up to an attachment point on the horizontal stabilizer and back down to an earth point on the top of the rear fuselage.

OPERATION

Under normal operation conditions, the KHF1050 HF system is connected to the Pilots Audio Panel on COM 3 input selection.

The operator is able to either directly set a frequency on the Control Unit, or in channel mode, select the appropriate frequency channel for the intended use.

Once a frequency or a channel has been selected and output power level set, pressing the PTT button will initiate tuning of the chosen frequency which should be completed after approx. 8 seconds. Unsuccessful tuning will result in an error message displayed on the Control Unit.

If the HF control unit indicates “PRS W”, the couple is losing Nitrogen pressure and may be approaching a pressure fault condition. The HF radio will continue to function normally but the indication should be reported to maintenance.

If the HF control unit indicates “PRS F”, the coupler has lost Nitrogen pressure and will therefore operate in the pressure fault condition. In this condition, the HF radio will reduce transmit power to 50W regardless of the transmit power selected by the crew. Report to maintenance.

The operator may choose to use and pre-program up to 99 channels with often used frequencies for direct access in operation. In addition, the system provides pre-programmed channels of the Maritime Radiotelephony Network (ITU) for aircraft/ship communication using HF equipment.

Under operational emergency conditions in areas with bad VHF coverage, the KHF1050 provides six pre-programmed emergency channels (EMR1 - EMR6) for international distress and calling.

EMR 1 is factory programmed to 2.182MHz international calling frequency.

EMR 2 to EMR 6 is factory programmed but can be overwritten by the operator if he wishes to use different emergency frequencies.

Refer to the KHF 1050 Pilot’s Guide for complete information on the operation of the HF system.

CAUTION

DO NOT OPERATE THE HF COMMUNICATIONS SYSTEM WHEN GROUND POWER IS CONNECTED

OPTIONAL EQUIPMENT

AEROWAVE 100 SATCOM SYSTEM

GENERAL

The Aerowave 100 satellite communication (SATCOM) system gives long range voice and data communication via the Inmarsat satellite constellation.

The Aerowave 100 system comprises:

- A High-speed Data Unit (HDU)
- An External Satcom Configuration Module (ESCM)
- A bias-T
- An active Low Gain Antenna (LGA)
- A Wi-Fi router
- An ON-OFF switch in the cockpit (Post SB 23-014 only)

The power supply to the Aerowave 100 system is 28 VDC through the AEROWAVE HDU, AEROWAVE BIAS-T and ROUTER circuit breakers on the NON ESS BUS circuit breaker panel.

The Aerowave 100 system is stand-alone and has no connection to on-board aircraft systems.

DESCRIPTION

The HDU is installed under the cabin floor on the aft side of frame 31. It provides the power, control and distribution of telephony and high-speed data services to the components in the system.

The ESCM is installed under the cabin floor on the forward side of frame 32. The ESCM is connected to the HDU and contains the Subscriber Identity Module (SIM). The SIM identifies the sitcom terminal of the HDU to the Inmarsat Services Provider.

The bias-T is installed under the cabin floor on the aft side of frame 32. It provides the power necessary for the active LGA to function. The bias-T also has an active GPS receiver element that works with the LGA to supply navigation data to the HDU. The navigation data is used to calculate the aircraft to satellite elevation (look angle) and Doppler effect while the aircraft moves.

The active LGA is installed on the top of the fuselage between frames 22 and 23. The active LGA lets the HDU communicate with the Inmarsat Swift Broadband Class 15 Services (SBB-200). These services supply voice and high-speed data to a maximum of 200 kbps when the look angle is above 20 degrees.

The Wi-Fi router is installed in the aft baggage compartment on the right side of the fuselage between frames 34 and 35. It is an IEEE 802.11 g and n wireless router that operates in the 2.4 GHz bandwidth spectrum and gives connection to any consumer data device with Wi-Fi connectivity. The Wi-Fi router supports WEP, WPA or WPA2 wireless security and has a single cast antenna.

Post SB 23-014:
The ON-OFF switch is installed in the cockpit on the RH side wall panel. The switch is used to turn the Aerowave 100 system ON or OFF as required.

OPERATION

The Aerowave 100 SATCOM system is in operation as soon as the non-essential bus is powered. When in operation, the system automatically connects to the Inmarsat satellite network with the subscriber information contained in the ESCM.

Post SB 23-014:
The ON-OFF switch in the cockpit can be used to disable the system when it is not needed.

Wi-Fi enabled devices that are connected to the Wi-Fi router can be used to access the internet.

An alternative Wi-Fi router gives the added function of Voice over Internet Protocol (VOIP). Customers can use VOIP to make voice calls with a Personal Electronic Device (PED). A maximum of three PEDs can be connected at the same time. Only one user (PED) can make a voice call at a time.

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PRIMUS APEX - SITUATION AWARENESS

GENERAL

Refer to Figure 7-30-1. APEX Situation Awareness - Schematic.

The situation awareness part of the Primus APEX comprises:

- RDR 2000 or RDR 2060 Weather Radar
- KRA 405B Radar Altimeter
- Navigation Map – refer to Flight Management System topic
- Optional Equipment (TAWS/TCAS, EGPWS, TCAS, LSS and XM)

WEATHER RADAR (WX)

Refer to Figure 7-30-2, APEX Weather Radar – Overlay Menu and Display.

The weather radar system gives the pilot a selectable horizontal or vertical display of thunderstorms or high density precipitation in front of the aircraft. The weather radar system can be used with an optional lightning sensor system, which shows areas of lightning activity 360 degrees around the aircraft.

The RDR 2000 or RDR 2060 Weather Radar installation consists of a radar receiver and radar transmitter in a radome installed in the right wing tip. The power supply to the weather radar is 28 VDC through the WX RDR circuit breaker on the AVIONIC 1 BUS circuit breaker panel.

DESCRIPTION

The RDR 2000 sensor unit receives pitch and roll signals from the ADAHRS to stabilize the radar antenna.

The RDR 2060 sensor unit receives pitch, roll and altitude signals from the ADAHRS to stabilize the radar antenna. The altitude signal is used to support additional functionality (e.g. Auto Tilt).

The sensor unit transmits a beam of pulsed microwave energy. When a pulse intercepts a bank of cloud, the energy is reflected back to the antenna. The return signals are processed by the sensor unit and sent to the Modular Avionics Unit (MAU) for display. The sensor unit is connected to a configuration module and receives an air/ground status from the MAU.

Weather radar can be displayed as overlays on the PFD’s and INAV Map. The PFD weather radar overlay can be assessed by pressing the soft key on the side of the HSI display. The soft key identifier OVRLY appears in white. Pressing the OVRLY soft key displays the overlay selection menu. Selecting WX RDR will enable the weather radar overlay to be displayed on the HSI. There is also an OFF selection to remove the overlay. The WX overlay can be displayed on the Situation Awareness MFD INAV Map. First select the WX overlay on the pilot’s HSI and then select the WX button on the Active Layers Control Bar.

APEX BUILD 10 and Higher:

APEX Build 10 allows independent selection of the WX overlay for either the PFD or Situational Awareness MFD within the same AGM. It should however be noted that the Situational Awareness MFD WX overlay is limited to the maximum resolution of the PFD HSI range and will be inhibited when the TAWS overlay is selected on the HSI.

APEX BUILD 11 and Higher:

APEX Build 11 allows to install the RDR 2060 weather radar as an option on the PC-12/47E. When the RDR 2060 is installed, APEX Build 11 or higher enables the additional features and functionalities designed for the RDR 2060. The main features and functionalities are described below:

- Magnetron power increased by 50% to 6 kW
  This extends the weather detection capability from 240 NM to 320 NM and allows the pilot to have a greater awareness of the airspace ahead.

- Auto Range Limiting (REACT)
  When the Auto Range Limit checkbox is selected, a blue area is displayed behind the weather systems where weather detection is no longer possible because of attenuation. This allows the pilot to have increased awareness about sensor performance.

- Auto Step Scan
  When the automatic step scan radio button is selected, the antenna does a complete scan, followed by sequential tilts (up or down) in 4 degree increments. This allows the pilot to vertically profile the entire azimuth scan angle by monitoring successive antenna scans.

- Auto Tilt
  When the automatic radio button is selected, the antenna position is automatically adjusted to maintain a common beam intercept point with the earth. For example, when the tilt is such that the last 10 percent of the display show ground returns, the system will automatically adjust the tilt based on barometric altitude during ascent or descent to maintain ground returns on 10 percent of the display.

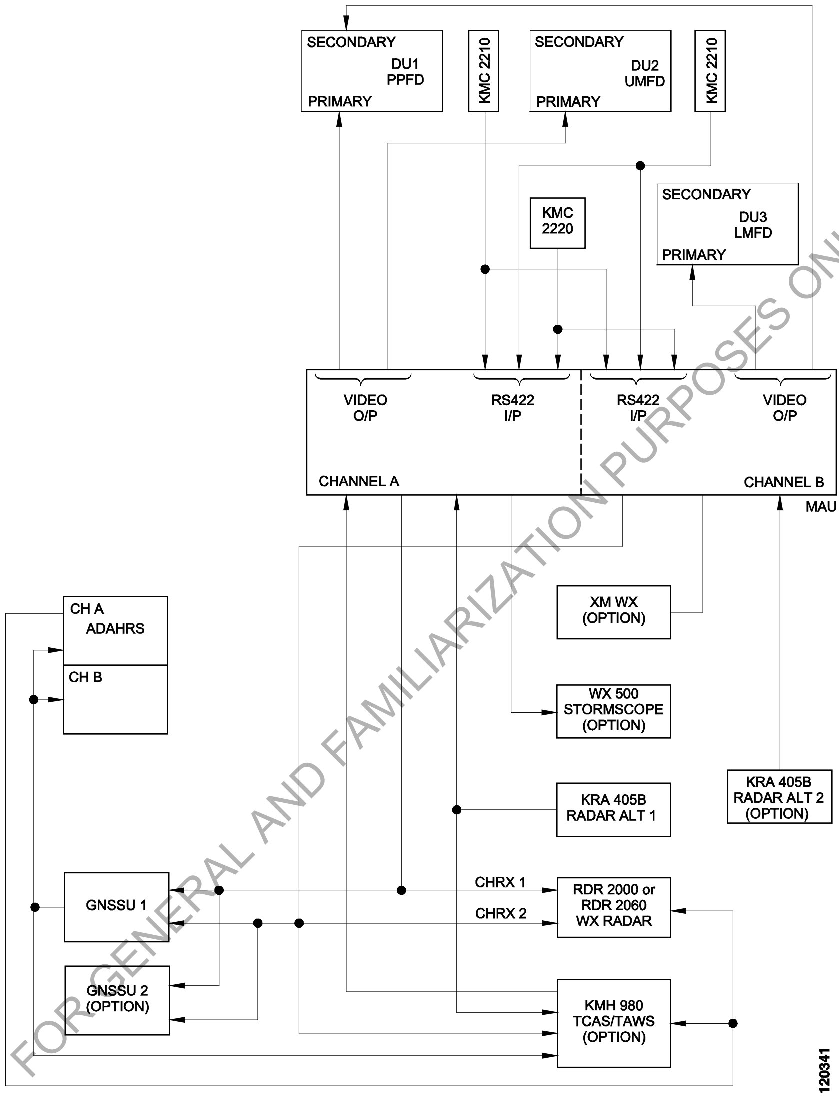
OPERATION

The controls for the weather radar are on the MF Controller. A WX RADAR dual concentric knob control, with a push select is used to control the mode and the tilt, gain settings. The outer control is a four position rotary knob with the positions OFF/STBY/TEST/WX. The inner control is rotary click control knob and is pressed to modify the tilt or gain setting. Weather radar annunciations for ALERT, MODE and TILT are located on the left side of the HSI. The ALERT annunciations are TX ON GND in amber when WX is selected on the MF Controller and the aircraft is on the ground. TGT ALRT is given in amber when there are potentially hazardous targets directly in front of the aircraft that are outside of the selected range. Longer ranges should be selected to view the questionable target. TGT is given in white when WX is selected and the aircraft is in the air. The MODE annunciation is that set by the WX RADAR outer control knob. The TILT annunciation value is a three digit number preceded by an arrow, up for positive value and down for negative value. Faults are annunciated WX FAULT in white on the right lower part of the weather radar overlay and failures are annunciated WX FAIL in amber.

For further information on operational techniques and weather interpretation consult the RDR 2000 or RDR 2060 Pilot Guide.

The Avionics window of the systems MFD contains WX/LX/TAWS setup pages. The WX setup tab is selected via the page menu of the multi functional window.

Refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E – Pilot Guide for complete information on the description and operation of the weather radar.



7-30-1. APEX Situation Awareness – Schematic

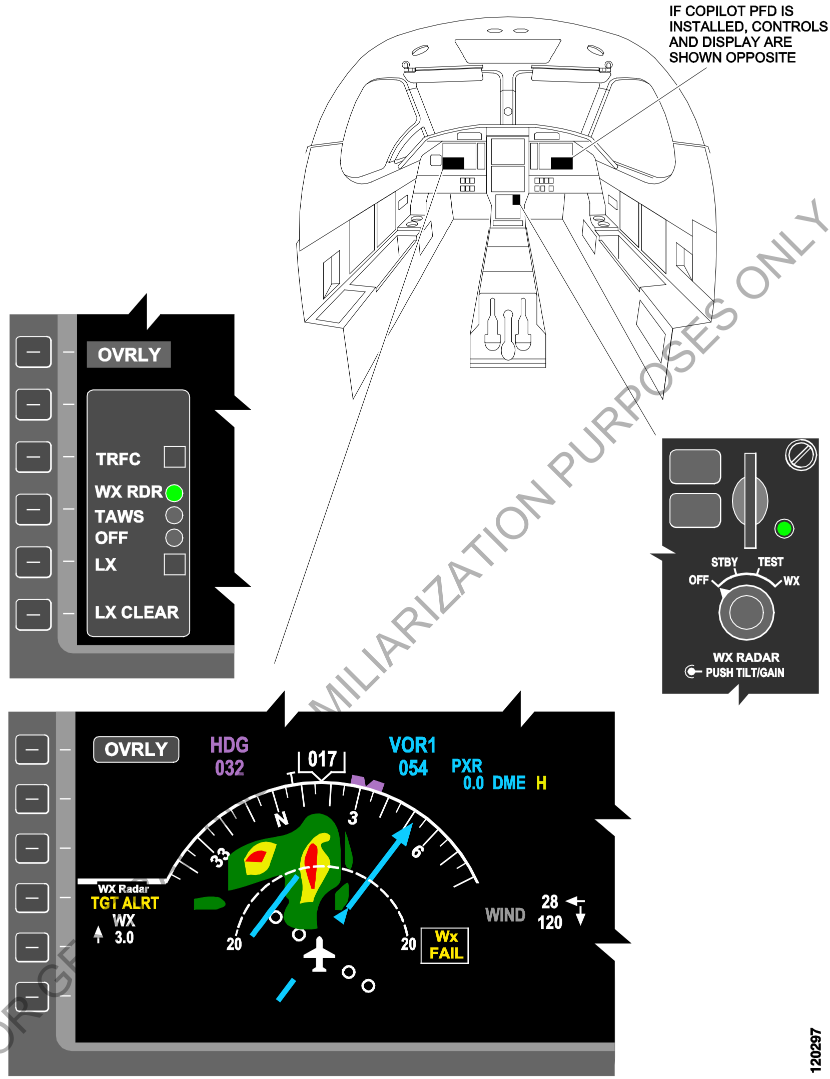


Figure 7-30-2. APEX Weather Radar – Overlay Menu and Display

RADAR ALTIMETER

The KRA 405B transceiver is installed under the cabin floor between frames 26 and 27. The power supply to the transceiver is 28 VDC through the RAD ALT 1 circuit breaker on the AVIONIC 1 BUS circuit breaker panel. An optional second radar altimeter can be installed.

The transceiver sends a signal to the transmit antenna and gets the return signal from the receive antenna. The transceiver measures the time between the transmitted signal and the reply signal then processes the data to give height from the ground. The maximum operating height AGL used by the system is 2500 ft.

The radar altimeter system measures the aircraft height Above Ground level (AGL) electronically and sends the height AGL data to the Modular Avionics Unit (MAU) for display in the ADI window of the pilot PFD and copilot PFD (when installed). The digital readout for radio altitude is displayed in white text in a black box in the lower center part of the attitude display on the PFD. The radar altitude display is removed at altitudes greater than 2500 ft. When altitude is less than 550 feet, the lower portion of the PFD altitude tape will show a yellow cross hatched box to indicate the ground proximity.

If the radar altitude data becomes invalid the digital readout will be replaced with RAD in white in an amber box. The radar altimeter data is also used by the optional situation awareness systems.

INDICATION / WARNING

The Crew Alerting system (CAS) window of the systems Multi Function Display (MFD) displays the following Caution messages for the radar altimeter status:

AMBER CAUTION

RA 1 Fail	Indicates RA failed in both CSIO module channels

OPTIONAL EQUIPMENT

TAWS/TCAS 1

GENERAL

The KMH 980 Multi Hazard Awareness Processor provides Terrain Awareness and Warning (TAWS) and Traffic Advisory and Collision Avoidance (TCAS) functions and comprises a processor, two directional antennas (Upper and Lower), a configuration Module and a regional terrain database card. Power supply to the processor is 28 VDC through the TAWS/TCAS circuit breaker on the Avionic 1 BUS circuit breaker panel.

The TAWS part provides a Class B Terrain Awareness and Warning Processor, which gives:

- Situation awareness
- Terrain alerting caution and warning
- Obstacle alerting caution and warning
- A display of terrain to the crew on the Primary Flight Display (PFD)

TCAS I is intended as an aid to the see and avoid concept. Once an Intruder is visually acquired, it is the pilot's responsibility to maneuver as necessary to maintain safe separation.

TCAS I does not incorporate the sophisticated sensors, bearing accuracy or track rate computations incorporated in TCAS II or TCAS III that are necessary for evasive maneuvering (rapid change in pitch, roll, normal acceleration, thrust or speed). In general, TCAS I does not provide adequate information for pilots to determine reliably which horizontal or, in some cases, vertical direction to move to increase separation, and there is some likelihood that such maneuvers will actually result in reduced separation.

The TCAS part of the processor detects and tracks potential intruder aircraft in near vicinity to itself by interrogating their operating transponders. When another aircraft is determined to be an intruder and poses a safety threat, the TCAS issues a Traffic Advisory (TA), alerting the crew to the threat with an aural advisory and display on the PFD.

The system is interfaced through the Modular Avionics Unit (MAU) to provide a display of terrain data and traffic data to the crew. The TCAS information provides traffic symbols which change shape and color to represent increasing level of urgency as separation with intruders decreases. Similarly, the color-coded terrain and obstacle display offers an enhancement to situational awareness.

Refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E – Pilots Guide, for information regarding the specific operating details of the system. For further information refer to the KMH 980 Pilots Guide.

DESCRIPTION

TAWS

The TAWS portion of the KMH 980 processor is a Class B enhanced ground proximity warning system (EGPWS). The TAWS provides aural voice alerts, visual annunciations and terrain display offering the flight crew increased situational awareness. Data is collected from a variety of sources including existing aircraft sensors and processed to determine if the aircraft is in danger. The (TAWS) terrain overlay when selected is displayed on the PFD HSI. Different colors are shown on the overlay to give a visual warning for terrain clearance. Solid red for a warning terrain threat area and solid yellow for a caution terrain threat area.

The TAWS receives GPS position from the MAU for accurate position determination in conjunction with a regional database. One of three databases may be installed in the KMH 980 unit (Atlantic, Americas or Pacific). The databases also contain the locations of all runways longer than 2000 feet that have a published instrument approach.

The TAWS aural alert messages have a priority from highest to lowest message. The highest priority message always takes priority and will immediately interrupt any lower priority message. Only one message is produced at any one time, if the aircraft is in a situation that meets more than one condition for an aural alert at the same time, the higher priority message will be heard until that condition is resolved. If a lower priority message is already in progress the lower priority message will be completed before the higher priority message is started.

TCAS

The TCAS is capable of surveillance of aircraft equipped with transponders (i.e. Mode S and Mode C) that are able to reply to ATCRBS Mode C interrogations in their operational environments. If the TCAS determines that certain safe boundaries may be violated, it issues an aural and visual Traffic Advisory to alert the crew that closing traffic is nearby. The TCAS system is unable to detect any intruding aircraft without an operating transponder.

The TCAS portion of the KMH 980 processor provides the flight crew with situational awareness and position information for transponder equipped aircraft in proximity to their own aircraft. The TCAS system provides the crew with Traffic Advisory (TA) information, it does not provide Resolution Advisories (RA). The TCAS system assists the crew in visually acquiring an intruding aircraft providing a 'backup' traffic advisory service in support of existing conventional air traffic control procedures without producing unwanted advisories. The operation of the TCAS is independent of ground-based systems.

The (TAS) traffic overlay when selected is displayed on the PFD or also on the Map window of the INAV. It displays the horizontal picture of the traffic around the aircraft. The horizontal picture represents aircraft (intruders) within the surveillance volume, including the range, azimuth, altitude and vertical direction arrows, when the information is available from the TAS processor.

OPERATION

TAWS

Ref. Fig 7-30-3, for APEX Terrain – Overlay Menu and Display.

The (TAWS) terrain overlay on the PFD HSI can be selected by pressing the bezel button adjacent to the OVERLAY annunciator, which then displays the overlay selection menu. Select TAWS with the bezel button and repress the OVERLAY bezel button. Terrain map data from the TAWS is displayed on the lateral map display on the HSI. TAWS amber or white status messages are shown on the lower part of the HSI. A TAWS mode white annunciator for TERR INH is displayed in the lower left portion of the HSI. If the terrain inhibit (TERR INHIB) control button is pressed on the MF controller. The glideslope inhibit (G/S INHIB) and the Flap Override (FLAP OVRD) control buttons on the MF controller have no function with the KMH 980, they are only for the EGPWS installation. A TAWS SELF TEST can be performed from the TAWS set up page.

TAWS annunciations are displayed in amber for TEST, FAIL, RANGE and N/A. The range update failure (RANGE) indicates the actual range of the TAWS does not match the currently displayed HSI range. The TEST annunciator indicates a functional test or configuration set-up in progress. If a fault is detected that would cause the KMH 980 unit to be inoperative, a FAIL annunciation is shown. A TERRAIN N/A status shows that the TAWS is not available.

When the TAWS initiates an aural alert an audio input is sent directly to the audio control panel and is available through the headphones and cockpit speaker. At the same time annunciations are displayed on the PFD ADI in an amber box for GND PROX or red box for PULL UP. The annunciations flash in reverse video for 5 seconds and then remain on until the condition is no longer detected. If the (TAWS) terrain overlay is not displayed and a TAWS alert is set, the terrain overlay will be displayed (automatic pop-up) on the HSI in the partial compass mode.

The TAWS portion of the KMH 980 is internally configured to suppress any TAS aural alerts for the duration of any TAWS aural alerts.

TCAS

Ref. Fig 7-30-4, for APEX Traffic – Overlay Menu and Display.

The (TCAS) traffic overlay on the PFD HSI can be selected by pressing the bezel button adjacent to the OVERLAY annunciator, which then displays the overlay selection menu. Select TRFC with the bezel button and repress the OVERLAY bezel button. The Traffic overlay is also available on the Map window of the INAV. It is displayed or removed by selecting the TCAS checkbox on the Active Layer Control Bar at the top of the map.

The aircraft intruder symbology consists of three different shapes:

- Traffic Advisory (TA) displayed as a solid amber circle
- Proximate Traffic (PA) displayed as solid cyan diamond
- Other Traffic, no threat, displayed as hollow cyan diamond

- A data tag representing intruder altitude is displayed above or below and a vertical speed arrow up or down to the right of the intruder symbol. The maximum number of intruders displayed is 32.

The annunciation TA BEHIND will be displayed on the Traffic overlay in amber when a TA intruder has a bearing that exceeds the display area behind the aircraft symbol (less than -110 degrees or greater than 110 degrees).

The TCAS system will issue an aural “Traffic, Traffic” alert message at the same time a TA is detected and displayed on the Traffic overlay. The TCAS aural alert is sent directly to the audio control panel and is available through the headphones and cockpit speaker. If the (TCAS) traffic overlay is not displayed and a TCAS alert is set, an amber TRFC soft key is displayed. Pressing the bezel button adjacent to the TRFC soft key will enable the traffic overlay to be displayed on the HSI in the partial compass mode.

The TCAS portion of the KMH 980 is internally configured to give audio priority for a TAWS aural alert over a TCAS aural alert and will automatically suppress any TCAS aural alerts for the duration of any TAWS aural alert message.

The TCAS inhibits aural annunciation under the following conditions;

- When the aircraft is below 400 feet AGL during descent
- When the aircraft is below 600 feet during ascent indication / warning

INDICATION/WARNING

The Crew Alerting System (CAS) window on the systems MFD will show the following advisory messages for the Terrain and Traffic Alerting systems status:

CYAN ADVISORY

Traffic Fail	Indicates traffic avoidance system data has become invalid
TAWS Fail	Indicates terrain avoidance system data has become invalid
Terr Inhib Active	Indicates terrain visual and aural alerting is inhibited

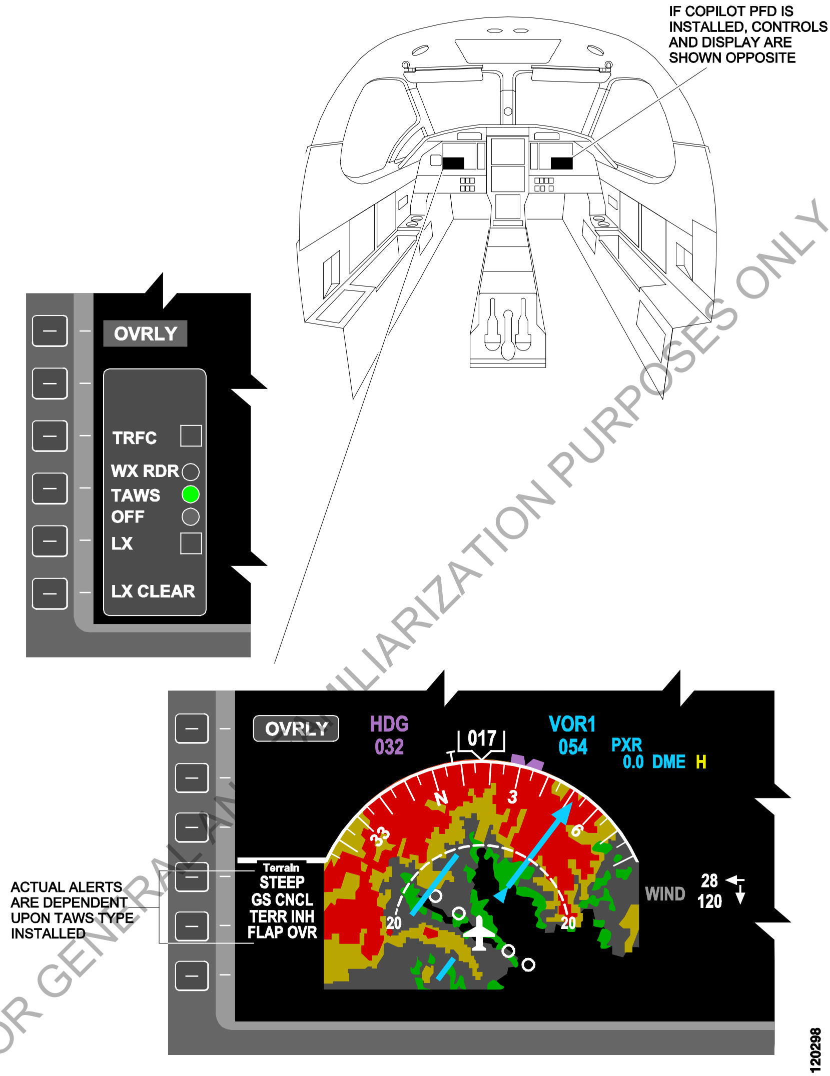
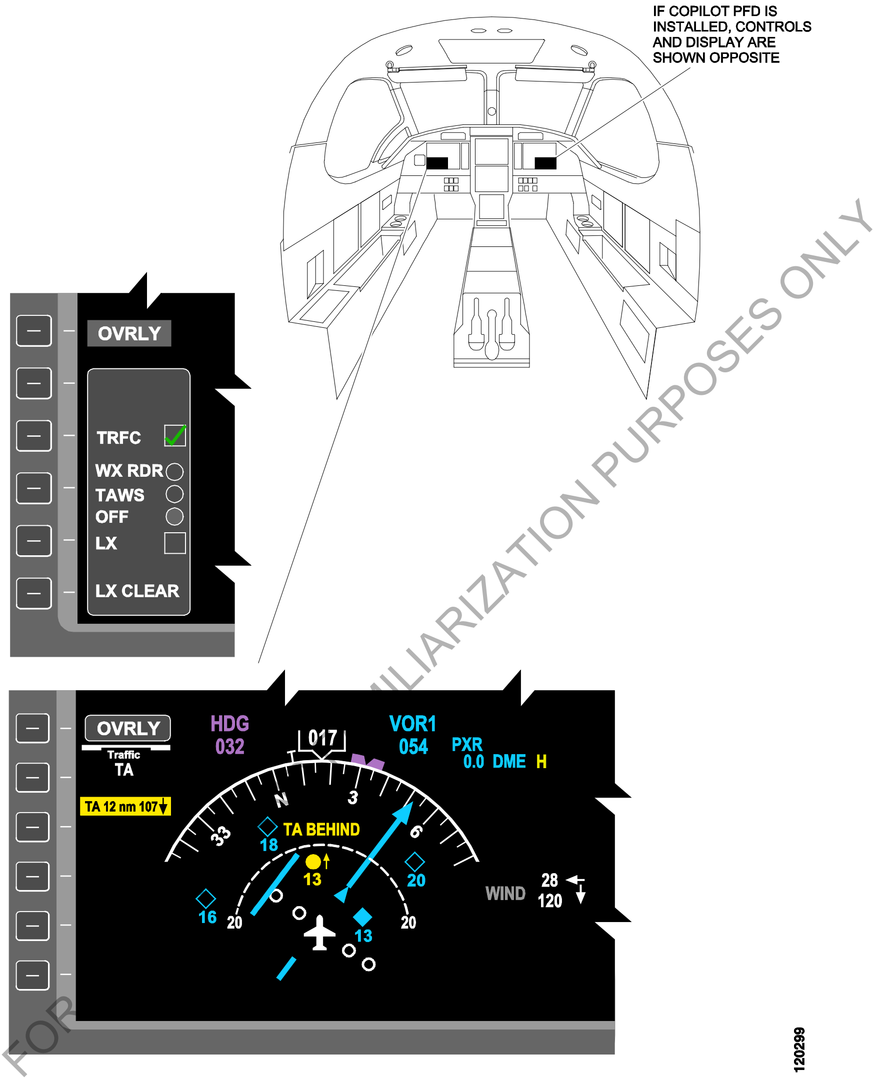


Figure 7-30-3. APEX Terrain – Overlay Menu and Display



7-30-4. APEX Traffic - Overlay Menu and Display

ENHANCED GROUND PROXIMITY WARNING SYSTEM (EGPWS)

GENERAL

The Mk VI Enhanced Ground Proximity Warning System (EGPWS) consists of an EGPWS computer and configuration module installed under the cabin floor between frames 32 and 33. The power supply to the EGPWS is 28 VDC through the TAWS circuit breaker on the AVIONIC 1 BUS circuit breaker panel.

The EGPWS provides an enhanced capability of reducing accidents caused by controlled flight into terrain. The system achieves this by receiving a variety of aircraft parameters as inputs, then applying alerting algorithms to provide the flight crew with aural messages and visual annunciation and display. The EGPWS provides the flight crew with enhanced Class A terrain awareness while following an ATC flight plan clearance.

The EGPWS receives GPS position from the MAU for accurate position determination in conjunction with a regional database. One of three databases, Atlantic, Americas or Pacific (one global database MSN 1401 - 1942), may be installed in the EGPWS unit. The databases also contain the locations of all runways longer than 2000 feet that have a published instrument approach. The (TAWS) terrain overlay when selected is displayed on the PFD HSI.

Refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E – Pilot's Guide, for information regarding the specific operating details of the system. For further information, refer to the latest edition of the Honeywell EGPWS Pilot's Guide.

DESCRIPTION

The EGPWS uses the database and inputs from the GPS, FMS, ADAHRS, APEX and radio altimeter to perform its proximity computations.

Terrain is displayed as a variable density dot pattern in green, yellow or red. The pattern density and color being a function of how close the terrain or obstacle is, relative to the altitude of the aircraft. Solid red for a warning terrain threat area and solid yellow for a caution terrain threat area.

The terrain alerting algorithms continuously compute the terrain clearance envelopes ahead of the aircraft. If the boundaries of these envelopes conflict with terrain elevation data in the terrain database, then alerts are issued. Two envelopes are computed, one corresponding to a terrain caution alert and the other to a terrain warning alert.

When the required conditions have been met to generate a terrain or obstacle caution alert, the terrain image on the PFD TAWS Overlay is enhanced to highlight the threatening terrain as solid yellow for caution threats and the appropriate aural alert is given. When the required conditions have been met to generate a terrain or obstacle warning alert, the display image on the PFD TAWS Overlay is enhanced to highlight the terrain as solid red and the appropriate aural alert is given.

OPERATION

Ref. Fig 7-30-3, for APEX Terrain – Overlay Menu and Display.

The (EGPWS) terrain overlay on the PFD HSI can be selected by pressing the bezel button adjacent to the OVERLAY annunciator, which then displays the overlay selection menu. Select TAWS with the bezel button and repress the OVERLAY bezel button. Terrain map data from the EGPWS is displayed on the lateral map display on the HSI.

EGPWS mode white annunciators for STEEP APR, G/S INHIB, TERR INHIB, FLAP OVRD and TERR are displayed in the lower left portion of the HSI. The steep approach (STEEP APR) mode which allows the pilot to fly a steeper approach angle without terrain callouts being generated, can be selected from the TAWS set up page. The TERR annunciation indicates normal operation of the TAWS. The terrain inhibit (TERR INHIB), glideslope inhibit (G/S INHIB) and flap override (FLAP OVRD) control buttons are on the MF controller.

Mode 5 Glideslope alerts can be manually cancelled when below 2000 feet Radio Altitude by pressing the G/S INHIBIT button. This button is typically pressed when an unreliable glideslope is expected or when maneuvering is required during an ILS final approach. The G/S INHIBIT function is automatically reset below 30 feet radar altitude or if the aircraft climbs above 2000 feet or by selecting a non-ILS frequency as the primary navigation source. Unsafe Terrain Clearance alerts can be manually inhibited by pressing the FLAP OVRD button.

All six modes can be manually inhibited by pressing the TERR INHIB button. All the terrain and aural alerts are de-activated. This feature is generally used when the position accuracy is inadequate or when operating at airports not in the terrain database.

Three amber annunciators for TEST, RANGE and TERR N/A can be displayed on the HSI. A test of the EGPWS can be performed from the TAWS set up page using the TAWS SELF TEST soft key. The range update failure shows that the actual range of the TAWS does not match the currently displayed HSI range. The terrain unavailable status shows that the TAWS is not available.

The EGPWS computer sends aural alert messages, when necessary, to the audio control panel and to the headphones and cockpit speaker. At the same time annunciations are displayed on the PFD ADI in an amber box for GND PROX or red box for PULL UP. The annunciations flash in reverse video for 5 seconds and then remain on until the condition is no longer detected. If the (TAWS) terrain overlay is not displayed and a EGPWS alert is set, the terrain overlay will be displayed (automatic pop-up) on the HSI in the partial compass mode.

The EGPWS sends a suppression signal to the TCAS to inhibit voice messages from the TCAS when the EGPWS is generating voice messages.

The enhanced feature of the EGPWS is the ability to alert the crew to and provide a display of potential conflict with terrain. Terrain conflict alerts will initiate a specific aural message and annunciator illumination. The EGPWS keeps a synthetic image of local terrain in front of the aircraft for display on the PFD Terrain Overlay.

Other enhanced features of the EGPWS are:

- Terrain Alerting and Display (TAD)
- Peaks
- Obstacles
- Envelope Modulation
- Terrain Clearance Floor (TCF)
- Runway Field Clearance Floor (RFCF)
- Geometric Altitude

The EGPWS issues voice messages and tones for the following types of warning:

- Sink rate pull up warning
- Terrain closure pull up warning
- Terrain awareness pull up warning (TAD)
- Terrain
- Terrain awareness caution (TAD)
- Too low terrain
- Altitude callouts
- Smart Callout (500)
- Too low gear
- Too low flaps
- Sink rate
- Don’t sink
- Glideslope
- Bank angle

INDICATION / WARNING

The Crew Alerting System (CAS) window on the Systems MFD will show the following advisory messages for the Terrain Avoidance system status:

CYAN ADVISORY

TAWS Fail	Indicates terrain avoidance system data has become invalid
Terr Inhib Active	Indicates terrain visual and aural alerting is inhibited

TRAFFIC COLLISION AND AVOIDANCE SYSTEM (TCAS)

GENERAL

The KMH 970 Traffic Collision and Avoidance System (TCAS I) comprises a processor, two directional antennas (Upper and Lower) and a configuration module. Power supply to the processor is 28 VDC through the TCAS circuit breaker on the Avionic 2 BUS circuit breaker panel. Aural alerts are available through the headphones and cockpit speaker.

TCAS I is intended as an aid to the see and avoid concept. Once an Intruder is visually acquired, it is the pilot's responsibility to maneuver as necessary to maintain safe separation.

TCAS I does not incorporate the sophisticated sensors, bearing accuracy or track rate computations incorporated in TCAS II or TCAS III that are necessary for evasive maneuvering (rapid change in pitch, roll, normal acceleration, thrust or speed). In general, TCAS I does not provide adequate information for pilots to determine reliably which horizontal or, in some cases, vertical direction to move to increase separation, and there is some likelihood that such maneuvers will actually result in reduced separation.

Refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E – Pilots Guide, for information regarding the specific operating details of the system. For further information refer to the KMH 970 Pilots Guide.

DESCRIPTION

The TCAS I detects and tracks other (Intruder) aircraft by interrogating their transponders. From the transponder replies, TCAS I determines range, bearing and (if the Intruder is equipped with a Mode C or S transponder) relative altitude. Intruders equipped with a Mode A transponder do not provide altitude information. With this data, the TCAS I uses standard algorithms to determine the threat of collision. When a possible collision hazard exists, the TCAS I issues a visual and aural Traffic Advisory (TA) to the flight crew. The TCAS I will not detect aircraft which have no operating transponder.

The (TCAS) traffic overlay when selected is displayed on the PFD or the Map window of the INAV. It displays the horizontal picture of the traffic around the aircraft. The horizontal picture represents aircraft (intruders) within the surveillance volume, including the range, azimuth, altitude and vertical direction arrows, when the information is available from the TCAS processor.

OPERATION

Ref. Fig 7-30-4, for APEX Traffic – Overlay Menu and Display.

The (TCAS) traffic overlay on the PFD HSI can be selected by pressing the bezel button adjacent to the OVERLAY annunciator, which then displays the overlay selection menu. Select TRFC with the bezel button and repress the OVERLAY bezel button.

The TCAS overlay can be displayed on the Situation Awareness MFD INAV Map by selecting the TCAS button on the Active Layers Control Bar.

The aircraft intruder symbology consists of three different shapes:

- Traffic Advisory (TA) displayed as a solid amber circle
- Proximate Traffic (PA) displayed as solid cyan diamond
- Other Traffic, no threat, displayed as hollow cyan diamond

A data tag representing intruder altitude is displayed above or below and a vertical speed arrow pointing up or down to the right of the intruder symbol. The maximum number of intruders displayed is 32.

The annunciation TA BEHIND will be displayed on the traffic overlay in amber when a TA intruder has a bearing that exceeds the display area behind the aircraft symbol (less than -110 degrees or greater than 110 degrees).

If an Intruder gets to within 15 to 30 seconds of a projected closest point of approach and/or meets other range and closure criteria, it is then considered a potential threat and a visual TA is issued with a voice message.

The TCAS I system will issue an aural “Traffic, Traffic” alert message at the same time a TA is detected and displayed on the Traffic overlay. This assists the pilot in achieving visual acquisition of the threat traffic. If the (TCAS) traffic overlay is not displayed and a TCAS alert is set, an amber TRFC soft key is displayed. Pressing the bezel button adjacent to the TRFC soft key will enable the traffic overlay to be displayed on the HSI in the partial compass mode.

The TCAS I aural alert is sent directly to the audio control panel and is available through the headphones and cockpit speaker. An EGPWS aural alert automatically takes audio priority over a TCAS aural alert. A priority signal is sent from the EGPWS to the TCAS to mute any simultaneous TCAS aural alerts.

TCAS I is intended as an aid to the see and avoid concept. Once an intruder is visually acquired, it is the pilots responsibility to maneuver as necessary to maintain safe separation.

INDICATION / WARNING

The Crew Alerting System (CAS) window on the systems MFD will show the following advisory message for the Terrain and Traffic Alerting systems status:

CYAN ADVISORY

Traffic Fail	Indicates traffic avoidance system data has become invalid

LIGHTNING SENSOR SYSTEM

GENERAL

The Lightning Sensor System (LSS) Stormscope WX 500 processor is installed under the cabin floor between frames 34 and 35. The power supply to the system is 28 VDC through the STORMSCOPE circuit breaker on the AVIONIC 2 BUS circuit breaker panel.

DESCRIPTION

The LSS detects lightning activity 360 degrees around the aircraft up to a distance of 200 nautical miles. The antenna is installed on the bottom of the fuselage, it detects intra-cloud, inter-cloud or cloud-to-ground electrical discharges and sends the resulting discharge signals to the processor. The processor converts the signals into range and bearing data then stores the data in memory. The processor then communicates the data to the Modular Avionics Unit (MAU) as strikes and cells with updates every two seconds.

To maintain correct storm orientation the system receives heading source data from the ADAHRS. If the heading source data becomes invalid the LSS may fail and remain failed until a complete power cycle is performed.

The LSS is inhibited automatically when the pilot or co-pilot presses his PTT switch. This prevents false lightning activity detections which could be caused by the communications transmission signals.

For further information on the use of the system, operational techniques and weather display interpretation consult the Stormscope Model WX-500 User’s Guide.

OPERATION

Ref. Fig 7-30-5, for APEX Lightning – Overlay Menu and Display.

The LSS is a passive system and is commanded into the normal working mode by the MAU at power up. The system has three levels of self test; at power on, continuous and pilot initiated. The pilot initiated LX self test which takes approximately 30 seconds can be done from the LX set up page accessed from the WX/LX/TAWS menu on the Systems MFD. The LX MODE can be toggled between Cell and Strike with the adjacent bezel button from the LX set up page. The power default state of LX MODE is Strike.

During the system operation the partial compass of the HSI display and the Situation Awareness MFD Map display can be overlaid with lightning information. There are two components of the lightning display, mode/fault annunciations; strike rate and lightning cell/strike data. Mode/fault and strike rate annunciations are placed outside the display area and the lightning cell/strike is placed inside the display using a lightning symbol as described in the cell and strike modes given below.

The Lightning (LX) overlay on the PFD HSI can be selected by pressing the bezel button adjacent to the OVERLAY annunciator, which then shows the overlay selection menu. Select LX with the bezel button and then press the OVERLAY bezel button again.

The Situation Awareness MFD INAV Map Lightning Sensor System overlay can be displayed by selecting the WX button on the Active Layers Control Bar and then selecting the LSS check box.

When the LSS overlay is selected the normal mode annunciations for CELL or STRIKE and the RATE are shown in white on the bottom left of the overlay. In either the cell or strike mode, if a lightning strike is detected within 25 nm of the aircraft position within the last three minutes the mode annunciator will change to amber.

Indicated distance of lightning activity may differ slightly from distance provided by the XM SAT Weather. This is due to the measuring technique used by the WX-500 Stormscope.

Annunciations in white are also given CLEAR, TEST and FAULT. If the lightning sensor fails an amber LX FAIL annunciation will be shown and the RATE and overlay display data will be removed.

Strike Display Mode (default mode)

In the strike display mode a discharge symbol is shown on the lightning detection overlay when the LSS detects a discharge within the selected range and view. The strike display mode shows the discharge points on the overlay in relation to where the discharges are actually detected instead of close to an associated group as is done in the cell display mode. The strike display mode is most useful during periods of light electrical discharge activity because it may show discharges associated with a building thunderstorm.

Cell Display Mode

In the cell display mode a discharge symbol is shown on the lightning detection overlay when the LSS detects discharges within the selected range and view. The system will show another discharge symbol close to the first for each additional discharge determined to be associated with the group. Discharges not associated with a group are not shown unless its detected within 25 nm radius of the aircraft. The effect of this clustering algorithm is to display the location of storm cells instead of individual discharges. The cell display mode is most useful during periods of heavy electrical discharge activity.

Clearing the discharge points periodically while monitoring thunderstorms is a good way to determine if the storm is building or dissipating. Discharge points in a building storm will reappear faster and in larger numbers. Discharge points in a dissipating storm will appear slower and in smaller numbers. The LX CLR soft key is accessed from the OVRLY window and when the adjacent bezel button is pressed an LX CLR “ON” indicator will show for three seconds and all the lightning cells or strikes will be removed from the PFD and any other displays.

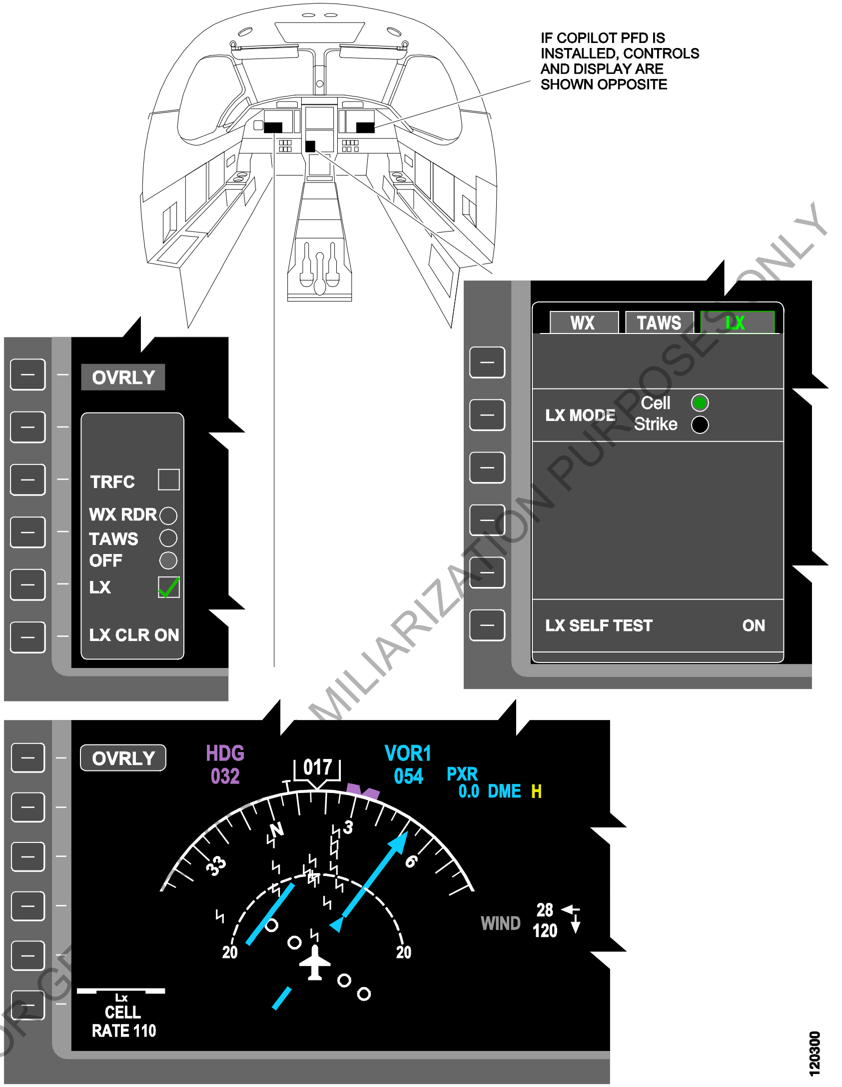


Figure 7-30-5. APEX Lightning – Overlay Menu and Display

XM SAT WEATHER

DESCRIPTION

The XM Sat Weather is a streaming weather data source which provides data to the Primus Apex system for display on the Situation Awareness MFD Map display. The XM Sat Weather processor is installed under the cabin floor between frames 27 and 28. The power supply to the XM Sat Weather system is 28 VDC through the XM SAT WX circuit breaker on the STANDBY BUS. An XM antenna is installed on the forward top of the fuselage.

The XM Weather Receiver sends validated data to the MAU.

OPERATION

The XM Sat Weather INAV overlays are selected from the WX button menu on the Situation Awareness MFD.

The following table gives the XM Sat Weather system declutter ranges (nm):

Layer Build 7	Layer Build 8 or higher	Min. Range (North Up)	Min. Range (Heading Up)	Max. Range (North Up)	Max. Range (Heading Up)
NEXRAD	NEXRAD	10	5	500	250
Satellite	Sat	50	25	500	250
Winds	Winds	50	25	500	250
Storm	Tops	10	5	500	250
Lightning	Lghtng	10	5	200	100
CAT	Turb	50	25	500	250
Echo Tops	E-Tops	10	5	500	250
TFR	TFR	5	2.5	500	250
AIRMET	AIRMET	50	25	500	250
SIGMET	SIGMET	5	2.5	500	250
CONUS	NXRDcv	Min INAV range	Min INAV range	Max INAV range	Max INAV range
METAR	METAR	Min INAV range	Min INAV range	* 75	* 37.5
TAF	TAF	Min INAV range	Min INAV range	* 75	* 37.5

* Airport symbols are decluttered at this range.

PRIMUS APEX - MONITOR WARNING SYSTEM (MWS)

GENERAL

The MWS performs the following functions:

- Monitor Warning Function (MWF)
  - System monitors
  - Aural Warning
- Crew Alerting System (CAS)
- Flight Alerting System (FAS)

MONITOR WARNING FUNCTION (MWF)

The Monitor Warning Function (MWF) continuously monitors the interfaced aircraft systems and initiates the appropriate warning, caution and aural alerts to the crew when necessary.

The MWF runs in both channels of the Modular Avionics Unit (MAU), each MWF is comparison monitored with its opposing channel for integrity of the resultant alert.

Each MWF instance will produce a priority status parameter, and dependent on its origin will be sent to the Flight Alerting System (FAS) (refer to Section 3 for these messages), Crew Alerting System (CAS) or to the Aural Warning system.

SYSTEM MONITORS

The MWF provides two levels of system monitoring, Level A and C. The level A monitor consists of the following:

- On ground
  - WOW air-ground monitor
  - Radio altitude air-ground monitor
  - Calibrated airspeed air-ground monitor
  - Aircraft on ground monitor
- PBIT on ground
- Engine running
- Inhibit monitors
  - Takeoff global inhibit monitor
  - Approach global inhibit monitor
  - Standby Bus On global inhibit monitor
  - Electrical power on functional inhibit monitor
  - Engine start functional inhibit monitor
  - Taxi functional inhibit monitor
- Cruise functional inhibit monitor
- Takeoff configuration
- Check DU graphics generation and display monitor

- Gear warning monitor
- Stall warning monitor
- Cabin pressurized warning monitor
- Overspeed warning monitor
- CPCS doors monitor
- CPCS takeoff roll monitor
- Landing gear status

The level C monitor consists of the following:

- Sensor miscompare
  - Selected ADAHRS data determination
  - Pitch miscompare monitor
  - Roll miscompare monitor
  - Heading miscompare monitor
  - Barometric corrected altitude miscompare monitor
  - Barometric correction miscompare monitor
  - Calibrated airspeed miscompare monitor
- Altitude alert
- Autopilot engage
- Minimums alert
- Gear enable energized
- De-ice boots
- Hydraulic pressure
- Engine automatic start
- Oil debris
- ACS control
- ASCB Bus

AURAL WARNING

The MWF consists of two monitor warning functions that provide requests for the aural warning drivers to output tones and/or voice callouts to the audio system.

The following table lists the aural alerts generated from the MWF in priority order:

CONDITION	AURAL MESSAGE/ TONE	TYPE	MUTABLE
Stall	"Stall"	Continuous	No
Terrain alerts	Numerous	External	Note 1
Traffic alerts	Numerous	External	Note 2
Gear	"Gear"	Continuous	No
Overspeed	"Speed"	Continuous	No
Takeoff Configuration	"No Takeoff"	Continuous	No
Cabin Pressurized	"Cabin"	Continuous	No
Warning Chime	Triple Chime	Continuous	Yes
Pitch Trim Runaway	"Trim Runaway"	Continuous	Yes
Engine Fire	"Fire"	Continuous	Yes
Cabin Altitude	"Cabin Altitude"	Continuous	Yes
Battery Hot Warning	"Battery Hot"	Continuous	Yes *
Propeller Low Pitch Warning	"Propeller Low Pitch"	Continuous	Yes
Caution Chime	Single Chime	Continuous	Yes
AP Uncommanded Disconnect	Cavalry Charge	Continuous	Yes
Minimums	"Minimums"	Single	No
AP Commanded Disconnect	Cavalry Charge	Single	No
Altitude	C Chord	Single	No
Vertical Track Alert	C Chord (0.2 sec on, 0.15 sec off, 0.2 sec on)	Single	No

NOTE 1: TAWS/EGPWS alerts are input directly to the audio panel and maybe heard simultaneously with MWF aurals/tones. TAWS/EGPWS alerts will mute TAS/TCAS alerts.

NOTE 2: TAS/TCAS alerts are input directly to the audio panel and maybe heard simultaneously with MWF aurals/tones. TAWS/EGPWS alerts will mute TAS/TCAS alerts.

NOTE 3: * Only when NiCad batteries are installed.

If the MWF detects a fault in the aural warning system a CAS caution message will be shown to annunciate the Aural Warning Failure. If one channel of the aural warning system becomes inhibited or defective a CAS advisory message will be shown to indicate an aural warning fault (Build 8.5 and higher). If one channel of the MWF becomes defective a CAS advisory message will be shown to indicate an MWF A or B channel failure. The aural warning system can be disabled by operation of the AURAL WARN INHIBIT switch on the cockpit rear left switch panel, in the event of a failed repetitive aural.

For normal operation the AURAL WARN INHIBIT switch should not be selected to INHIBIT. To reduce nuisance alerting in the cockpit, both channels of the aural warning are disabled while the aircraft is on the ground and not fully powered.

CREW ALERTING SYSTEM (CAS)

Refer to Figure 7-31-1, Crew Alerting System (CAS), for system layout.

When the MWF detects an out of limits condition it will illuminate either the master WARNING or master CAUTION attention lights and generate the appropriate message and aural alert. The Crew Alerting System (CAS) messages are displayed in the CAS window of the systems Multi Function Display (MFD). When no messages are active the window is blank except for the window title CAS and the scroll arrows. The window can display 12 lines of messages of 20 characters each.

The CAS messages have four levels:

- Warning (red) indicates a condition that requires an immediate corrective action by the pilot. A red warning CAS message will be displayed in reverse (red background) until acknowledged by pressing the WARNING attention light. After which the CAS warning message text will be shown in the red warning color
- Caution (amber) indicates a condition that requires a pilots attention but not an immediate reaction. An amber caution CAS message will be displayed in reverse (amber background) until acknowledged by pressing the CAUTION attention light. After which the CAS caution message text will be shown in the amber caution color. Unacknowledged reversed caution messages cannot be scrolled off the CAS window
- Advisory (cyan) indicates a system condition, which requires pilot awareness and may require crew action. A cyan advisory CAS message will be displayed in reverse (cyan background) for 5 seconds. After 5 seconds they will shown in the cyan advisory color
- Status (white) are only displayed on the ground in white text and indicate a maintenance action is required. The Event message will be displayed in flight to indicate that the crew initiated event recording is captured

The CAS messages have been given a hierarchical priority status. Red warning has priority over an amber caution, which has priority over cyan advisory. The purpose of the priority status is that new incoming messages will be held in a queuing system based on priorities. Whenever a new CAS message becomes active it will appear in the appropriate color in reverse video.

Red master WARNING and amber master CAUTION attention lights are positioned on the instrument panel directly in front of the pilot and copilot. They alert the crew to changes in the CAS monitoring status. Any condition that causes a red or amber CAS message also causes the applicable master WARNING or CAUTION attention light to come on. Some warnings are accompanied with a voice callout which will sound through the overhead speaker and/or headset(s). Pushing the applicable master WARNING or CAUTION attention light acknowledges the message and extinguishes the light. This action also changes the warning or caution message from reverse video to normal text in the CAS window. All advisory and status messages will be automatically acknowledged and revert to normal text after being in view for 5 seconds.

The master WARNING and CAUTION attention lights are checked before flight by pressing the LAMP switch on the overhead panel which will make the pilot and copilot attention lights illuminate.

In the event that more than 12 messages are active simultaneously, scrolling is provided for the pilot to view all active messages. Warning messages cannot be scrolled off the display. Caution messages can only be scrolled off the display when they have been acknowledged. Scrolling is not active until the message window is full. On the left side of the CAS window a digital display will show the number of CAS messages scrolled off the CAS window for each color. Acknowledged messages scrolled off the CAS window will appear in normal text and unacknowledged messages will be shown in reverse video.

To initiate CAS scrolling, press the bezel button adjacent to the up or down arrow softkey. Scrolling of the CAS messages can also be done with the MF controller by pressing the arrow keys, to bring the CAS window into focus, and then rotating the joystick control knob clockwise or counterclockwise to scroll up or down.

In the event of a Monitor Warning Function (MWF) miscompare condition, an amber MW annunciator is displayed on the left of the CAS window (Ref. Fig. 7-38). When this MW annunciator is displayed, the pilot can toggle between the MWF Sources by pressing the bezel button adjacent to the MW softkey. The pilot decides which MWF Source to select in a miscompare condition.

All the warnings (including their respective audio), cautions, advisory and status messages that can be displayed on the CAS are listed in the following tables. An X in the flight phase columns indicates a message is inhibited during that flight phase.

Refer to the relevant aircraft System Indication/Warning section for a description of the conditions when a CAS message will be generated. Refer to Section 3 for the relevant emergency procedures given for the CAS Warning and Caution messages.

CAS WARNING MESSAGES (RED)

Message Text	Voice	Stby Bus	Elec Pwr on	Eng Start	Taxl	Take -off	Cru- ise	App- roach
Engine Fire	Fire	X						
Engine ITT		X						
Engine Torque		X						
Engine NG		X						
Engine NP		X						
Engine Oil Press		X						
Engine Oil Temp		X						
Essential Bus		X		X				
Generators		X	X	X				
Cabin Pressure		X		X				
Starter Engaged		X		X				
Battery 1 Hot Battery 2 Hot Battery 1 + 2 Hot	Battery Hot	X X X		X X X		X X X		X X X
Pitch Trim Runaway	Trim Runa-way	X		X				
Engine Oil Level (only valid with engine oil pressure below 50 psig)		X		X				
Cabin Altitude	Cabin Altitude	X		X				
Passenger Door Cargo Door Pax + Cargo Door		X X X		X X X				X X X
Propeller Low Pitch	Prop-eller Low Pitch	X		X				

CAS CAUTION MESSAGES (AMBER)

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Cru-ise	App-roach
1: MAU A Fail 2: MAU B Fail			X X				
Engine ITT	X						
Engine Torque	X						
Engine NG	X						
Engine NP	X						
Engine Oil Press	X						
Engine Oil Temp	X						
Probes Off	X		X		X		X
Fuel Quantity Fault	X		X		X		X
Fuel Balance Fault	X		X		X		X
LH Fuel Low RH Fuel Low LH & RH Fuel Low	X X X		X X X				
Fuel Pressure Low	X						
Hydraulics	X		X		X		X
External Power	X		X		X	X	X
ACS Low Inflow	X		X		X		X
ECS Fault	X		X		X		X
CPCS Fault	X		X		X		X
Generator 1 Off	X		X		X		X
Generator 2 Off	X		X		X		X
Fuel Imbalance	X		X		X		X
Bus Tie	X				X		X
Pusher	X	-	X				

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Cru-ise	App-roach
Avionics 1 Bus	X		X		X		X
Avionics 2 Bus	X		X		X		X
Avionics 1 + 2 Bus	X		X		X		X
Fire Detector	X		X		X		X
Generator 1 Volts	X		X		X		X
Generator 2 Volts	X		X		X		X
Generator 1 + 2 Volts	X		X		X		X
Battery 1	X		X		X		X
Battery 2	X		X		X		X
Battery 1 + 2	X		X		X		X
Battery 1 Off	X		X		X		X
Battery 2 Off	X		X		X		X
Battery 1 + 2 Off	X		X		X		X
Flaps	X		X				
Engine Chip	X		X		X		X
Engine Oil Debris	X		X		X		X
Main Bus	X		X		X		X
Generator 1 Bus	X		X		X		X
Generator 2 Bus	X		X		X		X
Generator 1 + Bus	X		X		X		X
AOA De Ice	X		X				X
Pitot 1 Heat	X		X		X		X
Pitot 2 Heat	X		X		X		X
Pitot 1 + 2 Heat	X		X		X		X
Static Heat	X		X				X
Inertial Separator	X		X				X
De Ice Boots	X		X				X
1 : LH Windshield Heat	X		X		X		X
2 : RH Windshield Heat	X		X		X		X
3: LH + RH Windshield Heat	X		X		X		X
Propeller De Ice	X		X				X

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Cru-ise	App-roach
1: Check DU 1 2: Check DU 2 3: Check DU 1+2 4. Check DU 3 5. Check DU 1+3 6. Check DU 2+3 7. Check DU 1+2+3 8. Check DU 4 9. Check DU 1+4 10. Check DU 2+4 11. Check DU 1+2+4 12. Check DU 3+4 13. Check DU 1+3+4 14. Check DU 2+3+4 15. Check DU 1+2+3+4							
Non Essential Bus	X		X		X		X
Standby Bus			X		X		X
1: RA 1 Fail	X		X		X		
1: MMDR 1 Fail 2: MMDR 2 Fail 3: MMDR 1+2 Fail			X X X		X X X		X X X
1: XPDR 1 Fail 2: XPDR 2 Fail 3:: XPDR 1+2 fail	X X X	 X 	X X X		X X X		X X X
1: AHRS A Fail 2: AHRS B Fail 3. AHRS A+B Fail	X X X		X X X		X X X		X X X
1: ADC A Fail 2. ADC B Fail 3. ADC A+B Fail	X X X		X X X		X X X		X X X
Air/Ground Fail	X		X		X		X
Aural Warning Fail	X	X	X		X		X
1: DME 1 Fail	X		X		X		X
1: MMDR 1 Overheat 2: MMDR 2 Overheat 3: MMDR 1+2 Overheat			X X X		X X X		X X X

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Cru-ise	App-roach
HSI is MAG TRK HSI is TRU TRK (Build 6)	X	X	X				
1: HSI1 is MAG TRK	X	X	X				
2: HSI1 is TRU TRK	X	X	X				
3: HSI2 is MAG TRK	X	X	X				
4: HSI2 is TRU TRK	X	X	X				
5: HSI1+2 is MAG TRK	X	X	X				
6: HSI1+2 is TRU TRK (Build 7 and higher)	X	X	X				
1: AP Hold LH Wing Dn		X	X	X	X		
2: AP Hold RH Wing Dn		X	X	X	X		
1: AP Hold Nose Up		X	X	X	X		
2: AP Hold Nose Dn		X	X	X	X		
1: YD Hold Nose Left		X	X	X	X		
2: YD Hold Nose Right		X	X	X	X		
1: LH PFD CTLR Fail			X		X	X	X
2. RH PFD CTLR Fail	X	X	X		X	X	X
3. LH+RH PFD CTLR Fail	X	X	X		X	X	X
1: FLT CTLR Ch A Fail	X		X		X	X	X
2: FLT CTLR Ch B Fail	X	X	X		X	X	X
3: FLT CTLR Ch A+B Fail	X	X	X		X	X	X
1: DU 1 Overheat	X		X		X		X
2: DU 2 Overheat	X		X		X		X
3: DU 1+2 Overheat	X		X		X		X
4. DU 3 Overheat	X		X		X		X
5. DU 1+3 Overheat	X		X		X		X
6. DU 1+2+3 Overheat	X		X		X		X
7. DU 1+4 Overheat	X		X		X		X
8. DU 4 Overheat	X		X		X		X
9. DU 1+4 Overheat	X		X		X		X
10. DU 1+2+4 Overheat	X		X		X		X
11. DU 2+4 Overheat	X		X		X		X
12. DU 3+4 Overheat	X		X		X		X
13. DU 1+3+4 Overheat	X		X		X		X
14. DU 2+3+4 Overheat	X		X		X		X
15. DU 1+2+3+4 Overheat	X		X		X		X

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Cru-ise	App-roach
APM 1 Fail APM 2 Fail APM 1+2 Fail			X X X		X X X	X X X	X X X
CMS 1+2 Fail	X		X		X	X	X
System Config Fail			X		X	X	X
Validate Config	X		X		X	X	X
APM Miscompare	X		X		X	X	X
Cabin Pressure	X		X				
1: FMS-GPS1 Pos Misc 2: FMS-GPS2 Pos Misc 3. FMS-GPS1+2 Pos Misc (Build 6)			X X X		X X X		X X X
1 : FMS1-GPS1 Pos Misc 2 : FMS1-GPS2 Pos Misc 3 : FMS1-GPS1+2 Pos Misc 4 : FMS2-GPS1 Pos Misc 5 : FMS2-GPS2 Pos Misc 6: FMS2-GPS1+2 Pos Misc (Build 7 and higher)			X X X X X X		X X X X X X		X X X X X X
Unable FMS-GPS Mon	X	X	X		X		
Check Pilot PFD	X		X				
Check Copilot PFD	X	X	X				
Check Engine Display	X		X				
ASCB Fail	X		X		X		X
Gear Actuator Cntl	X		X				
Boots TEMP Limit (Build 10 and higher)							
Flaps EXT Limit (Build 10 and higher)							

CAS ADVISORY MESSAGES (CYAN)

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Crui-se	App-roach
Terr Inhib Active	X		X				
1: MWF A Fail 2: MWF B Fail	X		X X		X X		X X
Aural Warning Fault (Build 8.5 and higher)	X	X	X		X	X	X
No Alt Reporting (Build 6 and higher)							
Yaw Damper Fail	X		X		X		X
Autopilot Fail	X		X		X		X
1: AIOP A Module Fail 2: AIOP B Module Fail	X		X X		X X		X X
1: CSIO A Fail 2: CSIO B Fail 3: CSIO A + B Fail	X X		X X X		X X X		X X X
1: MAU A Overheat 2: MAU B Overheat 3: MAU A + B Overheat	X X		X X X		X X X		X X X
FMS Fail (Build 6)			X		X		X
1: FMS1 Fail 2 : FMS2 Fail 3 : FMS1+2 Fail (Build 7 and higher)			X X X		X X X		X X X
Maintenance Fail	X		X	X	X	X	X
MAU Fan Fail			X		X		X
MF CTLR Fail			X		X		X
FMS Synch Error	X		X		X		X
1: LH OAT Fail 2: RH OAT Fail 3: LH+RH OAT Fail	X X X		X X X		X X X		X X X

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Cru-ise	App-roach
1: LH PFD CTLR Fail 2: RH PFD CTLR Fail 3: LH+RH PFD CTLR Fail	 X X		X X X		X X X		X X X
Flight Director Fail	X		X		X		X
1: CMS 1 Fail 2: CMS 2 Fail	X		X X		X X		X X
1: GIO A Fail 2. GIO B Fail 3. GIO A+B Fail	X X		X X X		X X X		X X X
1: AGM 1 Fail 2: AGM 2 Fail	X		X X		X X		X X
Takeoff Config	X		X		X	X	X
ACMF Logs Full	X		X		X	X	X
ACMF Logs >80% Full	X		X		X	X	X
Engine Log Full	X		X		X	X	X
Engine Log >80% Full	X		X		X	X	X
Pusher Safe Mode	X		X				
1: FLT CTLR Ch A Fail 2: FLT CTLR Ch B Fail 3: FLT CTLR Ch A+B Fail	X X X		X X X		X X X		X X X
Traffic Fail	X		X		X		X
TAWS Fail	X		X				
1: GPS 1 Fail 2: GPS 2 Fail 3: GPS 1+2 Fail	 X X		X X X		X X X		X X X
AFCS Fault (Build 7 and higher)	X	X	X		X		X

CAS STATUS MESSAGES (WHITE)

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take -off	Cru- ise	App- roach
ODM Fault	X		X		X	X	X
Check Oil Debris	X		X		X	X	X
CPCS Fault	X		X		X	X	X
FCMU Fault	X		X		X	X	X
Low Lvl Sense Fault	X		X		X	X	X
Maint Memory Full	X		X		X	X	X
No Eng Trend Store	X		X		X	X	X
Engine Exceedence	X		X		X	X	X
Aircraft Exceedence	X		X		X	X	X
Event	X						
1: LH WOW Fault 2: RH WOW Fault 3: LH+RH WOW Fault	X X X		X X X		X X X	X X X	X X X
1: LH Fan Fault 2: RH Fan Fault 3: LH+RH Fan Fault	X X X		X X X		X X X	X X X	X X X
Crew Event Store	X		X		X	X	X
1: AGM1/FMS1 GFP Inop	X		X		X	X	X
1: AGM2/FMS1 GFP Inop	X		X		X	X	X
1: AGM 1 DB Error 2: AGM 2 DB Error 3: AGM 1+2 DB Error	X X X		X X X		X X X	X X X	X X X
1: AGM 1 DB Old 2: AGM 2 DB Old 3: AGM 1+2 DB Old	X x X		X X X		X X X	X X X	X X X
Function Unavailable	X		X		X		X

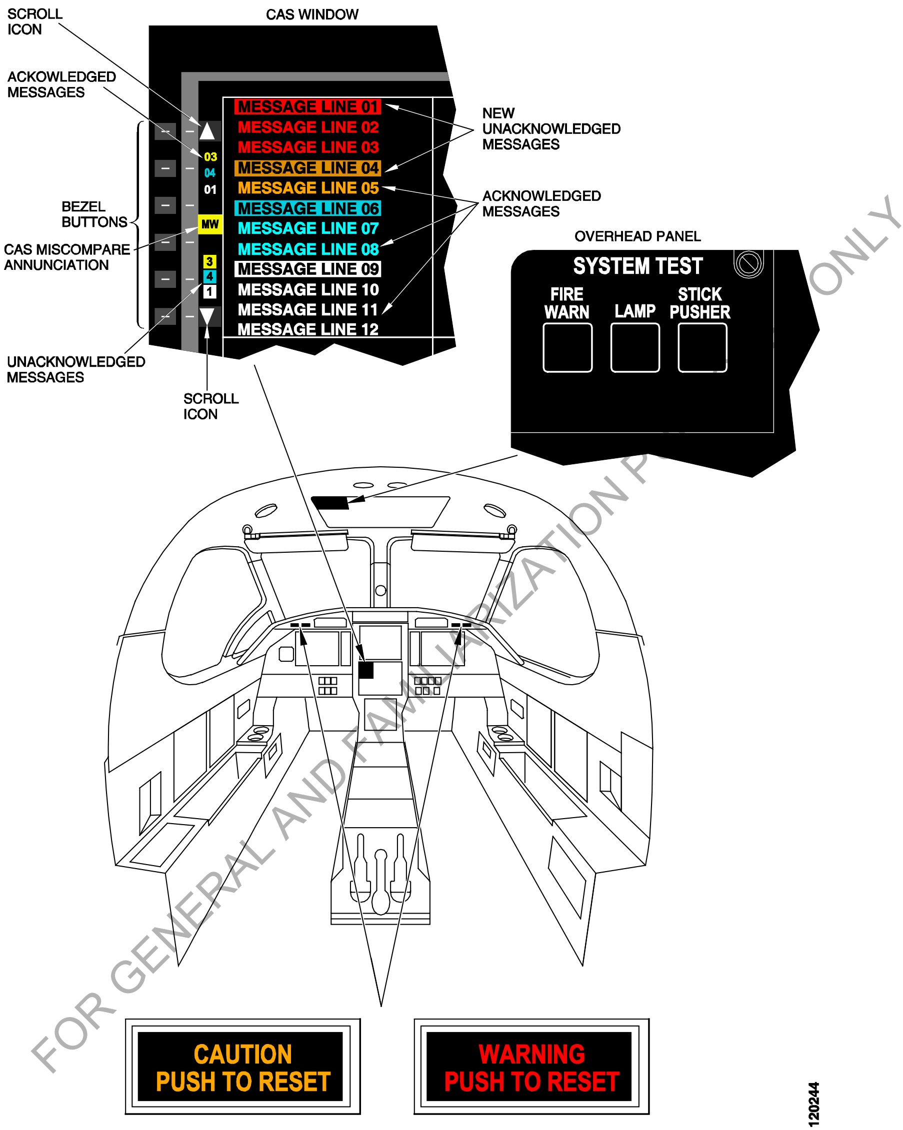


Figure 7-31-1. Crew Alerting System (CAS)

PRIMUS APEX - AUTOMATIC FLIGHT CONTROL SYSTEM

GENERAL

Refer to Figure 7-32-1, Automatic Flight Control System schematic.

The Automatic Flight Control System (AFCS) provides the following functions:

- Autopilot (including automatic pitch trim)
- Yaw Damper (including automatic yaw trim)
- Flight Director (FD) guidance

The AFCS function is hosted in the Modular Avionics Unit (MAU). The autopilot software runs in channels A and B of the MAU and both channels are required to be functional for normal autopilot operation. Pilot control is via a control panel installed above the upper Multi Function Display (MFD).

Auto flight control is accomplished with aileron, elevator and rudder servo actuator motors.

The AFCS consists of the following components:

- AFCS processing within the MAU
- Flight Controller (FC)
- Pitch and yaw trim adaptor and actuators
- Aileron, elevator and rudder servos

DESCRIPTION

The aileron, elevator and rudder servo motors communicate with the MAU via dual Controller Area Network (CAN) data buses. The AFCS function in the MAU generates servo commands that are identically output onto both of the CAN data buses. Commands received by the servo from each of the CAN data buses are dual processed within the servo and the resultant processed data must agree to effect a servo action. Additionally both servo channels must agree in their monitoring of motor current, clutch solenoid engagement and motor position.

The servo motors have an electrical clutch that is used to engage and disengage the output shaft from the drive train. The servo motors are mounted on capstans which are connected by autopilot cables to the flight control cables. The capstans incorporate a mechanical clutch, which can be physically overridden by the pilot if the electrical clutch will not disengage. Power to actuate the electrical clutch is supplied from the Avionic 1 bus A/P SERVO ENABLE circuit breaker through the MAU. When the autopilot is engaged the electrical clutches engage and connect the servo motors to the capstans in order to move the flight control surfaces. Electrical power to move the servos is supplied from the Avionic 1 bus through the A/P SERVO circuit breaker. The pilot can disconnect the electrical clutches (autopilot) by pressing the AP DISC push-button switch mounted on each control wheel yoke. This is the primary means of disconnecting the autopilot but operation of any of the following controls will also disconnect the autopilot:

Trim engage switch on the pilot or copilot control wheel

- Rudder trim switch on the PCL
- Alternate Stab Trim switch on the center console
- Trim Interrupt switch on the center console
- AP switch on the FC panel

When the autopilot is engaged the horizontal stabilizer trim actuator alternate motor and the rudder trim actuator motor are interfaced through the trim adapter to the AFCS autotrim function in the MAU. This autotrim function is to minimize the steady-state torque on the elevator and rudder servos. Manual trim commands are monitored by the Modular Avionics Unit (MAU) and disconnect the autopilot whenever sensed.

The pilot can momentarily disconnect the aileron and elevator electrical clutches by pressing the Touch Control Steering (TCS) push-button switch mounted on each control wheel. Release of the TCS push button will re-engage the aileron and elevator electrical clutches.

The Go Around (GA) switch on the left side of the Power Control Lever (PCL) is used to initiate a go around mode in the flight director.

Flap position and flap fail indications are provided to the AFCS function in the MAU as part of the auto pitch trim control laws. The AFCS monitors the positions of the control wheel AP DISC and TCS switches, the Go Around (GA) switch on the PCL, the manual pitch/roll trim switches on the control wheel, the rudder trim switch on the PCL and the TRIM INTERRUPT and ALTERNATE STAB TRIM switches on the center console.

The FC panel provides the means for selection of all AFCS functions except Go Around mode, touch control steering (TCS) and quick disconnect. Electrical power is supplied to the FC for Ch A from the Avionic 1 bus through the FLT CONT CH A circuit breaker. The FC Ch B is supplied from the Avionic 2 bus through the FLT CONT CH B circuit breaker.

Refer to Figure 7-32-1, Controls and Indications. AFCS mode selection provides the following functions:

L/R	Selects which PFD pilot or copilot (if installed) is used for coupling with the FD. At power up, the default setting for the control is L (left for pilot side).
HDG/T	Momentary push-button to engage or disengage the HDG or TRK mode. When pressed the green annunciator bar above the button comes on.
HDG TRK	The control is a dual concentric knob that allows selection between HDG and TRK mode and is used in conjunction with the HDG TRK switch. The outer control is a two-position rotary switch with a pointer. Selects either heading or track on the HSI compass card. The inner knob provides a continuous selection for the Heading or Track Select Bug on the HSI compass and digital readout. Clockwise increments and counter-clockwise decrements the heading or track value by 1 degree per detent. The dual concentric knob is also a momentary push-button PUSH SYNC for synchronization of the selected Heading or Track to the current aircraft heading or track.
AP, FD, YD	Momentary push-buttons to engage or disengage the autopilot, flight director and yaw damper. When pressed the green annunciator bar above the button comes on. The AP (and YD – Build 7 and higher) annunciators and FD command bars will be illuminated on the PFD displays, when the respective button is pressed and engagement occurs.
ALT	Controls the altitude pre-select and alerting bug on the altitude tape of the PFD displays. The control is a dual concentric knob. Clockwise rotation of the outer control increments and counter-clockwise decrements the altitude pre-select value by 1000 feet per detent. Clockwise rotation of the inner knob increments and counter-clockwise decrements the altitude pre-select value by 100 feet per detent.
NOSE UP/NOSE DN	Momentary push-buttons to adjust the vertical mode target values (pitch attitude, altitude, airspeed or vertical speed). These controls are only active if the FD is engaged.
BL	Momentary push-button to engage or disengage the high and low bank limits. A magenta arc is displayed on PFD ADI roll scale when low bank selected. The BL mode is only available in HDG or TRK mode. BL is automatically activated in HDG mode above FL 250.

NAV	Momentary push-button to engage NAV mode. When pressed the green annunciator bar above the button comes on. NAV mode provides tracking of the primary navigation source.
APR	Momentary push-button to engage APR mode. When pressed the green annunciator bar above the button comes on. APR mode gives capture and tracking of approaches.
VS	Momentary push-button to engage VS mode. When pressed the green annunciator bar above the button comes on. VS mode is used to climb or descend at the target vertical speed.
VNAV	Momentary push-button to engage VNAV mode. When pressed the green annunciator bar above the button comes on. Pressing VNAV arms the VNAV modes of the flight director.
SPD	Momentary push-button to engage SPD mode. **Build 6 and 7** - SPD mode can only be engaged if the altitude pre-select is set. **Build 8 and higher** - SPD mode can only be engaged if the altitude pre-select is set and is not at current aircraft altitude. The PCL needs to be used in the correct sense to allow proper operation of SPD mode. When pressed the green annunciator bar above the button comes on. The FMS provides guidance for the flight director to climb or descend at the speed target while complying with the altitude pre- selector. This mode is mainly used for climb and descent. The system will deviate from the pilot entered speed target in order to meet the altitude pre-selector.
ALT	Momentary push-button to engage ALT mode. When pressed the green annunciator bar above the button comes on. Alt mode is used to hold an altitude. The aircraft levels off at the present altitude when the ALT button is pressed.
MINIMUMS	Octagonal rotary knob to adjust the minimum height/altitude, referenced to either a target Radar Altitude or Barometric altitude respectively. Clockwise or counter-clockwise rotation when RA is active increases or decreases the minimums value over a range of 0 to 2500 feet. Clockwise or counter-clockwise rotation when BARO is active increases or decreases the minimums value over a range of 20 to 16,000 feet. The knob adjusts the minimums value 10 feet per detent. The rotary knob is also a momentary push-button PUSH RA/BARO to switch between a minimums referenced to radar altitude or to barometric altitude.

OPERATION

Pressing the AP push-button on the FC panel will engage the Autopilot (AP), Yaw Damper (YD) and Flight Director (FD). The associated annunciation bars will illuminate on the FC panel and the AP (and YD – Build 7 and higher) green annunciators and FD bars will be shown on the PFD. Whenever the autopilot is engaged, the pressing of the YD button will disengage the yaw damper and autopilot, the pressing of the AP button will not disengage the yaw damper. If the yaw damper fails the YD annunciator is shown in amber (Build 7 and higher).

Autopilot disengagement is defined as either normal or abnormal. A normal disengagement is initiated manually by pressing the AP DISC push-button on the control wheel or by the AP push button on the FC or by activating the manual trim system. A normal disconnect will cause the AP indication on the PFD to flash red/white and the aural “Cavalry Charge” warning tone to be activated. After 2.5 seconds the AP indicator and audio are removed. Any disengagement due to a monitor trip or failure is considered abnormal. An abnormal disconnect will cause the AP indication on the PFD to flash red/white and the aural warning tone to be activated until acknowledged via the AP DISC push-button. For some failures an autopilot disengagement will be accompanied by a CAS advisory indicating the reason for the disengagement.

The AFCS also controls the pitch and yaw manual trim actuators through the trim interface unit. Whenever the AP is engaged the pitch auto trim function is active, whenever the YD is engaged the yaw auto trim function is active. Pitch and roll commands are limited to +/- 20° and +/- 35° respectively. If the autopilot is engaged or the TCS is used to position the aircraft outside of these limits the autopilot will initially reduce the angles to the above limits.

When the autopilot is engaged the horizontal stabilizer trim actuator will be driven in order to minimize steady-state torque on the elevator servo motor. Operation of the trim switches on the control wheels or the ALTERNATE STAB TRIM switch on the center console will automatically disengage the autopilot and yaw damper. Similarly when the Yaw Damper is engaged the rudder trim actuator will be driven in order to minimize steady-state torque on the rudder servo motor. Operation of the Rudder Trim switch on the Power Control Lever will automatically disengage the autopilot and yaw damper.

Although it is not mandatory it is strongly recommended that the yaw damper is operating when flying above FL200. When flying at high altitude with the yaw damper off, high power selected and at low speed, large right rudder pedal deflection may cause large aircraft yaw angles and require the pilot to apply positive left rudder pedal force to re-establish balanced flight.

During autopilot operation, the voltages on each side of the horizontal stabilizer and rudder trim actuators are monitored by the MAU for trim runaway and trim inactive conditions. If either condition is detected, the trim engage relay is released and a CAS “Pitch Trim Runaway” and an aural “Trim Runaway” warning is given. A yaw damper failure will be shown as a CAS “Yaw Damper Fail” advisory.

The autopilot can be engaged with or without the Flight Director (FD) guidance modes active. When no flight director mode is active, engagement of the autopilot will automatically bring up the FD in the pitch hold vertical mode and the roll hold lateral mode with FD guidance on the PFD's. When FD guidance modes have been selected, the autopilot will couple itself to the pitch and roll commands generated by the FD guidance function.

HDG mode is not available if the heading flag is displayed on both HSI. All other modes may be operational.

Speed mode can be selected below 100 KIAS but the minimum speed bug setting is 100 KIAS. When the speed mode is engaged below 100 KIAS and the pre-selected altitude is above the aircraft altitude the aircraft will accelerate to 100 KIAS and continue climb if sufficient power is set. For an ILS or BC approach when the approach mode has been selected, check the flight mode annunciator is armed LOC or BC during the correct intercept heading.

The flight director source indicator arrow has a left side default at power up. If the pilot selects DU1 and DU 2 off the AGM 1 display capability is disabled and then flight director switches automatically to the right side PFD format (AGM 2). Selecting DU 1 and or DU 2 on again does not automatically revert the indicator arrow back to the left side. This can be done by pressing the L/R button on the FC panel.

INDICATION / WARNING

Depending on mode selection, the PFD displays the following AFCS related information:

- AP engage status
- YD engage status (Build 7 and higher)
- YD fail indication (Build 7 and higher)
- TCS status
- FD commands and status
- FD data source (PFD couple)
- Vertical speed bug
- Overspeed mode management
- Heading bug
- IAS bug
- Armed lateral mode
- Active lateral mode
- Armed vertical mode
- Active vertical mode
- Altitude pre-select

The Crew Alerting System (CAS) window of the systems MFD, displays the following warning, Caution and Advisory messages for the AFCS status:

RED WARNING

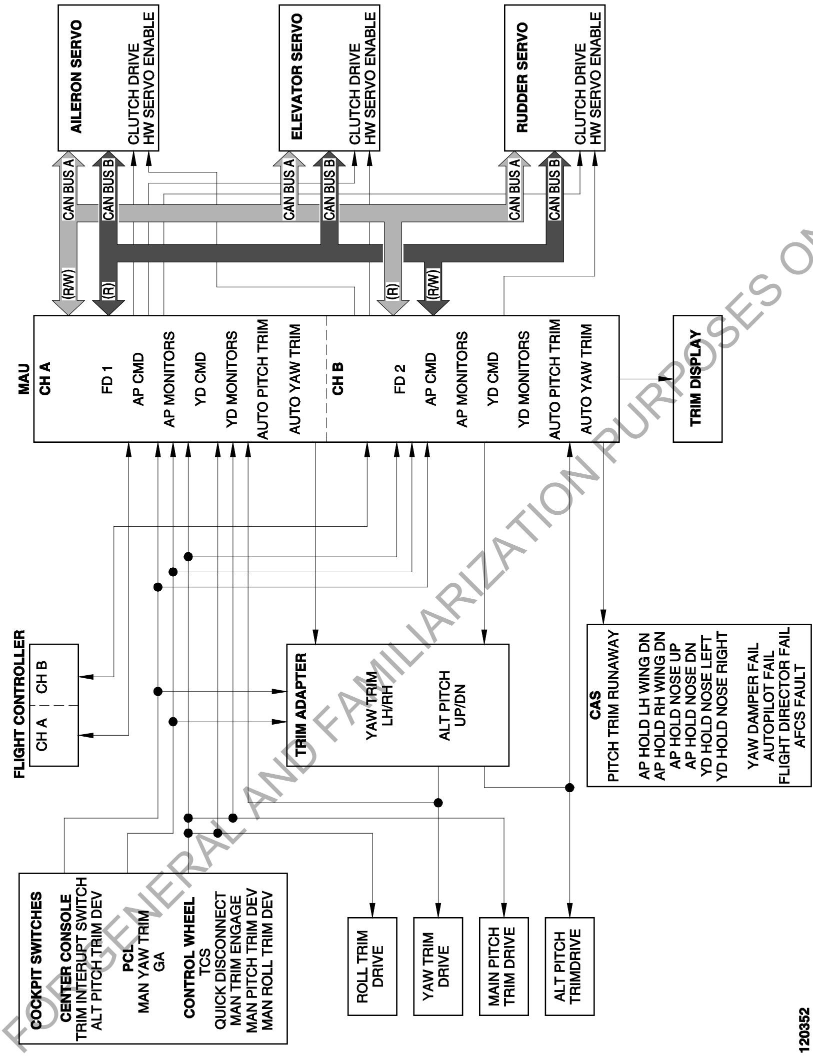
Pitch Trim Runaway	Manual or auto pitch trim runaway or trim failure, monitor detects failure of trim to properly respond, accompanied with voice callout “Trim Runaway”

AMBER CAUTION

AP Hold LH Wing DN	Roll mistrim, monitor detects excessive forces over an excessive time period
AP Hold RH Wing DN	
AP Hold Nose UP	Pitch mistrim, monitor detects excessive forces over an excessive time period
AP Hold Nose DN	
YD Hold Nose Left	Yaw mistrim, monitor detects excessive forces over an excessive time period
YD Hold Nose Right	

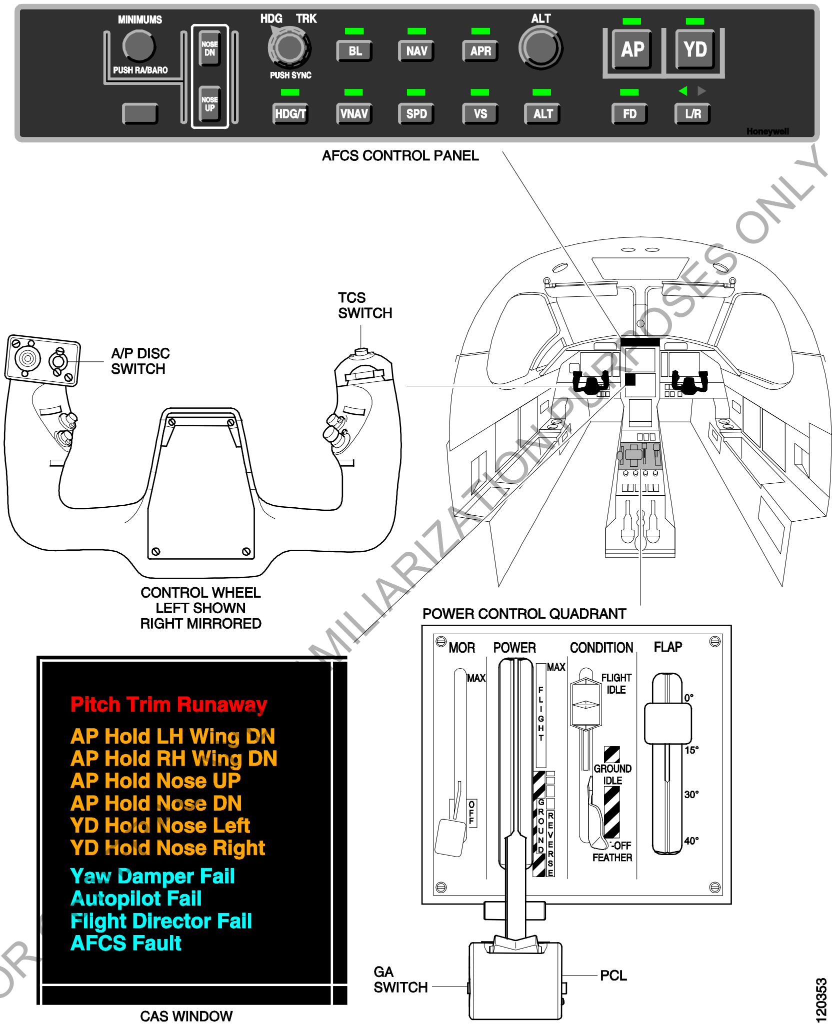
ADVISORY

Yaw Damper Fail	Yaw damper not available
Autopilot Fail	Autopilot not available
Flight Director Fail	Flight director not available
AFCS Fault (Build 7 and higher)	Fault detected in the AFCS system



Note – AFCS Fault is shown from Build 7 and higher.

Figure 7-32-1. AFCS Schematic
(Sheet 1 of 2)



Note- AFCS fault is shown from Build 7 and higher.

Figure 7-32-1. AFCS – Controls and Indications
(Sheet 2 of 2)

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PRIMUS APEX - FLIGHT MANAGEMENT SYSTEM (FMS)

GENERAL

DESCRIPTION

The flight planning function of the FMS enables the pilot to build, review and modify flight plans via the MF Controller. Flight plans are stored for retrieval and activation at a later time. They are a series of legs and are bounded by waypoints. Waypoints are named and precisely located by latitude and longitude. Database waypoints include airports, Navaids, runways, published named fixes, unnamed fixes and intersections. The FMS provides the pilot with the facility to create pilot defined waypoints as Lat/Long, Place/Bearing/Distance or Place/Bearing/ Place/Bearing in an active or secondary flight plan. If the pilot does not name a pilot defined waypoint, the FMS creates a temporary waypoint.

The active flight plan is the flight plan that the FMS is actively flying. An active flight plan contains a From waypoint, a To waypoint and a destination (optional). Waypoints are either database, pilot defined or temporary waypoints. Changes made to an active flight plan are inserted into a pending flight plan, which can be reviewed before the changes are incorporated into the active flight plan.

The FMS provides the ability to add altitude and speed constraints to waypoints of the active flight plan. It will also calculate a Top-Of-Climb (TOC) waypoint that laterally indicates where the cruise altitude level-off will occur and will similarly create a Top-Of-Descent (TOD) waypoint that laterally indicates where the descent from cruise altitude should occur. These waypoints are displayed on the Situation Awareness MFD map. A waypoint altitude constraint can be entered on any waypoint of the flight plan. The FMS will indicate a predicted or pilot entered descent angle for each waypoint.

When a “At” Altitude Constraint is defined for a waypoint in the descent portion of the flight plan, the FMS calculates the vertical profile with a default 3° descent angle. The pilot can enter up to 6° (or Aircraft with Build 8 or higher – up to 8°), perform a vertical direct-to limited to 6° (Aircraft with Build 8 or higher – limited to 8°),or load a procedure.

Before reaching the TOD, the FMS generates a Vertical Track Alert (VTA) and a Vertical Navigation Deviation Scale, similar to a Glideslope, is displayed on the PFD.

The VNAV information is for advisory only and cannot be coupled to the AP/FD. VNAV is based on the Barometric Altitude, therefore a correct Baro Correction Selection is essential for safe operation.

NOTES:

VNAV must not be used when the CAS cautions ADC A Fail, ADC B Fail or ADC A+B Fail are shown.

A secondary flight plan can be created and stored at any time and is not related to the active flight plan. Only one stored flight plan can be activated into the secondary state at a time to review.

Each stored and active flight plan can contain a maximum of 100 waypoints. The FMS can store up to 255 flight plans and 300 custom waypoints.

When entering a Non Directional Beacon (NDB) waypoint into a flight plan, the NDB identifier must be followed with NB.

When saving a flight plan into the stored database there is an unannunciated time delay of up to 45 seconds.

Stored flight plans do not contain procedures associated with the Origin or Destination and the Weather Alternate destinations not stored. The FMS provides only one active flight plan. Stored flight plans can be deleted.

FMS delays or display blanking can occur when the holding dialog box opens.

After the Performance Compute button is pressed there will be unannunciated time delay before the Computing Data … status is displayed.

After an electrical power cycle, the active flight plan is lost and must be reentered.

MSN 545, 1001-1180 Pre SB 34-020 and MSN 1181 - 1942 without SBAS enabled, the PRAIM function does not work when the aircraft is on the ground. When airborne and PRAIM is executed there is a long unannunciated time delay.

When a circling approach is chosen, the FMS will create a Discontinuity after the last waypoint of the overlay approach. Vertical guidance after this point cannot be relied on. The autopilot will revert to basic modes (Pitch and Roll).

Primus APEX Build 8 or higher. Visual Reporting Points (VRP) can be selected for display on INAV. A pilot defined waypoint can be created on top of the VRP to be used as part of the flight plan. Alternative, autopilot track line shown on INAV can be used to maneuver the aircraft over the VRP.

The FMS also has the ability to compute:

- Waypoints for specific legs, which includes Direct-To, holding patterns, procedure turns, leg intercepts, TOCs and TODs
- Distance and Course computations
- ETE and ETA calculations
- Curved path distance calculations
- Altitude constraint type determination

The active leg defined as the From To waypoint in an active flight plan, can be modified:

- Direct-To, any waypoint
- Present position hold, create a fix at the current latitude/longitude aircraft position from which the aircraft may hold (not always available-see Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E - Pilot Guide
- Pilot confirmation of an active leg modification change initiated by the pilot
- Automatic active leg sequencing, when satisfied the FMS makes the To waypoint the From waypoint and the next waypoint the To waypoint
- Procedure turns, creation and deletion of a procedure turn on the active flight plan that is part of a database procedure

A discontinuity leg may exist in the active flight plan when there is insufficient lateral flight plan definition. The FMS will allow the programming of a discontinuity leg when it is part of a database procedure.

FMS controls are provided on the Multi Function controller keyboard:

D→(direct-to) pushbutton	The Direct to Dialog box opens in the Waypoint List Window
INFO pushbutton	The INFO Dialog Box opens on the INAV
Joystick	Moves the cursor
Keyboard	Inputs data at the cursor position

OPERATION

GRAPHICAL FLIGHT PLANNING

The Graphical Flight Planning (GFP) mode allows the pilot to make and change flight plans. GFP can be performed on the Waypoint List and on the Interactive Navigation map display. GFP mode starts automatically and shows the options for the selected data or active flight planning task when the pilot moves the cursor over the object he wants to modify. This generates commands to the FMS. The FMS receives and validates the commands, actions them and displays the changed flight plan. Two menus are available when GFP mode is started – Select Object menu and Select Task menu.

- Select Object menu

  At large ranges on the lateral map, many objects may be shown very close to each other. The Select Object menu allows the pilot to tell the system which particular object he wants to change. Also, a waypoint may be listed more than once in the active flight plan, approach, missed approach or alternate flight plan. The pilot must tell the FMS which waypoint listing to change.

- Select Task menu, the following functions can be selected using the Select Task menu:

Task	Action
Center Map	Lateral map centers at the selected location
Direct To	Direct To route modification performed
Intercept …	Starts a dialogue box to define a heading select intercept leg inbound to an object
Change Dest	Assigns the selected airport as the new destination
Show Info …	Starts a dialogue box showing all the information about the selected object
Departure/Arrival	Starts a dialogue box to insert, delete, modify and review the selected departure/arrival procedure
Amend Route	Performs modification of the selected flight plan route
Delete Wpt	Removes the selected waypoint from the flight plan
Cross …	Starts a dialogue box to define lateral and vertical constraints on a waypoint
Hold …	Starts a dialogue box to define, modify and/or delete holding patterns for waypoints

Procedure Turn …	Starts a dialogue box to define, modify and/or delete a procedure turn
Direct To Recovery	Adds to the pending flight plan waypoints that were removed when a direct-to was previously performed
PPOS Hold …	Starts a dialogue box to define, modify and/or delete a holding pattern for PPOS
Offset …	Starts a dialogue box to define, modify and/or delete offset
Airway …	Starts a join airway dialogue box to add an airway to the flight plan
XXXX Departure	Starts the procedure dialogue box for the origin
YYYY Arrival	Starts the procedure dialogue box for the destination

ACTUAL FLIGHT PLANNING

The Flight Management Window (FMW) is used to access or create a fight plan. The FMW is displayed in a 1/6th window format on the Situation Awareness MFD. A Flight Plan (FPLN) pull down menu allows selection of either the Active or Secondary flight plan for display and interaction. The Phase of Flight (POF) selections for a flight plan are Init, Preflight, Departure and Arrival. Available POFs are indicated by white outlined icons with gray button borders. Upon selection the button border and icon changes to green and the available tabs are displayed.

The INIT (initialization) POF when selected, displays a Time/Date tab, a Data Bases tab and an S/W (software) tab.

Primus APEX Build 8 or higher – position is automatically initialized at power up.

The Preflight POF when selected, displays a FPLN (Flight Plan), an Alt/Spd tab and a Fuel/Weight tab. When all the mandatory data has been entered on the Preflight tabs the Compute button becomes highlighted. Pressing the Compute button initiates the computation of performance parameters by the FMS. The Computing Data message will be removed when the computed performance data is available for display.

The Departure POF when selected, displays a SID (Standard Instrument Departure)/Takeoff page that includes the Takeoff V Speeds and the Transition Altitude.

The Arrival POF when selected, displays a STAR (Standard Terminal Arrival Route)/Landing page that includes the Landing V Speeds and the Transition level.

The pilot can also define a Secondary flight plan which is totally independent of the primary active flight plan. The Secondary flight plan may be created, stored and activated at any time, but only one stored flight plan may be activated into the secondary state for review.

Once airborne the aircraft can be flown either indirectly through the Flight Director or automatically through the autopilot. The FMS active flight plan is used to steer the aircraft and the FMS constantly calculates and updates the aircraft position and performance data output data to the displays.

DISPLAYS

Flight plans are shown pictorially on the Situation Awareness MFD with vector lines between successive connected waypoints, transition onto waypoints, holding patterns and procedure turns.

The following ARINC 424 leg types are supported by the FMS:

- IF Initial Fix
- TF Track to a Fix
- CF Course to a Fix
- DF Direct to a Fix
- FA Fix to an Altitude
- RF Constant Radius Arc
- AF Arc to a Fix
- VA Heading to an Altitude
- VI Heading to an Intercept
- VM Heading to a Manual Termination
- PI Procedure Turn
- HA Holding with Altitude Termination
- HF Holding with Single Circuit Termination at the Fix
- HM Holding with a Manual termination

Flight planning information is shown in the upper left 1/6 window. This window can be made larger (upper left and lower left windows combined 1/3 window) to show more information when Waypoint (WPT) information is active. The information displayed is controlled by on-screen pull-down menus which are selected by the MF Controller joystick and keyboard.

Navigation and steering information is displayed on the PFD ADI/HSI and the upper MFD right window. A bezel button on the PFD HSI, which is currently inoperative will be used to select an Overlay menu which will show flight planning and situational awareness information on the HSI.

DATABASE LOADING WITH RT OR SD CARD

The Navigation Database updates can be loaded from Secure Digital (SD) cards in the slot on the MF Controller (or alternatively with the Remote Terminal software) to the FMS Navigation Database. Prepare the SD cards by only putting the folders needed by APEX on the card, otherwise the loading process will take much longer than necessary. Refer to the PC-12 NG Data Loading Guide (Document Number 02313). The guide can be found at www.pilatus-aircraft.com -> Customer Support -> Publications -> PC-12.

Create a separate folder for each disk:

Purple Disk Depending on APEX software load (e.g. Build 6, 7 or 8) (see Section 7-27, Operation, for software P/N identification) different Databases need to be loaded.	Copy only the following folder to the SD card: iNav16M (this is the iNav Com & Nav and FMS data)
Blue Disk	Copy all files to SD Card
Green Disk	Load with a maintenance laptop configured with Remote Terminal and DLS through the LAN connector using LAN Kit 990.00.01.203. Refer to PC-12 NG Data Loading Guide Document No. 02313 latest issue.

NOTE

If a Connected Flight Deck (CFD) is installed, it must be disabled by opening the CB “WLAN Data Load” before energizing the aircraft electrical system.

With the aircraft electrical system energized and the Navigation Database update SD card in the slot on the MF Controller, the first action is to select SCMS/DL page on the Systems MFD lower left window. Press the MF Controller ENT button, then select the DATA LOAD page and press ENT button again, this will display the soft key FILE LIST for uploading from the SD card. Press the “FILE LIST” soft key to display the update files and then press the “LOAD ALL” soft key.

The CAS advisory MF CTLR Fail and the green annunciator adjacent to the SD card slot will come on. A red cross will be shown on the MFD and PFD, this is normal and due to the AGM being set to download data mode.

The load process will start and the process status is displayed in the status line at the bottom of the page. If there are any problems with the data loading process error messages will be given in the status line at the bottom of the page. The ABORT soft key can be used to stop the data loading process at any time. The green annunciator will go off and all four displays will return to their default configuration, when the loading has been successfully completed.

DATABASE LOADING WITH CONNECTED FLIGHT DECK (CFD)

If the optional Connected Flight Deck (CFD) is installed, an Apple iPad can be used to load Navigation and Electronic Chart Databases to PRIMUS APEX. To do this, the INDS Data Manager application is used on an iPad with an INDS subscription. Firstly, the iPad must be connected to an internet network to download the databases. Thereafter, the iPad can be connected to the wireless network of the aircraft to upload the databases to PRIMUS APEX. Refer to the PC-12 NG Wireless Data Loading (Connected Flight Deck) guide (Document Number 02373). The guide can be found at www.pilatus-aircraft.com -> Customer Support -> Publications -> PC-12.

The loading of the Navigation and Electronic Chart Databases can be done with the aircraft only powered by the STBY bus, after pressing the MAU DATA LOAD switch on the co-pilot side panel. A red cross will be shown on all powered MFDs and PFDs during the data loading process. This is normal and due to the AGM being set to download data mode. The data loading process shall not be interrupted nor shall the aircraft be de-energized.

When the data loading has been completed, the lower MFD (and, if powered, the co-pilot PFD) will return to their default configuration. The pilot PFD and upper MFD will continue to display red crosses.

A full power cycle of the aircraft is required to return the aircraft to normal operation.

STUCK DATABASE UPLOAD

When attempting to upload INDS databases (Charts, Navigational, Terrain) using the INDS Data Manager iPad application, in rare cases the status bar in the application remains at 64% for 2 minutes or more, and does not complete the upload. The APEX pilot PFD and upper MFD show red crosses, while the co-pilot PFD and MFD return to normal screens. The following procedure shall be performed to resolve the issue:

CAUTION

Do NOT remove electrical power from the aircraft.

1.	**On the iPad: Force close the INDS Data Manager app**	**Push the home button (double click) on the iPad and swipe up to close the app**
2.	**WLAN DATA LOAD circuit breaker (Standby Bus $_L$X4)**	**Pull**

CAUTION

You must wait the full 1 minute for the Connected Flight Deck to completely power down.

3.	**WLAN DATA LOAD circuit breaker (Standby Bus $_L$X4)**	**Reset**

Wait 2-3 minutes for the Connected Flight Deck to fully reboot. The iPad should reconnect automatically

When the iPad has reconnected to the Connected Flight Deck:

5.	**Re-start the INDS Data Manager application on the iPad**	
6.	**Push the upload button of the database that remained stuck at 64%**	**Verify that the progress bar goes up to 100% and the database upload completes successfully.**
7.	**Do a full power cycle of the aircraft**	

Following database uploads should complete successfully without issues. If not, repeat the above procedure.

INDICATION / WARNING

The Crew Alerting System (CAS) window on the systems MFD will show the following caution, advisory and status messages for the FMS:

AMBER CAUTION

1: FMS-GPS1 Pos Misc	Indicates FMS to GPS 1 position miscompare
2: FMS-GPS2 Pos Misc	Indicates FMS to GPS 2 position miscompare (only if GPS 2 installed)
3: FMS-GPS1+2 Pos Misc	Indicates FMS to GPS 1+2 position miscompare (only if GPS 2 installed)
Unable FMS-GPS Mon	Indicates FMS to GPS position monitor has failed (Typical RAIM not available)

CYAN ADVISORY

FMS Fail	Indicates FMS has failed

WHITE STATUS

AGM2/FMS 1GFP Inop	Indicates graphical flight planning function failed in AGM 2
1: AGM 1 DB Error	Indicates database in AGM 1 has an error
2: AGM 2 DB Error	Indicates database in AGM 2 has an error
3: AGM 1+2 DB Error	Indicates database in AGM 1+2 have an error
1: AGM 1 DB Old	Indicates database in AGM 1 is out of date
2: AGM 2 DB Old	Indicates database in AGM 2 is out of date
3: AGM 1+2 DB Old	Indicates database in AGM 1+2 are out of date

The following FMS annunciations can be shown on the PFD:

APP Approach advisory	Indicates FMS is in approach mode
XTK Offset advisory	Displayed when lateral offset has been entered
MSG Message advisory	Displayed when message is shown on INAV map
DR Dead Reckoning alert	Displayed when operating in DR mode for more than 2 minutes
DGRD Degraded alert	Displayed when FMS accuracy cannot guarantee accuracy for present phase of flight due to sensor availability

The following FMS messages can be shown on the INAV Map or on other INAV windows and dialogue boxes, refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E – Pilot Guide for the explanations:

ACDB Config Mismatch
ACDB Database Mismatch
Active Mode is Mag/True Hdg
Active Mode is Mag/True Trk
Alt Constraint Deleted
Brg/Crs must be in True
Check *PD Placement
Check Alt Constraint
Check Baro Set
Check data Load (xx)
Check Dest Fuel
Check GPS 1 Position
Check GPS 2 Position
Check Loaded Wind/Temp
Check Spd/Altitude Limit
Check Speed Constraint
Compare Fuel Quantity
Data Base out of Date
DB Transfer Aborted
DB Transfer Complete
DB Transfer in Progress
Entering Polar Region
Exceeds Cert Ceiling
Exceeds Max Gross Weight
Exceeds Max Landing Weight
Exceeds Max Landing WT
Exiting Polar Region
Flight Plan Full
FLT Path Angle Too Steep
FMS Exiting Hold
FMS-LPV Miscompare
FPL Storage Full
GPS RAIM Above Limit
GPS Config Miscompare
GPS RAIM Unavailable
High Holding GRD SPD
High PCDR Turn GRD SPD
Intersection Not Found
Invalid Aircraft DB
Invalid Custom DB
Invalid Direct To Entry
Invalid Entry
Invalid FPLN Operation
Invalid NAV DB
NDB Over Max Size
No Position Sensors
No Present Position
Offset Cancel
Offset Cancel Next WPT
Check Orbit Radius / GSPD
PERF-VNAV Unavailable
Predict LPV Unavailable
Radials Do Not Intersect
RAIM Will Exceed Limit
Reset ALT SEL?
SBAS APPR Load Fail
Single Operation
Stored FPL PERF Unavailable
Unable *PD Placement
Unable Approach Mod
Unable CDB XLOAD In Prog
Unable Hold Change
Unable Next ALT
Unable Offset
Unable PCDR Turn Change
Unable RNP
Unable RNP Next WPT
Used by Active FPL
Vert Dir Over Max Ang
Vert Dir Under Min Ang
Waypoint Not Found
WPT Storage Full
Temp Comp Cancelled

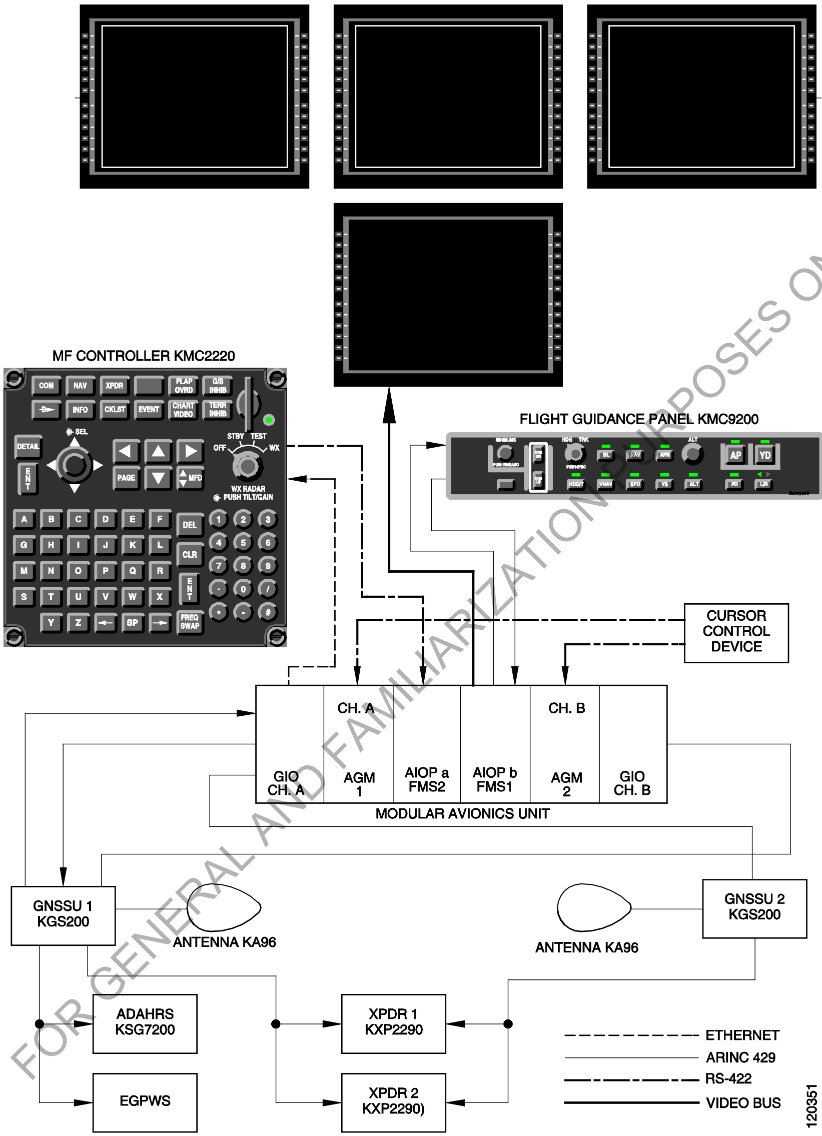

Figure 7-33-1. FMS Schematic

DUAL FMS (OPTIONAL) – BUILD 7 OR HIGHER

APEX software Build 7 provides a new option for dual FMS. This option activates a second instance of the FMS. FMS 1 is located on AIOP b card and FMS 2 is located on AIOP a card. Both FMS share the existing APEX resources and interfaces (INAV, MFC, and CCD). The dual FMS system can operate in either Synch mode or Single mode.

Dual FMS provide a “One FMS” view to the crew. In normal operation both FMS are in Synch mode (Primary/Secondary). In this configuration both FMS have the same flight plan and all synchronization between the multiple FMS instances is automatic. Although the FMS operates in a Synch mode, some data is computed independently to enhance safety. For example, the desired track and cross track error on each HSI are driven and computed independently. The positions of each FMS are cross-compared, and a message is shown if the positions disagree.

In Single mode, data is not synchronized between the two FMS and all navigation guidance is calculated independently. The guidance information from FMS 1 or 2 can be selected for display on each HSI by using the NAV SEL button on PFD controller. In FMS Single mode, the crew can only apply changes to the FMS which is selected for display on the INAV. INAV always represents the information from the FMS on the FD coupled side HSI.

Refer to the Honeywell Primus APEX Pilots Guide for additional information.

FMS SYNCHRONIZATION

Active and Selected FMS mode fields (Single or Synch) are shown on the FMS Sensor Page. The selected mode can be manually changed on this page. If the Active Mode does not match the selected mode for any of the FMS, the FMS Synch Error is shown on the CAS window and the Problems button becomes selectable for access to the FMS Problems dialog box. Once on Battery power, to solve synchronization problems, select the Avionics window tab Custom DB and select the Xload tab. This action synchronizes FMS 1 and FMS 2 Custom databases.

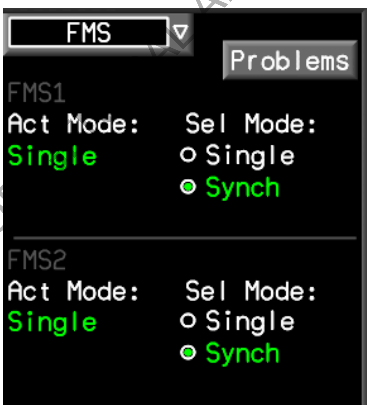

Figure 7-33-2 FMS Mode Selection Page (Dual FMS)

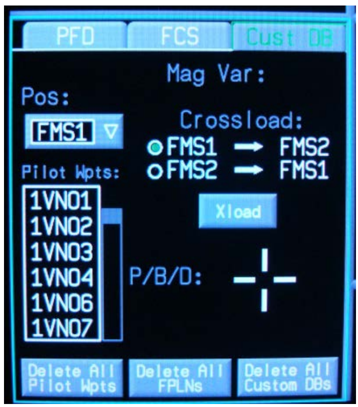

Figure 7-33-3 Avionics Window Custom DB Tab (Dual FMS)

In Synch mode the following items are synchronized between the two FMS:

- Position Initialization Data, when both FMS are running
- Active Flight Plan Data
- Secondary Flight Plan Data
- Custom Database, when both FMS are running.

NOTE

Both FMS need to be up and running (Batteries ON) for automatic synchronization of “Custom Database” and “Position Initialization Data”. In PDC mode only FMS 1 is powered, therefore changing the Custom Database in PDC mode (saving flight plan or pilot defined waypoints), causes database miscompare and forces the both FMS into Single mode when FMS 2 is powered. Cross-loading of the “Custom Database” on the “Cust DB” tab in the avionics window is required to re-synchronize both FMS.

NOTE

In PDC mode only FMS 1 is powered. If FMS position initialization is done in PDC mode then FMS 2 position will not be initialized. Consequently, after power up, FMS 2 will not provide guidance information until position initialization is repeated.
With Primus APEX Build 8 or higher FMS1 and FMS2 position will be auto-initialized at power up.

INDICATION / WARNING

The Crew Alerting System (CAS) window on the systems MFD will show the following caution, advisory and status messages for the Dual FMS:

AMBER CAUTION

1: FMS1-GPS1 Pos Misc	Indicates FMS1 to GPS 1 position miscompare
2: FMS1-GPS2 Pos Misc	Indicates FMS1 to GPS 2 position miscompare
3: FMS1-GPS1+2 Pos Misc	Indicates FMS1 to GPS 1+2 position miscompare
4: FMS2-GPS1 Pos Misc	Indicates FMS2 to GPS 1 position miscompare
5: FMS2-GPS2 Pos Misc	Indicates FMS2 to GPS 2 position miscompare
6: FMS2-GPS1+2 Pos Misc	Indicates FMS2 to GPS 1+2 position miscompare

CYAN ADVISORY

FMS1 Fail	Indicates FMS1 has failed
FMS2 Fail	Indicates FMS2 has failed
FMS1+2 Fail	Indicates FMS1 and FMS2 have failed
FMS Synch Error	Indicates the active mode does not match the selected FMS mode

WHITE STATUS

AGM1/FMS1 GFP Inop	Indicates FMS1 graphical flight planning function failed in AGM 1
AGM1/FMS1+2 GFP Inop	Indicates FMS1 and 2 graphical flight planning function failed in AGM 1
AGM1/FMS2 GFP Inop	Indicates FMS2 graphical flight planning function failed in AGM 1
AGM2/FMS 1GFP Inop	Indicates FMS1 graphical flight planning function failed in AGM 2
AGM2/FMS1+2 GFP Inop	Indicates FMS1 and 2 graphical flight planning function failed in AGM 2
AGM2/FMS2 GFP Inop	Indicates FMS2 graphical flight planning function failed in AGM 2

1: AGM 1 DB Error	Indicates database in AGM 1 has an error
2: AGM 2 DB Error	Indicates database in AGM 2 has an error
3: AGM 1+2 DB Error	Indicates database in AGM 1+2 have an error

1: AGM 1 DB Old	Indicates database in AGM 1 is out of date
2: AGM 2 DB Old	Indicates database in AGM 2 is out of date
3: AGM 1+2 DB Old	Indicates database in AGM 1+2 are out of date

SUNRISE/SUNSET PAGE – BUILD 7 OR HIGHER

The Primus APEX system provides the capability to calculate sunrise/sunset times for airports based on their position, date and local time zone. The information is accessed by the Show Info function. The Sunrise/Sunset dialog box shows:

- Date
- Local time zone
- Local sunrise
- Local sunset
- Zulu sunrise
- Zulu sunset

The date and Local time zone fields are user-enterable. The calculated value is the official sunrise and sunset as opposed to Civil, Nautical or Astronomical.

Figure 7-33-4   Sunrise/Sunset Page

FLIGHT SUMMARY PAGE – BUILD 7 OR HIGHER

The Primus APEX system provides a Flight Summary Page that can be shown in the Flight Management Window (FMW). This tab is automatically displayed in the FMW after landing. The Flight Summary Page shows the following information:

- Average true airspeed
- Air distance
- Average groundspeed
- Ground distance
- Origin airport
- Destination airport

- Take-off time
- Landing time
- Flight time

The information is provided by the FMS and is based on the values recorded for the active flight plan.

Figure 7-33-5 Flight Summary Page

PRIMUS APEX – BUILD 10 OR HIGHER

PILOT ENTERED WAYPOINTS

When the Pilot-Entered (P-E) waypoints overlay is selected, the INAV Map automatically displays the five nearest pilot defined waypoints to the aircraft position. P-E waypoints are displayed up to 50NM half range.

ROUTE FLIGHT LOG INFORMATION

The Route flight log is selectable as a Waypoint List format. When the Route flight log is selected the Waypoints List displays the Airways, SID and STAR procedure identifiers associated with each waypoint

ETE ON THE CROSS FLIGHT LOG

The Cross flight log is selectable as a Waypoint List format. When the Cross flight log is selected the Waypoint List displays the Estimated Time Enroute (ETE) for each waypoint

TEMPERATURE COMPENSATION

The FMS provides the capability to create a constant angle vertical path for the final approach segment of a non-precision approach. The vertical descent profile for transition to such a final approach segment is based on altitude constraints in the navigation database and is flown with reference to the indicated barometric altitude.

In addition the FMS provides the temperature compensation function that barometrically compensates altitudes, flight path angles and rates of descent to ensure the aircraft maintains the geometrical altitudes, flight path angles and rates of descent required for compliance to published navigation charts.

All temperature compensation calculations are based on the pilot entered destination OAT and it is the flight crew's responsibility to ensure the correct value is entered. The Temperature compensation function is selectable from the Arrival tab on the Flight Management Window.

ORBITAL PATTERNS (OPTIONAL)

The FMS has an APM option enabled function that provides the capability to insert an orbital pattern at ILS, VOR, Navigation Database, Airport, Pilot Defined or Temporary waypoints in an active, pending or secondary flight plan.

PRIMUS APEX - AIRCRAFT CONDITION MONITORING SYSTEM (ACMS)

GENERAL

ENGINE TREND RECORDING

The engine trend recording function of the ACMS records selected engine trend data into a Stable Cruise log file stored in NVM. The Stable Cruise file record is created once per flight when the aircraft is in a stable cruise condition. Stable cruise is determined from pre set conditions achieved in two minute window and then records pressure altitude, static air temperature, computed airspeed, torque, Np, Ng, ITT and fuel flow. The Stable Cruise file is capable of storing up to 5000 records, which should be enough for between engine overhauls. If the Stable Cruise file does reach maximum capacity, the oldest record is removed and the newest added to the log file. CAS advisories are generated when the log file has less than 20% storage capacity remaining and another when the file is full.

TREND DATA DOWNLOAD WITH RT OR SD CARD

The Primus Apex system supports two methods for transferring the ACMS log data on the ground. One is to a Secure Digital (SD) card in the slot on the MF Controller and the other is via the LAN connector on the aircraft maintenance panel to a laptop computer. Only the SD card method is described here. Use SD cards with a 1 or 2 GB (max) capacity of the following brands; Verbatim, Memorex, Kingston or Sandisk.

NOTE

If a Connected Flight Deck (CFD) is installed, it must be disabled by opening the CB “WLAN Data Load” before energizing the aircraft electrical system.

With the aircraft electrical system energized and an SD card in the slot on the MF Controller, the first action is to select SCMS/DL page on the Systems MFD lower left window. Press the MF Controller ENT button, then select the DATA LOAD page and press ENT button again, this will display the soft keys for data uploading to the SD card. The “GET LOG” soft key is used to start the log file downloading process. The possible log file(s) to upload are the Aircraft Data log, Navigation and Air Data log and the Engine Data log. The “GET CRZ” soft key is used to start the Engine Trend Recording - Stable Cruise log file uploading process.

The CAS advisory MF CTLR Fail and the green annuciator adjacent to the SD card slot will come on. A red cross will be shown on the MFD and PFD, this is normal and due to the AGM being set to load/download data mode.

Once the downloading process has started the ACMS stops writing data to the log files and the download process status is displayed in the status line at the bottom of the page. If there are any problems with the data downloading process error messages will be given in the status line at the bottom of the page. The ABORT soft key can be used to stop the data downloading process at any time. The green annuciator will go off and all four displays will return to their default configuration, when the downloading has been successfully completed. The ACMS will check, when the GET LOG soft key has been operated, that all three log files have been properly transferred. Similarly after the GET CRZ soft key has been operated for the Stable Cruise files.

TREND DATA DOWNLOAD WITH CONNECTED FLIGHT DECK (CFD)

If the optional Connected Flight Deck (CFD) is installed, the Honeywell MyCMC Apple iPad application can be used to download the ACMS files. The MyCMC application can also be used to reset the “ACMF Logs Full” CAS message from APEX. The iPad must be connected to the CFD wireless network of the aircraft to download the files from the PRIMUS APEX. Refer to the PC-12 NG Wireless Data Loading (Connected Flight Deck) guide (Document Number 02373). The guide can be found at www.pilatus-aircraft.com -> Customer Support -> Publications -> PC-12.

The download of these files can be done with the aircraft only powered by the STBY bus, after pressing the MAU DATA LOAD switch on the co-pilot side panel. A red cross will be shown on all powered MFDs and PFDs during the data loading process. This is normal and due to the AGM being set to download data mode. The data loading process shall not be interrupted nor shall the aircraft be de-energized. When the data loading has been completed, the lower MFD (and, if powered, the co-pilot PFD) will return to their default configuration. The pilot PFD and upper MFD will continue to display red crosses.

A full power cycle of the aircraft is required to return the aircraft to normal operation.

CAUTION

THE SYS CONFIG AND DATA LOAD PAGES SHOULD NOT BE ACTIVE BEFORE TAKEOFF. NORMALLY THE DATA LOADING PAGE IS GRAYED OUT (UN-SELECTABLE) WHEN THE AIRCRAFT IS IN FLIGHT. HOWEVER IF THE SYS CONFIG AND DATA LOAD WINDOW IS SELECTED BEFORE TAKEOFF IT WILL REMAIN ACTIVE AND DATA LOADING COULD BE INITIATED IN FLIGHT, WITH THE SUBSEQUENT BLANKING OF DISPLAYS.

INDICATION

The Crew Alerting System (CAS) window on the systems MFD will show the following advisory and status messages for the ACMS:

CYAN ADVISORY

ACMF Logs Full	Indicates that one or more Aircraft Data, Navigation & Air data, or Engine Data log files are full. Data will be lost if not transferred
ACMF Logs >80% Full	Indicates that one or more Aircraft Data, Navigation & Air data, or Engine Data log files are more than 80% full. Data may be lost if not transferred
Engine Log Full	Indicates that Engine Stable Cruise data log files are full. Data will be lost if not transferred
Engine Log >80% Full	Indicates that Engine Stable Cruise data log file is more than 80% full. Data may be lost if not transferred

WHITE STATUS

No Engine Trend Store Build 6	Indicates that a Stable Cruise flight data store was not successful. During the last flight. Will remain on until successful Stable Cruise flight data store is successful
Build 7 and higher	Indicates that a Stable Cruise flight data store was not successful. During the last flight. Will remain on until next power cycle.
Engine Exceedance	Reminds on the ground that during flight a WARNING was displayed for an exceedance of one or more of the following engine parameters: Oil Pressure, Oil Temperature, ITT, TORQUE, NG or NP. If no exceedances were noted by the pilot, continue flight and report to maintenance personnel. If an exceedance was noted, maintenance action may be required before continued flight, depending on the extent of the exceeded parameter. Build 6. The CAS message will always be displayed on the ground as a reminder, until cleared by maintenance action. Further exceedance if any will not be displayed. Build 7 and higher. The CAS message will be displayed on the ground as a reminder, until the next power cycle.

Aircraft Exceedence	Reminds on the ground that during flight an AIRSPEED WARNING was displayed or an acceleration (g limit) was exceeded. If no exceedances were noted by the pilot, continue flight and report to maintenance personnel. If an exceedance was noted, maintenance action may be required before continued flight, depending on the extent of the exceeded parameter. Build 6. The CAS message will always be displayed on the ground as a reminder, until cleared by maintenance action. Further exceedance if any will not be displayed. Build 7 and higher. The CAS message will be displayed on the ground as a reminder, until the next power cycle.
Event	5 sec airborne indication, to show that a crew initiated event has been recorded
Crew Event Store	Indicates after landing, that a crew initiated event has been recorded and is available for download

EVENT BUTTON

The use of the Event button on the MF-controller may aid maintenance crew with troubleshooting. When pressed, the sampling rate of selected aircraft, navigation, air and engine parameters increases from once per minute to once per second. Maintenance should be informed about the use of the Event button.

PRIMUS APEX - AIRCRAFT DIAGNOSTIC AND MAINTENANCE SYSTEM (ADMS)

GENERAL

The Aircraft Diagnostic and Maintenance System (ADMS) consists of a Central Maintenance Computer (CMC) function and member systems. The CMC function is a software application hosted on the MAU Advanced Graphics Module. It runs under the DEOS operating system. The CMC acquires the Fault Reports from the various Member Systems and the Flight Deck Effects from the MWF system. Member systems are the aircraft system equipment that comply with the requirements of the CMC Specifications for Member Systems. A list of the member system equipment can be found in the Aircraft Maintenance Manual. A data file called Loadable Diagnostic Information (LDI) contains the Member System information that is used to drive the CMC. The CMC collects information and stores failures in a Fault History Database which can be accessed by a maintenance technician, using the Remote Terminal, to assess the past and present operating condition of the aircraft.

DESCRIPTION

The CMC's function is to provide the means to identify and isolate faulted hardware LRU's. modules and wiring. The Member Systems implement their own BIT capability either by initiated BIT, continuous BIT or power up BIT. The BIT capability identifies faults and provides information to the CMC which is processed against Member system specific data from the LDI data file to produce maintenance messages, which are then stored in the Fault History Database.

The MWF continuously provides the CMC a list of all MWF messages and indication of the status of each message. The CMC correlates MWF messages with maintenance messages and stores this information in the Fault History Database (FHDB) along with the correlation with MWF messages, indications of which fault report caused the massage and the Date/Time, Flight Leg and Phase. A Flight Leg is a sequential number incremented at each transition of the aircraft from ground to air. Each midnight UTC the CMC software resets the Flight Log to 1. The Flight Phase definitions are contained in the LDI. The FHDB has a capacity to store up to 10 MB of data. Once full capacity is reached the CMC will overwrite the oldest records with the newest records. The CMC is functional but not accessible in flight, full maintenance functionality is only available on the ground. On the ground, the CMC will generate a CAS advisory message if there is a fault in the system and a status message when the ADMS memory is full.

A PC loaded with Remote Terminal Software allows access to the CMC through the LAN BUS connector on the Aircraft Maintenance Panel. The Remote Terminal Software provides all the user interface capability that is needed to perform diagnostics on the systems. In order to use this software the AGM in the MAU must be operating.

MAINTENANCE DATA DOWNLOAD WITH RT OR SD CARD

The Fault History Database can be transferred to a SD data card located in the MF Controller. Use SD cards with a 1 or 2 GB (max) capacity of the following brands, Verbatim, Memorex, Kingston or Sandisk.

NOTE

If a Connected Flight Deck is installed, it must be disabled by opening the CB “WLAN Data Load”, prior to powering up the aircraft.

With Build 6, the Fault History Database can be downloaded through SD Card as follows:

With the aircraft electrical system energized and a SD card in the slot on the MF Controller, the first action is to select SCMS/DL page on the Systems MFD lower left window. Press the MF Controller ENT button, then select the DATA LOAD page and press ENT button again, this will display the soft keys for data uploading to the SD card. The “GET MAINT” soft key is used to start the FHDB log file uploading process.

The CAS advisory MF CTLR Fail and the green annunciator adjacent to the SD card slot will come on. A red cross will be shown on the MFD and PFD, this is normal and due to the AGM being set to load/download data mode.

Once the uploading process has started the CMC software stops writing to the FHDB and the upload process status is displayed in the status line at the bottom of the page. If there are any problems with the data uploading process error messages will be given in the status line at the bottom of the page. The ABORT soft key can be used to stop the data uploading process at any time. The green annunciator will go off and all four displays will return to their default configuration, when the uploading has been successfully completed.

The Fault History Database can also be downloaded using the Honeywell Remote Terminal software running on a laptop computer connected through the LAN bus. Refer to the PC-12 NG Data Loading Guide (Document Number 02313).

The CMC software provides the facility to clear the FHDB memory when commanded from the PC through the LAN bus.

Primus APEX Build 7 and higher. The GET MAINT function on the SCMS/DL page is no longer available to download the FHDB to the SD card. Downloading the FHDB can be performed with a laptop and the Honeywell Remote Terminal software, or via the optionally installed Connected Flight Deck.

MAINTENANCE DATA DOWNLOAD WITH CONNECTED FLIGHT DECK (CFD)

If the optional Connected Flight Deck is installed, the Honeywell MyCMC Apple iPad application can be used to download the Fault History Database. The iPad must be connected to the CFD wireless network of the aircraft to download the files from PRIMUS APEX. Refer to the PC-12 NG Wireless Data Loading (Connected Flight Deck) guide (Document Number 02373). The guide can be found at www.pilatus-aircraft.com -> Customer Support -> Publications -> PC-12.

The download of the FHDB files can be done with the aircraft only powered by the STBY bus, after pressing the MAU DATA LOAD switch on the co-pilot side panel. A red cross will be shown on all powered MFDs and PFDs during the data loading process. This is normal and due to the AGM being set to download data mode. The data loading process shall not be interrupted nor shall the aircraft be de-energized.

When the data loading has been completed, the lower MFD (and, if powered, the co-pilot PFD) will return to their default configuration. The pilot PFD and upper MFD will continue to display red crosses.

A full power cycle of the aircraft is required to return the aircraft to normal operation.

INDICATION

The Crew Alerting System (CAS) window on the systems MFD will show the following advisory and status messages for the ADMS.

CYAN ADVISORY

Maintenance Fail	On ground, indicates ADMS failure

WHITE STATUS

Maint Memory Full	On ground, indicates ADMS memory is full

INTENTIONALLY BLANK

PRIMUS APEX – OPTIONAL ELECTRONIC CHARTS

GENERAL

The Primus APEX system provides the functionality to display optional Jeppesen Sanderson terminal charts. The charts functionality is hosted on the Advanced Graphic Module 1 (AGM 1 – single charts) and AGM 2 (dual charts) within the MAU and displays information primarily from the charts database. Refer to Section 7-27 for the APEX system architecture. Updated charts are released every two weeks and are loaded when the aircraft is on the ground through the Secure Digital (SD) card slot in the MF Controller. Alternatively, the charts database updates can be downloaded with the Remote Terminal software. Refer to the Database Downloading paragraph for the procedure to download data. The charts are stored as vector images that can be scaled, rotated and split. The pilot has the ability to select and manipulate the charts for viewing by using the MF Controller or CCD.

Refer to the limitations given in Section 2 for the use of electronic charts.

Refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12E – Pilot Guide for complete information on the description and usage of Jeppesen charts.

FUNCTIONALITY

Refer to Figure 7-36-1 for the Charts Graphical User Interface.

The charts functionality can be activated by pressing the Charts softkey on the Situation Awareness MFD or from the MF Controller by pressing the CHART VIDEO button or by selecting Page on the Systems window. The Charts softkey activates the charts on the Situation Awareness MFD. The charts then replace the INAV map and the remaining one third window is used to display the Waypoint List and the Flight Management Window. The CHARTS VIDEO button provides the facility to switch the Systems MFD between the synoptic, chart (option) and video (option) window. The Charts functionality can be activated on both MFDs if the dual charts option is installed, otherwise the charts functionality can only be activated on the upper MFD with single Charts, on both MFDs with dual Charts.

The Airport Pull-Down Menu located at top left and is activated by placing the cursor over the Airport Selection Box and then pressing the ENT button on the MF Controller. This provides the ability to display a maximum of four airports (three automatic selections and one search selection). The automatic selections consist of origin, destination and alternate airports derived from an active flight plan. In addition, the pilot can display charts from any airport by using the Search Aprt menu item. In the case when a flight plan is not complete (with origin, destination and alternate), the automatic selections for the charts may not be able to provide the full functionality.

Chart effectivity and coverage information can be viewed using the Revision Info menu item. When the chart data is current the volume label is displayed in white. If the chart is used beyond its intended cycle time, the volume label and a notification “May contain outdated information” are displayed in amber to indicate that the database needs to be updated. In addition, a CAS status message “AGM 1 DB Old” (single charts) and “AGM 2 DB Old” (dual charts) is displayed.

The seven chart type tabs for each airport are segregated into the following categories:

- Aprt Airport Diagrams
- SID Standard Instrument Departure
- STAR Standard Terminal Arrival Route
- App Approach procedures
- Noise Noise abatement procedures
- NOTAM Airport notice to airmen
- Airsp Terminal airspace

The MF Controller joystick rotary knob or the CCD scroll function controls the magnification of the chart window, which allows the smallest chart characters to be sized to a readable level.

The scroll frame is enabled whenever the cursor is placed along the chart display edge in any direction. Once the cursor is located within the frame leg of the desired scroll direction, the ENT button on the MF Controller or CCD can be used for scrolling. Each press of the ENT button, the chart will scroll in increments in the direction of the arrows.

The aircraft symbol will only be shown on Geo referenced charts. Geo referenced charts are indicated by a small aircraft symbol on the right of the chart title bar.

With Build 8 or higher the airport chart for destination airport will be automatically displayed after landing if charts window is shown on MFD

ELECTRONIC CHART DATABASE LOADING WITH RT OR SD CARD

The Charts Database updates can be downloaded from Secure Digital (SD) cards in the slot on the MF Controller to the FMS Navigation Database. Alternatively, the charts database updates can be downloaded with the Remote Terminal software. Refer to the PC-12 NG data Loading Guide (Document Number 02313) available on the Pilatus web site.

NOTE

If a Connected Flight Deck (CFD) is installed, it must be disabled by opening the CB "WLAN Data Load" before energizing the aircraft electrical system.

With the aircraft electrical system energized and the Charts Database update SD card in the slot on the MF Controller, the first action is to select SCMS/DL page on the Systems MFD lower left window. Press the MF Controller ENT button, then select the DATA LOAD page and press ENT button again, this will display the soft key FILE LIST for uploading from the SD card. Press the "FILE LIST" soft key to display the update files and then press the "LOAD ALL" soft key.

The CAS advisory MF CTLR Fail and the green annunciator adjacent to the SD card slot will come on. A red cross will be shown on the MFD and PFD, this is normal and due to the AGM being set to download data mode.

The load process will start and the process status is displayed in the status line at the bottom of the page. If there are any problems with the data loading process error messages will be given in the status line at the bottom of the page. The ABORT soft key can be used to stop the data loading process at any time. An UPLOAD COMPLETE message is displayed in the status line at the bottom of the page and the green annunciator will go off, when the loading has been successfully completed.

Alternatively, the Charts database updates can be downloaded with the Remote Terminal software.
Refer to the Honeywell Pilot's Guide to Upload FMS Database and Download ACMS Data of Primus APEX (Document Number 02313).

ELECTRONIC CHART DATABASE LOADING WITH CONNECTED FLIGHT DECK (CFD)

If the optional Connected Flight Deck (CFD) is installed, an Apple iPad can be used to load Navigation and Electronic Chart Databases to PRIMUS APEX. To do this, the INDS Data Manager application is used on an iPad with an INDS subscription. Firstly, the iPad must be connected to an internet network to download the databases. Thereafter, the iPad can be connected to the wireless network of the aircraft to upload the databases to PRIMUS APEX. Refer to the PC-12 NG Wireless Data Loading (Connected Flight Deck) guide (Document Number 02373). The guide can be found at www.pilatus-aircraft.com -> Customer Support -> Publications -> PC-12.

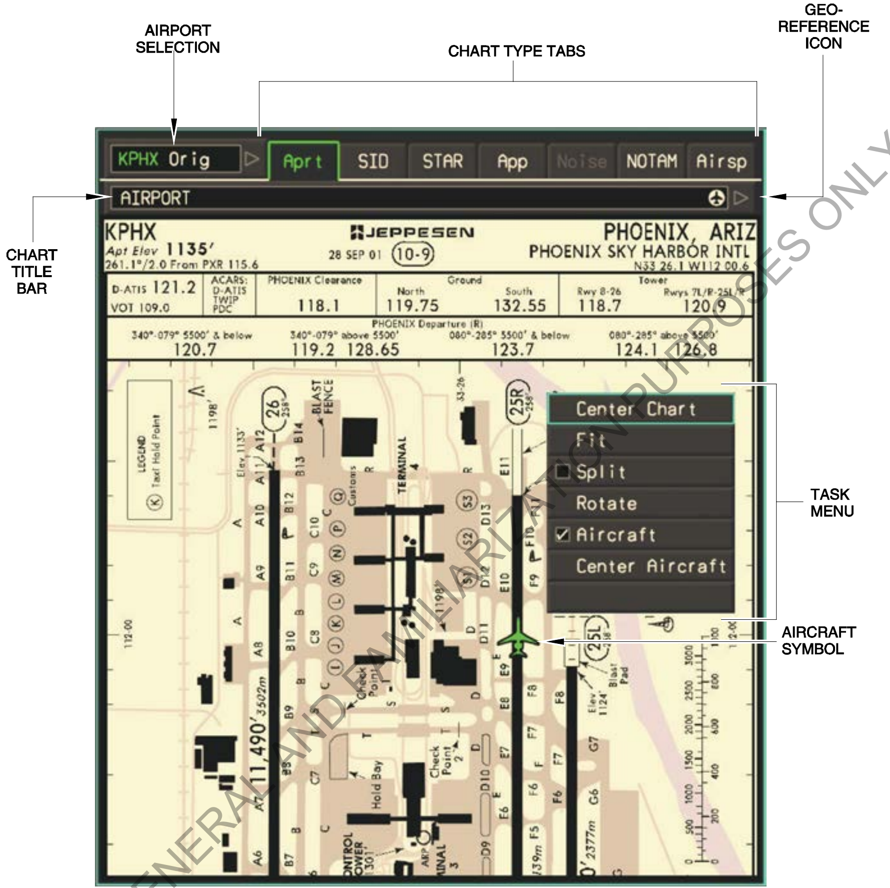

Figure 7-36-1. Charts Graphical User Interface

OPTIONAL APEX VIDEO INPUT

GENERAL

The Primus APEX system provides the functionality to display video on the Systems MFD. An optional video input module converts analogue video input signals to digital format that can be used by the Modular Avionics Unit (MAU) to display the video.

NOTE

It is the responsibility of the operator to apply for operational approval at the local authority for displaying video on the Systems MFD by using the optional video input module.

FUNCTIONALITY

The video functionality can be activated by pressing the MF Controller short cut key CHART VIDEO. Each press of the short cut key CHART VIDEO cycles the display through video, charts and systems format.

INTENTIONALLY BLANK

PRIMUS APEX – OPTIONAL ELECTRONIC CHECKLIST

GENERAL

The Primus APEX system provides the functionality to host an optional Electronic Checklist (ECL) database that will be supplied and certified independently. Refer to the limitations given in this POH Section 2 for the use of the ECL.

Control of the ECL is via the MF Controller joystick and buttons, soft keys on the ECL display and flight control wheel yoke buttons.

The default location of the ECL is on the lower MFD in the bottom left window.

DESCRIPTION

The ECL layout consists of two types of line items, Menu line items and Checklist line items. The Menu line items are the Normal Procedures Checklist and the Checklist line items are divided into two types. These are Open Loop and Inactive. The Open Loop items are those items that will require pilot feed back to check-off. An inactive item can be used as a Note to the pilot or to allow blank lines. Inactive items do not require any pilot action.

OPERATION

When pressed the CKLST button on the MF Controller will call up the ECL to the GENERAL MENU page. The Normal Procedures Checklist can then be selected with the joystick and ENT button. If there are no procedures installed for a Checklist or a failure occurs, a “Checklist Unavailable” message will be displayed in the checklist window. When using the displays bezel buttons (soft keys), the ECL function uses the buttons as the equivalent of the MF Controller joystick and ENT button.

The selected checklist menu will appear in the checklist window. Inside the checklist the cursor will be positioned on the first unchecked item in the checklist. To check off items in a checklist either press the ENT button on the MF Controller or the CKLST button on the pilot or copilot control wheel yoke. The item checkbox will then be filled with a checkmark and the cursor will then move to the next item. Once all the checklist items are checked off, the message “Checklist Complete” will be displayed at the end of the checklist. Press the MF Controller ENT or the display ENT bezel soft key to complete the checklist actions.

When using the CKLST button on the pilot or copilot control wheel yoke an item can only be checked or unchecked. The bezel soft keys or MF Controller controls must be used to move the cursor in all other circumstances.

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PRIMUS APEX – COUPLED VNAV APPROACH

GENERAL

The Primus APEX avionics suite Build 6 and subsequent provides a coupled VNAV approach functionality.

DESCRIPTION

The FMS is capable of generating a 3-Dimensional geo-referenced path by adding altitude, angle and speed constraints to the flight plan waypoints. The waypoint constraints come from the Navigation Database via terminal procedures. The FMS is then able to calculate the path deviation by using aircraft navigation sensors (GNSSU and ADAHRS).

The coupled VNAV approach functionality allows the FMS to guide the aircraft on the descent path. The AFCS approach mode used is called Vertical Glidepath (VGP) and is equivalent to Vertical Speed (VS) with VS reference set by FMS.

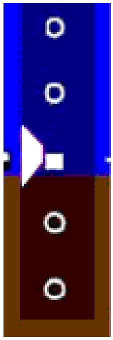
The VGP mode can be armed using the APR pushbutton on the FGP when the aircraft is within approximately 30 nm of the destination airport and an unmodified RNAV approach is loaded from the Navigation Database. Within 5 nm from the FAF (or other first approach waypoint) the FMS VNAV transitions to the VGP mode. In VGP mode the FMS uses the Landing Threshold reference point for descent path calculation.

Use of NAV Preview (LOC or VOR) during FMS VNAV approaches is not allowed. NAV Preview must be deselected before the approach mode is armed using the APR pushbutton. If NAV Preview is used the system will transition to LOC or VOR and therefore the FMS VNAV approach guidance will not be available.

PILOT'S DISPLAY

Pre-approach pointer

Vertical pre-approach path deviation will be indicated on the left side of the vertical deviation scale as a solid pointer as shown below. The pre-approach pointer is not labelled as it always represents the barometric VNAV pointer driven by the FMS and it is always on the left of the vertical scale.



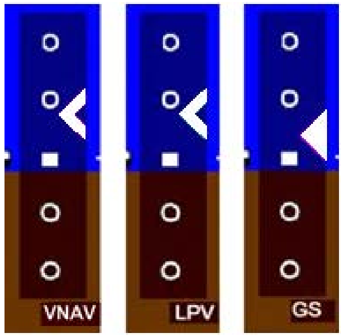
FMS Pre-approach Pointer

Approach Pointer Display

The vertical approach path deviation is displayed on the right side of the vertical deviation scale as a solid pointer and is displayed as soon as the approach capture criteria are met. The approach pointer will be labelled in a white font off to the right and below the vertical scale to identify the pointer as follows:

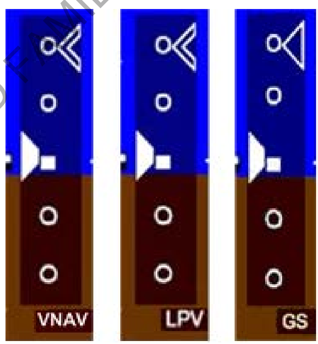
- VNAV, if the pointer is driven by the FMS using barometric altitude from the ADAHRS. The VNAV pointer is displayed during LNAV or LNAV/VNAV approaches
- LPV, if the pointer is driven by the FMS using the GNSSU proportional path deviation prior transition to the LPV approach or if the pointer is driven directly by the GNSSU during LPV approach
- GS, if the pointer is driven by the Multi Mode Digital Radio during ILS approach.

The approach pointers for the VNAV, LPV and ILS approaches are mutually exclusive and are shown below.



VNAV, LPV and GS Pointers

If the selected approach path deviation becomes valid at any time within the terminal area, then it will be displayed as a ghost preview pointer until the approach capture criteria are met. The display of a ghost preview pointer allows the crew to arm the approach mode before the approach becomes captured. The ghost preview pointer will be displayed as a hollow pointer as shown below. The labelling for the ghost preview pointer follows the same philosophy as for the approach pointer.



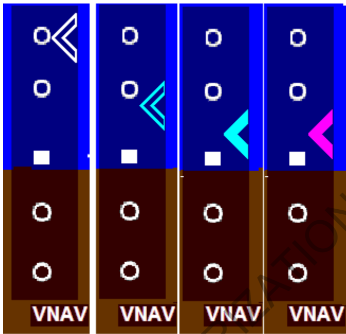
VNAV, LPV and GS Ghost Preview Pointers

NOTE

NAV Preview is not available while executing a VNAV or LPV approach.

Coupled VNAV Approach

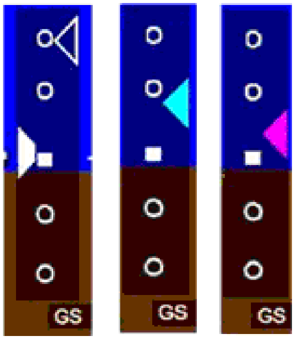
The vertical deviation pointers displayed during a standard VNAV approach are shown below. The left picture shows the ghost preview pointer displayed along with any vertical AFCS mode except VGP. The next picture shows the armed ghost preview pointer displayed when the next leg is not the FAF and the corresponding AFCS mode is VGP armed mode. The next picture shows the armed approach pointer displayed when the active leg is to the FAF and the corresponding AFCS mode is VGP armed mode. The right picture shows the approach pointer displayed when the approach capture criteria are met and the corresponding AFCS mode is VGP active mode.



Vertical Deviation Pointer During Standard VNAV Approach

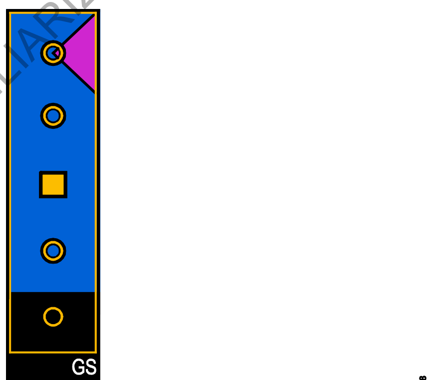
ILS Approach

The vertical deviation pointers displayed during standard ILS approach are shown below. The left picture shows the ghost preview pointer displayed along with any vertical AFCS mode except GS. The next picture shows the ILS approach pointer displayed when the ILS localizer is captured and the corresponding AFCS mode is GS armed mode. The right picture shows the approach pointer displayed when the ILS glideslope is captured and the corresponding FD mode is GS active mode.



Vertical Deviation Pointers During Standard ILS Approach

Primus APEX Build 10 and higher has an excessive vertical deviation indication for ILS approaches that triggers when the ILS approach is captured, radar altimeter is less than 500 ft and the vertical deviation exceeds one dot. When these conditions are valid, the deviation scale flashes amber for five seconds and then shows in steady amber for as long as the conditions are true.



Excessive Vertical Deviation during ILS Approach

VERTICAL SITUATION DISPLAY

The Vertical Situation Display (VSD) provides a vertical flight view that supplements the lateral map. The VSD can be used to improve the pilot situational awareness during coupled VNAV operation. The VSD will be available with APEX software Build 7. The VSD is selectable through the VSD softkey on the 2/3 INAV Window on the MFD. The VSD overlays the bottom of the INAV window. The following are displayed on the VSD:

- Aircraft Symbol
- FMS vertical Flight Plan
- Actual Flight Path
- FMS Computed Points (Top of Climb, Top of Descent)
- Runway (Origin, Destination, Alternate)
- Altitude pre-selector Bug and Readout
- Terrain
- ILS Beam
- Flight Plan or Track mode annunciation
- Cursor position on VSD with distance and coordinates indication.

Figure 7-38-1 Vertical Situation Display

.

NOTE

THE VERTICAL SITUATION DISPLAY PROVIDES SITUATIONAL AWARENESS AND MUST NOT BE USED FOR NAVIGATION PURPOSES.

Items that exist in both INAV and VSD will be displayed using the INAV color code.

The vertical profile is calculated by the FMS and is displayed on the VSD. After changes to the vertical flight profile it can take up to 10 seconds to re-compute the VSD.

Vertical profile is calculated based on the baro-setting from PFD. Therefore when flying with STD baro-setting, the profile for an approach can be shown with an offset.

Refer to the Honeywell Primus APEX Pilot's Guide for details of the Vertical Situation Display.

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PRIMUS APEX – OPTIONAL LPV/LP APPROACH

GENERAL

Refer to Section 9 Supplement No. 5 for the description of the optional LPV/LP Approach functionality.

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LIGHTWEIGHT DATA RECORDER (IF INSTALLED)

DESCRIPTION

The Lightweight Data Recorder (LDR) is an airborne crash-survivable recording system which records both cockpit voice and aircraft flight data.

The LDR simultaneously records:

- One channel of audio from the pilot's audio panel. The latest 120 minutes of recorded audio data is retained.
- One channel of audio from the Cockpit Area Microphone (CAM). The latest 120 minutes of recorded audio data is retained.
- One channel for flight data information received from the Modular Avionics Unit (MAU) by ARINC 717 databus. The latest 25 hours of ARINC data at a rate of 256 words per second is retained.

The LDR correlates the voice and flight data to within ± 1 second.

The LDR system has:

- A LDR installed in the rear fuselage between frames 36 and 37.
- A CAM installed on the right lower sidewall panel in the flight compartment.
- A CV ERASE/CVFDR TEST switch and a CVFDR TEST LED installed on the copilot's auxiliary panel.

The power supply to the LDR system is 28 VDC from the Battery and External Power Junction Box (BEPJB) through the CVFDR POWER circuit breaker installed in the rear fuselage. The LDR is powered when the STBY BUS switch is ON and the HOT BATT BUS has a minimum of 18 VDC.

CVFDR TEST LED indicator and a CV ERASE/CVFDR TEST switch is installed on the copilot's auxiliary panel.
The green CVFDR TEST LED indicator is ON to show the LDR has no faults when the CV ERASE/CVFDR TEST switch has been set to CVFDR TEST.
The CV ERASE switch gives the option to delete the recorded voice data. The spring loaded switch must be set to ERASE for at least three seconds to erase the voice data. It does not erase the flight data.

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OPERATION

Power off

The LDR system is not operating, no data is recorded.

Power on

The LDR system operates and records audio and flight data.

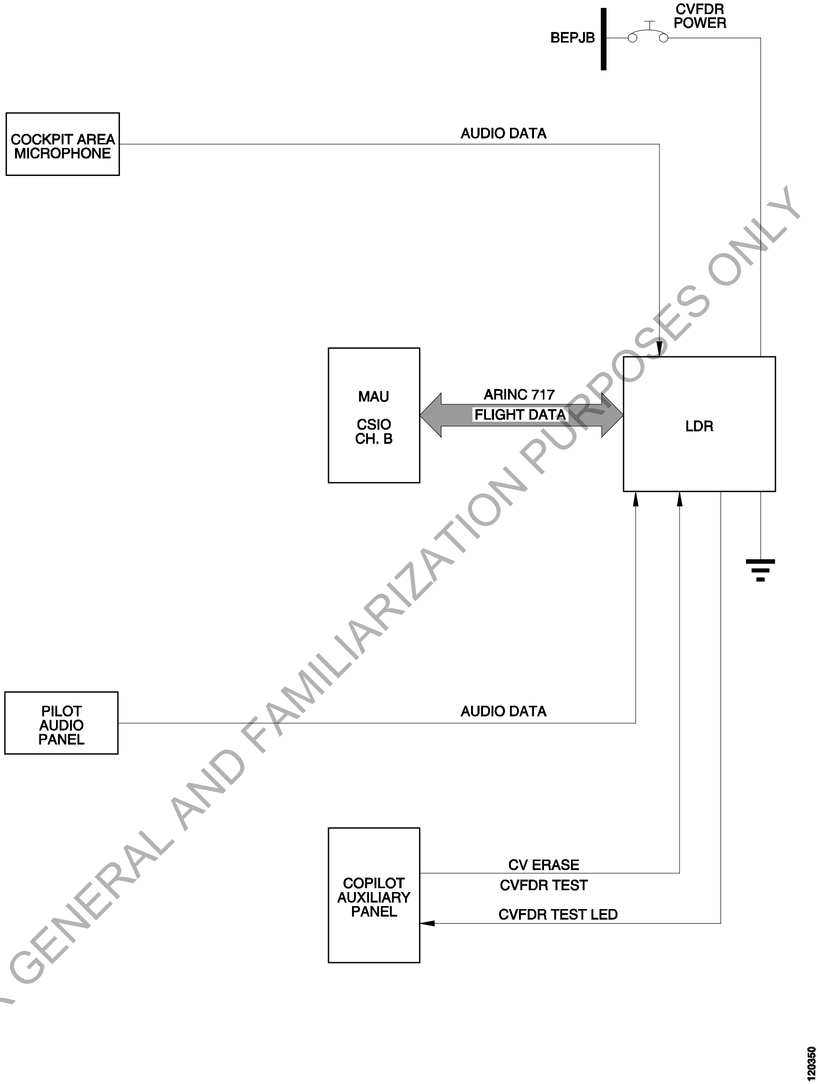

Figure 7-40-1. LDR - Schematic

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SECTION 8

HANDLING, SERVICING AND MAINTENANCE

TABLE OF CONTENTS

GENERAL

This section contains factory-recommended procedures for proper ground handling and routine care and servicing of the PC-12 airplane. It also identifies certain inspection and maintenance requirements that must be followed if the airplane is to retain its performance and dependability. It is recommended that a planned schedule be followed for lubrication and preventive maintenance based on climatic and flying conditions which may be encountered.

All correspondence regarding the airplane must contain a reference to the manufacturer's serial number (MSN) and be addressed to:

PILATUS AIRCRAFT LTD.
CUSTOMER SUPPORT GENERAL AVIATION,
CH-6371 STANS,
SWITZERLAND

Tel: 41-41-619 3333
Fax: 41-41-619 7311
eMail: SupportPC12@pilatus-aircraft.com

Pilatus Aircraft Ltd. cannot accept responsibility for continued airworthiness of any airplane not maintained in accordance with the information contained within this section or the Airplane Maintenance Manual (AMM).

IDENTIFICATION PLATE

An identification plate is located on the lower left side of the fuselage aft of the cargo door. This plate displays the manufacturer's name, model designation, serial number (MSN), date of manufacture and the FOCA and FAA type certificate numbers.

Certain regulations may require an identification plate that displays the airplane registration number. This identification plate is located in the empennage.

AIRPLANE INSPECTIONS

AIRPLANE INSPECTION PERIODS

As required by regulations, all civil airplanes must undergo a complete inspection annually (each twelve calendar months). In addition to the required annual inspection, the manufacturer also requires Inspections based on flying hours and Time Limited Inspections.

Other inspections may be required by the issuance of airworthiness directives or service bulletins applicable to the airplane, engine, propeller and components. It is the responsibility of the operator to ensure compliance with all applicable airworthiness directives and, when the inspections are repetitive, to take appropriate steps to prevent inadvertent non-compliance.

AIRPLANE SCHEDULED INSPECTIONS

As required by regulations, the airplane must be the subject of a complete Annual Inspection each 12 calendar months of operation. In addition, national regulations may require periodic, hourly inspections. The PC-12 AMM Chapter 5 gives the manufacturers recommended time limits for inspections, maintenance checks and the scheduled and unscheduled inspections.

The inspection intervals are based on normal usage of the airplane under average environmental conditions. Airplane operated in extremely humid tropics, or in exceptionally cold, damp climates, salt-laden conditions may need more frequent inspections for wear, corrosion and lubrication. Under these adverse conditions, the Hourly Inspection should be done in compliance with the inspection sheets at a more frequent interval. The owner or operator can then set his own inspection interval based on field experience.

The Hourly Inspection interval should never be exceeded by more than 10 hours, which can be used only if additional time is required to reach a maintenance center. Any extension of the hourly interval must be subtracted from the following inspection interval. For an example, if a 100 Hour Inspection is at 110 hours, the next is due 90 hours later at 200 hours.

The owner or operator is responsible for complying with any local regulations. The owner or operator is primarily responsible for maintaining the airplane in an airworthy condition, including compliance with Airworthiness Directives. It is further the responsibility of the owner or operator to make sure that the airplane is inspected in conformity with the inspection sheets.

Inspection sheets have been prepared to assist the owner or operator in meeting the foregoing responsibilities. They include, together with the inspection requirements, lists of tools, equipment, parts and materials which are necessary to do the inspections. The inspections sheets are not intended to be all-inclusive, for no such sheets can replace the good judgment of a qualified mechanic in the performance of his duties. As the one primarily responsible for the airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the airplane.

Detailed information of systems and sub-systems on the airplane can be found in the relevant chapters of the AMM. Reference is made to the topics in this manual and Pilatus issued Service Bulletins for inspection, repair, removal and installation procedures called for in the inspection sheets. It is the responsibility of the owner or operator to make sure that mechanics inspecting the airplane have access to these documents as well as the inspection sheets.

The Hourly Inspection and Annual Inspection sheets list the maintenance and structural significant items for inspection and state the level of inspection required.

The Time Limited Inspection sheets list items that require inspecting at intervals that are different from the hourly and annual inspections.

COMPONENT LIFE POLICY

The AMM Section 4 contains the Airworthiness Limitations which specify Life Limit and Inspection Intervals for major components of the airplane.

The AMM Section 5 contains the time limits for overhaul and replacement of components based on average usage and environmental conditions. The stated time limits do not constitute a guarantee that the component will remain in service until this time as the environmental conditions that the component is operated in cannot be controlled by the manufacturer.

PREVENTIVE MAINTENANCE

Pilots operating airplane should refer to the regulations of the country of registry for information on preventive maintenance that may be performed by pilots.

The holder of a Pilot Certificate may perform certain preventive maintenance described in FAR Part 43. This maintenance may be performed only on an airplane which the pilot owns or operates and which is not used to carry persons or property for hire, except as provided in the applicable FAR's. Although such maintenance is allowed by law, each individual should make an analysis as to whether he/she has the ability to perform the work.

Pilatus Aircraft Ltd should be contacted for further information, or for the required maintenance which must be accomplished by appropriately licensed personnel. All other maintenance required on the airplane should be accomplished by the appropriately licensed personnel.

The aircraft has Computer Aided Testing (CAT) connectors which are installed in the maintenance test panel on the right side of the flight compartment. They are the central access point for ground maintenance to do aircraft system tests using either a portable computer or a maintenance box. Serious flight safety implications could result if equipment is connected to the CAT connectors during flight. The protective CAT connector caps must be installed during flight and all test equipment must be removed from the aircraft.

If maintenance is accomplished, an entry must be made in the appropriate logbook. The entry should contain:

The date the work was accomplished.
Description of the work.
Number of hours on the airplane.
The certificate number of pilot performing the work.
Signature of the individual doing the work.

MODIFICATIONS OR REPAIRS

It is essential that the Airworthiness Authorities of the country of registry be contacted prior to any modifications to the airplane to ensure that the airworthiness of the airplane is not violated. Modifications or repairs to the airplane must be accomplished by licensed personnel.

SERVICE BULLETINS AND SERVICE LETTERS

Pilatus Aircraft will issue Service Bulletins and Service Letters from time to time which will be sent to owners, service centers and distributers. Service Bulletins should be complied with promptly and depending on their nature material and labor allowances may apply, this aspect will be addressed in the Planning Information section of the bulletin. Service Letters give information on product improvements, changed part numbers or discussion on field problems. Service Bulletin and Service Letter Indexes are issued periodically to provide a complete listing of all issued bulletins and letters.

GROUND HANDLING

TOWING

The use of a towing arm which attaches to lugs on the nose leg is the recommended method of towing the airplane over prepared, hard, even ground. The towing arm should incorporate shock absorbers to prevent damage to the airplane. The steering arm provided for this airplane is a steering bar extension to the tail stand. When not in use the components of the towing arm are stowed inside the rear fuselage cone accessible through the battery door.

When towing the airplane, a qualified person should sit in the cockpit ready for immediate braking action, in the event that the towing arm becomes uncoupled. The movement of the towing vehicle should always be started and stopped slowly to avoid unnecessary shock loads. When towing in a congested area, two helpers should watch the wing tip and tail clearances.

In any towing operation, especially when towing with a vehicle, do not exceed the nose gear maximum tow limit angle either side of center or damage to the nose gear will result. The maximum tow limit angle is indicated by a placard on the nose strut. If the airplane is towed or pushed over a rough surface during hangaring, watch that the normal cushioning action of the nose gear does not cause excessive vertical movement of the tail and the resulting contact with low hangar doors or structure. A flat nose tire will also increase the tail height.

When towing an aircraft with a 5-bladed propeller it is recommended to install the propeller towing restraint to avoid damage to the propeller. The towing restraint, which is part of the parking equipment, is attached to the propeller restraint and the tow bar. During this operation, the propeller restraint has to be attached to the spinner dome with the hooks, provided in the parking equipment.

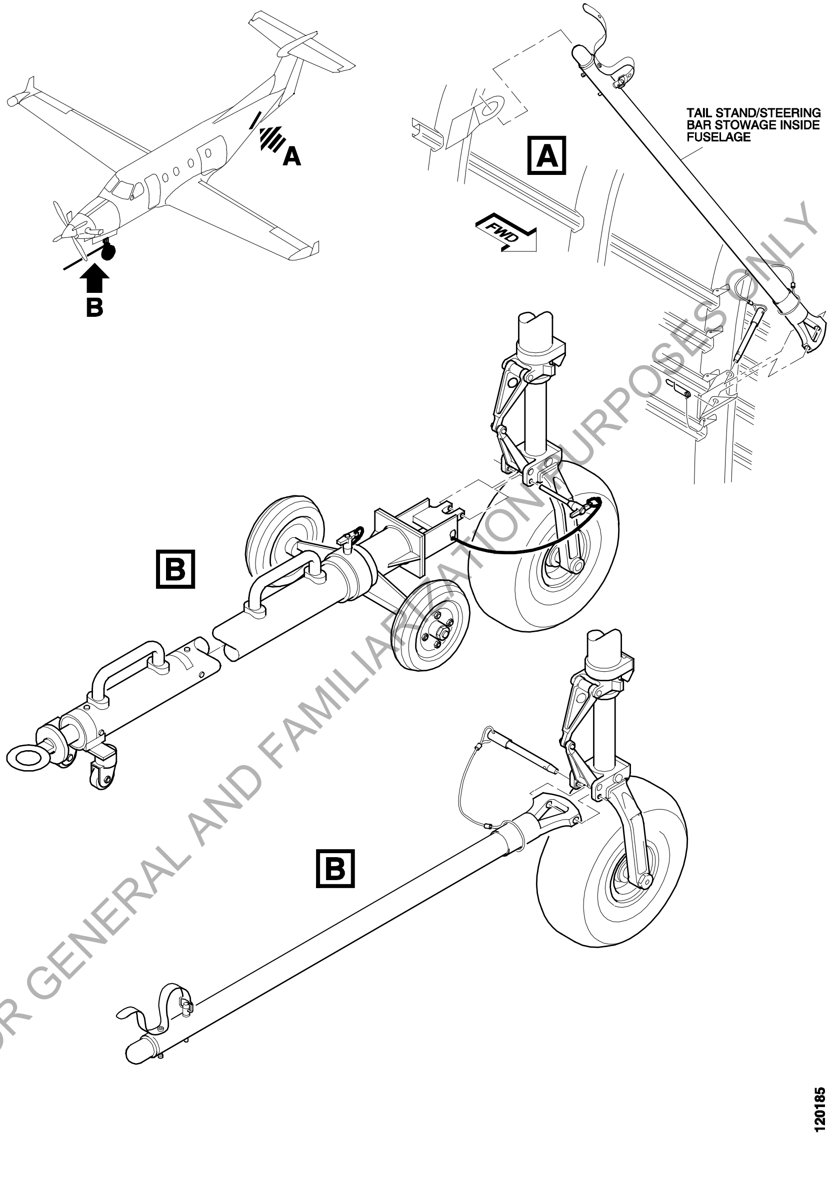

Figure 8-1. Aircraft Towing

CAUTION

TO AVOID ANY DAMAGE, THE PROPELLER RESTRAINT MUST NOT BE ATTACHED TO THE EXHAUST COVERS OR THE ENGINE COWLING.

In the event that towing lines are necessary, ropes should be attached to the main gear struts as high as possible without contacting brake lines or wire harness. The lines should be long enough to clear the nose and/or tail by not less than 20 feet. A qualified person should occupy the pilot's seat to maintain control of the airplane by the use of the nose wheel steering and brakes.

It is acceptable to tow the aircraft by grasping the nose wheel and lifting it just enough to clear the ground

PARKING

In normal weather conditions, the airplane can be parked on any firm surface, headed into wind (if possible) and the parking brake applied, or wheel chocks in place, or both. Make sure that the rudder/nose wheel is centered.

The tail stand should be installed any time the aircraft is parked outside and wet snow fall is expected.

Parking for long periods should be done with wheel chocks in place and the parking brake released. Install cockpit control locks. Blanks and covers should be fitted at any time the airplane is parked for an extended time or overnight (Ref. Fig. 8-2 or Fig. 8-3). Before the blanks and covers are installed they must be checked for condition and completeness (i.e. in serviceable condition with all warning flags attached). When the aircraft is parked in direct sunlight and OAT is above 30°C it is recommended to install the Cockpit Sun Screen.

The airplane should be moored if it is to be parked in the open for long periods and weather conditions are unfavorable. In extreme conditions, the airplane should be parked in a hangar, as structural damage can occur in high winds, even when moored correctly.

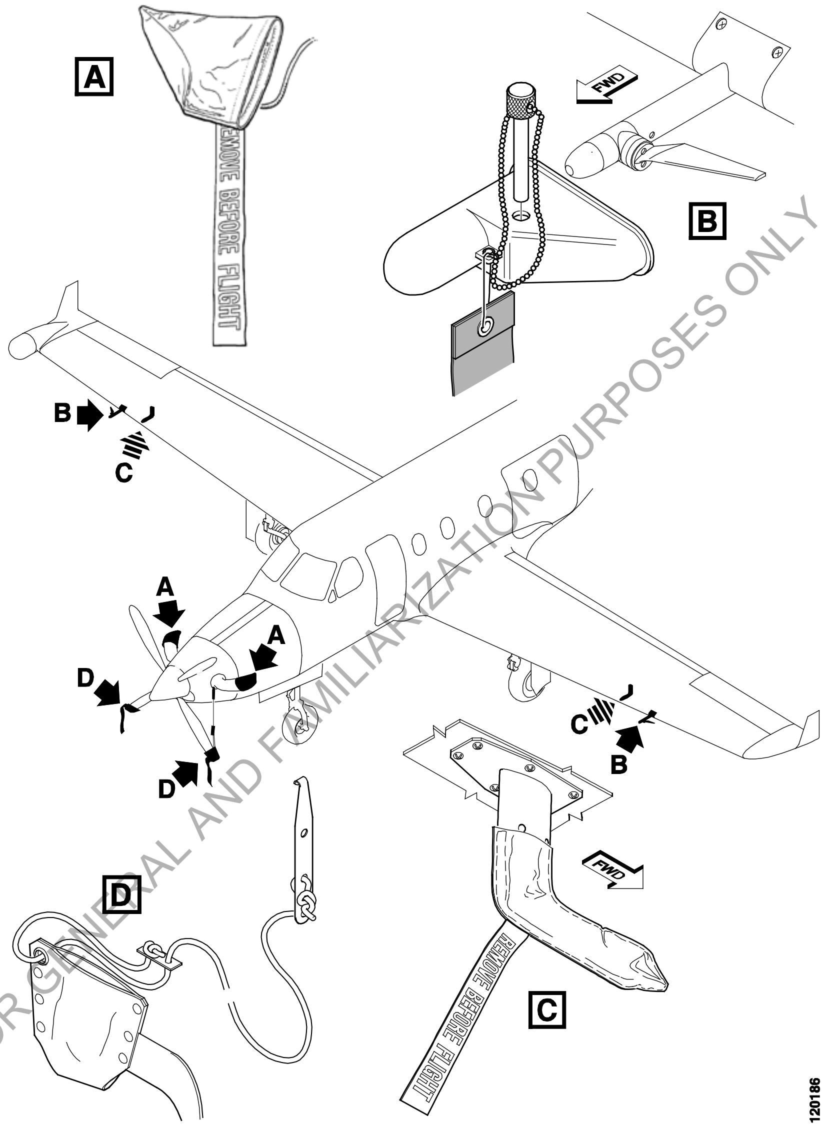

Figure 8-2. Blanks and Covers (Existing Standard)
(Sheet 1 of 2)

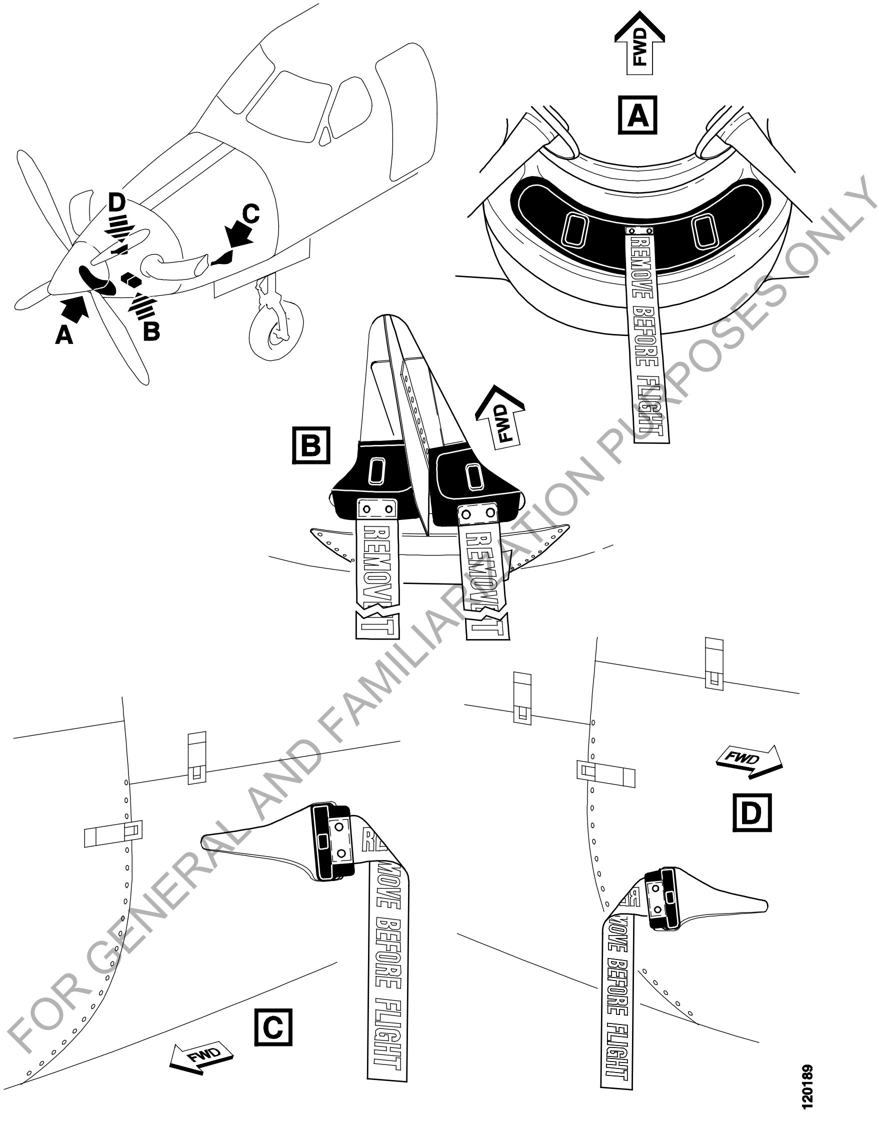

Figure 8-2. Blanks and Covers (Existing Standard)
(Sheet 2 of 2)

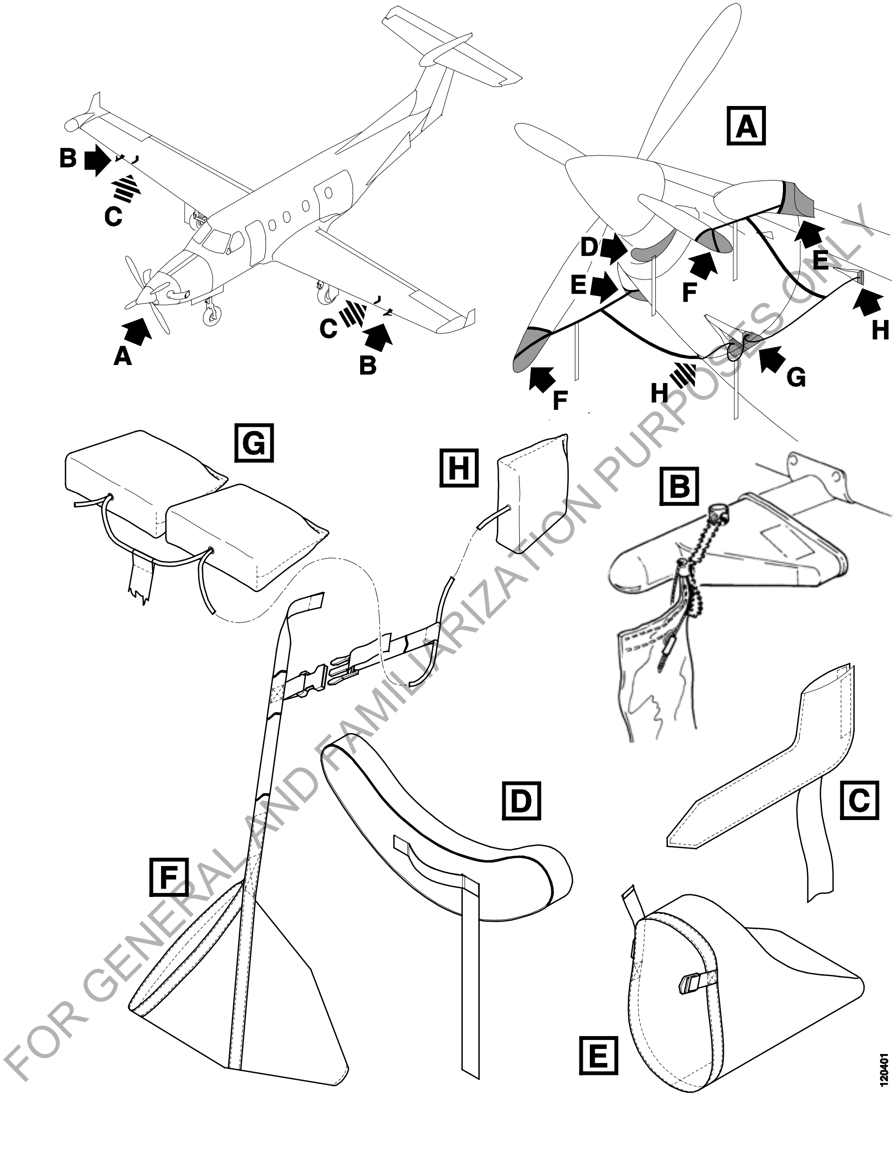

Figure 8-3. Blanks and Covers (New Standard) (4-bladed propeller)
(Sheet 1 of 2)

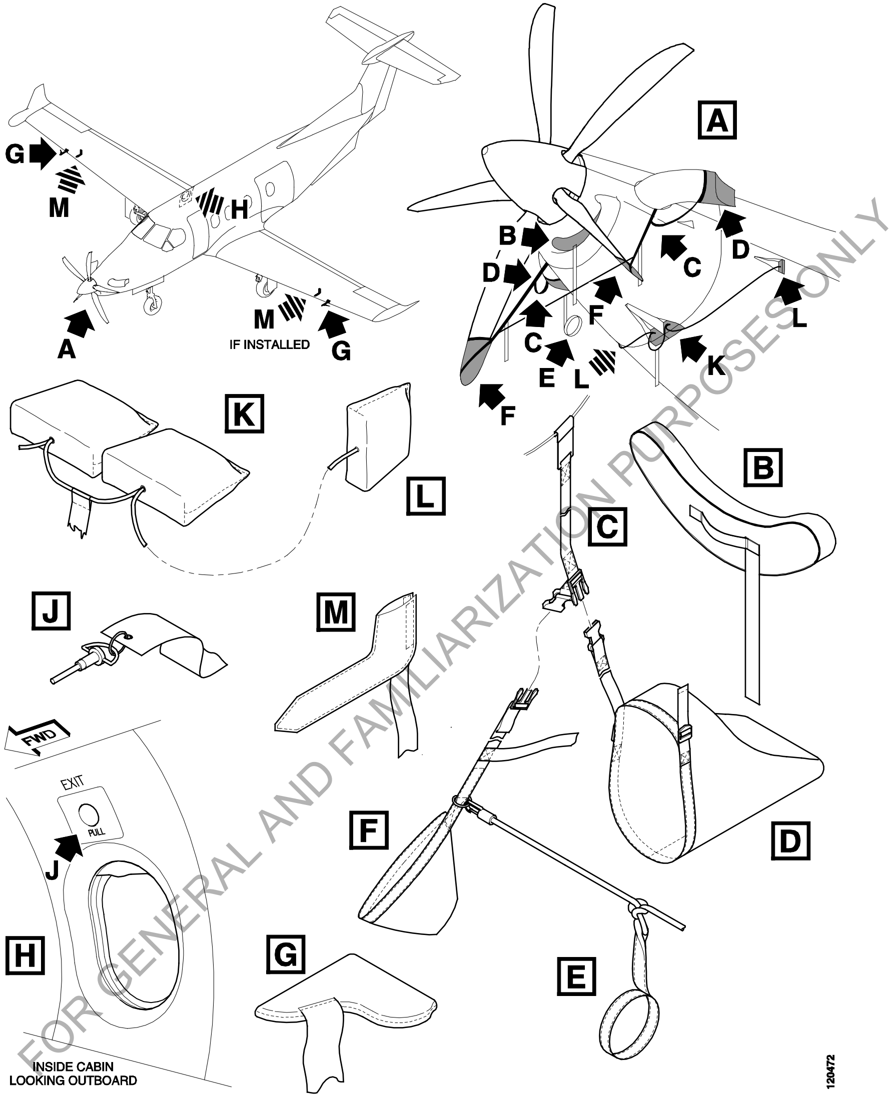

Figure 8-3. Blanks and Covers (New Standard) (5-bladed propeller)
(Sheet 2 of 2)

MOORING

The airplane should be moored for immovability, security and protection. The following procedures should be used for the proper mooring of the airplane (Ref. Figs. 8-2, 8-3 and 8-4):

Head the airplane into wind, where possible.

Retract the flaps.

Close the inertial separator.

Install cockpit control locks.

Chock the wheels.

Install the blanks and covers.

Install the propeller anchor.

Secure tiedown ropes to the wings at approximately 45° and tail tiedown points at a maximum of 25° angle to the ground.

Fit the propeller boots, and attach to the nose landing gear, to prevent engine wind milling.

If the aircraft is in direct sunlight and OAT is above 30°C it is recommended to install the Cockpit Sun Screen.

CAUTION

USE BOWLINE KNOTS, SQUARE KNOTS OR LOCKED SLIP KNOTS. DO NOT USE PLAIN SLIP KNOTS.

CAUTION

MAKE SURE PROPELLER ANCHOR IS PROPERLY INSTALLED TO PREVENT POSSIBLE ENGINE DAMAGE DUE TO WINDMILLING WITH ZERO OIL PRESSURE.

NOTE

When using rope of a non-synthetic material, leave sufficient slack to avoid damage to the airplane should the ropes contract. Hemp ropes contract significantly in high moisture conditions.

NOTE

Additional preparations for high winds include using tiedown ropes from the nose landing gear.

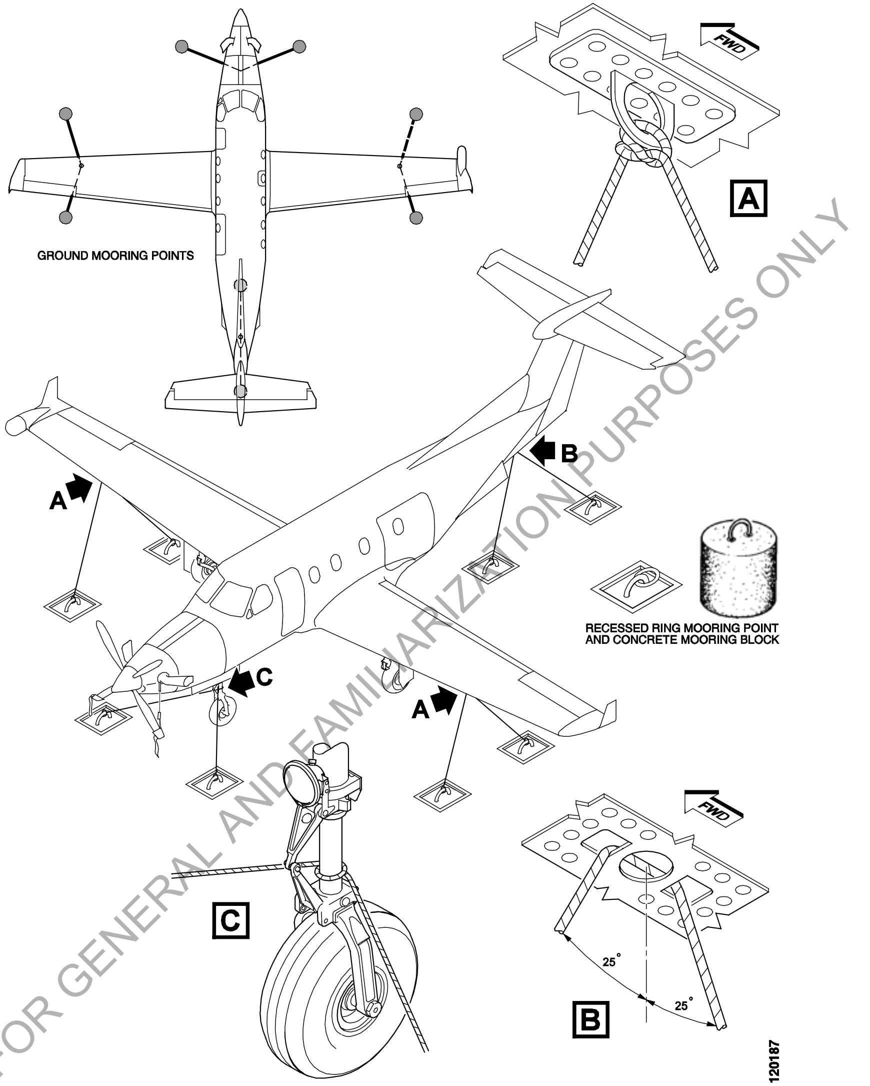

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Figure 8-4. Airplane Mooring

JACKING

SINGLE WHEEL JACKING

To assist in wheel and brake maintenance, both the two main wheels and the nose wheel can be jacked, independently, using a bottle jack and an adapter (Ref. Fig. 8-5). The adapters are shaped to accept the piston of a bottle jack. It is advisable that when jacking the nose wheel up, the tail support should be fitted in the rear main jacking pad as a precautionary measure.

Chock the other two tires before single wheel jacking to prevent airplane movement.

AIRPLANE JACKING

The airplane is equipped with two main jacking points and a combined tail jacking pad/mooring point (Ref. Fig. 8-6). The two main jacking points are located on the wing bottom surface just outboard of the fuselage and the tail jacking pad is located on the fuselage bottom surface just forward of the empennage.

Hydraulic jacks are used at the main jacking points to raise and lower the airplane. The tail jacking point is used to maintain the airplane in a level attitude during lifting. When the airplane is raised or lowered, the airplane tail is also progressively raised or lowered accordingly.

CAUTION

ATTACH BALLAST TO THE TAIL JACKING POINT TO PREVENT ANY POSSIBLE REAR FUSELAGE UPWARDS MOVEMENT, WHILE THE AIRPLANE IS ON JACKS.

Refer to the Aircraft Maintenance Manual Chap 7 for procedures on lifting and lowering the complete airplane and information concerning the amount of ballast to be attached to the tail jacking point.

NOTE

When jacking the airplane outdoors, use the tiedown for provisions for the wing and tail as described in Figure 8-4.

LEVELLING

Longitudinal and lateral leveling of the airplane is achieved by positioning a spirit level along or across one of the seat rails in the aft fuselage area. This task is normally done in conjunction with raising the airplane on the three main jacks for weighing, setting of landing lights and fuel system calibration.

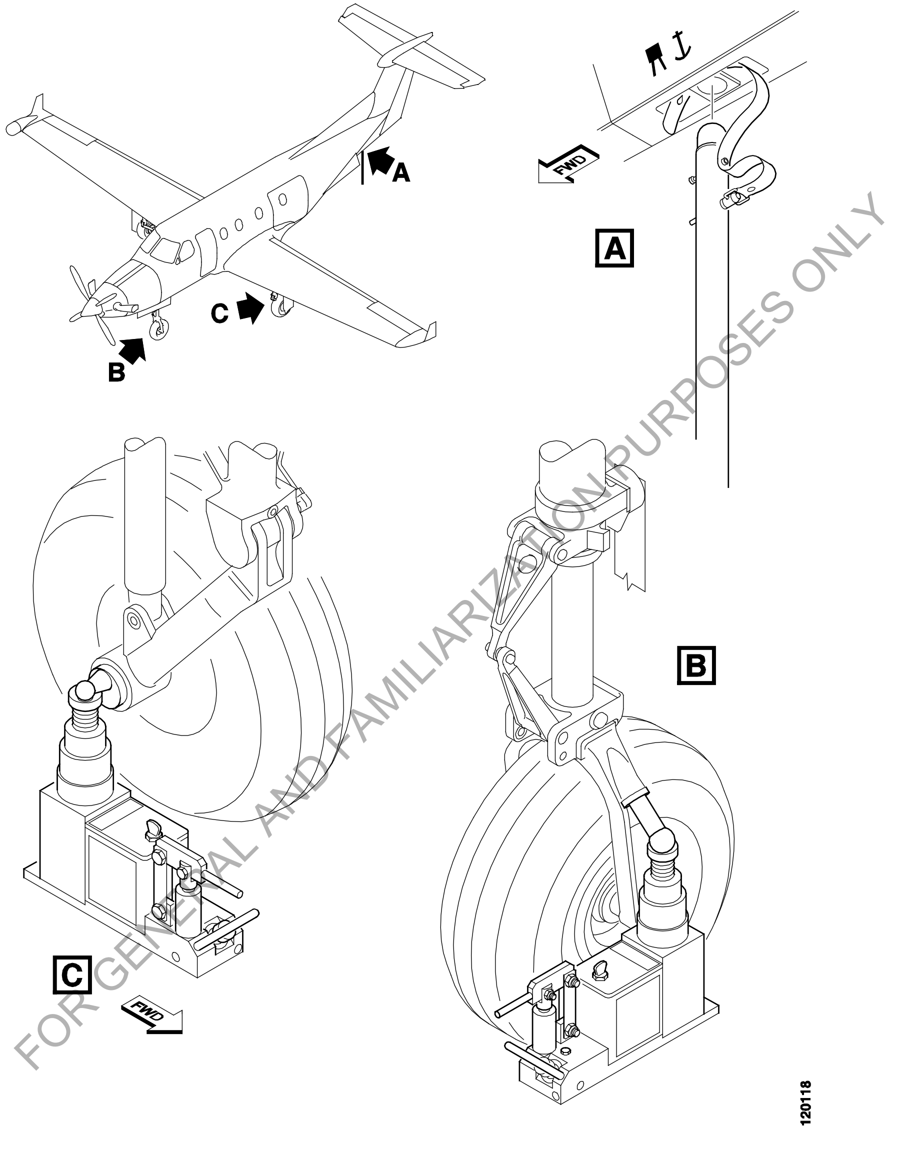

Figure 8-5. Single Wheel Jacking

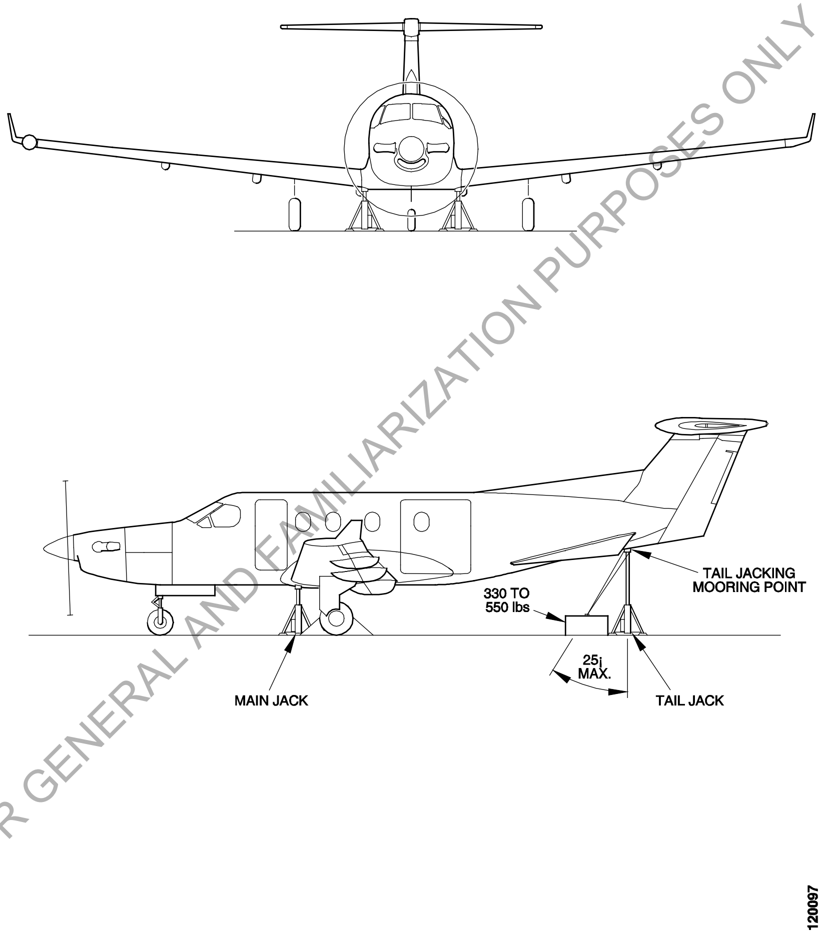

Figure 8-6. Main Jacking Points

PASSENGER SEAT REMOVAL AND INSTALLATION

Pilots may remove and install passenger seats in accordance with the information given in Section 6 – Weight and Balance.

SERVICING

In addition to the inspection periods (detailed in Airplane Inspection) and the pre-flight inspections provided in Section 4 of this Handbook, complete servicing instructions are detailed in the AMM Chapter 12-00-00. The following sub-paragraphs give an overview.

BATTERY

Access to the batteries is gained by opening the hinged panel (31AB) located on the rear fuselage bottom surface. The batteries must be regularly maintained in accordance with the AMM. The operator must also make sure that the battery vents pipes which extrude from the fuselage, just aft of the hinged panel, are free of dirt and any sign of corrosion. In the event that corrosion or a blockage is found, a maintenance shop visit is required, as this situation - if left unchecked - could lead to explosive pressure being reached within the battery which could jeopardize airplane safety.

An external power control unit is installed which will allow the batteries to be charged on the ground. With an external power unit connected and operating set the EXT PWR and BAT 1 or BAT 2 switches to ON to ground charge a battery. The battery must be vented during ground charging operations, refer to the AMM Chap 24 for instructions.

ENGINE OIL

Oils specified for use in the PT6A-67P) engine oil system are listed in the Pratt and Whitney (P&WC) SB No. 14001, latest revision.

If operating conditions are such that the engine will be subjected to frequent cold soaking at an ambient temperature of -18°C or lower, the use of PWA521, Type II oil (5cs) (viscosity) oil (Type II) is recommended. The engine oil dipstick is marked MAX HOT, MAX COLD, ADD US QUARTS, 1,2,3,4,5,6. The term HOT refers to the engine condition when the engine has been shutdown. COLD refers to the engine condition when the engine has been shutdown for 12 hours or more. Ideally, the engine oil tank level should be checked and replenished, as required, within 10 minutes of shutdown.

A visual sight gauge is provided to allow the oil level to be checked without removing the dipstick. If the oil level is below the green band on the sight gauge the oil level has to be checked with the dipstick.

CAUTION

THE GREEN MARKS ON THE FILLER SLEEVE AND THE DIPSTICK MUST BE ALIGNED WHEN THE DIPSTICK IS INSTALLED.

NOTE

The usual oil level is when the dipstick shows one to two quarts below maximum. Oil above this level can be vented overboard.

CAUTION

NEVER REPLENISH THE OIL IN A COLD ENGINE, AS THIS CAN RESULT IN OVERFILLING OF THE SYSTEM. START THE ENGINE AND RUN AT GROUND IDLE FOR 5 MINUTES, RECHECK THE OIL LEVEL BEFORE ADDING OIL TO THE SYSTEM.

MAKE SURE THAT THE OIL IS OF THE CORRECT TYPE. REFER TO P&WC SERVICE BULLETIN 14001.

TO PREVENT OIL DRIPPING FROM THE DIPSTICK AND CONTAMINATING EQUIPMENT, HOLD A PIECE OF ABSORBENT LINT-FREE MATERIAL UNDER THE DIPSTICK DURING REMOVAL.

OIL REPLENISHMENT PROCEDURE

Open the left engine access panel and secure open with the struts.

Use a ladder for better access to the filler cap/dipstick.

Disconnect the electrical cannon plug.

Release the locking mechanism and remove the filler cap/dipstick assembly from the filler neck on the filler neck on the accessory gearbox.

Replenish the oil according to HOT/COLD condition of the engine.

Reinstall the filler cap/dipstick assembly and engage the locking mechanism.

Connect the electrical cannon plug.

Check green markings on the filler sleeve and dipstick are aligned.

NOTE

To check if the filler cap is properly installed, open the right hand engine access door. The green line cannot be seen from the LH engine access door without a mirror being used.

Close the access panel.

COMPLETE OIL SYSTEM REPLENISHMENT

Refer to the AMM for the Complete Oil System Replenishment procedure.

WARNING

MAKE SURE THE FILLER CAP/DIPSTICK IS PROPERLY ENGAGED AND LOCKED AFTER REPLENISHMENT.

FUEL SYSTEM

The left and right wing fuel tanks are gravity filled through openings on the upper surface. The tanks should always be kept full between flights to reduce explosive vapor space and condensation. Allowance should be made for expansion to minimize venting of fuel if ambient temperature is expected to rise markedly. Approved fuels conforming to P&WC specifications are to be used.

WARNING

CHECK FUEL SUPPLY VEHICLE FOR CORRECT FUEL GRADE AND TYPE. USE AN APPROVED WATER DETECTION KIT TO CHECK FOR WATER CONTAMINATION.

CAUTION

AS THE ANTI-ICING ADDITIVE IS NOT ALWAYS INDICATED ON THE FUELLING INSTALLATION PLACARD, CHECK WITH THE FUEL SUPPLIER TO MAKE SURE THE FUEL CONTAINS AN APPROVED ANTI-ICING ADDITIVE.

IF IT IS KNOWN THAT THE AIRCRAFT WILL FLY IN AMBIENT TEMPERATURES OF LESS THAN 0° C AND IF THE FUEL DOES NOT CONTAIN AN ANTI-ICING ADDITIVE, ONE MUST BE BLENDED WITH THE FUEL DURING FUELING.

NOTE

There are two fuel tank drain valves on the lower surface of each wing and one on the front left of the fuselage, aft of the nose wheel well.

REFUELING PRECAUTIONS

During refueling/defueling operations, the following arrangements must be complied with:

Refuel and defuel only in a well-ventilated area.

Do not allow open flame or smoking in the vicinity of the airplane while refueling.

Do not replenish the oxygen system during refueling or defueling.

Do not operate airplane electrical or radio equipment while refueling.

High frequency pulse transmissions in the vicinity of the airplane represent a fire hazard.

During all refueling/defueling operations, fire fighting equipment must be available.

FUELING PROCEDURE

Make sure the fuel supplied is checked for type, grade and freedom from contamination.

Make sure that the refueling vehicle is grounded.

Ground the vehicle to the airplane (attach the vehicle grounding lead to the nose landing gear).

Remove external power, if connected

Make sure all electrical power is OFF.

Connect the grounding cable from the nozzle to grounding point next to the fuel cap.

CAUTION

DIRECTING THE NOZZLE OUTBOARD MAY CAUSE DAMAGE TO THE FUEL QUANTITY PROBE.

Open the wing fuel cap and insert the nozzle, directing it inboard, after first making sure that the filler nozzle is clean.

Add fuel. Allow the fuel to settle when topping-off the fuel tank. Remove the fuel nozzle and disconnect the grounding cable. Secure the filler cap.

Repeat the procedure for the other wing tank.

Remove the vehicle grounding cable from the airplane.

Clean up any fuel spillage (Use a water hose if excessive).

On the overhead panel set the STBY BUS switch to ON
Check all system switches are OFF.

Set both Battery switches to ON and check the fuel quantity gauges for correct indication.

Set both Battery switches to OFF.

Set the STBY BUS switch to the OFF position.

FUEL CONTAMINATION

Fuel contamination is usually the result of foreign material present in the fuel system. This foreign material can take many forms, i.e. water, sand, dirt, microbes or bacterial growth. In addition, additives that are not compatible with the fuel used can cause the fuel to become contaminated.

Jet fuel contains some dissolved, suspended water and is a fuel contamination concern. The quantity of water that can remain in solution will depend upon the temperature of the fuel. Dissolved water cannot be removed by a filter during a fuel service but will be released from suspension as the fuel temperature decreases, as during flight. These supercooled water droplets only need to contact solid contaminates or receive an impact shock to change into ice crystals. If a sufficient quantity of water drops out of suspension and changes to ice, a blocked filter may result.

Before the first flight of the day and after each refueling, use a clean container and drain at least one sample of fuel from each tank drain valve to determine if contaminants are present (and that the airplane has been fueled with the proper fuel). If contamination is detected, drain all fuel drains points until all contamination has been removed. If after repeated sampling, evidence of contamination still exists, the fuel tanks should be completely drained and the fuel system flushed. Do not fly the airplane with contaminated or unapproved fuel.

In addition, operators who are not acquainted with a particular airfield should be assured that the fuel supply has been checked for contamination and is properly filtered before allowing the airplane to be serviced. Also, fuel tanks should be kept full between flights, provided weight and balance considerations will permit, to reduce the possibility of water condensing on the walls of partially filled tanks.

FUEL ANTI-ICE ADDITIVE

Anti-icing additive must be used for all flight operations in ambient temperatures below 0°C.

WARNING

OPERATING IN AMBIENT TEMPERATURES LESS THAN 0°C WITHOUT FOLLOWING THE PROCEDURE TO ADD ANTI-ICING ADDITIVES MAY LEAD TO ICE IN THE FUEL SYSTEM, WHICH MAY EVENTUALLY BLOCK DELIVERY LINES AND COMPONENTS OF THE FUEL SYSTEM, INCLUDING THE FUEL FILTER, SUBSEQUENTLY RESTRICTING OR STOPPING THE FLOW OF FUEL TO THE ENGINE.

Refer to Section 2 – Limitations – for additive types and concentration levels.
Blend the additive in accordance with the following procedure:

Calculate the quantity of anti-icing additive required based on the quantity of fuel to be added. Refer to the CAUTION below.

Remove the cap containing the tube and clip assembly from the "HI-FLO PRIST" blender, model PHF-204.

Attach the pistol on the collar, press the tube into the button, and clip the tube end to the fuel nozzle.

Pull trigger firmly to ensure full flow, then lock into place.

Start flow of additive when fueling begins. Refueling rates should be between 30 and 60 gallons per minute.

Do a water drain check before the first flight of the day.

WARNING

THE FUEL SYSTEM ANTI-ICING ADDITIVES CONTAIN ETHYLENE GLYCOL MONOETHYL ETHER WHICH IS HIGHLY TOXIC. THESE PRODUCTS MUST BE HANDLED WITH EXTREME CARE. AVOID ALL DIRECT CONTACT WITH SKIN AND CLOTHING. ANY CLOTHING ACCIDENTLY CONTAMINATED BY SPLASHING SHOULD BE PROMPTLY REMOVED AND THE SKIN WASHED WITH SOAP AND WATER. PREVENT CONTACT WITH EYES AND AVOID INHALATION OF VAPORS. IF CONTACT IS MADE WITH THE EYES THEY SHOULD BE FLUSHED WITH WATER FOR 15 MINUTES. CONSULT A PHYSICIAN AS RAPIDLY AS POSSIBLE AFTER ALL CONTACT CASES.

CAUTION

THE ADDITIVE CONCENTRATION BY VOLUME SHALL BE A MINIMUM OF 0.06% AND A MAXIMUM OF 0.15%.

THE CORRECT MIX OF ANTI-ICING ADDITIVE IS IMPORTANT. CONCENTRATIONS OF MORE THAN 0.15% BY VOLUME WILL CAUSE DAMAGE TO THE PROTECTIVE PRIMER AND SEALANTS OF THE FUEL TANKS AND TO THE SEALS IN THE FUEL SYSTEM AND ENGINE COMPONENTS. CONCENTRATIONS OF LOWER THAN 0.06 VOL % MAY NOT BE ENOUGH TO INHIBIT ICE FORMATION.

MAKE SURE THAT THE ADDITIVE IS DIRECTED INTO THE FUEL STREAM. START ADDITIVE FLOW AFTER THE FUEL FLOW STARTS AND STOP THE ADDITIVE FLOW BEFORE THE FUEL FLOW STOPS. DO NOT ALLOW CONCENTRATED ADDITIVE TO CONTACT THE INTERIOR OF THE FUEL TANKS OR EXTERIOR PAINTED SURFACES.

LANDING GEAR - TIRES

For maximum service, keep tires inflated to the proper pressures. All wheels and tires are balanced before original installation, and the relationship to tire and wheel should be maintained upon reinstallation. Unbalanced wheels can cause extreme vibration in the landing gear; therefore, in the installation of new components, it may be necessary to re-balance the wheels with tires mounted. When checking the tire pressures, examine the tires for wear, cuts, bruises and slippage.

Nose Wheel Tire

Wheel type - BFG PN3-1501
Tire size - 17.5 x 6.25-6, 8PR, TL (160 mph)
Tire Pressure - 60 +3 -0 psi (4.1 +0.2 -0 bar)
Max. castor rotation - +/- 60° free (+/- 12° Nose Wheel Steering)

Main Wheel Tires

Wheel type - BFG PN3-1543-1
Tire size - 8.50-10, 10PR, TL (160 mph)
Tire pressure - 60 + 3 - 0 psi (4.1 + 0.2 - 0 bar)

Refer to the AMM for the alternative types of tires that can be installed.

LANDING GEAR - BRAKES

The fluid level should be checked periodically or at a scheduled maintenance event and replenished as necessary. Each brake assembly incorporates a brake lining wear indicator. As the brake pads wear, the pin will be pulled into the piston housing. When the system is pressurized and the pin is flush with the piston housing, the brake linings must be overhauled.

Refer to the AMM for complete information on the type of hydraulic fluid, servicing the fluid level and brake inspection and replacement.

HYDRAULIC SYSTEM

With the cargo door open, the hydraulic fluid level can be checked on the visual indicator installed on the hydraulic pressure tank in the wing root.

Servicing of the hydraulic system should only be performed by approved personnel with the correct maintenance equipment in accordance with procedures in the AMM. It is normally not required between annual inspections.

LUBRICATION POINTS

Proper lubrication is essential for trouble-free operation of mechanical components. Lubricants and dispensing equipment must be kept clean. Use only one lubricant in a grease gun or oil can. After lubrication, clean off all excessive grease or oil to prevent dust and dirt build-up.

The frequency of application may be increased for a particular type of operation or if excessive wear is experienced. For lubricating instructions, locations and lubricants refer to the AMM, Chapter 12.

VAPOR CYCLE COOLING SYSTEM (VCCS) (IF INSTALLED)

CAUTION

OPERATION OF THE SYSTEM AT LOW AMBIENT TEMPERATURES FOR MORE THAN 15 MINUTES CAN RESULT IN MAJOR DAMAGE TO THE COMPRESSOR

NOTE

If ambient temperature is below 10°C (50°F), the pressure switch is designed to keep the system from operating and causing possible damage if operated for extended periods of time. In this case, it is recommended that the aircraft be heated above this threshold to enable the system to operate.

During cold winter months, the system should be operated for 10-15 minutes every two weeks to maintain a thin oil film on the compressor output shaft dynamic seal to prevent shaft leakage.

Prior to selecting on the air conditioning system (energizing the compressor drive), run the blowers on high speed for a minimum of 5 minutes. This will aid in warming the refrigerant and bringing it up to an acceptable temperature enabling operation of the system.

OXYGEN SYSTEM

The standard oxygen system replenishment is carried out at a hinged service panel (11BR) on the right side of the fuselage, forward of the wing leading edge. The service panel is fitted with an oxygen replenishment valve and a system pressure gage. The gage is marked from 0 to 2000 psi, with a red zone from 1850 to 2000 psi. A charge pressure/temperature chart is installed on the inside of the service panel.

The larger capacity oxygen system replenishment is carried out at a hinged service door (31AB) on the bottom of the fuselage, rear of the wing trailing edge. An oxygen service panel is installed inside of the rear fuselage on the forward frame. The service panel is fitted with an oxygen replenishment valve and a system pressure gage. The gage is marked from 0 to 2000 psi, with a red zone from 1850 to 2000 psi. A charge pressure/temperature chart is also installed on the service panel.

REPLENISHMENT PROCEDURE

WARNING

MAKE SURE THAT THE AIRPLANE IS FITTED WITH A GROUNDING CABLE AND IS PROPERLY GROUNDED. THE OXYGEN CART MUST BE ELECTRICALLY BONDED TO THE AIRPLANE.

DO NOT OPERATE THE AIRPLANE ELECTRICAL SWITCHES OR CONNECT/DISCONNECT GROUND POWER DURING OXYGEN SYSTEM REPLENISHMENT.

DO NOT OPERATE THE OXYGEN SYSTEM DURING REFUELING/DEFUELING OR ANY OTHER SERVICING PROCEDURE THAT COULD CAUSE IGNITION.

INTRODUCTION OF PETROLEUM BASED SUBSTANCES SUCH AS GREASE OR OIL TO OXYGEN CREATES A SERIOUS FIRE HAZARD. USE NO OIL OR GREASE WITH THE OXYGEN REPLENISHMENT EQUIPMENT.

ALWAYS OPEN SHUT-OFF VALVE SLOWLY TO AVOID GENERATING HEAT AND REPLENISH THE SYSTEM SLOWLY (MINIMUM TIME 6 MINUTES).

CAUTION

REPLENISHMENT OF THE OXYGEN SYSTEM SHOULD ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL.

Obtain the outside air temperature. (OAT). A fully charged cylinder has a pressure of 1841 psi at a temperature of 20°C. Filling pressures will vary depending upon the ambient temperature in the service bay and the temperature rise due to the compression of the oxygen. If the airplane is or has been parked outside in the sun, the temperature inside the fuselage will be appreciably higher than ambient. Figure 8-7 lists the required charging pressures for a range of temperatures.

Open the oxygen service panel 11BR on aircraft with the standard oxygen system.
Open the service door 31AB on aircraft with the larger capacity oxygen system.

Hold the thermometer close to the oxygen cylinder.

Make sure the thermometer indication is constant. Make a note of the indication.

Refer to the temperature/pressure graph for the correct oxygen cylinder pressure.

If the pressure on the service panel gage is low, fill the oxygen cylinder.

Make sure the area around the service panel charging valve is clean. Remove the cap from the charging valve.

Make sure the oxygen supply hose is clean and connect it to the charging valve.

Slowly pressurize the oxygen cylinder to the correct pressure.

Close the oxygen supply and let the cylinder temperature become stable.

Monitor the oxygen pressure on the gage and fill to the correct pressure if necessary.

Release the pressure in the oxygen supply hose and disconnect from the charging valve.

Install the cap on the charging valve. Make sure the work area is clear of tools and other items.

Close the service panel 11BR or the service door 31AB.

Temp (°C)	Press (psig)
85	2419
80	2375
75	2331
70	2287
65	2242
60	2198
55	2153
50	2108
45	2063
40	2018
35	1974
30	1930
25	1885
21	1850
20	1841
15	1798
10	1755
5	1712
0	1669
-5	1628
-10	1586
-15	1545
-20	1505
-25	1466
-30	1426
-35	1388
-40	1351
-45	1313
-50	1275
-55	1239

Figure 8-7. Oxygen Charging Pressures

CLEANING AND CARE

WINDSHIELD/SIDE WINDOWS

CAUTION

REMOVE WRIST-WATCHES, RINGS AND OTHER JEWELRY FROM HANDS AND WRISTS BEFORE CLEANING THE SIDE WINDOWS.

WINDSHIELDS AND WINDOWS ARE EASILY DAMAGED BY IMPROPER HANDLING AND CLEANING TECHNIQUES.

DO NOT USE SOLVENTS, FUELS, DETERGENTS, ALCOHOL, ACETONE OR THINNERS TO CLEAN THE SIDE WINDOWS.

TRANSPARENT PLASTICS LACK THE SURFACE HARDNESS OF GLASS. EXERCISE CAUTION WHEN CLEANING ALL THE SIDE WINDOWS TO AVOID SCRATCHING OR SCORING TRANSPARENCIES.

The following procedures provide information regarding cleaning and servicing of windshields and windows. Improper cleaning, or use of unapproved cleaning agents, can cause damage to these surfaces. As a preventive measure, do not park the airplane where it might be subjected to direct contact with or vapor from: methanol, denatured alcohol, gasoline, benzene, xylene, MEK, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays, paint strippers or other types of solvents. Do not park airplane near a paint-spray shop.

Windshield (Glass)

Place the airplane inside a hanger or in a shaded area and allow to cool from the heat of the sun's rays.

Using clean (preferably running) water, flood the surface. Use bare clean hands, with no jewelry, to feel and dislodge any dirt or abrasive materials.

Using a mild soap or detergent (such as dish washing liquid) in water, wash the surface. Again, use only the bare hand to provide rubbing force. (A clean lint-free cloth may be used to transfer the soap solution to the surface, but extreme care must be excised to prevent scratching the surface.)

Rinse the surface thoroughly with clean fresh water and dry with a clean cloth or damp chamois leather.

Side Windows (Acrylic)

Flush with clean water to remove loose dust etc.

Wash the side windows using a soft sponge, warm water and soft soap solution.

Rinse with clean water and dry with a damp chamois leather.

Use an appropriate transparency cleaner to remove any grease, smears, etc., still adhering to the side windows.

NOTE

Rubbing transparencies with a dry cloth will cause scratches and the build-up of an electrostatic charge which attracts dust. Where an electrostatic charge is present, gently pat the area with a damp chamois leather to remove the charge and any accumulated dust.

EXTERIOR PAINT SURFACES

The airplane should be washed with a mild soap and water solution. Harsh abrasives or alkaline soaps or detergents could make scratches on painted or plastic surfaces or cause corrosion of metal. Cover areas where cleaning solutions could cause damage.

Exterior Recommended Cleaning Agents:

Mild soap or approved detergent.

Jet MULSO 2 (TURCO product) or equivalent.

To wash the airplane, use the following procedure:

NOTE

To prevent water from entering the pitot/static systems, the pitot tube openings and the static ports should be blanked off. Exposed flight control bearings should be protected prior to washing. Install wheel covers to minimize water ingress.

Flush away loose dirt with water.

Apply cleaning solution with a soft cloth, a sponge or a soft bristle brush. Do not allow the solution to dry before washing off. To remove exhaust stains, allow the solution to remain on the surface longer.

To remove stubborn oil and grease, use a cloth dampened with naphtha.

Rinse all surfaces thoroughly.

Polish and seal the surfaces with a wax polish.

NOTE

Any good automotive wax may be used to preserve the painted surfaces. Soft lint-free cleaning cloths should be used to prevent scratches when cleaning or polishing. A heavier coating of wax on the leading surfaces will reduce the abrasion problems in these areas, but see also paragraph "DEICING BOOT CARE".

DEICING BOOT CARE

The wings, T-tail, and propeller deicing boots have a special electrical-conductive coating to bleed off static charges which cause radio interference and may perforate the boots. Fuelling and other servicing practices should be done carefully to avoid damaging the conductive coating or tearing of the boots.

To prolong the life of the deicing boots, they should be washed, with a mild soap and water solution, rinsed with clean water, and serviced on a regular basis in accordance with the instructions in the AMM. Keep the boots clean and free from oil, grease and other solvents which cause neoprene to swell and deteriorate.

BRAKE CARE (AIRCRAFT WITH PARKER BRAKES)

If the brakes are used exclusively for low speeds (below 25 knots), it is recommended to condition (glaze) the brake linings by performing a firm brake after landing (at about 80 knots) every 30 landings to ensure optimum service life is achieved

PROPELLER CARE

Propeller care consists of checking the propeller area for leaks and damage; this also includes any damage to the propeller hub and deicing boots. Inspect the visible hub parts daily for surface damage. Look for evidence of grease and or oil leaks. Inspect the propeller blades, daily, for scratches and gouges in the leading or trailing edge, or on the blade face and camber surfaces.

WARNING

ABNORMAL GREASE LEAKAGE CAN BE AN INDICATION OF A FAILING PROPELLER BLADE OR BLADE RETENTION COMPONENT, WHICH MAY EVENTUALLY RESULT IN AN IN-FLIGHT BLADE SEPARATION.

Check blades for radial play or movement of blade tip (in and out, back and forth). Refer to loose blades in the Inspection Procedures section of the Propeller Owner's Manual.

Inspect de-ice boots for damage. Refer to the de-ice systems chapter of the Propeller Owner's Manual for the inspection information.

AIRCRAFT WITH 4-BLADED PROPELLER

Inspect the propeller blades, daily, for scratches and gouges in the leading or trailing edge, or on the blade face and camber surfaces.

NOTE

Any scratch or gouge, in a metal blade, must be repaired before next flight. Otherwise, fatigue cracks may start, and the blade may fail in flight. Scratches and gouges in the outer 18 in. (457 mm) of the blade propeller diameter are especially critical because this is the area of highest vibratory stress.

The inner third of the propeller blades are shot peened in order to increase their fatigue life.

Should any damage, scratches or gouges be found, obtain a qualified opinion prior to flight.

AIRCRAFT WITH 5-BLADED PROPELLER

Visually inspect the entire blade and the erosion shield (lead, trail, face and camber sides) for nicks, gouges, looseness of material, erosion, cracks and debonds. Visually inspect the blades for lightning strike. Defects or damage discovered during preflight inspection must be evaluated in accordance with the allowable damage given in the Propeller Owner's Manual to determine if repairs are required before further flight.

LANDING GEAR CARE

Before cleaning the landing gear, place a plastic cover or similar material over the wheel and brake assembly.

Place a catch-pan under the gear to catch the waste.

Spray or brush the gear area with solvent or a mixture of solvent and degreaser, as desired. Where heavy grease and dirt deposits have collected, it may be necessary to brush the areas sprayed, in order to clean them.

Allow the solvent to remain on the gear from five to ten minutes. Then rinse the gear with additional solvent and allow to dry. If necessary help the drying process with a gentle blast of compressed air.

Remove the plastic cover and the catch-pan from the wheel.

Lubricate the gear in accordance with the Lubrication Chart in the AMM.

ENGINE CARE

The engine exterior and compartment may be cleaned, using a suitable solvent. Most efficient cleaning is done using a spray-type cleaner. Before spray cleaning, make sure the protection is afforded for components which might be adversely affected by the solvent. Refer to the AMM for proper lubrication of controls and components after engine cleaning.

INTERIOR CARE

The cockpit area should be frequently vacuum-cleaned. Instrument and side panels may be cleaned with a chamois leather made moist with clean water.

CAUTION

DO NOT CLEAN FABRIC SURFACES WITH A SOAP SOLUTION OR WATER. THIS CAN INHIBIT THE PROPERTIES OF THE FIREBLOCK TREATMENT APPLIED TO THE FABRIC.

Seat harnesses that have been soiled may be cleaned by gently scrubbing with a soft brush, water and an approved soap. Alternatively, an officially approved detergent emulsion may be used when diluted in the proper proportions. Seats may be cleaned as per manufacturers-recommended instructions.

Dust and loose dirt should be picked up regularly with a vacuum-cleaner. Stained carpets should be cleaned with a non-flammable dry cleaning carpet shampoo which should be kept as dry as possible and again vacuumed.

Blot up any spilled liquid on the seats promptly with cleansing tissue or rags. Do not pat the spot; press the blotting material firmly and hold it for several seconds. Continue blotting until no more liquid is taken up. Scrape off any sticky materials with a dull knife, then spot-clean the area, following the manufacturer's instructions.

Headliners, side panels and paint work should be cleaned with a lint-free cloth dampened with a mild soap and water mixture. Oil and grease can be removed with a sponge and common household detergent and then wiped dry with a clean rag.

Oxygen masks assemblies should be cleaned with a suitable oil-free disinfectant. and then wipe dirt or foreign particles from the unit with a clean dry lint-free cloth.

Care kits are available for the care of leather upholstery and high gloss cabin furniture, refer to the Illustrated Parts Catalog for the kit Part No’s.

PRIMUS APEX DISPLAY CARE

CAUTION

REMOVE WRIST-WATCHES, RINGS AND OTHER JEWELRY FROM HANDS AND WRISTS BEFORE CLEANING THE PRIMUS APEX DISPLAY SCREENS.

DO NOT USE A CLEANER THAT HAS ACETONE, THINNER, BENZENE, ETHYL ALCOHOL, TOLUENE, ETHYL ACID, AMMONIA, METHYL CHLORIDE OR ALKALINE BASED SOLVENTS. THESE CHEMICALS CAN DAMAGE THE DISPLAY SCREEN ANTI GLARE COATING.

DO NOT ATTACH SELF-ADHESIVE LABELS OR NOTES ON THE DISPLAY SCREEN SURFACES. THIS CAN DAMAGE THE ANTI-GLARE COATING.

The Primus Apex display screens (Primary Flight Display and Multi Function Display) must only be cleaned with the manufacturer's-recommended cleaning material (Isopropyl alcohol) and a clean microfiber cloth. Fold a clean microfiber cloth around a small piece of rigid (credit card sized) plastic, and ensure that the cloth covers the entire plastic. Use the Isopropyl alcohol to moisten the cloth, then wipe the screen carefully to remove dust and marks.

Clean the display bezel with a damp cloth and a minimum quantity of soap solution.

EXTENDED STORAGE

Prolonged out-of-service care applies to all airplanes which will not be flown for an indefinite period (less than 60 days) but which are to be kept ready-to-fly, with the least possible preparation. If the airplane is to be stored temporarily, or indefinitely, reference must be made to the AMM for the proper storage procedures, which are all time related and classified as follows:

Stage 1	Up to 7 days.
Stage 2	7 to 30 days.
Stage 3	30 to 90 days.
Stage 4	More than 90 days.

Stages 1 and 2 are considered as flyable storage status.

No special service care is required for Stage 1 other than the airplane is moored and properly grounded, all covers and blanks are fitted, and that the fuel tanks are full. The engine may be left in an inactive state, with no preservation protection, provided the engine is sheltered, humidity is not excessively high, and the engine is not subjected to extreme temperature changes that would produce condensation. Where possible, cover the windshield with a light cotton dust cover.

Stage 2 storage, begins after Stage 1 (7 days) has elapsed, and includes placing desiccant bags and humidity indicators in the engine exhaust stubs and behind the exhaust stub covers. A suitable means must be provided to view the humidity indicators with the stub covers installed. An engine inactive for up to 28 days requires no preservation provided all engine openings are sealed off and relative humidity in the engine is maintained at less than 40%.

At 7 day intervals:

Check the tire pressures.

Drain any water from the fuel system.

Check the humidity indicator, in the engine exhaust stubs, and replace the desiccant bags, if the humidity is in excess of 40%.

At 14 day intervals:

Move the airplane to prevent flat areas on the tires. Mark the tires with tape to ensure the tires are placed approximately 90 degrees from their previous position.

Stage 3 storage should be a planned situation, when the time difference can be foreseen but following on from the Stage 2, the engine fuel system would need to be preserved in accordance with the P&WC EMM. Remove the batteries and regularly check their state of charge.

At 30 day intervals:

Drain all fuel drain points and check for water accumulation. Prolonged storage of the airplane will result in a water build-up in the fuel which "leeches out" the EGME fuel additive. An indication of this is when an excessive amount of water accumulates at the fuel drain points. The concentration can be checked using a differential refractometer, but, it is imperative that the technical manual for differential refractometer be followed explicitly when checking the additive concentration.

Stage 4 is a definite planned exercise, when deterioration of the airplane must be considered. An engine inactive for over 90 days in the airframe, or removed for long term storage, must in addition to the Stage 3 procedure, have the engine oil drained and filled with preserving oil in accordance with the P&WC EMM.

To return the airplane to service, refer to the AMM for specific instructions.

CORROSION INSPECTION

If a flight to a Service Center imposes an operational burden, the following bi-weekly corrosion inspection may be carried out by the operator. Pilots must be trained by qualified maintenance personnel to identify corrosion and to understand the critical inspection areas. The training must be given to the corrosion inspection procedures as detailed in the AMM.

The inspection must be recorded in the aircraft flight log book.

If corrosion is evident or suspected, you must contact a Pilatus service center for further instructions.

GEOGRAPHICAL LOCATION AND ENVIRONMENT

The geographical location and environmental conditions can cause damage to the aircraft exposed to the conditions that follow:

- Marine atmospheres
- Moisture
- Acid rain
- Tropical temperatures
- Industrial chemicals
- Soil and dust in the atmosphere

Moisture is in the air as a gas, water vapor or as finely divided droplets of liquid. These forms of moisture contain chemicals such as chlorides, sulfates and nitrates. When the moisture evaporates the chemicals remain on the surfaces. The moisture and the chemicals can be trapped in joints. A capillary action can put moisture in to bond lines and cause corrosion.

Salt particles, when dissolved in water, form strong electrolytes. Sea winds carry the dissolved salt, on to the land and can make the coastal environments very corrosive.

The industrial chemicals that follow can cause corrosion:

- Carbon
- Nitrates
- Ozone
- Sulfur dioxide
- Sulfates.

These industrial chemicals cause damage to non-metallic materials and can cause severe corrosion of many metals.

Warm, moist air, usually in tropical climates can make the formation of corrosion a very quick process. Cold dry air, usually in cold climates makes the formation of corrosion a slower process.

Islands and areas near the sea are in severe corrosion zones.

CORROSION INSPECTION

Aircraft based/operated in severe climatic areas must be inspected every 14 days as follows:

- Wash the exterior surface of the aircraft
- Examine the aircraft skin, especially around the seams and fasteners
- Make sure all drain holes are clear
- Examine the landing gear compartments, specially the landing gear, wheels, tubing clamps and hydraulic actuators
- Examine the flight control surfaces, specially the bearings
- Examine all doors, specially the locks, handles and hinges.

Based on inspection results, the inspection interval can be increased to every 30 days. At this interval it is recommended that the aircraft is washed on a weekly basis.

SECTION 9

SUPPLEMENTS

TABLE OF CONTENTS

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GENERAL

This section provides information in the form of supplements for the operation of the airplane when equipped with optional equipment or systems which are not installed on the standard airplane. All of the supplements are EASA Approved and those that are applicable are part of this Handbook.

The information contained in each supplement applies only when the specific equipment or system is installed in the airplane.

SUPPLEMENTS LIST OF EFFECTIVE PAGES

Report. No.	Page No.	Rev. No.
02277/9/1	See Supplement	1
02277/9/2	See Supplement	3
02277/9/3	See Supplement	5
02277/9/4	See Supplement	4
02277/9/5	See Supplement	5
02277/9/6	See Supplement	3
02277/9/7	See Supplement	2
02277/9/8	See Supplement	1
02277/9/9	See Supplement	1
02277/9/10	See Supplement	1
02277/9/11	See Supplement	7
02277/9/12	See Supplement	0
02277/9/13	See Supplement	3
02277/9/14	See Supplement	0
02277/9/15	See Supplement	0
02277/9/16	See Supplement	0
02474	See Supplement	0

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PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 1
FOR
IAC AR CERTIFIED PC-12/47E AIRPLANES

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual for IAC AR certified PC-12/47E airplane. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Approved by:

This Airplane Flight Manual Supplement is approved by EASA on behalf of the Aviation Register of Interstate Aviation Committee (IAC AR)
Ref – P.EASA.CSV.A.01393

Date of Approval:

0 7 NOV 2008

Bundesamt für Zivilluftfahrt - Federal Office of Civil Aviation
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LIST OF EFFECTIVE PAGES

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LOG OF TEMPORARY REVISIONS

The incorporation of temporary revisions into this supplement are to be recorded on the sheet below. Instructions for the removal of temporary revisions will be given in the instruction sheet issued with revisions.

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
1 Mar 02, 2016		Certification Authority designation updated. Supplement 1 updated to new format; to include LOEP, LOTR and LOR.
	9-1-1	Title updated on Title Page.
	9-1-3	LOEP inserted.
	9-1-5	LOTR inserted.
	9-1-7	LOR inserted.
	9-1-9	Compliant statement updated.
	9-1-10	Equipment requirement text updated. Approved to fly text updated.
	9-1-6 thru 9-1-14	New pages.
		Revision No 1 to AFM 02277 Supplement No. 1 is approved under the authority of DOA ref. EASA.21J.357 Approval Date: 02 March 2016

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SECTION 1 – GENERAL

The Service Bulletin 04-011 lists the tasks which must be done to have the aircraft compliant to PC-12/47E IAC AR Type Design.

SECTION 2 – LIMITATIONS

FUEL

In addition to the fuels listed in the AFM, the following fuels can be used:

- RT
- TS-1.

NOTE

TS-1 is subject to the restrictions given in Pratt & Whitney Canada Service Bulletin SB No. 14004.

FLIGHT CREW LIMITS

Minimum required flight crew is one pilot in the left hand seat.

No passenger shall be allowed to occupy the right crew seat.

For commercial operations two pilots are required.

KINDS OF OPERATION EQUIPMENT LIST

Add the following column for operations in RVSM airspace to the kinds of operation equipment list.

SYSTEM / EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING
Primary Flight Display	1	1	2	2	2
ADF	1	1	1	1	1
DME	1	1	1	1	1
VOR	1	1	1	1	1
ELT 406 MHz	1	1	1	1	1
EGPWS with bank angle callout	1	1	1	1	1
WX	1	1	1	1	1
ATC Transponder	1	1	1	1	1
CVR	1	1	1	1	1
FDR (commercial operations)	1	1	1	1	1

Aircraft performing flights over hard-to-reach or sparsely populated regions or over vast water areas must be equipped with the emergency VHF radio or with portable ELT operating in the VHF/UHF range, COSPAS-SARSAT system, with a function of the emergency radio.

NOTE

Availability and installation of the emergency radio or of the portable ELT operating in the VHF/UHF range, COSPAS-SARSAT system, with a function of the emergency radio is the responsibility of the Operator.

For flights in areas not covered by VHF communications, the installation of HF Radio (Pilatus Option Part No. 500.21.12.003) is mandatory.

OUTSIDE AIR TEMPERATURE LIMITS

Operation on the ground is prohibited when the aircraft has been exposed to outside air temperatures below minus 35° C for more than 3 hours without the engine running.

OTHER LIMITATIONS

Aircraft operation is limited to dry and wet paved runways and surfaces with a minimum surface hardness of 8 kg/cm^2.

Maximum airfield elevation is 14000 feet.

Flights over an expanse of water must be performed within the gliding range of land.

Maximum allowed wind value limits:

During taxiing			50 kts	(26 m/s)
For take-off and landings:				
	Tailwind		10 kts	(5 m/s)
	Crosswind	Flap 0°	30 kts	(15 m/s)
		Flap 15°	25 kt	(13 m/s)
		Flap 30°	20 kts	(10 m/s)
		Flap 40°	15 kt	(8 m/s)

During en-route navigation without VOR/DME coverage, in case of GPS data not available, the pilot is required to confirm aircraft position with ATC not less than once each 30 minutes.

The aircraft is approved to fly on routes covered by ATC ground facilities operating transponders in RBS mode.

SECTION 3 – EMERGENCY PROCEDURES

No change.

SECTION 4 – NORMAL PROCEDURES

4.6 BEFORE TAXIING

7. PFD, MFD CAS	No flags or red warnings captions. Check PFD is showing metric altitude and baro correction.

4.8 BEFORE TAKEOFF

5. Flap	15° (For reduced Take-off distance flap 30° may be used).

Take-off and Landing techniques for operations from prepared unpaved surfaces are defined in AFM/POH Section 10 Operations from Prepared Unpaved Surfaces.

4.10 FLIGHT INTO KNOWN ICING CONDITIONS

WARNING

IF SEVERE ICING CONDITIONS ARE ENCOUNTERED, REQUEST PRIORITY HANDLING FROM AIR TRAFFIC CONTROL TO FACILITATE A ROUTE OR AN ALTITUDE CHANGE TO EXIT THE ICING CONDITIONS.

While exiting the severe icing conditions:

- With flap 0° maintain indicated airspeed above 155 kts
- With flap 15° maintain indicated airspeed above 135 kts
- Manoeuver with bank angles less than 30°
- Avoid sideslip
- Avoid more than half travel of aileron.

SECTION 5 – PERFORMANCE

The total landing distance obtained from the landing charts should be factored as follows:

Primary airfield	1.67
Secondary airfield	1.43.

SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in Section 6 of the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

SECTION 7 - DESCRIPTION

PRIMUS APEX

The avionics window on the Systems MFD provides the pilot with the capability to configure the barometric format to HPA and to enable the metric altitude digital readouts on the ADI and HSI. This is done by selecting the AVIONICS page on the Systems MFD lower left window and then on the SET UP tab selecting BARO CORRECTION to HPA and METRIC ALTITUDE to ENABLE.

PRIMUS APEX – MONITOR WARNING SYSTEM

NOTE

For normal operation the AURAL WARN INHBIT switch should not be selected to INHIBIT.

SECTION 8 - HANDLING, SERVICING AND MAINTENANCE

PARKING

For wind strengths greater than 30 m/s (53 kts) the aircraft must be parked in an area protected from the wind.

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PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 2

OPERATIONS IN COLD CONDITIONS

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E in cold conditions with the factory option installed. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Initially Approved by:

European Aviation Safety Agency (EASA)
EASA.A.A.01869

Revision 2 Approved under authority of DOA No. EASA.21J.357

Date of Approval: 14 Dec 2010

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
3 05.09.2016		Supplement updated to new format: added LOEP, LOTR and LOR.
		Editorial and layout changes.
	9-2-9 thru 9-10-12	115V Cold weather kit (SB 25-041 and SB 25-042) incorporated.
		The Revision Number 3 to AFM Supplement No. 2 is approved under the authority of DOA ref. EASA.21J.357.
		Approval Date: 05.09.2016

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SECTION 1 - GENERAL

This supplement provides the information necessary to operate the PC-12/47E aircraft in cold temperatures with the cold operation package factory option installed or with one of the following SBs incorporated:

- Post SB 25-034 for a 110V system
- Post SB 25-041 for a 115V system
- Post SB 25-035 or Post SB 25-042 for a 230V system.

SECTION 2 - LIMITATIONS

OTHER LIMITATIONS

OPERATIONS IN COLD CONDITIONS

Ambient ground temperature	0 to -15° C	Battery heater required
Ambient ground temperature	-15° C and below	Battery, engine and supplementary cabin heater required. External engine blanket recommended

A cabin underfloor temperature of -15° C or warmer is required prior to takeoff.

The aircraft must be clear of deposits of snow, ice and frost from the lifting and control surfaces immediately prior to takeoff.

PLACARDS

Near the Engine Heating electrical power connector:

110 VOLTS AC
ENGINE HEATER

OR

230 VOLTS AC
ENGINE HEATER

OR

115 VOLTS AC 60HZ
ENGINE HEATER

Near the Battery Heater electrical power connector:

110 VOLTS AC
BATTERY HEATER AND
CABIN POWER OUTLET

OR

230 VOLTS AC
BATTERY HEATER AND
CABIN POWER OUTLET

OR

115 VOLTS AC 60HZ
BATTERY HEATER AND
CABIN POWER OUTLET

SECTION 4 - NORMAL PROCEDURES

GENERAL

If the aircraft is to be parked outside for an extended period of time and the ambient ground temperature is expected to be:

0 to -15° C	Connect a 110/115 or 230 VAC (as placarded) ground power supply to the battery heater connector.
-15° C and below	Connect a 110/115 or 230 VAC (as placarded) ground power supply to the battery and engine heater connectors. Put a blanket cover over the engine. Put a supplementary heater in the center of the cabin.

For the 230 VAC system, the heater connector access doors must be opened and adapter cables installed. The adapter cables are contained in the aircraft flight bag.

PRE FLIGHT INSPECTION

Switch off and disconnect the ground power supply to battery and engine heaters. For the 230 VAC system, remove the adapter cables and stow them in the aircraft flight bag and close the heater connector access doors. Remove blanket cover from engine nacelle and supplementary heater from the cabin.

ENGINE STARTING

It is recommended to use external power procedure for engine starting, using a ground power unit capable of supplying 1000 ampere DC current.

After engine start at cold temperatures of below -15° C, maximum cabin heating should be selected and the temperature of the underfloor avionic bay monitored on the environmental window of the systems MFD, to observe a minimum temperature of above -15° C prior to commencement of flight.

SECTION 7 - SYSTEM DESCRIPTION

GENERAL

The factory option is available for 110/115 VAC and 230 VAC. The correct operation voltage is placarded adjacent to the connectors.

BATTERY HEATER SYSTEM

Description

A belt type heating element is wrapped around the outside of the batteries. A temperature sensor is attached to the aircraft skin and a wiring harness connects the temperature sensor to the batteries heating element and the external power connector. The wiring harness has an additional connector installed for the connection of a supplementary cabin heater. The connector and a power on indicator light are installed in the lower rear fuselage. The 230 V option has the connector and power on indicator light installed in a mounting box under an access door on the lower rear fuselage. The connector has a protective cap installed.

Operation

When AC power is supplied to the external connector the indicator light will come on and power is supplied to the temperature sensor and supplementary heater connector. The temperature sensor will supply power to the battery heating elements when the skin temperature of the aircraft goes below 0° C.

ENGINE HEATER SYSTEM

Description

Four wrap around type heating elements are installed on the engine at the following locations:

- on the LH side of the reduction gearbox
- on the RH side of the reduction gearbox
- on the LH side of the accessory gearbox
- on the underside of the fuel control unit.

A wiring harness routed down the left side of the engine connects the heating elements to an external power connector. The connector and a power on indicator light are installed in the lower front fuselage. The 230 V option has the connector and power on indicator light installed in a mounting box under an access door on the left lower front fuselage. The connector has a protective cap installed.

Operation

When AC power is supplied to the external connector the indicator light will come on and power is supplied to the four engine heating elements. An insulated engine cover is placed over the engine nacelle to assist in heat retention in the engine bay.

SUPPLEMENTARY HEATER

Supplementary ceramic element safety heater with a maximum rating of 1500 Watts is placed in the center of the aircraft cabin to provide heating. The cabin heater is connected to the connector on the battery heating element wiring harness.

CAUTIONS

FOR A 110/115 VAC SYSTEM, THE CABIN HEATER CONNECTOR IS LIMITED TO A MAXIMUM OF 1500W.

FOR A 230 VAC SYSTEM, THE CABIN HEATER CONNECTOR IS LIMITED TO A MAXIMUM OF 1850W.

DO NOT OVERLOAD, AS THIS MAY RESULT IN DAMAGE TO THE CONNECTOR AND WIRING.

DO NOT USE A SUPPLEMENTARY HEATER OF A DIFFERENT VOLTAGE RATING TO THAT PLACARDED ON THE AIRCRAFT.

A temperature sensor is installed under the cabin floor between frames 17 and 18. When configured for cold weather operations, the under floor temperature is displayed as part of the environment window of the systems MFD.

SECTION 8 - HANDLING, SERVICING AND MAINTENANCE

On the first use of the adapter cables the free end will need to be equipped with electrical connectors appropriate for the country of operation power supply.

SERVICING

At each aircraft inspection examine the battery and engine heating elements for damage and the wiring harnesses for security of attachment.

BATTERY SERVICING

Depending on the type of battery installed, a more frequent check of the fluid level maybe recommended, when using the battery heating system for long periods of time. Check the battery manufacturers information for any additional servicing requirements.

When removing and installing the battery from the battery box take care not to damage the heating element on the edges of the box. Small tears in the element can be repaired with RTV silicone. If any of the element wire is exposed the element should be replaced.

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PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 3
FOR
PC-12/47E REGISTERED IN CANADA

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E in Canada. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Approved by:

European Aviation Safety Agency (EASA)
EASA.A.A.01869

Date of Approval:

16.10.2009

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LOG OF TEMPORARY REVISIONS

The incorporation of temporary revisions into this supplement are to be recorded on the sheet below. Instructions for the removal of temporary revisions will be given in the instruction sheet issued with revisions.

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
3 May 08, 2012	- 9-3-6	Pages 9-3-1A thru 9-3-1G issued. Seat layout code updated. Approved under DOA No. EASA.21J.357
4 February 26, 2016	9-3-1B 9-3-1F 9-3-2	Update LOEP. Update LOR. Page number changed from 9-3-1G to 9-3-1F. Update page references. The Revision Number 4 to AFM Supplement No. 3 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 26.02.2016.
5 July 12, 2017	9-3-1B 9-3-1F 9-3-2 9-3-3 thru 9-3-9 9-3-10	Update LOEP. Update LOR. 17347 - Barometric VNAV limitation updated. Text run on (editorial). New page intentionally blank. The Revision Number 5 to AFM Supplement No. 3 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 12.07.2017.

SECTION 2 - LIMITATIONS

This supplement gives the information necessary for the operation of the aircraft in Canada with the Canadian Certification Factory Option Kit Part No. 500.21.12.040 or 500.21.12.039 installed, or Post Service Bulletin 04-010 which lists the aircraft tasks that must be done prior to the registration of the aircraft in Canada.

PC-12/47E CENTER OF GRAVITY LIMITS

Weight Pounds (kilograms)	Forward Limit A.O.D.: In. / M	Aft Limit A.O.D.: In. / M
10450 (4740)	232.20 / 5.898	240.43 / 6.107
9921 (4500)	232.20 / 5.898	240.94 / 6.120
9039 (4100)	227.49 / 5.778	241.63 / 6.143
7938 (3600)	227.49 / 5.778	243.06 / 6.172
6615 (3000)	227.49 / 5.778	243.06 / 6.172
5732 (2600)	227.49 / 5.778	-

PRIMUS APEX – FLIGHT MANAGEMENT SYSTEM

Page 2-29

Barometric VNAV guidance during approach including the approach transition, final approach segment, and the missed approach procedure is not temperature compensated. Unless a temperature limitation is reflected on the approach chart, operating at uncompensated minimum IFR altitudes will not provide expected terrain and obstacle clearance for temperatures below ISA.

Primus APEX Build 10 or higher - Barometric VNAV guidance during approach including the approach transition, final approach segment, and the missed approach procedure can be temperature compensated and minimum IFR altitudes will provide terrain and obstacle clearance for temperatures below ISA. Temperature can be compensated by the pilot by: entering the destination airport OAT into the FMW Tab for temperature compensation, calculate and crosscheck the corrected altitudes on the Waypoints list before activating the changes.

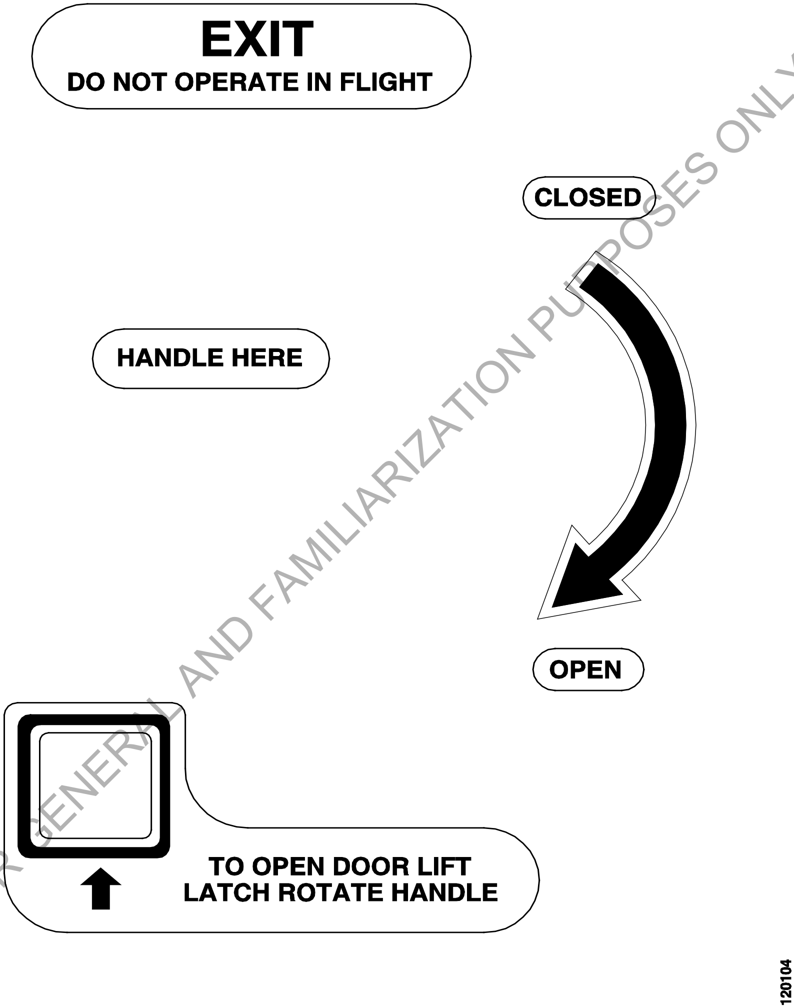
PRIMUS APEX – ADAHRS

Page 2-29

To operate the PC-12/47E within the Northern Domestic Airspace (NDA) of Canada with respect to the operational approvals for Global Positioning Systems (GPS), the current requirements are for a non GPS alternate. This will require a directional gyro. This directional gyro shall be able to operate in a free gyro mode (not slaved to magnetometer or GPS) when needed to meet the navigation requirements without the use of the GPS within NDA.

PLACARDS

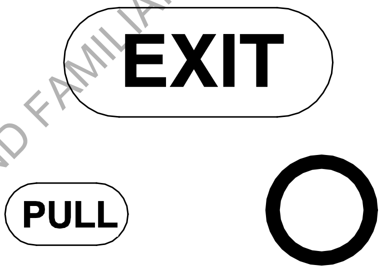
Luminescent placards on Interior of Cabin Door:



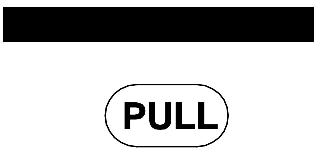
Luminescent placard on Interior of upper LH sidewall near Cabin Door:

Luminescent placard on Interior of upper RH sidewall near Emergency Exit:

Luminescent placards on Interior of Emergency Exit:



Luminescent placards underneath cover on Emergency Exit:



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Luminescent placards on rear of LH forward bulkhead:

ELT LOCATED IN THE UN-PRESSURISED REAR FUSELAGE

OPERATING INSTRUCTIONS:

ARM: TO ARM ELT FUNCTION
ON: TO ACTIVATE ELT FUNCTION
OFF: TO DE-ACTIVATE ELT FUNCTION

Placard near ELT remote control switch:

FOR AVIATION EMERGENCY USE ONLY
UNAUTHORIZED OPERATION PROHIBITED

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SECTION 4 - NORMAL PROCEDURES

4.4 BEFORE STARTING ENGINE

Additional item:

19a. Before first flight of the day:

Trim interrupt switch	INTR
Pitch trim switch	OPERATE. Check trim interrupted
Trim interrupt switch	NORM and guarded

SECTION 6 - WEIGHT AND BALANCE

Refer to POH Section 6, Interior Configurations and then to the applicable Interior Code No. for seat locations, permitted seat Part Nos. that can be installed, seat weight and moment charts and seat occupant moment charts.

The following Interior Configurations are approved for PC-12/47E use in Canada:

Corporate Commuter Interior Code STD-9S (9 single seats)

Corporate Commuter Interior Code STD-6S-3B (6 single seats and a 3 seat bench)

Executive Interior Code EX-6S-2 (6 single seats)

Executive Interior Code EX-4S-3B (4 single seats and a 3 seat bench)

Executive Interior Code EX-4S-STD-4S (4 single executive seats and 4 single standard seats)

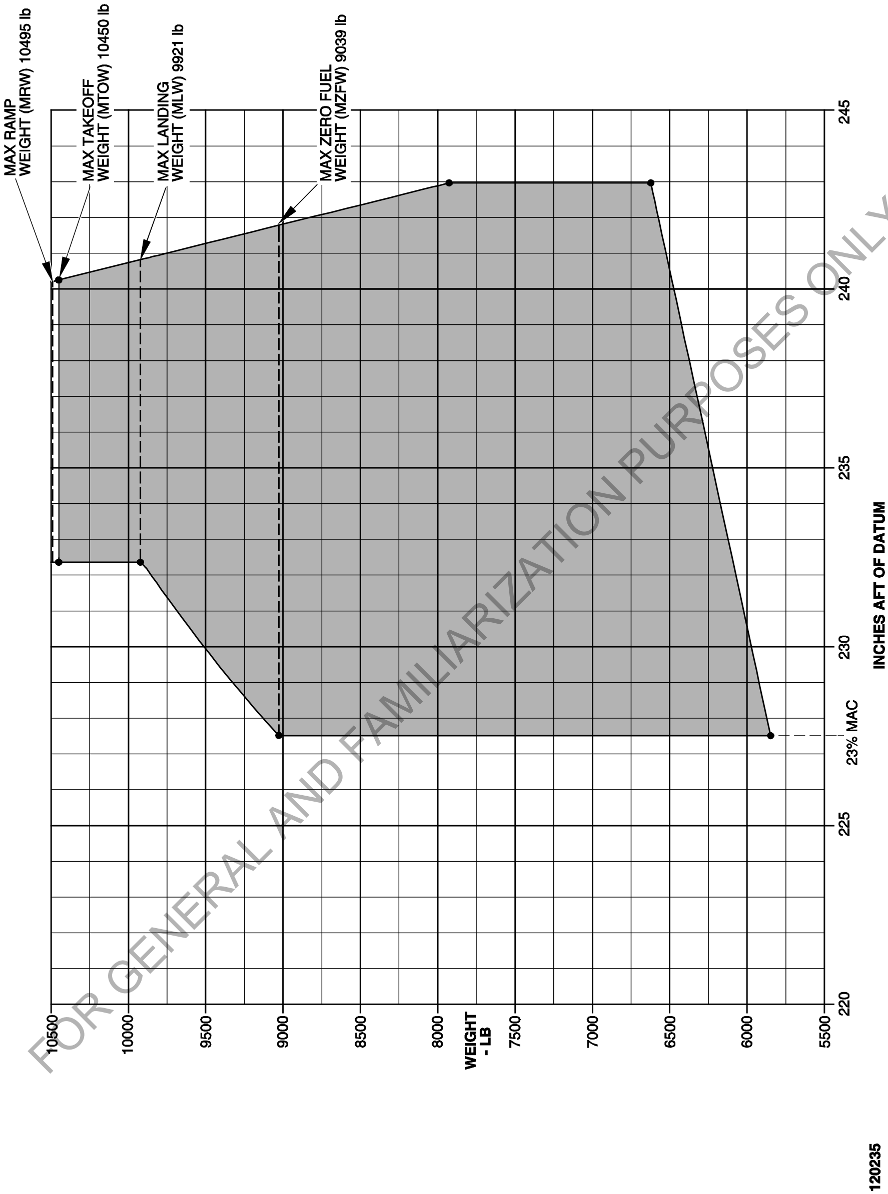

Figure 6-9. C. G. Envelope (lb)
(Sheet 1 of 2)

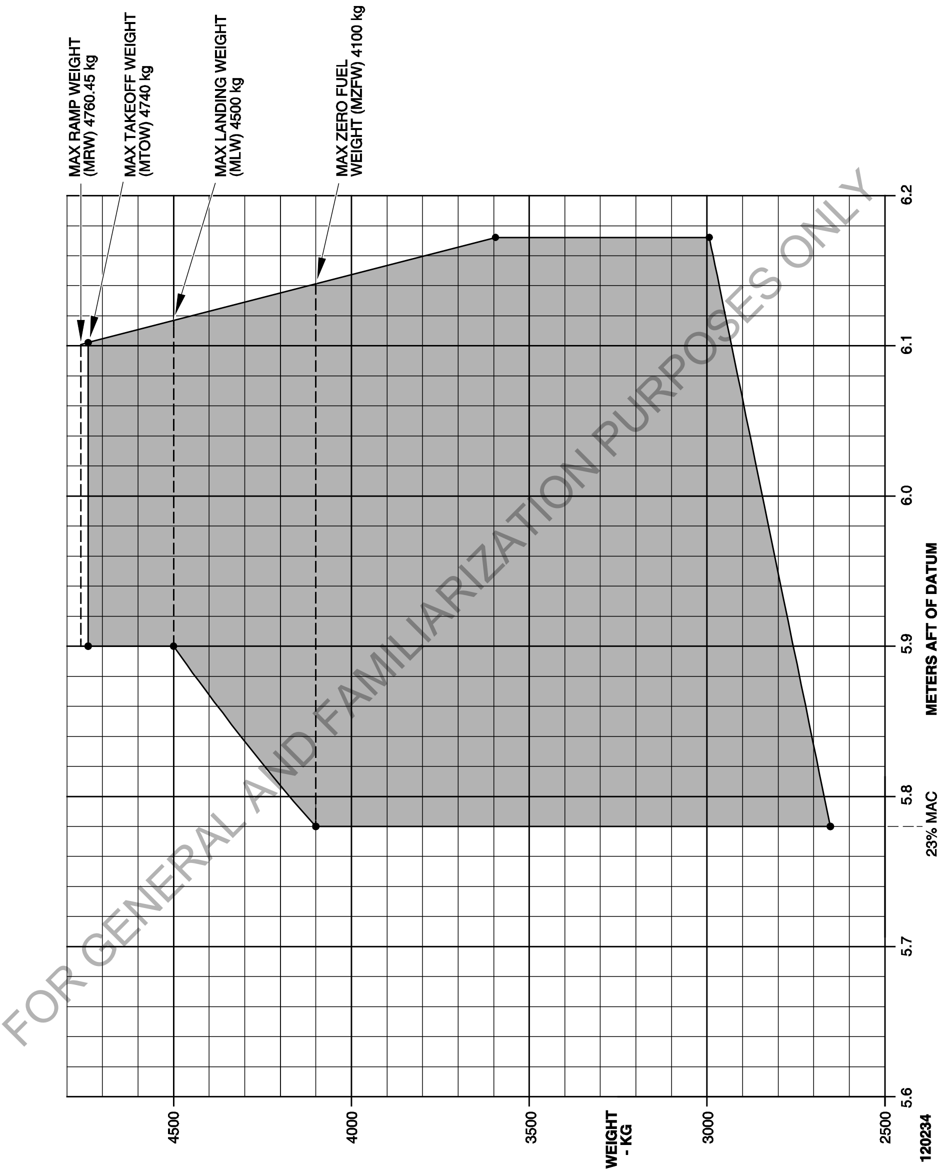

Figure 6-9. C. G. Envelope (kg)
(Sheet 2 of 2)

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PILOT'S OPERATING HANDBOOK AND FOCA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 4 FOR AIRCRAFT WITH RVSM CAPABILITY

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E with RVSM capability. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

FAA approved for U.S. registered aircraft in accordance with FAR 21.29.

Approved by:

European Aviation Safety Agency (EASA)
Ref – EASA.A.C.10685

Date of Approval: 0 2 JUN 2009

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LIST OF EFFECTIVE PAGES

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
3 26.02.2016	 9-4-3 9-4-5 9-4-7 9-4-12 9-4-14	Complete Supplement re-issued to give standard format. Editorial changes. LOEP added. LOTR added. LOR added. Para references to APEX headings corrected. Para references corrected. Revision Number 3 to AFM Supplement No. 4 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 26.02.2016
4 06.01.2020	9-4-3 9-4-7 9-4-10	LOEP updated. LOR updated. 20566 - Editorial (updated effectivity). Revision Number 4 to AFM Supplement No. 4 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 06.01.2020

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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12-47E aircraft in Reduced Vertical Separation Minimum (RVSM) airspace.

SECTION 2 – LIMITATIONS

This aircraft has been evaluated in accordance with JAA Administrative and Guidance Material, Section One, General Part 3, Temporary Guidance Leaflet No.6, Revision 1 and FAA document No. 91-RVSM, change 2 and is qualified for RVSM operations as a group aircraft.

NOTE

Airworthiness Approval alone does not authorize flight into airspace for which an RVSM Operational Approval is required by an ICAO regional navigation agreement. Operational Approval must be obtained in accordance with applicable operating rules.

For aircraft MSN 545, 1001 – 1100 Pilatus Service Bulletins 34-018 and 45-001 must be embodied to make the aircraft RVSM capable.

The following equipment must be operational to enter RVSM airspace:

- Both ADC channels of ADAHRS KSG 7200 (channel 1 & 2)
- One (1) flight controller KMC 9200 with altitude pre-selector
- One (1) automatic flight control system (AFCS) with altitude hold
- One (1) altitude reporting transponder KXP 2290.

The Electronic Standby Instrument System (ESIS) does not meet RVSM performance requirements and shall only be used for emergency procedures.

The RVSM option in the PRIMUS APEX option file has to be activated. Contact Pilatus customer support for further proceeding.

KINDS OF OPERATION EQUIPMENT LIST

Add the following column for operations in RVSM airspace to the kinds of operation equipment list.

SYSTEM / EQUIPMENT	RVSM
PRIMUS APEX	
Pilot PFD	1
MFD	1
Modular Avionics Unit (MAU) CH A&B	1
PFD Controller	1
MF Controller	1
Audio Marker Panel	1
ADAHRS Channels	2
Magnetometer	1
MMDR (COM/NAV)	1
Mode S Transponder	1
GPS	1
DME	1
Miscellaneous Instruments	
Clock (not required with APEX Build 10 and up)	1
Electronic Standby Instrument (ESIS)	1
Standby Magnetic Direction Indicator (ESIS Heading (MSN 1271 - 1942 / SB 34-042) OR Magnetic Compass E2B)	1
Engine	
No. 1 Generator	1
No. 2 Generator	1
Inertial Separator	1
Engine Driven Low Pressure Fuel Pump	1
Electric Wing Tank Fuel Boost Pump	2
Firewall Fuel Shutoff Valve	1
FCU Manual Override System	1
Torque Limiter	1
Ignition System	1
Fire Detect System	1
Electrical	
No. 1 Battery	1
No. 2 Battery	1
Stall Warning/Stick Pusher System	1
AOA Probes	2
CAS	1
Longitudinal (Stab) Trim System	1
Alternate Stab Trim System	1
Lateral Trim System	1
Directional Trim System	1
Trim Interrupt System	1

SYSTEM / EQUIPMENT	RVSM
Windshield Heat	2*
Position Lights	3
Strobe Lights	2
Landing Lights	2
Taxi Light	1
Instrument and Panel Lighting	AR
Audio System	1
Cockpit Speaker	1
Cabin Speaker	1
Deice Boot Timer	0
AOA Heater LH	1
AOA Heater RH	1
Probe Current Monitor	1
Propeller Deice Timer	0
Propeller Deice Brush	0
Propeller Deice MOV	0
Propeller Deice Boots	0
Propeller Deice OAT Sensor	0
Left Wing Inspection Light	0
Mechanical Systems	
Landing Gear Actuation System	1
Emergency Gear Extension System	1
Flap Control	1
Flap Interrupt System	1
Seat Restraints (each occupant)	AR
Firewall ACS Shutoff Valve	1
Emergency Ram Air Scoop	1
Negative Pressure Relief Valve	2
Oxygen System	1
Deice Boot PRV	1
Deice Boot EFCV's	1
Deice Boot Pressure Switches	0
Deice Boot, Inner Wing LH	1
Deice Boot, Outer Wing LH	1
Deice Boot, Inner Wing RH	1
Deice Boot, Outer Wing RH	1
Deice Boot, Tail LH	1
Deice Boot, Tail RH	1
Fuel Control & Monitoring System	1
For Pressurized Flight	
ACS	1
Cabin Pressure Control Unit	1
Outflow Valve	1
Safety Valve	1

*Refer to Section 2 System and Equipment Limits – Heated Windshield of the basic approved AFM for the actual limitation.

SECTION 3 – EMERGENCY PROCEDURES

The emergency procedures are the same as those in the basic approved AFM, except as follows:

3.22 APEX FAILURES

3.22.10 ADC FAILURES

Indication: CAS caution – ADC A Fail

Add:

4. Determine aircraft altitude using ADAHRS 2 source.
5. Cross-check aircraft altitude using ESIS. Record each altimeter reading. The differences between the operating ADAHRS 2 altimeter and the standby altimeter readings should be noted for use in additional contingency situations. Repeat procedure each hour.
6. Inform Air Traffic Control to facilitate a route or an altitude change to exit RVSM airspace.

NOTE

Pilots should be aware of any national RVSM contingency procedures for loss of redundancy of primary altimetry systems.

Indication: CAS caution – ADC B Fail

Add:

4. Determine aircraft altitude using ADAHRS 1 source.
5. Cross-check aircraft altitude using ESIS. Record each altimeter reading. The differences between the operating ADAHRS 1 altimeter and the standby altimeter readings should be noted for use in additional contingency situations. Repeat procedure each hour.
6. Inform Air Traffic Control to facilitate a route or an altitude change to exit RVSM airspace.

NOTE

Pilots should be aware of any national RVSM contingency procedures for loss of redundancy of primary altimetry systems.

Indication: CAS caution – ADC A+B Fail

Add:

3. Monitor and maintain assigned altitude by using ESIS.
4. Inform Air Traffic Control to facilitate a route or an altitude change to exit RVSM airspace.

NOTE

Pilots should be aware of any national RVSM contingency procedures for loss of redundancy of primary altimetry systems.

ABNORMAL PROCEDURES

3A.4 PRIMARY ALTIMETER DIVERGE BY 200 FEET OR MORE

A. If able to identify defective altimetry system [(1)]:

1. Determine aircraft altitude using operating ADAHRS channel.
2. Disengage autopilot and flight director.
3. Select operating ADAHRS channel, using the flight director couple select switch (L/R).
4. Re-engage autopilot and flight director.
5. Perform appropriate national RVSM contingency procedures for loss of redundancy of primary altimeters.

B. If unable to determine accuracy of either altimetry system, perform appropriate national RVSM contingency procedures for loss of all primary altimetry systems.

NOTE

[(1)] The copilot's and ESIS share a common static source. Therefore the ESIS should not be used in determining which altimetry system is defective.

3A.5 LOSS OF AUTOPILOT ALTITUDE HOLD FUNCTION IN RVSM AIRSPACE

A. Ensure altitude hold function of autopilot is disengaged.

B. Maintain assigned altitude manually.

C. Perform appropriate national RVSM contingency procedures for loss of altitude hold capability.

SECTION 4 – NORMAL PROCEDURES

4.3 PREFLIGHT INSPECTION

In addition to the normal preflight inspection procedures in the basic approved AFM, also add the following:

4.3.1 EMPENNAGE

Change:

7. Static ports and skin inspection CHECKED (2)

NOTE

(2) Visually inspect the static port plates and an area 18" fwd, 6" aft, 8" above, 6" below the plates (static port RVSM critical area). No paint ridges or flanking shall be allowed near the static port plate. Verify that there is no corrosion, elongation, deformation of the static port areas and ensure that no foreign matter is found within the static port orifice.

4.12 CRUISE

In addition to the normal cruise procedures in the basic approved AFM, also add the following:

CRUISE WITHIN RVSM AIRSPACE

1. Cross-check altimeters maximum differences 200 ft (3)
2. Altimeters Record indicated altitudes (4)
3. Autopilot / Altitude Hold Verify altitude hold within ±65 ft(5)

NOTE

3) Ensure matched altimeter baro-settings (STD).

(4) Record pilot, co-pilot and ESIS readings in the flight plan master log upon entering RVSM airspace and each hour thereafter while in RVSM airspace for contingency situations.

(5) The flight director couple select switch (L/R) ensures that the autopilot and transponder are coupled to the same ADAHRS channel.

SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

No change.

SECTION 7 - AIRPLANE AND SYSTEMS DESCRIPTION

No change.

SECTION 8 - HANDLING, SERVICING, AND MAINTENANCE

No change.

SECTION 9 - SUPPLEMENTS

No change.

SECTION 10 - SAFETY AND OPERATIONAL TIPS

No change.

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 5
FOR AIRCRAFT WITH
LOCALIZER PERFORMANCE WITH VERTICAL (LPV) GUIDANCE
AND/OR
LOCALIZER PERFORMANCE (LP)
APPROACH CAPABILITY

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E with LPV/LP Approach capability. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Approved by:

European Aviation Safety Agency (EASA)
EASA.0010004233-001

Date of Approval:

27 July 2010

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LIST OF EFFECTIVE PAGES

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description	
1 30 Jun, 2010		Complete Supplement re-issued. FOCA signature date: 27 July 2010	
2 30 Jul, 2011	9-5-3 9-5-5 9-5-7 9-5-8 thru -10	LOEP issued. LOR issued. Post SB 34-032 added. Mode 5 alert sentence added. EGNOS limitations added. Page run-on. Approved by EASA under Project No. 0010010689-00001: EASA signature date. 23 Sep 2011	
3 28 Jun 2013	9-5-3 9-5-5 9-5-7	LOEP issued. LOR issued. Reference to EASA AMC 20-28 added. The Revision number 3 to the AFM Supplement No. 5 is Approved under the authority of DOA ref. EASA.21J.357. Approval date: 08.07.2013.	13246
4	9-5-3 9-5-5 9-5-7 thru -12	LOEP issued. LOR issued. Decision height limitation for EGNOS LPV approach restricted to Apex Build 6, 7 or 8 aircraft. Sections repositioned to be on separate pages.	15165
5 12 Jul, 2017	9-5-1 9-5-3 9-5-5 9-5-7 thru -11 9-5-11 9-5-12 thru -14	Title updated to include LP Approach. LOEP updated. LOR updated. LP Approach information added. Changed “Green APR” to read “Green APP”. Updated Section 7 to include LPV/LP Approach information. The Revision number 5 to the AFM Supplement No. 5 is Approved under the authority of DOA ref. EASA.21J.357. Approval date: 12.07.2017	16616

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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12-47E aircraft with Localizer Performance with Vertical (LPV) Guidance or Localizer Performance (LP) Functionality as factory options installed.

LPV Approach is an option available for aircraft that have a PRIMUS APEX BUILD 6 and higher avionics suite installed.

LP Approach is an option available for aircraft that have a PRIMUS APEX BUILD 11 and higher avionics suite installed.

LPV/LP Approach:
The installed SBAS GNSSU and Honeywell PRIMUS APEX avionics suite complies with FAA AC 20-138A (LPV Approach), FAA AC 20-138D (LP Approach), FAA AC 90-107 (aircraft and systems requirements) and EASA AMC 20-28 for navigation using GPS with WAAS or EGNOS (within the coverage of a Satellite-Based Augmentation System complying with ICAO Annex 10) for en route, terminal area, non-precision approach operations (including “GPS”, “or GPS”, and “RNAV” approaches), approach procedures with vertical guidance (including “LNAV/VNAV” and “LPV”). The Primus APEX Suite complies with AC20-129 for Baro VNAV.

For all aircraft the relevant Primus Apex option SBAS function has to be activated in the APM options file.

A detailed description of the system operation can be found in the Honeywell PRIMUS APEX Integrated Avionics System for the Pilatus PC-12 NG - Pilots’s Guide.

LPV Approach -PRIMUS APEX BUILD 6 and higher
For aircraft with TAWS Class A (EGPWS) installed, mode 5 alert “below glideslope” is not provided for LPV approaches.

LPV Approach - PRIMUS APEX BUILD 10 and higher
For aircraft with TAWS Class A (EGPWS) installed with -30 software or higher, mode 5 alert “below glideslope” is provided for LPV approaches.

SECTION 2 – LIMITATIONS

A valid and compatible database must be installed and contain current data.

For autopilot coupled LPV/LP approaches the autopilot must be disengaged below 200ft AGL.

If NAV preview is selected, LPV/LP approach will not be available. Use of NAV preview functionality will cause an amber “LPV UNVL” or “LP UNVL” message to be displayed.

Additional limitations for operation within EGNOS coverage area:

- For aircraft with TAWS Class A (EGPWS) installed and Primus APEX Build 6, 7 or 8 the mode 5 alert “below glideslope” is not available for LPV approaches and therefore the LPV lowest decision height is limited to 250ft.
- When an alternate airport is required by the applicable operational rules, it must be served by an approach based on other than GPS navigation.

SECTION 3 – EMERGENCY PROCEDURES

EMERGENCY PROCEDURES

No Change

ABNORMAL PROCEDURES

1. If PRIMUS APEX avionics suite GPS navigation information is not available or invalid, utilize remaining operational navigation equipment as appropriate.

2. Degradation of Approach Capability (amber "LPV UNVL" or "LP UNVL" message) in the terminal or initial approach phase of flight (prior to FAF). Descent to LPV/LP minima is not allowed.

   LPV Approach:
   - On STAR/Landing page (RNAV tab) select LNAV/(VNAV) minima.
   - Brief new LNAV or LNAV/VNAV approach (or different approach type), as applicable
   - Set minimum accordingly

   LP Approach:
   - Choose different navigation type/source, or initiate a Go-Around

3. Degradation of Approach Capability (amber "LPV UNVL" or "LP UNVL" message) on the final approach segment (after FAF). Descent to LPV/LP minima is not allowed. Vertical guidance information is not provided.
   - If runway threshold is visible continue approach by using visual references.
   - If runway threshold is not visible proceed as follows:

     LPV Approach:
     - Descent to LNAV minimum is allowed if "DGRD" message is not displayed
     - If below LNAV minimum, initiate a Go-Around and follow published standard missed approach procedure as long as "DGRD" message is not displayed. If "DGRD" message is displayed, avoid obstacles with remaining operational navigation equipment as applicable.

     LP Approach:
     Initiate a Go-Around and follow published standard missed approach procedure as long as "DGRD" message is not displayed. If "DGRD" message is displayed, avoid obstacles with remaining operational navigation equipment as applicable.

4. Predicted Degradation of Approach capability ("PREDICT LPV UNAVAIL" or "PREDICT LP UNAVAIL" message on the INAV). The predicted performance of the navigation system is not sufficient to conduct approach to LPV/LP minimum.
   - Select other approach or continue with LPV/LP approach
   - If LPV/LP approach is continued then monitor the LPV/LP status indication. Revert to applicable procedures in case the "LPV UNVL" or "LP UNVL" message is displayed.

SECTION 4 – NORMAL PROCEDURES

1. DETAILED OPERATING PROCEDURES

LPV Approach:
Normal operating procedures are described in the PRIMUS APEX Integrated Avionics System for the PC-12E Pilot's Guide, P/N D200701000011-REV 2, or later appropriate revision.

LP Approach:
Normal operating procedures are described in the PRIMUS APEX Integrated Avionics System for the PC-12E Pilot's Guide, P/N D201703000010-R000, or later appropriate revision.

2. OPERATING PROCEDURES FOR APPROACH TO LPV/LP MINIMUM

- Retrieve approach chart for the RNAV approach
- Select RNAV approach on the STAR/Landing FMW page
- Verify LPV/LP minimum is selected in the RNAV minimum field
- Compare FMS Flightplan to approach charts (Approach name, Waypoints, Altitudes, Missed Approach)

NOTE

If INAV message "FMS-LPV miscompare" or "FMS-LP miscompare" is displayed reloading of the approach is required

- Set Minimums for the selected approach
- Verify FMS is selected as Primary NAV source
- Verify NAV preview is deselected
- If terminal area is entered, a white LPV or LP status indicator will appear on PFD
- If the FAF is the active waypoint or the present position is within 5 nm from the FAF, the vertical deviation pointer (right hand side of the vertical deviation scale) will be displayed as hollow or a solid pointer (Refer to Section 7 for System Description).
- Arm the approach mode by pressing the APR button on the Flight Guidance Panel as required.

NOTE

The autopilot lateral approach mode (NAV) must be captured before the vertical approach mode (VGP).

- Intercept Final Approach Course
- Capture LPV/LP approach using the lateral and vertical deviation pointers. The LPV/LP status indicator will flash for 5 seconds and turn green.

NOTE

LPV/LP can be captured within 2 nm miles from the FAF. Green APP indication will be displayed on the HSI.

- Verify NAV and VGP are the active autopilot modes (if required)
- LPV Approach:
  Continue approach to LPV minimum by using lateral and vertical deviation pointers
- LP Approach:
  Continue approach to LP minimum by using lateral deviation pointer and baro altitude to comply with published approach procedure (vertical deviation pointer is advisory only)
- Monitor the LPV/LP status indicator
- Disengage autopilot below 200ft

3. FLIGHT DIRECTOR/AUTOPILOT COUPLED OPERATION

The LPV/LP approach mode can be armed via the APR button on the Flight Guidance Panel as soon as the vertical deviation pointer "LPV" or "LP" is displayed on the PFD. The autopilot approach modes are displayed as NAV (lateral) and VGP (vertical).

SECTION 5 PERFORMANCE

No change.

SECTION 6 WEIGHT AND BALANCE

No change.

SECTION 7 AIRPLANE AND SYSTEMS DESCRIPTION

PRIMUS APEX – OPTIONAL LPV/LP APPROACH

DESCRIPTION

The SBAS GNSSU provides GPS position corrected by the SBAS providing improved accuracy and integrity. Refer to the Primus Apex Comms and Nav – GPS section for a description of the SBAS GNSSU.

The RNAV approach to LPV/LP minimum may be selected on the Flight Management Window (FMW) STAR/Landing page. If the Final Approach Segment data block is available for any selected RNAV approach then the LPV/LP minimum selection will be displayed by default. The pilot can change the RNAV minimum if required. The selection of LNAV(/VNAV) is only meant to de-select the LPV/LP approach, since landing minima is set manually using the MINIMUMS knob on the Flight Guidance Panel (FGP).

PILOT'S DISPLAY

The SBAS GNSSU information is displayed on the Primary Flight Display (PFD) and Multi Functional Display (MFD).

The LPV/LP status indicator provides the following information to the pilot.

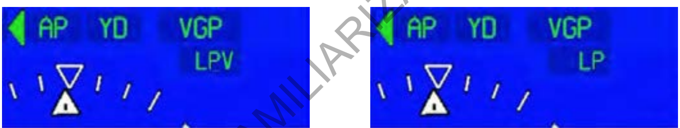
White (arm)

The LPV/LP approach status is indicated on the LPV/LP status field. The LPV/LP status field is located below the flight director vertical mode display as shown below.

LPV and LP Approach Status Display Armed

Green (active)

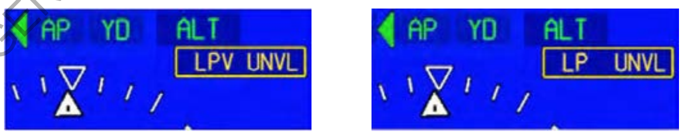
LPV or LP is displayed in green on the PFD when LPV/LP status is active and the aircraft is within the approach area



LPV and LP Approach Status Display Active

Amber ("LPV UNVL" or "LP UNVL")

LPV UNVL or LP UNVL is displayed in amber when the pilot loads an RNAV approach to LPV/LP minimums, but an error has been detected or the pilot selected a NAV preview outside the approach area or VGP was not armed nor captured.



LPV and LP Approach Status Display Unavailable

Vertical Deviation Display

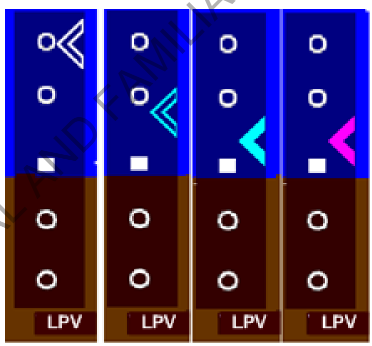
Vertical deviation information is displayed on the right side of the Attitude Direction Indicator (ADI) sphere next to the altitude tape. The Vertical deviation display provides the pre-approach and approach path deviation.

For LPV the approach path deviation is provided by the SBAS GNSSU.

For LP approach Baro-VNAV is used to provide vertical deviation indication. The LP vertical guidance is advisory only and pilots must use the barometric altimeter as the primary altitude reference. This is to ensure compliance with any and all altitude restrictions during instrument approach operations.

LPV Approach

The vertical deviation pointers displayed during a standard LPV approach are shown below. The left picture shows the ghost preview pointer displayed along with any vertical AFCS mode except VGP. The next picture shows the armed ghost preview pointer displayed when the next leg is not the FAF and the corresponding AFCS mode is VGP armed mode. The next picture shows the armed approach pointer displayed when the active leg is to the FAF and the corresponding FD mode is VGP armed mode. The right picture shows the approach pointer displayed when the approach capture criteria are met and the corresponding FD mode is VGP active mode.



Vertical Deviation Pointers During Standard LPV Approach

LP Approach

The vertical deviation pointers displayed during a LP approach are identical to a Baro-VNAV approach.

PILOT'S OPERATING HANDBOOK
AND
FOCA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 6
FOR
PC-12/47E REGISTERED IN THE REPUBLIC OF ARGENTINA

This supplement is approved in accordance with the paragraph 21.29 of the DNAR 21 for Argentine registered aircraft and is approved by EASA on behalf of the Administracion Nacional de Aviacion Civil (ANAC).

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E in the Republic of Argentina.

The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Approved by:

European Aviation Safety Agency (EASA)
Ref – P-EASA.CSV.A.01459

Date of Approval:

22 SEP 2009

Bundesamt für Zivilluftfahrt - Federal Office of Civil Aviation - BERN

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LIST OF EFFECTIVE PAGES

Page No	Rev No.	Page No.	Rev No.
9-6-1	0		
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9-6-8 and 9-6-9	1		
9-6-10	3		
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9-6-14	3		
9-6-15 thru 9-6-24	1		

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LOG OF TEMPORARY REVISIONS

The incorporation of temporary revisions into this supplement are to be recorded on the sheet below. Instructions for the removal of temporary revisions will be given in the instruction sheet issued with revisions.

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
1 01.09.2014	9-6-2 thru 9-6-24	Alternate placards added. Structure completely revised. New LOEP, LOTR and LOR. Editorial and layout changes. The Revision Number 1 to AFM Supplement No. 6 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 23. September 2014
2 18.03.2016	9-6-3 9-6-7 9-6-10 9-6-11 thru 9-6-13	LOEP updated. LOR updated. Additional placard shown. Effectivity added. Page run on. The Revision Number 2 to AFM Supplement No. 6 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 18.03.2016.
3 06.01.2020	9-6-3 9-6-7 9-6-10 9-6-14	LOEP updated. LOR updated. 19880 - Editorial (Changed "cabin door" to "passenger door") 20566 - Editorial (effectivity updated). 19880 - Editorial (Changed "cabin door" to "passenger door") The Revision Number 3 to AFM Supplement No. 6 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 06.01.2020.

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20566

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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12-47E aircraft in the Republic of Argentina.

SECTION 2 – LIMITATIONS

On airplanes registered in the Republic of Argentina, the necessary equipment for the different kinds of operations must comply with the applicable Argentinean Regulations.

GLOBAL POSITIONING SYSTEM

The pilot is not authorized to use the Global Positioning System (GPS) for precision approach and landing.

EMERGENCY LOCATOR TRANSMITTER

The Emergency Locator Transmitter (ELT) must comply with RAAC 91.207.

EXTERNAL PLACARDS

On exterior of passenger door (MSN 1001 – 1575):

TIRE DE LA MANIJA
Y GIRE PARA ABRIR

NO ABRIR LA PUERTA
CON EL MOTOR EN MARCHA
EXCEPTO EN EMERGENCIA

ABRIR

On exterior of passenger door (MSN 1576 - 1942):

PRESIONE AQUI PARA ABRIR
TIRE DE LA MANIJA Y
TIRE DE LA PUERTA HACIA AFUERA

NO ABRIR LA PUERTA
CON EL MOTOR EN MARCHA
EXCEPTO EN EMERGENCIA

On exterior of cargo door:

PRESIONE AQUI PARA ABRIR TIRE DE LA MANIJA Y TIRE DE LA PUERTA HACIA AFUERA NO ABRIR LA PUERTA CON EL MOTOR EN MARCHA EXCEPTO EN EMERGENCIA

TIRAR PARA ABRIR

On exterior of emergency exit:

SALIDA DE EMERGENCIA

EMPUJE

EMPUJE HACIA ADENTRO DESPUES DE SOLTAR

Near the static ports:

PRESION ESTATICA MANTENER LIMPIO

On each side of the rudder:

NO EMPUJAR

Inside the left engine cowling:

<u>ACEITE PARA TURBINA</u> ACEITES ACEPTABLES VER P+W SB 14001 CAPACIDAD TOTAL DEL SISTEMA 14.5 QRT 13.5 LTR

TIPO DE ACEITE DE MOTOR UTILIZADO,
--
NO MEZCLAR DISTINTOS TIPOS DE ACEITE

On the nose landing gear:

TIERRA
A//C GND

DO NOT TURN BEYOND RED MARKS
NO GIRAR MAS ALLA DE LAS MARCAS ROJAS

Near the fuel filler each side:

PUNTO DE CONEXION PARA
RECARGA DE COMBUSTIBLE

COMBUSTIBLE:
ASTM-D-1655 JET A, JET A-1 Y JET B
(ESPECIFICACION CPW 204)
CAPACIDAD TOTAL
770 LTS 203 US GAL
CAPACIDAD UTILIZABLE
761 LTS 201 US GAL
USAR ADITIVO ANTI-HIELO
CONFORME A MIL-I-27686

On the top surface of each aileron and three places on the top surface of each flap:

NO EMPUJAR

On the main landing gear doors:

PRESION DE NEUMATICO 60 PSI

On the nose landing gear doors:

PRESION DE NEUMATICO 60 PSI

Near the external power connector:

28 VDC TOMA EXTERNA

CABIN PLACARDS

The following placards are installed in all aircraft.

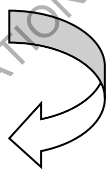
On interior of passenger door:

SALIDA/EXIT
NO UTILIZAR EN VUELO
DO NOT OPERATE IN FLIGHT

NO ABRIR LA PUERTA CON EL MOTOR EN MARCHA EXCEPTO EN EMERGENCIA
DO NOT OPEN DOOR WHEN ENGINE IS RUNNING UNLESS IN EMERGENCY

CERRADO
CLOSED

SOLO UNA PERSONA A LA VEZ EN LAS ESCALERAS
ONLY ONE PERSON ON STAIRS AT ANY TIME



PARA ABRIR LEVANTAR EL CERROJO Y ROTAR LA MANIJA
TO OPEN LIFT LATCH ROTATE HANDLE

ABIERTO
OPEN

PRESIONE BOTON PARA LUZ DE CABINA
PUSH BUTTON FOR COCKPIT DOME LIGHT

On interior of emergency exit:

SALIDA / EXIT

On interior emergency exit handle:

TIRE / PULL

On interior cargo door handle cover:

NO QUITAR LA CUBIERTA EN VUELO
DO NOT REMOVE COVER IN FLIGHT

On interior cargo door handle:

LEVANTAR LA PALANCA DE TRABA, TIRAR DE LA
MANIJA Y EMPUJAR LA PUERTA HACIA AFUERA
LIFT LOCKING LEVER AND PULL HANDLE PUSH DOOR OUT

On interior of cargo door:

NO ABRIR LA PUERTA CON EL MOTOR
EN MARCHA EXCEPTO EN EMERGENCIA
DO NOT OPEN DOOR WHEN ENGINE
IS RUNNING UNLESS IN EMERGENCY

On the forward and rear cargo door frame:

MAXIMO PESO DE CARGA = 1500 kg / 3300 lb

Carga Maxima Sobre Rieles de Asientos	Carga Maxima Sobre Los Paneles De Piso
1000 kg/m^2	600 kg/m^2
205 lb/ft^2	125 lb/ft^2

LA CARGA NO DEBE OBSTRUIR EL ACCESO
A LA PUERTA DE CABINA Y
SALIDA DE EMERGENCIA

On lower cargo door frame:

INSTALAR EL SOPORTE DE COLA
ANTES DE CARGAR EL AVION

INSTALL TAIL SUPPORT STAND
BEFORE LOADING CARGO

On cabin to baggage area step:

MANTENGA LIBRE LA REJILLA KEEP GRILL CLEAR

Below the Baggage light switch:

LUZ DE CARGA CARGO LIGHT

Above the baggage area:

MAXIMA CARGA DE EQUIPAJE = 265 lb / 120 kg MAX BAGGAGE LOAD = 265 lb / 120 kg

or

MAXIMA CARGA DE EQUIPAJE = 400 lb / 180 kg MAX BAGGAGE LOAD = 400 lb / 180 kg

Above the baggage area with large baggage net installed:

MAXIMA CARGA DE EQUIPAJE = 500 lb / 225 kg (SOLO SI LA RED DE EQUIPAJE 525.25.12.026 ESTA INSTALADA) MAX BAGGAGE LOAD = 500 lb / 225 kg (ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

On the rear of the left cockpit bulkhead:

EL BOTIQUIN DE PRIMEROS AUXILIOS ESTA UBICADO EN LA CABINA, DETRÁS DEL ASIENTO DEL PILOTO FIRST AID KIT LOCATED ON COCKPIT SIDE L.H. BULKHEAD BEHIND PILOT SEAT

EL EXTINTOR DE INCENDIOS ESTA UBICADO EN LA CABINA, DETRAS DEL ASIENTO DEL COPILOTO FIRE EXTINQUISHER LOCATED ON COCKPIT SIDE R.H.BULK- HEAD BEHIND CO-PILOT SEAT

9 SEAT CORPORATE COMMUTER INTERIOR (Interior Code STD-9S)

The cabin placards plus the following are those required for this interior.

Near each passenger oxygen outlet:

OXIGENO
OXYGEN

On the rear of the left cockpit bulkhead:

NO FUMAR
NO SMOKING

On the rear of the left and right cockpit bulkheads:

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO
OXYGEN MASK LOCATED UNDER YOUR SEAT

On the back of each standard passenger seat (except seat 5):

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO
OXYGEN MASK LOCATED UNDER YOUR SEAT

On the rear of the left and right cockpit bulkheads, and on the rear of each seat:

PARA DESPEGUE Y ATERRIZAJE
-AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES
-EL RESPLANDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL

FOR TAKEOFF AND LANDING
-FASTEN SEAT LAP AND SHOULDER BELT
-SEAT BACK MUST BE FULLY UPRIGHT

or

PARA DESPEGUE Y ATERRIZAJE
-EL RESPLANDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL
-AJUSTAR EL REPOSACABEZAS
-AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES

FOR TAKEOFF AND LANDING
-SEAT MUST BE FULLY UPRIGHT
-ADJUST HEADREST TO SUPPORT HEAD
-FASTEN SEAT LAP AND SHOULDER BELT

On the back of seat 5:

MASCARA DE OXIGENO UBICADA DEBAJO DEL ASIENTO AL FRENTE
OXYGEN MASK LOCATED UNDER SEAT IN FRONT

120412

6 SEAT CORPORATE COMMUTER INTERIOR AND A THREE SEAT BENCH (Interior Code STD-6S-3B)

The cabin placards, the 9 seat corporate commuter placards and the following replacement/additional placards are required for this interior.

On the rear of seats 5 and 6:

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO OXYGEN MASK LOCATED UNDER YOUR SEAT

On the rear of seat 5:

EL ASIENTO IZQUIERDO DEBE ESTAR TOTALMENTE PLEGADO HACIA ATRAS DURANTE TODO EL VUELO LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

On the left side of the bench seat:

EL ASIENTO IZQUIERDO DEBE ESTAR TOTALMENTE PLEGADO HACIA ATRAS DURANTE TODO EL VUELO LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

When the large baggage net is installed:

MAXIMA CARGA DE EQUIPAJE = 500 lb / 225 kg (SOLO SI LA RED DE EQUIPAJE 525.25.12.026 ESTA INSTALADA) MAX BAGGAGE LOAD = 500 lb / 225 kg (ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

6 SEAT EXECUTIVE INTERIOR (Interior Code EX-6S-2)

The cabin placards plus the following are those required for this interior.

Above the baggage area coat rail:

MAX PESO A COLGAR 11 lb / 5 kg MAX COAT RAIL LOAD 11 lb / 5 kg

Above the baggage area:

MAXIMA CARGA DE EQUIPAJE = 400 lb / 180 kg MAX BAGGAGE LOAD = 400 lb / 180 kg

On the forward left stowage unit:

On the upper drawer

PESO LIMITE WEIGHT LIMIT 10 lb / 4,5 kg

On the lower drawer

PESO LIMITE WEIGHT LIMIT 25 lb / 11,5 kg

On the forward right stowage unit:

On the upper drawer

PESO LIMITE WEIGHT LIMIT 5 lb / 2,2 kg

On the lower drawer

PESO LIMITE WEIGHT LIMIT 7 lb / 3,2 kg

On each oxygen mask pocket:

MASCARA DE OXIGENO EN EL INTERIOR **OXYGEN MASK INSIDE**

On the armrest near each passenger oxygen mask:

TIRE DE LA CINTA PARA **LA MASCARA DE OXIGENO** **PULL TAPE FOR** **OXYGEN MASK**	or	**TIRE DE LA CINTA PARA** **LA MASCARA DE OXIGENO** **PULL TAPE FOR** **OXYGEN MASK**

Near each Executive seat:

PARA DESPEGUE Y ATERRIZAJE
- EL RESPALDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL MOVER EL ASIENTO HASTA EL TOPE TRASERO Y HASTA EL TOPE PARED
- AJUSTAR EL REPOSACABEZAS
- AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES
- PLEGAR Y ASEGURAR LA MESA

FOR TAKEOFF AND LANDING
- SEAT MUST BE FULLY UPRIGHT FULLY TO THE REAR OF CABIN AND FULLY OUTBOARD
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT
- TABLE MUST BE STOWED

Near each ashtray:

NO FUMAR MIENTRAS SE USE OXIGENO **DO NOT SMOKE WHILE OXYGEN IN USE**

4 SEAT EXECUTIVE AND 4 SEAT CORPORATE COMMUTER (Interior code EX-4S-STD-4S)

The cabin placards, the 6 seat executive and the following placard is required for this interior:

On the armrest near Passenger Oxygen Mask for seats 7 and 8:

**TIRE DE LA CINTA PARA
LA MASCARA DE OXIGENO
PULL TAPE FOR
OXYGEN MASK**

or

**TIRE DE LA CINTA PARA
LA MASCARA DE OXIGENO
PULL TAPE FOR
OXYGEN MASK**

TOILET PLACARDS

The toilet placards are installed in all executive interiors.

On the toilet door #1:

**NO FUMAR
EN EL LAVABO
NO SMOKING
IN LAVATORY**

**NO OCUPAR EL LAVABO DURANTE
DESPEGUE / ATERRIZAJE Y TURBULENCIA
TOILET COMPARTMENT NOT TO BE OCCUPIED DURING
TAKEOFF / LANDING AND TURBULENCE**

**PARA CERRAR
TIRE AQUI
TO CLOSE
PULL HERE**

On the toilet door #3:

PARA CERRAR
TIRE AQUI
TO CLOSE
PULL HERE

Near the toilet seat:

PRESIONE PARA
VACIAR LA CISTERNA
PUSH TO FLUSH

On the oxygen mask box:

LUZ DEL LAVABO
LAVATORY LIGHT

MASCARA DE OXIGENO EN EL INTERIOR
OXYGEN MASK INSIDE

Below the oxygen mask box:

TIRE DE LA CINTA PARA
LA MASCARA DE OXIGENO
PULL TAPE FOR OXYGEN MASK

8 SEAT EXECUTIVE (Interior Code EX-8S) and 6 SEAT EXECUTIVE and 2 SEAT CORPORATE COMMUTER (Interior Code EX-6S-STD-2S)

The cabin placards, the 6 seat executive placards and the following replacement/additional placards are required for this interior.

Rear of executive passenger seat No. 5, 6, 7 and 8:

DEJAR ESTE ASIENTO DESOCUPADO DURANTE DESPEGUE Y ATERRIZAJE A MENOS QUE EL ASIENTO DE ENFRENTE ESTE OCUPADO LEAVE THIS SEAT VACANT DURING TAKE-OFF AND LANDING UNLESS SEAT IN FRONT IS OCCUPIED

TIRE DE LA CINTA PARA LA MASCARA DE OXIGENO PULL TAPE FOR OXYGEN MASK	⇨ or ⇦	TIRE DE LA CINTA PARA LA MASCARA DE OXIGENO PULL TAPE FOR OXYGEN MASK

4 SEAT EXECUTIVE and THREE SEAT BENCH (Interior Code EX-4S-3B)

The cabin placards, the 4 seat executive placards and the following replacement/additional placards are required for this interior.

On rear of seats 3 and 4:

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO OXYGEN MASK LOCATED UNDER YOUR SEAT

PARA DESPEGUE Y ATERRIZAJE -AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES -EL RESPLANDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL FOR TAKEOFF AND LANDING -FASTEN SEAT LAP AND SHOULDER BELT -SEAT BACK MUST BE FULLY UPRIGHT	or	PARA DESPEGUE Y ATERRIZAJE -EL RESPLANDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL -AJUSTAR EL REPOSACABEZAS -AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES FOR TAKEOFF AND LANDING -SEAT MUST BE FULLY UPRIGHT -ADJUST HEADREST TO SUPPORT HEAD -FASTEN SEAT LAP AND SHOULDER BELT

Near to the left bench seat on the armrest:

EL ASIENTO IZQUIERDO DEBE ESTAR TOTALMENTE PLEGADO HACIA ATRAS DURANTE TODO EL VUELO LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

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On left side of the bench seat:

EL ASIENTO IZQUIERDO DEBE ESTAR TOTALMENTE PLEGADO HACIA ATRAS DURANTE TODO EL VUELO LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

When the large baggage net is installed:

MAXIMA CARGA DE EQUIPAJE = 500 lb / 225 kg (SOLO SI LA RED DE EQUIPAJE 525.25.12.026 ESTA INSTALADA) MAX BAGGAGE LOAD = 500 lb / 225 kg (ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 7
FOR PC-12 SERIES AIRCRAFT REGISTERED IN THE PEOPLE'S REPUBLIC OF CHINA (PRC)

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12 series of aircraft in the PRC. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Approved by:

European Aviation Safety Agency (EASA)
Ref – EASA.A.C.0010001050

Date of Approval:

06.11.2009

Bundesamt für Zivilluftfahrt - Federal Office of Civil Aviation - BERN

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LIST OF EFFECTIVE PAGES

Page No	Rev No.
9-7-1	0
9-7-2	1
9-7-3	2
9-7-4 thru 9-7-6	1
9-7-7	2
9-7-8 and 9-7-9	1
9-7-10 thru 9-7-12	2
9-7-13 and 9-7-14	1

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LOG OF TEMPORARY REVISIONS

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
1 26.02.2016	9-7-2 thru 9-7-14 9-7-10 9-7-11	New Supplement layout. LOEP, LOTR, and LOR included. Effectivity added. Additional placard shown. Effectivity added. The Revision Number 1 to AFM Supplement No. 7 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 26.02.2016. 16148
2 06.01.2020	9-7-3 9-7-7 9-7-10 thru 9-7-12 9-7-11	LOEP updated. LOR updated. 19880 - Editorial (Changed "cabin door" to "passenger door"). 20566 - Editorial (effectivity updated). The Revision Number 2 to AFM Supplement No. 7 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 06.01.2020. 20566

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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12 Series of aircraft in the PRC.

SECTION 2 – LIMITATIONS

FUEL

In addition to the fuels listed in the AFM, the following fuels can be used:

RP-3

EXTERNAL PLACARDS

The following placards are required to be in the Chinese language.

On exterior of passenger door (MSN 1001 - 1575):

提起拉手并转动可
开启

除非紧急情况，否则请勿在发动机运
转时开门

开

On exterior of passenger door (MSN 1576 - 1942):

按这里打开拉手，
向外拉门

除非紧急情况，否则请勿在发动机运
转时开门

On the emergency exit door:

紧急出口

推

开锁后向里推

On the cargo door:

按这里打开拉手，
向外拉门

除非紧急情况，否则请勿在发动机运
转时开门

提起可开启

INTERNAL PLACARDS

On the passenger door:

出口

请勿在飞行过程中操作

关闭

除非紧急情况，否则请勿
在发动机运转时开门

开

请转动拉手开
启插销

在任何时间只能有一
个人在舷梯上

On the emergency exit door:

出口

拉

拉

On the cargo door

在飞行过程中请勿开启

除非紧急情况，否则请勿
在发动机运转时开门

拔起插销并提起拉手，向外推门

PILOT'S OPERATING HANDBOOK AND EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 8 FOR STEEP APPROACH LANDINGS

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when performing steep approach landings. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

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	9-8-6	LOEP, LOTR and LOR inserted
	9-8-7	LOEP, LOTR and LOR inserted
	9-8-8	LOEP, LOTR and LOR inserted
	9-8-9	Content moved from 9-8-2. Build 8 paragraphs added.
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	9-8-11	Description added.
		Approved by: European Aviation Safety Agency (EASA) EASA Project Number: 0010010513-001 Approval Date: 19.12.2011 Bundesamt für Zivilluftfahrt - Federal Office of Civil Aviation - BERN -

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SECTION 1 - GENERAL

This supplement supplies the information necessary for the operation of the airplane when performing steep instrument approaches using an approved flight path reference system:

- Steep approaches flown manually using raw data vertical guidance provided by ILS, LPV or FMS
- Steep approaches coupled to autopilot/flight director if following FMS vertical guidance (VNAV)
- **Aircraft with Primus APEX Build 8** – Optional steep approaches coupled to autopilot/flight director if following ILS glideslope or FMS Vertical Guidance (VNAV).

SECTION 2 - LIMITATIONS

STEEP APPROACH

NOTE: This Supplement does not guarantee operational approval to conduct steep approaches. It is the responsibility of the operator to apply for operational approval with the local authorities.

Steep approaches greater than 8° are not approved.

Aircraft with Primus APEX Build 7 -The use of coupled autopilot / Flight Director for ILS or LPV approaches greater than 4° is not allowed.

Aircraft with Primus APEX Build 8 and higher – The optional Steep Approach selection ENABLE softkey on the avionics window FCS tab must be enabled for ILS approaches greater than 4°.

For steep approaches with autopilot coupled to FMS vertical guidance (VNAV) the autopilot must be disengaged below 400 ft AGL.

For optional steep approaches with autopilot coupled to ILS glideslope the autopilot must be disengaged below 200 ft AGL.

Steep approaches with tail winds greater than 5 kts are not permitted.

Steep approaches in icing conditions or with any visible ice accretion on the airframe are not permitted.

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

4.13 DESCENT

For a steep approach extend the landing gear and set the flaps to 40° prior to intercepting the glide scope. Maintain the flaps at 40° until landing.

Aircraft with Primus APEX Build 8 and higher – For optional steep ILS approaches activate the Steep Approach ENABLE softkey on the avionics window FCS tab before capturing the ILS glideslope.

WEATHER MINIMA

When intending to carry out a steep approach and landing based on visual references, it is recommended that the visual element of the approach be commenced not below the approved circling minima for the runway and approach in use at the time, or 500ft AGL, whichever is greater. When flying with reference to flight deck instruments (IMC/IFR), the appropriate minima for the instrument approach procedure being flown should of course be used in accordance with IFR regulations.

SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

No change.

SECTION 7 DESCRIPTION

GENERAL

APEX Build 8 provides an additional set of GS gains which are optimized for ILS approaches with angle steeper than 4°. The Steep Approach gains can be selected on the Avionics FCS tab as shown below.

120399

Figure 9-8-1 Avionics FCS Tab

If TAWS Class A is installed, selecting/deselecting Steep Approach gains on the avionics FCS tab automatically selects/deselects "Steep Appr" option on the TAWS tab, and vice versa. TAWS class B does not provide selection of "Steep Appr" option on TAWS tab. When the steep approach is selected and AFCS GS mode is active or armed then "STEEP" annunciation is shown on PFD, as shown below.

120400

Figure 9-8-2 Steep Annunciation

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PILOT'S OPERATING HANDBOOK AND FOCA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 9 FOR COUPLED VNAV FUNCTIONALITY

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E with Coupled VNAV functionality. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

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	9-09-12	Content moved from 9-09-5.
	9-09-13	Content moved from 9-09-6.
	9-09-14	Content moved from 9-09-7. Build 8 statement added.
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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12-47E aircraft

SECTION 2 – LIMITATIONS

Aircraft with Primus APEX Build 7 - During coupled VNAV descent operations, if the active vertical mode is VSEL (or becomes VSEL), changing the altitude pre-selector should cause the VSEL mode to transition back to VPTH or VSPD. If this does not occur, the pilot should be aware that the autopilot could cause rapid altitude capture and the pilot should disconnect the autopilot and stabilize the aircraft. Movement of the altitude pre-selector while the active vertical mode is VSEL should be carefully monitored.

Aircraft with Primus APEX Build 7 - Do not use VSPD mode with the pre-selected altitude (PSA) set at current aircraft altitude, because the aircraft would maintain PSA and may deviate from the target speed with VSPD mode annunciated as active in the FMA. In case of total loss of engine power (NG below 60%), the system will ignore the PSA and descend at the target speed.

SECTION 3 – EMERGENCY PROCEDURES

No change.

SECTION 4 – NORMAL PROCEDURES

No change.

SECTION 5 – PERFORMANCE

No change.

SECTION 6 – WEIGHT AND BALANCE

No change.

SECTION 7 – AIRPLANE AND SYSTEMS DESCRIPTION

SECTION 7-38 COUPLED VNAV (OPTIONAL)

DESCRIPTION

The FMS is capable of generating a vertical flight profile by using altitude and angle constraints from the flight plan waypoints. The waypoint constraints used by the FMS for both climb and descent, may come from the Navigation Database via terminal procedures or may be entered by the crew. The VNAV function will ensure compliance with the pre-selected altitude (PSA) or the FMS altitude constraints whichever target is closer to the actual altitude.

The FMS calculates the path deviation by using barometric altitude signal from the ADAHRS.

Flight Guidance Panel (FGP) with additional “VNAV” button and Primus Apex Build 7 or higher software is required to activate the coupled VNAV.

The vertical profile calculated by the FMS can be displayed on the Vertical Situational Display (VSD). After changes to the vertical flight profile it can take up to 10 seconds to re-compute the VSD.

Refer to Honeywell APEX Pilots Guide for more information on coupled VNAV.

VNAV MODES

The FMS supports four vertical modes:

- **VNAV Speed (VSPD):** The FMS provides guidance for the flight director to climb or descend at the speed target while meeting the altitude constraints and complying with the altitude pre-selector. This mode is mainly used for climb and descent. The system will deviate from the speed target in order to meet the altitude constraints and the altitude pre-selector. In case of total loss of engine power (Ng below 60%) the system will ignore the PSA and descend at the target speed.

- **VNAV Altitude Select Capture (VSEL):** VSEL is active whenever the aircraft is capturing FMS or PSA altitude and VNAV is active.

- **VNAV Altitude Hold (VALT):** VALT is used for holding an altitude as computed by the FMS or by the pre-selected altitude (PSA). The autopilot automatically transitions from VALT to VSPD or VPTH mode when an altitude constraint is passed, next altitude constraint is at different altitude and PSA allows a flight level change.

- **VNAV Path (VPTH):** VPATH mode is a descent mode used by the FMS to guide the aircraft along a geo-referenced path.

PILOTS DISPLAY

With coupled VNAV active, the following information is displayed on the PFD:

- **Vertical Deviation Pointer:** Represents the FMS VNAV descent profile deviation.

- **FMS Altitude and Target Bug and digital Readout:** Provides information for the next altitude constraint defined in the flight plan and is displayed as long as the FMS is selected as the primary navigation source.

- **VNAV Modes:** VNAV autopilot armed and active modes (VSPD, VSEL, VALT and VPTH).

- **Vertical Tracks Alert:** Warns the pilot of an impending vertical-mode or vertical-track change by VNAV (e.g. before crossing a climb / descent constraint that does not equal the altitude pre-selector).

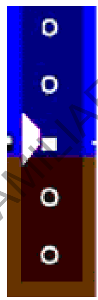
VNAV – Example Indications

VERTICAL DEVIATION DISPLAY

The vertical deviation information is displayed on the right side of the Attitude Director Indicator (ADI) sphere next to the altitude tape. The vertical deviation display provides the pre-approach and approach path guidance. Approach path guidance is described in section 7-38-3 of the POH

VNAV PRE-APPROACH PATH GUIDANCE

VNAV pre-approach path deviation will be indicated on the left side of the vertical deviation scale as a solid pointer as shown below. The so called VNAV pre-approach pointer is not labelled as it always represents the barometric VNAV pointer driven by FMS and it is always on the left of the vertical scale. If an IFR approach procedure is available and loaded into the FMS the pre approach pointer will be removed when the system is transitioning to GS, LPV of VGP for final approach guidance. The FMS is able to guide the aircraft on the pre-approach vertical path by using the VPTH mode on a continuous descent profile from TOD down to a runway threshold for a visual approach supplementary guidance.



FMS VNAV Pre-Approach Pointer

ALTITUDE PRE-SELECTOR

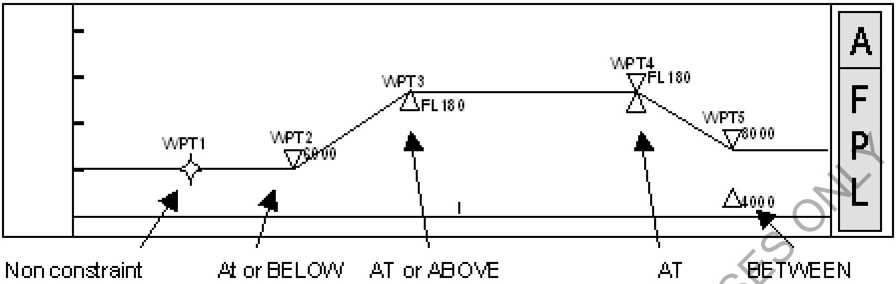
The altitude pre-selector is displayed as PSA altitude bug and a PSA digital readout. The pilot selects ATC assigned altitudes using the PSA knob to ensure that the aircraft will not fly through a clearance limit. VNAV uses the altitude pre-selector to compute altitude targets as well as a variety of other calculations.

In all VNAV modes (except VGP or if engine out condition exists) the FMS will not command the aircraft to move away from the pre-selected altitude. This gives the pilot a means to control the aircraft movement and to confirm the climb / descent commands of the VNAV functionality.

VERTICAL TRACK ALERT

The FMS will output a Vertical Track Alert (VTA) message to warn the pilot of an impending vertical mode or vertical track change. The VTA annunciation will be displayed in white with a semi-transparent background above the vertical deviation display. Conditions causing a display of VTA include the following:

- Before crossing a climb/descent constraint that does not equal the altitude pre-selector.
- Before TOD while in VALT.
- Before resumption of climb after a constraint.
- Prior to resuming descent after level-off at the speed/altitude limit or descent intermediate level segment
- One minute prior to a TOD in VALT when in a holding pattern and Exit Hold has been selected
- In climb and holding one minute prior to a constrained Hold Fix and Exit Hold has been selected



Flight Plan on Vertical Situation Display

VNAV Operation Description

Defining a lateral FMS flight plan entering origin and destination also automatically generates a vertical flight plan, when performance is initialized. Top of climb is calculated according the generic aircraft performance model based on set cruise altitude or PSA whichever is higher. After takeoff when VNAV mode on the FGP is pressed, VSPD mode is automatically engaged setting the speed bug at the current climb speed. The speed target can be manually adjusted by the pilot using the up/down buttons on the FGP.

Altitude constraints can be found in terminal procedures or can be defined by the pilot in the waypoints list cross dialogue box. During the VNAV climb in speed mode the system will comply with all restricting altitude constraints or the PSA, whichever target is closer to the current altitude. If an FMS altitude constraint waypoint in climb is passed, the system will automatically switch back to VSPD mode to continue the climb, but the pilot has to change the speed target or power setting to initiate the climb.

Keeping the VALT mode engaged in cruise will allow the aircraft to descend in VPTH mode once the TOD is reached and the PSA is set to a lower altitude. Typical descents are flown in VPTH mode. However, intercepting a VPTH descent from above or below can also be made in VSPD mode. When VNAV is active, VSPD mode can be initiated for climb or descent (to a maximum of 8° with Primus APEX Build 8) by pressing the SPD button.

The default descent profile in VPTH mode is 3°, but can be modified by the pilot to a maximum of 6° (to a maximum of 8° with Primus APEX Build 8). Coupled VPTH continuous descents can be flown from TOD until 400ft AGL on a visual approach. However from maximum 30 NM to the destination airport the approach path guidance is typically transitioned to VGP, LPV or ILS using the FGP approach button. The vertical direct to function can be used to define a direct vertical path from the present aircraft altitude to the FAF altitude constraint for a coupled continuous descent approach passing through several waypoints.

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 10
FOR
PRIMUS APEX SMARTVIEW (SYNTHETIC VISION SYSTEM)

This supplement must be attached to the Pilot's Operating Handbook and EASA approved Airplane Flight Manual when operating the PC-12/47E with Primus APEX SmartView. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA approved Airplane Flight Manual.

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LOG OF TEMPORARY REVISIONS

The incorporation of temporary revisions into this supplement are to be recorded on the sheet below. Instructions for the removal of temporary revisions will be given in the instruction sheet issued with revisions.

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
1 01.09.2014	9-10-3 & 9-10-4 9-10-7	LOEP updated to highlight pages at Revision 1. Editorial change in footer. LOR issued at Revision 1.
	9-10-9 thru 9-10-12	Extra details added to General description. Editorial changes.
	9-10-14 thru 9-10-40	Addition of aircraft track to Synthetic Scenery description. Information added about synthetic view centering. Flight director modes description completely revised. Editorial changes. The Revision Number 1 to AFM Supplement No. 10 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 23. September 2014.

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SECTION 1 – GENERAL

This supplement provides the necessary information to operate the PC-12/47E aircraft with the optional SmartView - Synthetic Vision System (SVS) – and advanced flight path symbology on the Primary Flight Display.

The overall intended function of SmartView (SV) is to enhance the situational and terrain/obstacle awareness of the flight crew.

If selected ON, SmartView (SV) displays synthetic scenery on the pilot's PFD and co-pilot's PFD (if installed). The synthetic scenery shows a 3D image of the outside world similar to what the flight crew would see through the windshield in good weather conditions during daylight. The outside world view image includes runways and obstacles and is orientated to aircraft track. Depending on drift corrections, the outside world view image may not correspond to the outside view as referenced to the aircraft longitudinal axis. North/South and East/West orientated grid lines and terrain tracing range rings on the synthetic scenery give a general sense of motion and altitude above the ground. They also aid depth perception and terrain closure rate to the flight crew. The destination runway outline with extended runway centre line improves spatial orientation.

Advanced flight path symbology decreases the pilot workload. This symbology includes a Flight Path Symbol (FPS) to easily and accurately fly at a specific flight path, a Flight Path Director (FPD) which provides pitch and roll guidance cues with respect to the current flight path and an Acceleration Chevron which enables the pilot to make power adjustments to smoothly control the aircraft speed at a given flight path.

Figure 9-10-1 shows an example of the PFD with SV OFF (left) and SV ON

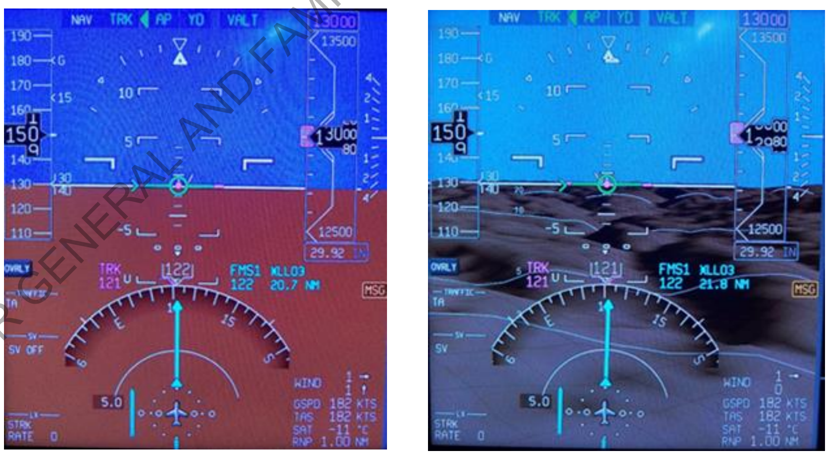

Figure 9-10-1 PFD with SV OFF (left) and SV ON (right)

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SECTION 2 – LIMITATIONS

PRIMUS APEX - USE OF SMARTVIEW

SmartView (SV) does not provide the accuracy or reliability upon which the flight crew can solely base decisions and/or plan maneuvers to avoid terrain or obstacles.

The use of SmartView (SV) alone for navigation is prohibited.

The use of SmartView (SV) alone for obstacle and/or terrain avoidance is prohibited.

The use of SmartView (SV) alone for aircraft control without reference to the APEX primary flight indications or Electronic Standby Instrument System (ESIS) is prohibited.

SECTION 3 – EMERGENCY PROCEDURES

No change.

SECTION 3A – ABNORMAL PROCEDURES

SECTION 3A.3 – SMARTVIEW

IF SMARTVIEW INFORMATION IS INCONSISTENT WITH APEX PRIMARY FLIGHT INDICATIONS:

1. **Select PFD OVRLY menu**
2. **Turn SV OFF by deselecting the checkmark "SVS ON"**
3. **Verify SV is removed from the PFD**
4. **Use APEX primary flight indications**

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IF APEX OPERATION IN REVERSIONARY MODE IS REQUIRED DUE TO A DU 1 FAILURE:

NOTE

If APEX operation in reversionary mode (due to DU 1 or AGM failure), the PFD format reverts to SV off (blue over brown) and to the default flight director cross pointer (X-Ptr). After approximately 2.5 minutes the SV is displayed automatically and the pilot can re-select the preferred flight director mode on the FCS tab.

Example Indication: CAS caution Check DU 1.
Condition: Pilot PFD is blank or suspect.

1. **Reversion Controller** **Set DU 1 control knob to OFF/REV**

2.	**Aircraft**	**PPFD is shown on upper MFD in SV off format (blue over brown) and pitch based X-Ptr default flight director is active**
After 2.5 minutes:		
3.	**Aircraft**	**SV is automatically re-displayed**
4.	**Pilot**	**Re-select preferred flight director mode on FCS Tab**

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Figure 9-10-2 shows the SmartView related status and failure indications on the SV status/failure field:

SV Indication	Description
SV	Position and altitude used to position the synthetic scenery meets the integrity requirements. SV is selected ON and displayed.
SV OFF	Position and altitude used to position the synthetic scenery meets the integrity requirements, but SV is not selected ON.
SV RATE	SV is selected but not being displayed due to a too low refresh rate.
SV POS	SV is selected but not being displayed due to position/altitude failure.
SV POS	SV is being displayed but a position integrity error was detected.
SV FPS	SV is selected but not being displayed due to the Flight Path Symbol (FPS) being invalid.
SV TER	SV is selected but not being displayed due to a terrain rendering failure.
SV TRK	SV is selected but not being displayed because APEX has been switched to track mode (e.g. at high latitudes).
SV REV	SV is selected but not being displayed due to the PFD being switched to composite mode.

Figure 9-10-2 SV Failure indications

NOTE

The SV related status and failure indications are for information only. No pilot action is required.

SECTION 4 – NORMAL PROCEDURES

4.27 SV SELECTION AND BRIGHTNESS CONTROL

If installed, SV is automatically activated at start-up.

SV can be turned ON/OFF by selecting or deselecting the “SVS ON” checkbox from the OVRLY menu, which is located just above the HSI on the outboard side of either PFD (Figure 9-10-3).

The SV brightness control “SVS BRT” is available if SV is selected ON. With “SVS BRT” the terrain and sky dimming can be controlled by placing the cursor over SYS BRT and using the Cursor Control Device (CCD) or Multi-Function Controller (MFC) scrollwheel to set the brightness.

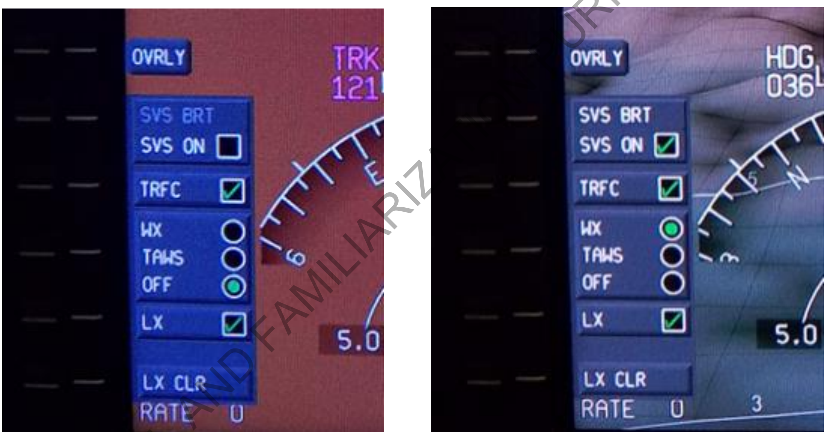

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Figure 9-10-3 PFD OVRLY Menu

NOTE

When pointing directly towards the sun, or with the sun shining directly onto the PFD and during night operations, it is important to adjust the SV dimming to achieve a good level of contrast and readability on the PFD.

SECTION 5 – PERFORMANCE

No change.

SECTION 6 – WEIGHT AND BALANCE

No change.

SECTION 7 – AIRPLANE AND SYSTEMS DESCRIPTION

SECTION 7-30 SITUATIONAL AWARENESS

OPTIONAL EQUIPMENT - SMARTVIEW

GENERAL

The purpose of SmartView (SV) is to enhance the pilot's awareness of the aircraft position in relation to terrain, obstacles and airports within the limits of the navigation source capabilities of the system.

SmartView (SV) does not provide the accuracy or reliability upon which the flight crew can solely base decisions and/or plan maneuvers to avoid terrain or obstacles.

NOTE

To avoid intentional misuse of SmartView (SV) refer to Section 2 (Limitations) of this supplement.

The integrity of SV depends on the validity of the installed Obstacle and Terrain database. If using SV, it is the Pilot's responsibility to verify that a valid database is installed.

Along with the SV option, the new PFD also provides PFD symbology to reduce pilot's workload, which is available whether SV is turned ON or OFF.

PRIMARY FLIGHT DISPLAY AND SMARTVIEW ELEMENTS

SMARTVIEW DISPLAY

Refer to Figures 9-10-4 thru 9-10-7.

Advanced PFD symbology consists of:

1. Flight Path Symbol
   The Flight Path Symbol (FPS) is a representation of the current aircraft flight path over ground, i.e. Flight Path Angle (FPA) and track.
2. Flight Path Director
   The Flight Path Director (FPD) provides guidance cues with respect to the Flight Path Symbol (FPS).
3. Acceleration Chevron
   The relative position of the Acceleration Chevron with respect to the Flight Path Symbol (FPS) indicates the instantaneous acceleration/deceleration of the aircraft with respect to the current Indicated Air Speed (IAS).

4. Zero Pitch/Path Reference Line

   The new PFD includes a white horizon line that represents the true horizon. If the Aircraft Reference Symbol (ARS) is in line with that white horizon line it indicates a zero pitch. If the Flight Path Symbol (FPS) is in line with that white horizon line it indicates zero Flight Path Angle (FPA). Therefore the white horizon line is called Zero Pitch/Path Reference Line (ZPRL).

5. Track Reference Symbol

   The Track Reference Symbol (TRS) on the Zero Pitch/Path Reference Line (ZPRL) represents the aircraft track.

6. Heading Reference Symbol

   The Heading Reference Symbol (HRS) on the Zero Pitch/Path Reference Line (ZPRL) indicates the current aircraft heading.

NOTE

The angle between the TRS and HRS represents the current Drift Angle (DA). If the DA is greater than 9 degrees the HRS will be parked on either side of the display (on the right side if the wind comes from the right and on the left side if the wind comes from the left) and will be ghosted (dashed). In this scenario, the HRS is non-conformal to the synthetic scenery and the angle between the HRS and the TRS does not represent the DA anymore.

SmartView consists of:

1. Synthetic Scenery

   The synthetic scenery provides the display of sky, water and terrain relative to the current aircraft position and track, and is depicted from the perspective of the flight crew. The synthetic scenery is created based on the terrain database.

NOTE

The terrain database has an area of coverage from latitude 80 degrees North to latitude 80 degrees South in all longitudes.

2. Grid Lines

   Grid lines are regularly spaced black lines on terrain that help to provide an optical flow for general sense of motion and altitude above ground and aid depth perception and terrain closure rate to the flight crew.

3. Range Rings

   The terrain tracing range rings indicate points on the terrain that are the same indicated ground distance from the aircraft. The white range rings mark distances of 3 nm, 5 nm, 10 nm and 20 nm.

4. Obstacles

All obstacles in the database that are 200 ft AGL or higher are shown on the synthetic scenery by a purple rectangle that represents the true height of the obstacle, but not the true width. Obstacles are always assumed to be 80 ft wide. Obstacles appear when the obstacle position is 13 nm (ground range) from the aircraft. The obstacles are created based on the obstacle database.

NOTE

Terrain and obstacles shown above the Zero Pitch/Path Reference Line (ZPRL) are above the current aircraft altitude. Similarly, terrain and obstacles shown below the ZPRL are below the current aircraft altitude.
SV is intended to assist as an awareness tool only. It may not provide either the accuracy or fidelity (or both) on which to solely base decisions and plan maneuvers to avoid terrain or obstacles.

5. Runways and Runway Markings

All runways from the database are displayed on the synthetic scenery. Runways appear on the display at a range of 33 nm (ground distance). Runways are shown with a realistic looking surface texture, runway identification number and center line.

NOTE

All runways are shown without thresholds, stop ways and clear ways.

6. Destination Runway Outline

A cyan box is placed around the FMS selected runway to help the pilot to easily identify the destination runway.

7. Destination Runway Extended Centre Line

The destination runway extended centre line is a line originating from the FMS selected destination runway end along the runway direction. The length of the extended centre line is 10 nm.

NOTE

The extended destination runway center line does not represent a localizer.

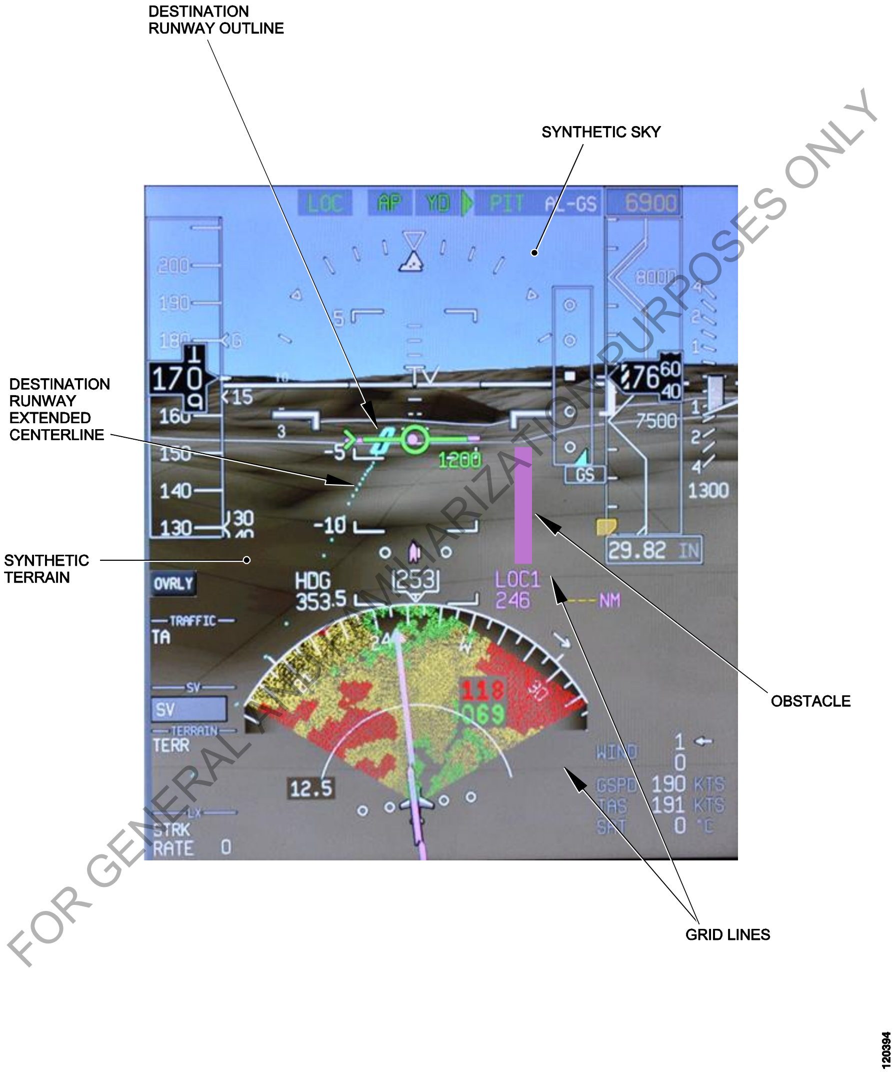

Figure 9-10-4 SmartView Display Elements

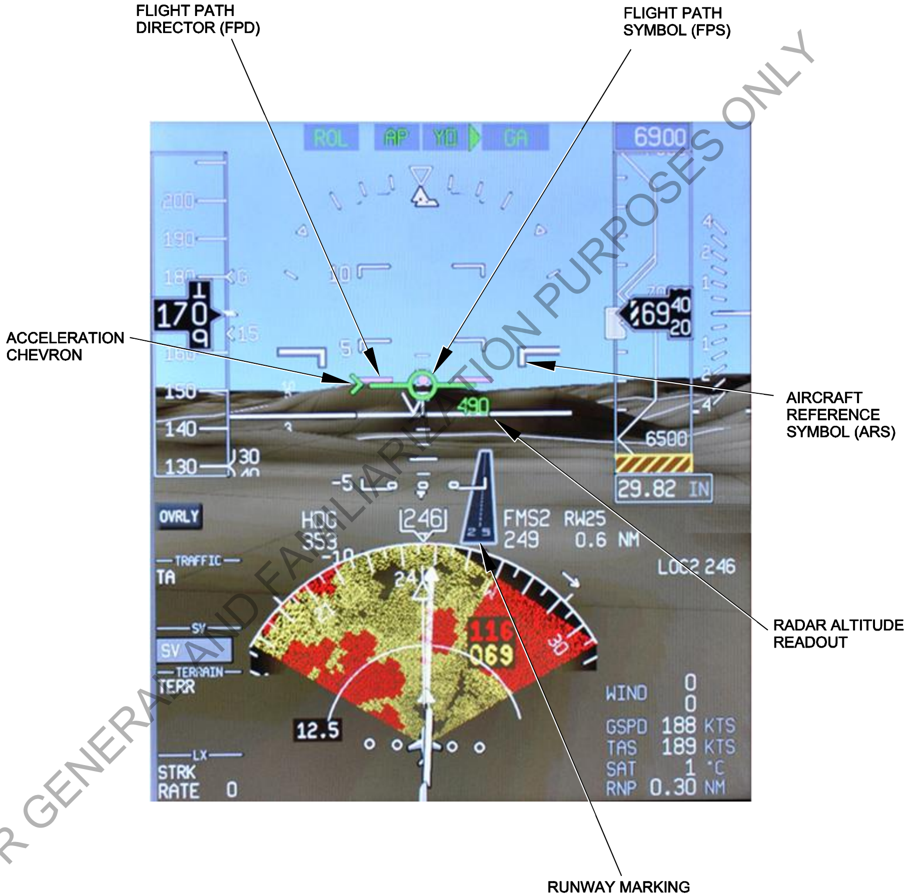

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Figure 9-10-5 SmartView Display Elements

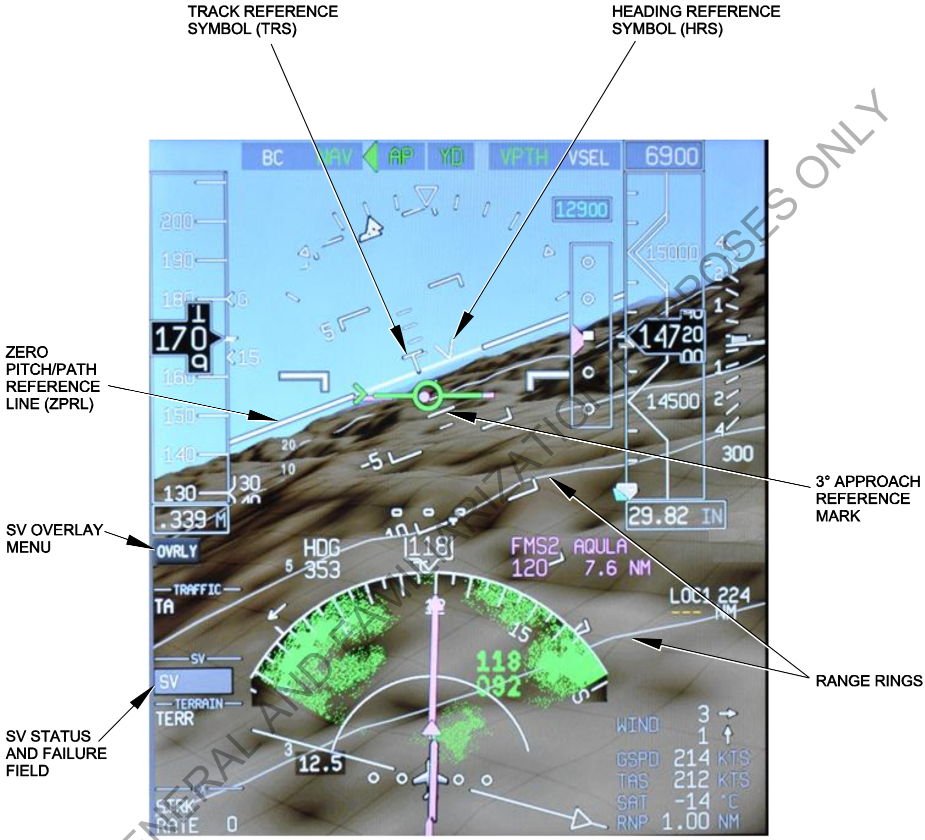

Figure 9-10-6 SmartView Display Elements

PARKED HEADING REFERENCE SYMBOL

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Figure 9-10-7 Parked Heading Reference Symbol

SV VERTICAL CENTERING MODE

The vertical centering mode is pitch-based. This means the synthetic terrain is vertically centered with the Aircraft Reference Symbol (ARS), which does not move vertically. The vertical scale is positioned so that the ARS represents the correct aircraft pitch attitude.

NOTE

The synthetic scenery is vertically centered to where the aircraft is pointing at (pitch angle) and not where it is going to (Flight Path Angle).

NOTE

The FPS can move vertically to indicate the current aircraft Flight Path Angle (FPA) in respect to the vertical scale.

SV LATERAL CENTERING MODE

The SV lateral centering mode is track-based. This means the synthetic terrain is laterally centered with the Flight Path Symbol (FPS), which does not move laterally.

NOTE

The FPS is always conformal to the synthetic scenery, obstacles and runways. The synthetic scenery is laterally centered to where the aircraft is going to (tracking) and not where it is pointing at (heading).

NOTE

The ARS does not move laterally. Therefore it does not indicate the aircraft heading. For indication of the aircraft heading the pilot must use the (Horizontal Situation Indicator) HSI. The HRS on the ZPRL also gives a reference for the aircraft heading with respect to the background synthetic scenery.

SV FIELD OF REGARD LINES

Refer to Figure 9-10-8.

The lateral Field of Regard (FOR) lines are displayed on the 2D map (iNAV). The FOR lines represent the lateral limits of the displayed synthetic scenery.

NOTE

As a consequence of the track-based lateral centering mode the FOR lines are also centered according to the aircraft track. Therefore during high Drift Angles (DA) the FOR lines will not symmetrically line up with the aircraft longitudinal axis (heading).

120393

Figure 9-10-8 iNAV lateral Field of Regard line

FLIGHT DIRECTOR SELECTION

Refer to Figure 9-10-9 and 9-10-10.

Three Flight Director (FD) modes are available. They can be selected from the FCS tab in the Avionics window:

- Single-Cue (S-Cue) Flight Director with a flying wedge as primary reference symbol
- Cross-Pointer (X-Ptr) Flight Director with gull wings as primary reference symbol
- Flight Path (Flt-Path) Flight Director with a Flight Path Symbol (FPS) as primary reference symbol

Figure 9-10-9 FCS Tab

If Flt-Path is selected as Flight Director mode the Flight Path Symbol (FPS) is the primary reference symbol and gull wings are shown as a secondary reference symbol (Aircraft Reference Symbol). In this case the FPS cannot be selected OFF (FPS selection is greyed out).

If S-Cue or X-Ptr is selected as Flight Director mode the flying wedge or gull wings are shown as the primary reference symbol. The Flight Path Symbol (FPS) in this case is a secondary symbol and can be selected ON or OFF in the FPS selection line in the FCS tab in the Avionics window.

The Flight Director (FD) selection menu can be controlled via DU bezel buttons or via CCD or MFC on the FCS tab in the Avionics window. The FD selection will cycle with each press between S-Cue, X-Ptr and Flt-Path.

At power-up the default is the last pilot selection. In the case that the FPS is invalid initially at power-up, the system defaults to X-Ptr.

	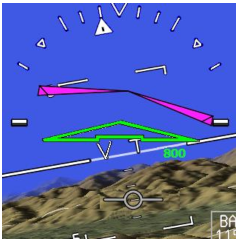	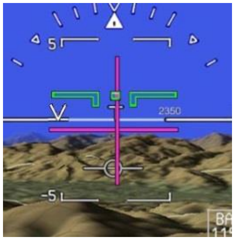	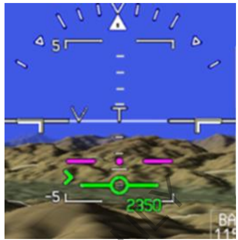
Pitch-Based Mode			Path-Based Mode
Guidance Cue	Single Cue (S-Cue) Flight Director	Cross Pointer (X-Ptr) Flight Director	Flight Path (Flt-Path) Director
Primary Control Reference	Flying Wedge Aircraft Reference Symbol	Gull Wings Aircraft Reference Symbol	Flight Path Symbol
Secondary Reference	De-emphasized Flight Path Symbol	De-emphasized Flight Path Symbol	De-emphasized Gull Wings Aircraft Reference Symbol

Figure 9-10-10 Flight Director Modes

1 Pitch-Based Mode

In pitch-based mode (S-Cue or X-Ptr Flight Director) the primary control reference is the Aircraft Reference System (ARS) displayed as a green flying wedge or gull wings. The Flight Path Symbol (FPS), if selected, is de-emphasized (smaller and grey in colour) as it is a secondary reference. In this mode the magenta Flight Director (S-Cue or X-Ptr) provides guidance cues with respect to the green ARS.

2 Path-Based Mode

In path-based mode (Flt-Path Flight Director) the primary control reference is the FPS, displayed as a green circle with wings. The ARS is shown as gull wings. As the ARS in this case is a secondary reference, it is shown de-emphasized (thinner, expanded and white/grey in colour). In this mode the magenta Flight Path Director (FPD) provides guidance cues with respect to the green FPS.

UNUSUAL ATTITUDES

Refer to Figure 9-10-11 and 9-10-12.

1. Semi-Transparent Blue over Brown in unusual attitudes

In unusual attitudes, there may not be enough sky or terrain shown to provide an adequate interpretation of the aircraft altitude. To aid this information a semi-transparent blue or brown is overlaid in certain attitudes. The sky/terrain colour is semi-transparent so the pilot can continue to see the terrain behind the sky/terrain colour for terrain awareness. In this case the Zero Pitch/Path Reference Line (ZPRL) is non-conformal, i.e. the angle between the ZPRL and the Aircraft Reference Symbol (ARS) does not represent the current aircraft pitch angle anymore and the angle between the Flight Path Symbol (FPS) and the ZPRL does not represent the current Flight Path Angle (FPA). However, the ARS and the FPS are still presented correct with respect to the background vertical scale of the display.

120382

Figure 9-10-11 Unusual Attitude Overlays

NOTE

In normal operation, with enough blue (sky) on the top of the display, the semi-transparent synthetic blue will not be visible. When terrain is displayed on the upper part of the display (e.g. when tracking to a mountain), the semi-transparent synthetic blue becomes visible.

120381

Figure 9-10-12 Synthetic Blue Display

2. Reversion to PFD due to excessive bank angle:

   Refer to Figure 9-10-13.

   At excessive angles of bank the PFD symbology is de-cluttered. SV is removed if the bank angle increases at 65 degrees left or right. The Flight Path Symbol (FPS) will be removed at 70 degrees left or right bank.

120380

Figure 9-10-13 Excessive Bank Angle

3. Reversion to PFD due to excessive pitch angle:

Refer to Figure 9-10-14.

The PFD will declutter at 30 degrees pitch up or 20 degrees pitch down. The Flight Path Symbol (FPS) will be removed at 40 degrees pitch up or 30 degrees pitch down.

120379

Figure 9-10-14 Excessive Pitch Angle

SECTION 8 HANDLING, SERVICING AND MAINTENANCE

No change.

SECTION 10 SAFETY AND OPERATIONAL TIPS

OPERATIONAL USE OF THE FPS

The Flight Path Symbol (FPS) is the representation of the current aircraft flight path over ground, i.e. Flight Path Angle (FPA) and track.

The Flight Path Angle (FPA) is the angle between the Zero Pitch/Path Reference Line (ZPRL) and the Flight Path Symbol (FPS). Refer to Figure 9-10-15.

Figure 9-10-15 Flight Path Angle

NOTE

The pitch angle is the angle between the Zero Pitch/Path Reference Line (ZPRL) and the Aircraft Reference Symbol (ARS).

The FPS may be used to easily and accurately fly at a specific Flight Path Angle (FPA). This can be done by aligning the centre of the FPS with the ZPRL (for level flight) or with the appropriate number on the vertical scale for climb or descent.

NOTE

In path-based mode, the radar altitude digits are attached to the FPS.

120377

Figure 9-10-16 Controlling Speed and Altitude during a Turn

The position of the FPS against the vertical scale indicates the aircraft approach angle (e.g. FPS on the 3 degrees reference mark shows an approach angle of 3 degrees).

NOTE

The Flight Path Symbol (FPS) is not a trajectory. Therefore it does not predict the position of the aircraft over time. The track and the Flight Path Angle (FPA) which are presented by the FPS represent an instantaneous time only.

The FPA is affected by wind (at a constant climb angle a headwind increases the FPA and a tailwind decreases the FPA).

If the FPS is displayed below terrain or an obstacle, the aircraft will clearly not clear that terrain or obstacle when flying on the current flight path. Refer to Figure 9-10-17 and 9-10-18.

120385

Figure 9-10-17 FPS Below Terrain

The aircraft will maintain its current flight path clearing terrain and obstacles if, and only if, the following conditions are true:

- the FPS points clearly above or beside that terrain or obstacle
- the current aircraft configuration is maintained
- the aircraft performance and wind condition will permit the aircraft to maintain its current flight path
- the angle between the ZPRL and FPS represents the correct aircraft FPA, i.e. the FPS is conformal to the synthetic scenery (FPS not highlighted in yellow)

120386

Figure 9-10-18 FPS Above Terrain

If the FPA is larger than what is possible to be displayed the SV cannot show the FPS conformal to the background synthetic scenery anymore. In this case the FPS will be displayed in green/yellow (highlighted) and the synthetic scenery will be removed (revert to blue over brown) when the vertical scale starts to compress. Refer to Figure 9-10-19 and 9-10-20.

120376

Figure 9-10-19 FPS with Compressed Pitch Scale

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Figure 9-10-20 Non Conformal FPS

INTERPRETATION OF LATERAL DEVIATION

The lateral displacement between the destination runway extended centerline and the Flight Path Symbol (FPS) indicates the lateral deviation of the aircraft position with the RWY centerline (90° means on centerline). Refer to Figure 9-10-21.

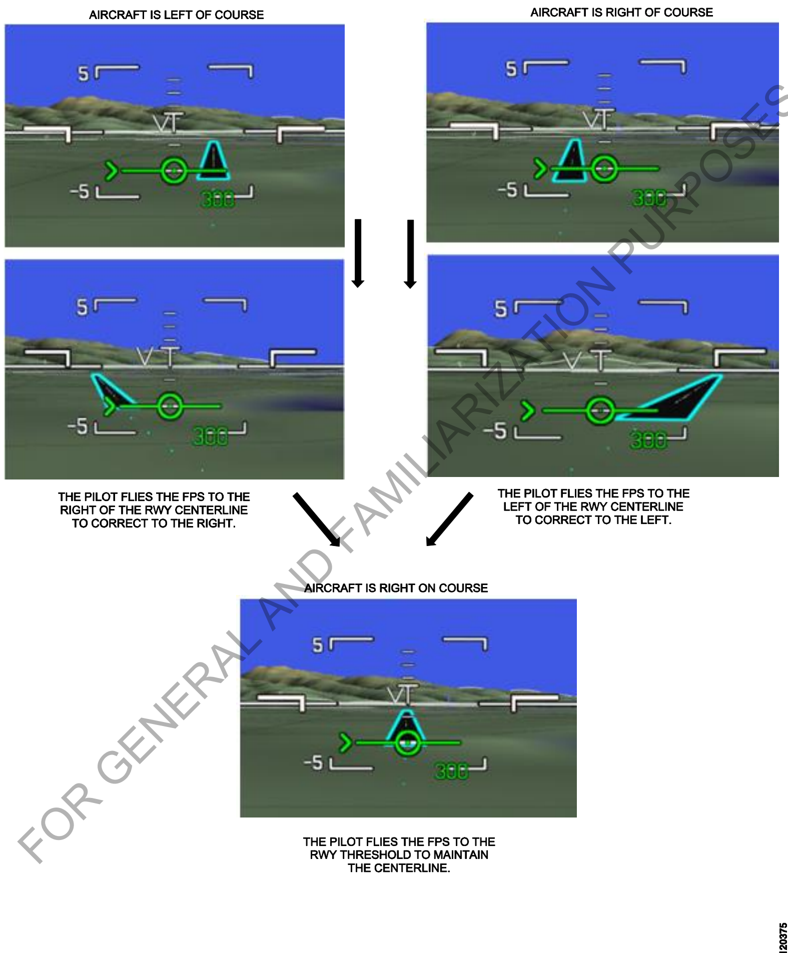

Figure 9-10-21 Example Interpretation of Lateral Deviation

NOTE

Do not use SV runway depiction as the sole means of determining the proximity of the aircraft to the runway.

INTERPRETATION OF VERTICAL DEVIATION

The vertical position of the Flight Path Symbol (FPS) with respect to the vertical scale indicates the aircraft Flight Path Angle (FPA). Refer to Figure 9-10-22.

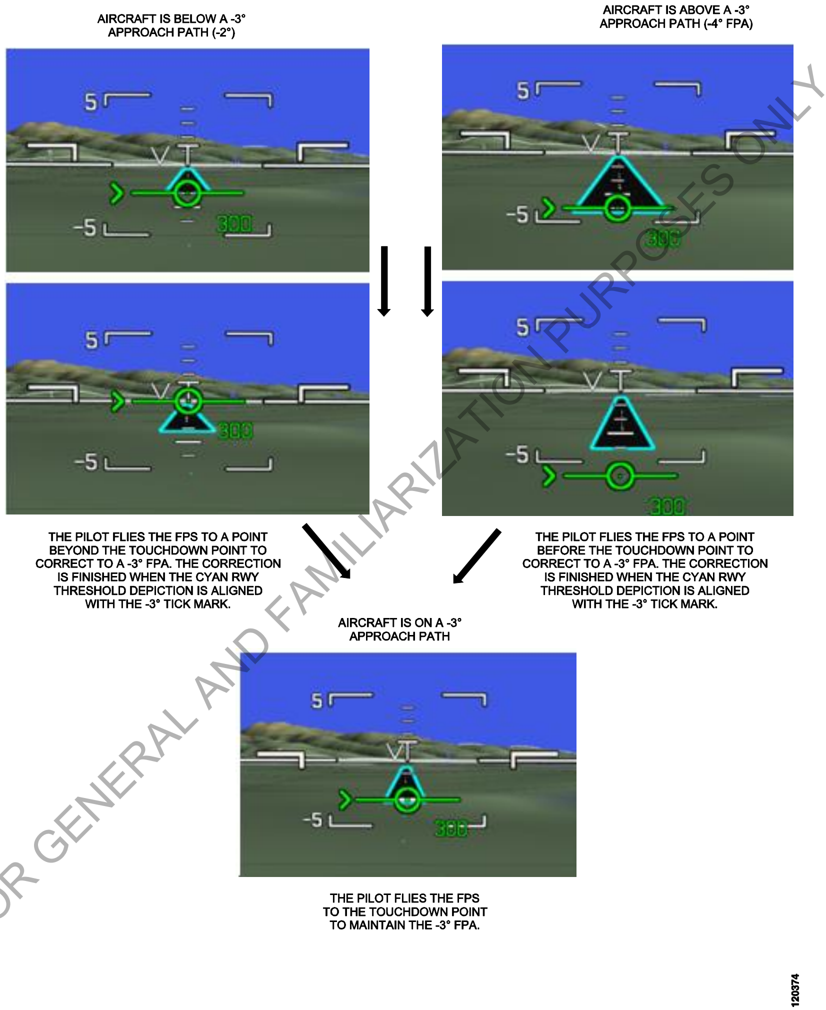

Figure 9-10-22 Example of Interpretation of Vertical Deviation

NOTE

Do not use SV runway depiction as the sole means for maintaining the proper approach path angle.

OPERATIONAL USE OF THE ACCELERATION CHEVRON

The relative position of the Acceleration Chevron with respect to the Flight Path Symbol (FPS) indicates the acceleration/deceleration of the aircraft with respect to Indicated Air Speed (IAS) (refer to Figure 9-10-23). The Acceleration Chevron also indicates the Flight Path Angle (FPA) that the aircraft is capable of, at constant IAS. It enables the pilot to make power adjustments to smoothly control the aircraft IAS at a given flight path.

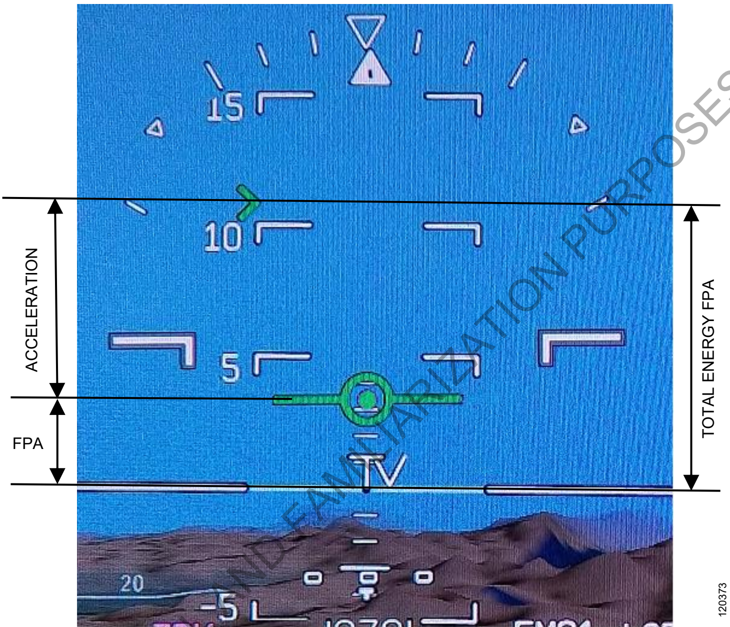

Figure 9-10 23 Acceleration Chevron above FPS: Aircraft accelerates (aircraft is climbing in this example)

To hold a constant IAS in level flight the pilot has to apply required power setting to maintain the Acceleration Chevron vertically aligned with the FPS.
To hold a constant IAS during climb or descent the pilot has to apply required power setting and then apply required pitch until the FPS is vertically aligned with the Acceleration Chevron. Refer to Figure 9-10-24 thru 9-10-26.

120389

Figure 9-10 24 Acceleration Chevron above FPS: Aircraft accelerates
(aircraft is in level flight in this example)

120388

Figure 9-10 25 Acceleration Chevron in line with FPS:
Aircraft flies at constant IAS (aircraft is in level flight in this example)

Figure 9-10 26 Acceleration Chevron below FPS: Aircraft decelerates
(aircraft is in level flight in this example)

OPERATIONAL USE OF THE FLIGHT PATH DIRECTOR

A Flight Director (FD) provides cues to guide the pilot or autopilot control inputs along a selected (from the FMS computed) 3D-Trajectory by commanding pitch and roll changes. The newly introduced Flight Path Director (FPD) is no different from a conventional FD in that respect. The only difference is that the new FPD commands the roll and pitch changes with respect to the current flight path (represented by the FPS) and not with respect to the current roll and pitch attitude (represented by the ARS). Refer to Figure 9-10-27.

To follow the FPD (magenta) commands, pitch and roll the aircraft until the wings and centre of the FPS (green) are aligned with the FPD.

Figure 9-10-27 Flight Path Director

DECISION HEIGHT

The photograph below (Figure 9-10-28) shows an actual view through the windshield during an approach at minimums. The aircraft is tracking towards the runway. Due to a crosswind component of approximately 16 knots from the right, the aircraft is pointing to the right of the runway.

Figure 9-10-28 Windscreen View during Approach

The display below (Figure 9-10-29) shows the exact same SV scenario on the PFD. On the HSI a drift angle (DA) of about 11° can be seen.

120370

Figure 9-10-29 PFD SV during Approach

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 11
FOR
ELECTRO-MECHANICAL LANDING GEAR

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E with Electro-mechanical Landing Gear. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

This Aircraft Flight Manual Supplement is
EASA Approved under Approval Number:
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9-11-18 and 9-11-19	2		
9-11-20	7		
9-11-21	2		
9-11-22 and 9-11-23	7		
9-11-24 thru 9-11-26	2		
9-11-27	6		
9-11-28 and 9-11-29	2		
9-11-30 and 9-11-31	7		
9-11-32	2		
9-11-33 and 9-11-34	3		

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LOG OF TEMPORARY REVISIONS

The incorporation of temporary revisions into this supplement are to be recorded on the sheet below. Instructions for the removal of temporary revisions will be given in the instruction sheet issued with revisions.

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
1 26.11.2012	9-11-3 9-11-7 9-11-12 thru 9-11-15 9-11-22	LOEP updated. LOR updated Procedures updated Emergency Gear Extension clarified Approved under EASA Approval Number 10042339 Date: 26 November 2012
2 01.09.2014	9-11-3 thru 9-11-6 9-11-7 9-11-9 and 9-11-10 9-11-16 9-11-18 thru 9-11-34	LOEP updated. Editorial change. LOR updated Editorial change. Step removed from Flight Training procedure. Landing gear warning condition changed. Part Numbers Updated. Editorial changes. The Revision Number 2 to AFM Supplement No. 11 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 23. September 2014.
3 27.01.2016	9-11-3 9-11-7 9-11-16 9-11-33 9-11-34	LOEP updated. LOR updated. Emergency gear extension handle reset clarified. Page references corrected. Equipment List updated. The Revision Number 3 to AFM Supplement No. 11 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 27.01.2016
4 11.08.2016	9-11-3 9-11-7 9-11-16 9-11-23	LOEP updated. LOR updated. Paragraph reference updated. Figure 7-4-1 Sheet 1 revised. The Revision Number 4 to AFM Supplement No. 11 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 11.08.2016

LOG OF REVISIONS

Revision Number and Date	Page Number	Description
5 12.07.2017	9-11-3 9-11-8 9-11-14 9-11-15	LOEP updated. LOR updated 17242 - Updated CAS condition (editorial). 17242 - Updated CAS condition (editorial). The Revision Number 5 to AFM Supplement No. 11 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 12.07.2017
6 08.10.2018	9-11-3 9-11-8 9-11-27	LOEP updated LOR updated 18552 - Updated (VCCS) CPRSR PWR circuit breaker name on PEBJB to VCCS The Revision Number 6 to AFM Supplement No. 11 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 08.10.2018
7 06.01.2020	9-11-3 9-11-8 9-11-10 9-11-11 9-11-13 9-11-14 9-11-16 9-11-17 9-11-20 9-11-22 9-11-23 9-11-30 9-11-31	LOEP updated LOR updated 20218 - "or" statement added 20218 - Post SB 32-028 placard added 20218 - Emergency lever procedure updated 20218 - Emergency lever procedure updated 20218 - Changed "handle" to "lever" (editorial) 20218 - Changed "handle" to "lever" (editorial) 20218 - Changed "handle" to "lever" (editorial) 20218 - Changed "handle" to "lever" (editorial) 20218 - Changed "handle" to "lever" (editorial) 20218 - Changed "handle" to "lever" (editorial) 20092 - Added optional USB charging ports The Revision Number 7 to AFM Supplement No. 11 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 06.01.2020

SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12/47E aircraft with electro-mechanical landing gear installed.

SECTION 2 – LIMITATIONS

The following cockpit placards are changed:

On left Cockpit Side Panel and Right Cockpit Side Panel

(LH shown, RH opposite)

EMERGENCY GEAR EXTENSION

- AIRSPEED 110 KIAS
- ENSURE LANDING GEAR HANDLE DOWN
IF 3 GREENS NOT ILLUMINATED AFTER 30 SECONDS
- EMERGENCY GEAR PUMP HANDLE (AFT END OF CENTRE PEDESTAL)
EXTEND AND PUMP (UP/DOWN) UNTIL 3 GREENS ARE OBTAINED
IF 3 GREENS STILL NOT ILLUMINATED
- YAW AIRCRAFT TO LOCK LH & RH GEAR
- REDUCE AIRSPEED TO LOCK NOSE GEAR

Replaced by:

Pre SB 32-028

EMERGENCY GEAR EXTENSION

- AIRSPEED 120 KIAS
- ENSURE LANDING GEAR HANDLE DOWN
IF 3 GREENS NOT ILLUMINATED AFTER 30 SECONDS
- EMERGENCY GEAR EXTENSION SYSTEM (AFT END OF CENTRE PEDESTAL)
- OPEN COVER
- PULL EMERGENCY GEAR EXTENSION HANDLE. CHECK 3 GREENS ARE OBTAINED. IF 3 GREENS STILL NOT ILLUMINATED
- TO LOCK LH & RH GEAR: CONDUCT LEVEL TURNS LEFT AND RIGHT AT ANGLES OF BANK UP TO 30°, MAINTAIN CONSTANT SPEED
- TO LOCK NOSE GEAR: REDUCE AIRSPEED (POWER IDLE)
- KEEP HANDLE IN PULLED POSITION

or

(see next page)

Post SB 32-028

EMERGENCY GEAR EXTENSION

- AIRSPEED 120 KIAS
- ENSURE LANDING GEAR SELECTOR DOWN
  IF 3 GREENS NOT ILLUMINATED AFTER 30 SECONDS
- EMERGENCY GEAR EXTENSION SYSTEM (AFT END OF CENTRE PEDESTAL)
- OPEN COVER
- PULL EMERGENCY GEAR EXTENSION LEVER FIRMLY TO HARD STOP.
  CHECK 3 GREENS ARE OBTAINED. IF 3 GREENS STILL NOT ILLUMINATED
- TO LOCK LH & RH GEAR: CONDUCT LEVEL TURNS LEFT AND RIGHT AT
  ANGLES OF BANK UP TO 30°, MAINTAIN CONSTANT SPEED
- TO LOCK NOSE GEAR: REDUCE AIRSPEED (POWER IDLE)
- KEEP EMERGENCY GEAR EXTENSION LEVER IN PULLED POSITION

At rear of Center Console:

FUEL EMER SOV HANDLE | HYDRAULIC HAND PUMP HANDLE | ACS EMER SOV HANDLE

Replaced by:

FUEL EMER SOV HANDLE | EMERGENCY GEAR EXTENSION | ACS EMER SOV HANDLE

120369

SECTION 3 – EMERGENCY PROCEDURES

3.10 LANDING GEAR SYSTEM FAILURE

3.10.1 LANDING GEAR FAILS TO RETRACT

Indication: All Landing Gear Indicator Lights do not change to UP.

1.	**Airspeed**	**Below 180 KIAS**

Note: To cycle the landing gear for troubleshooting is not recommended. However, if during landing gear retraction moderate turbulence and/or considerable G-load was present, the pilot may consider cycling the landing gear once, at his own discretion.

2.	**Landing Gear Selector**	**Select DN**

If 3 green lights not illuminated within 30 sec:

3.	**Aircraft**	**Refer to Emergency Gear Extension (Sect. 3.10.3)**

If 3 green lights illuminated:

4.	**Aircraft**	**Land as soon as practical**

END

3.10.2 HYDRAULIC SYSTEM FAILURE

Procedure removed.

END

3.10.3 EMERGENCY GEAR EXTENSION

Indication: Incorrect Indication on landing gear indicator lights
Red unlocked lights on and/or green lights not illuminated.

1.	**Airspeed**	**120 KIAS**
2.	**Landing Gear Selector**	**Select DN**

If 3 green lights not illuminated within 30 sec:

3.	**Emergency Gear Extension Lever Cover**	**Open**
4.	**Emergency Gear Extension Lever**	**PULL FIRMLY TO HARD STOP**

If 3 green lights still not illuminated:

To lock the main landing gear

5.	**Aircraft**	**Conduct level turns left and right at angles of bank up to 30°, maintaining constant airspeed, until main landing gears indicate locked down**

To lock the nose landing gear

6.	**Airspeed**	**Reduce power to idle and airspeed to minimum safe airspeed**

If 3 green lights illuminated:

7.	**Aircraft**	**Land as soon as practical**
8.	**After landing**	**Report Emergency Gear Extension System use to maintenance.**

If 3 green lights still not illuminated:

9.	**Aircraft**	**Carry out Emergency Landing procedure for landing gear unlocked (Sect. 3.9.3 to 3.9.5)**

END

3.10.4 GEAR ACTUATOR CONTROL

Indication: CAS caution - Gear Actuator Control

A. ON GROUND

1.	**Aircraft**	**Do not take off – Maintenance required**

B. IN FLIGHT

1.	**Landing gear**	**Do not cycle**

Before landing:

2.	**Airspeed**	**Below 180 KIAS**
3.	**Landing Gear Selector**	**DN**

If 3 green lights not illuminated within 30 sec:

4.	**Airspeed**	**120 KIAS**
5.	**Emergency Gear Extension Lever Cover**	**Open**
6.	**Emergency Gear Extension Lever**	**PULL FIRMLY TO HARD STOP**

If 3 green lights still not illuminated:

To lock the main landing gear

7.	**Aircraft**	**Conduct level turns left and right at angles of bank up to 30°, maintaining constant airspeed, until main landing gears indicate locked down**

To lock the nose landing gear

8.	**Airspeed**	**Reduce power to idle and airspeed to minimum safe airspeed**

If 3 green lights illuminated:

9.	**Aircraft**	**Land as soon as practical**
10.	**After landing**	**Report Emergency Gear Extension System use to maintenance.**

If 3 green lights still not illuminated:

11.	**Aircraft**	**Carry out Emergency Landing procedure for landing gear unlocked (Sect. 3.9.3 to 3.9.5)**

END

3.10.5 INVALID GEAR CONFIGURATION

Indication: CAS caution - Invalid Gear Config

ON GROUND

1.	**Aircraft**	**Do not take off – Maintenance required.**

END

3.15 ELECTRICAL SYSTEM FAILURES

3.15.2 Essential Bus

Replace:

CAUTION

THERE WILL BE NO HYDRAULIC POWER PACK OPERATION. REFER TO SECT 3.10.3 EMERGENCY GEAR EXTENSION.

With:

CAUTION

THERE WILL BE NO NORMAL LANDING GEAR OPERATION. REFER TO SECT 3.10.3 EMERGENCY GEAR EXTENSION.

END

3A.2 CAS ADVISORIES

CAS ADVISORY MESSAGE	MEANING, EFFECTS AND POSSIBLE ACTIONS
* Gear Control Fault	Indicates loss of redundancy in landing gear control system, such as a stuck gear handle position switch. Gear will still function normally with a single fault

3A.4 FLIGHT TRAINING

3A.4.1 EMERGENCY GEAR EXTENSION LEVER RESET

If Emergency Gear Extension Lever has been pulled in flight:

1.	**Landing Gear Selector**	**DN**
2.	**Emergency Gear Extension Lever**	**Press black release lever and push red lever down.**
3.	**Emergency Gear Extension Lever cover**	**Close**

SECTION 4 – NORMAL PROCEDURES

4.3 PREFLIGHT INSPECTION

4.3.1 EMPENNAGE

Step 5 removed.

4.3.8 COCKPIT

Step 24 changed to "Emergency Gear Extension Lever – Stowed".

24. Emergency Gear Extension Lever STOWED

SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

No change.

SECTION 7 - AIRPLANE AND SYSTEMS DESCRIPTION

SECTION 7-4 LANDING GEAR

Replace entire Section 7-4.

GENERAL

Refer to Figure 7-4-1, Landing Gear System, for system operation.

The landing gear is a conventional tricycle configuration that is extended and retracted using electro-mechanical actuators. Landing gear operation is completely automatic upon pilot gear selection.

All landing gear are held in the fully retracted position by a mechanical brake internal to the actuators. No mechanical uplocks are installed.

Landing gear position is shown on three icons in the GEAR window of the systems MFD. Nosewheel steering is accomplished by mechanical nosewheel steering and by differential braking.

Aircraft braking is controlled by toe pedals that operate brake assemblies attached to the left and right landing gear. Propeller reverse also contributes to aircraft braking. Refer to Propeller system, Section 7-11, for more information.

DESCRIPTION

The nose gear is a hydraulic fluid and nitrogen filled shock strut. The shock strut consists of a piston and fork assembly that slides inside a cylinder. A torque link connects the piston/fork assembly to the cylinder. The cylinder is mounted inside the nosewheel well. The nose gear is locked in the extended position by putting the folding strut in an overcenter position. A spring is attached to the nose gear to assist in free fall during emergency extension. The nose gear doors are spring loaded to the open position and are mechanically closed during nose gear retraction. The nose gear retracts rearward into the nosewheel well and is completely enclosed by the gear doors when the landing gear is retracted. Proximity switches give the up or down signal to the MAU.

Both main landing gear are trailing link types. A hydraulic fluid and nitrogen filled shock strut connects the trailing link to the main leg hinge point. The main gears are locked in the extended position by putting the folding strut in an overcenter position. A spring is attached to the main gears to assist in free fall during emergency extension. The main landing gear doors consist of a single door that is attached to the main gear leg and the outside edge of the main gear wheel well. Each main gear retracts inward into the main gear wheel well. With the landing gear retracted the main landing gear wheel and tire assemblies are not enclosed and protrude out of the main gear wheel well approximately one inch (25.4 mm). Proximity switches give the up signal to the MAU. Microswitches give the down signal to the MAU.

All landing gear are held in the fully retracted position by a mechanical brake internal to the actuators. No mechanical up-locks are required.

Nose wheel steering is accomplished using the rudder pedals which are mechanically connected to the nosewheel. Additional nosewheel steering is done through differential braking. Use of rudder pedal only will turn the nosewheel ± 12 degrees from center while differential braking will turn the nosewheel ± 60 degrees from center. A shimmy damper is installed on the nose landing gear strut to eliminate nosewheel oscillations.

The tires are a low pressure type that allow operations from soft and unimproved fields.

ELECTRO-MECHANICAL ACTUATORS DESCRIPTION

Both nose landing gear and main landing gear actuators have the same functionality and are electro-mechanical, self-rigging type actuators. The actuator motor control and monitoring electronics are incorporated within the actuator. Control is provided by the landing gear selector handle and the landing gear control system (including the Gear Relay Unit).
The actuator consists of an electric motor connected to a series of gears which reduce speed. The gear train has a thrust bearing connected to a ball screw and shaft. The ball screw transforms the rotation of the gear to the linear movement necessary to extend and retract the landing gear.
The motor brake is engaged when actuator movement is stopped.
An emergency gear extension system is a cable-operated system to disengage the gear train from the electric motor. Once initiated, the emergency free-fall is damped by a centrifugal brake within the actuator to avoid damage to the structure.

Electrical power supply for the actuators is provided from the SECONDARY POWER LINE. Power is applied to the actuators for 30 seconds following gear handle movement.

Cockpit controls consist of the following:

- A landing gear selector handle is located on the pilot's lower right panel and facilitates extension or retraction of the landing gear. It activates up and down switches situated directly on the handle system. The handle is equipped with an electrical spring loaded solenoid which prevents it from moving to the retracted position when the airplane is on the ground. The airplane on ground status is sensed by the MAU.

- An emergency gear extension (release cable) system, actuated with a lever, located at the rear of the center console, is used to disengage the gear train in the actuator and enables emergency free-fall of the landing gear if the electric drive system fails.

ELECTRIC ACTUATOR OPERATION

When the landing gear handle is set to the up (or down) position a command signal is sent to the actuator to move to the retracted/extended position. At the same time the actuators are powered for 30 seconds.
The main and nose landing gears are held in its extended position by an over-center two piece drag link and an overcenter spring.

INDICATION/WARNING

Extended position indication is provided by micro switches situated at the main landing gear drag link and a proximity switch on the nose landing gear door. Retraction position indication is provided by proximity switches on the main and nose landing gear doors.

Landing gear position is shown by three icons (one for each gear) in the GEAR window of the systems MFD. Each icon can show gear displays for the following conditions:

Condition of left main gear, right main gear and nose gear	Color and Font	Gear Display
State is 'undetermined'	Amber cross on black background	
State is 'Gear Up' normal	White UP with white box outline	
State is 'Gear Up' declutter (flaps up)	Grey UP with grey box outline	
State is 'Gear Up' warning	White UP in red box	
State is 'Gear Down'	Black DN with green background	
State is 'Gear in Transit'	White hatched lines with black background	
State is 'Gear in Transit Warning'	White hatched lines with red background	

The Flight Alerting System (FAS) will initiate a Gear warning message on the PFD and an aural warning will sound if the landing gear is not down and locked whilst in the air with:

- an airspeed of less than 130 KIAS and the PCL at idle
- the flaps set to 30 or 40°
- a radar altitude of less than 200 ft and a power setting of less than 10 psi.

The Crew Alerting System (CAS) displays the following cautions and advisory messages for the Electric Landing Gear System:

AMBER CAUTION

Gear Actuator Cntl Indicates a failure reported by one of the landing gear actuators. Gear should not be cycled unnecessarily. Gear can be lowered if it is raised. Maintenance action required.

Invalid Gear Config Indicates that Aircraft with Electro-mechanical Landing Gear has an option file that incorrectly specifies gear type as Hydraulic.

CYAN ADVISORY

Gear Control Fault Indicates loss of redundancy in landing gear control system, such as a stuck gear handle position switch. Gear will still function normally with a single fault.

EMERGENCY GEAR EXTENSION SYSTEM

To manually extend the landing gear set the landing gear selector handle to DN with airspeed 120 KIAS. Open the Emergency Gear Extension Lever cover and pull the Emergency Lever. This will allow the landing gear to free fall. If the landing gear does not completely extend and show three green indicators, banking the airplane left and right to use the G-load may assist the emergency extension of the main landing gear. Reducing airspeed and engine power to reduce aerodynamic load may assist the emergency extension of the nose landing gear.

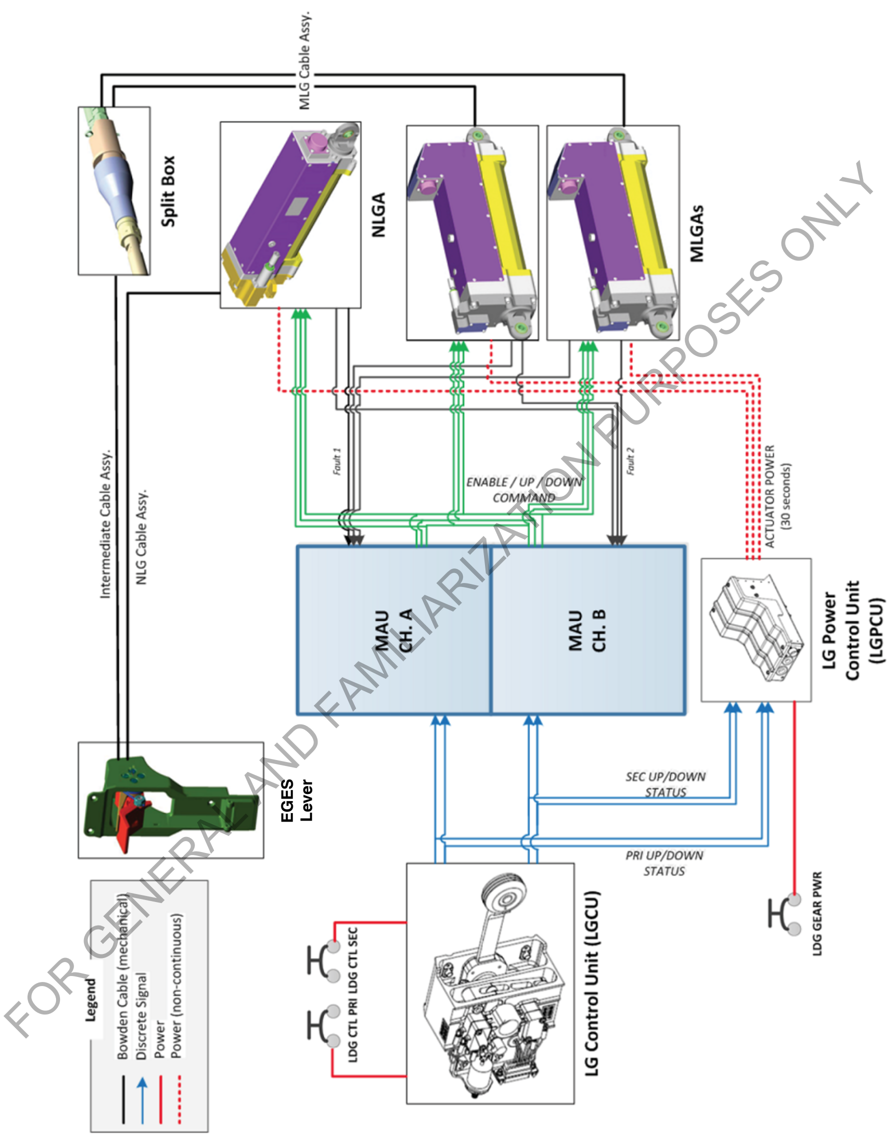


Figure 7-4-1. Landing Gear System
(Sheet 1 of 3)

This Illustration is removed.

Figure 7-4-1. Landing Gear System
(Sheet 2 of 3)

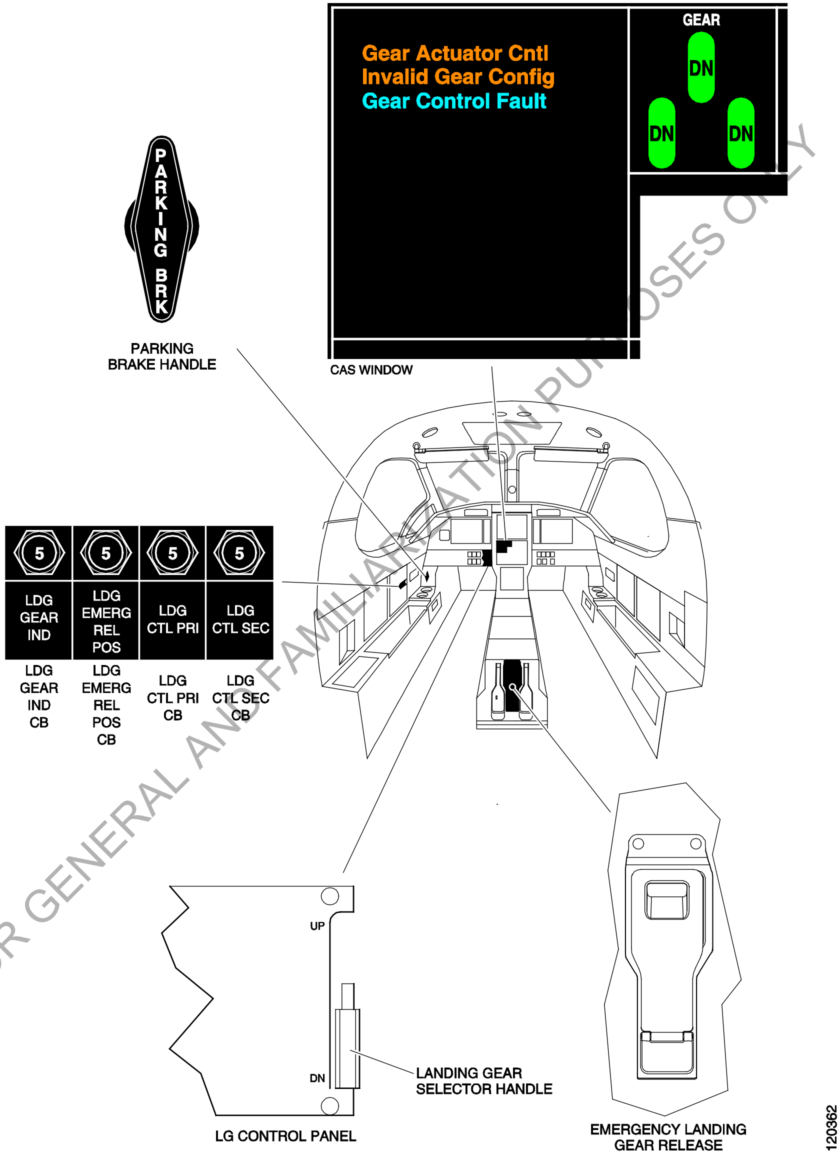


Figure 7-4-1. Landing Gear System
(Sheet 3 of 3)

AIR / GROUND SYSTEM

The aircraft “in air” or “on ground” (AIR/GND) status is determined from a combination of aircraft systems interfaced to the Modular Avionics Unit (MAU):

- LH main gear proximity switch
- RH main gear proximity switch
- Radar Altimeter – altitude
- Calibrated airspeed (ADAHRS computed)

By comparison monitoring of the above systems the MAU determines the AIR/GND status of the aircraft. MAU Channel A outputs a discrete signal to control the LH AIR/GND relays. MAU Channel B outputs a discrete signal to control the RH AIR/GND relays.

The LH AIR/GND signal is sent to the following systems:

- Propeller de-ice
- Flaps
- ECS
- LH Stick Pusher Computer
- Flight Time Counter

The RH AIR/GND signal is sent to the following systems:

- RH Stick Pusher Computer
- Logo Lights (optional system)

If the MAU determines a disparity between the monitors by comparison monitoring, a correct determination of the AIR/GND status is still possible as the suspect (invalid) monitor is disregarded in the determination. When the MAU determines that all monitors disagree it results in an invalid AIR/GND state. If the AIR/GND state is invalid a Air/Ground Fail caution will be shown on the Crew Alerting System (CAS).

When the Air/Ground Fail caution is shown the AIR/GND state defaults to AIR.

A dormant fault in the LH and RH main gear proximity switches is possible as a result of the AIR/GND monitor function of the MAU. To avoid this CAS status alerts will be given for LH WOW Fault, RH WOW Fault or LH + RH WOW Fault when the MAU determines either or both proximity switch inputs are invalid.

SECTION 7-13 ELECTRICAL

DESCRIPTION

These paragraphs and illustrations are changed from those in the AFM.

BUS BARS

The Secondary Power Line is the source of electrical power with the second highest level of integrity. It supplies the Main, Avionic 2, Non-Essential and Cabin Busbars and power for the landing gear system, RH windshield de-ice, VCCS and under floor heating.

CIRCUIT BREAKERS

The circuit breakers for the high current consuming systems FLAP PWR, LH W/SHLD, PROP DE-ICE and CABIN HTG are all installed on the LH PJB. The circuit breakers for the high current consuming systems LDG GEAR PWR, RH W/SHLD, U/FLOOR HTR and optional FOOTWARMER are all installed on the RH PJB. The circuit breakers for the VCCS and optional LOGO LT are installed on the BEPJB.

OPERATION

In the event of a dual generator failure the Bus Tie closes and both the batteries supply the Power Line. The Secondary Power Line will also be powered but apart from LDG GEAR PWR all the distribution busbars will be automatically load shed. A warning will be displayed in the CAS window. This is the PGDS emergency condition and automatic load shedding takes place. With the STBY BUS switch on, the Avionic 1 bus can be manually switched off with the AV 1 BUS switch to further reduce the electrical load.

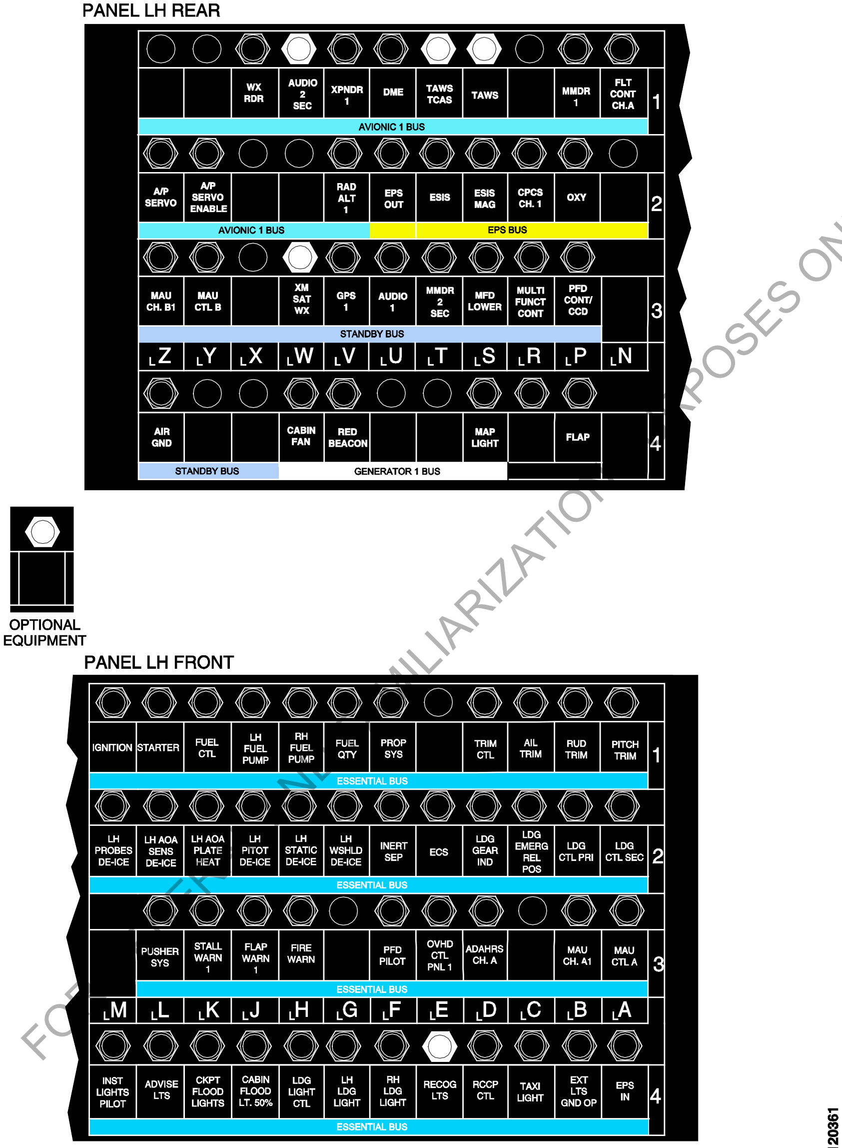


Figure 7-13-1. PGDS LH Circuit Breaker Panels
(Sheet 2 of 4)

Replace ~~Hydraulic Power~~ with Landing Gear Power on these schematic diagrams (Secondary Power Line). The illustrations are not shown here.

Figure 7-13-2. PGDS Normal Operation Condition – Both Generators On-Line (Sheet 1 of 4)

Figure 7-13-2. PGDS Abnormal Operation Condition – Generator 1 Off-Line (Sheet 2 of 4)

Figure 7-13-2. PGDS Abnormal Operation Condition – Generator 2 Off-Line (Sheet 3 of 4)

Figure 7-13-2. PGDS Emergency Operation Condition – Both Generators Off-Line (Sheet 4 of 4)

SECTION 7-15 ENVIRONMENTAL CONTROL SYSTEM

This paragraph is changed from that in the AFM.

AUXILIARY HEATING DESCRIPTION

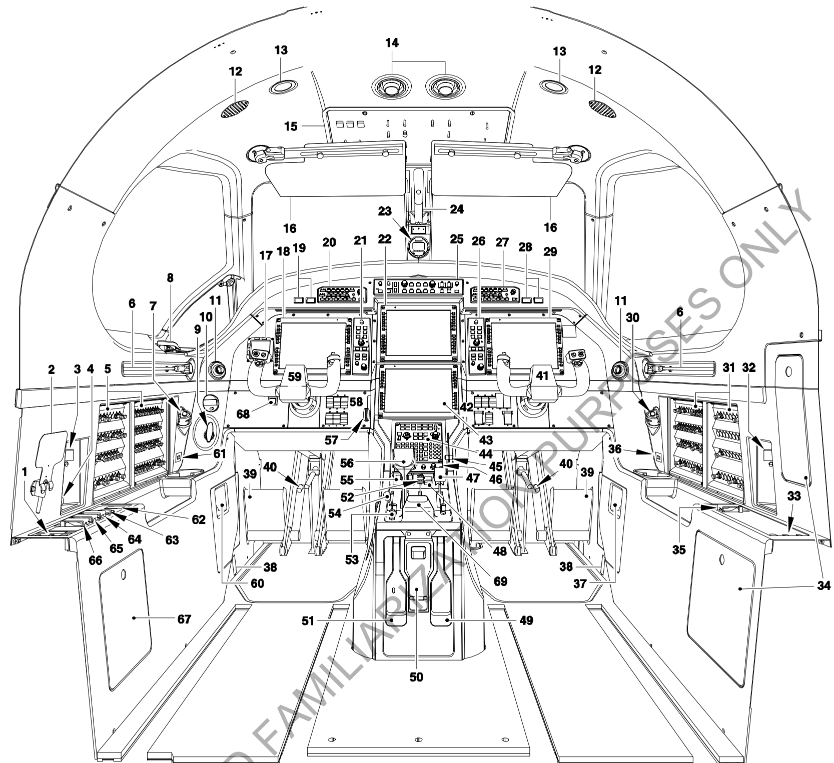
The power for the heater element circuits is interrupted when the landing gear moves or the cooling system (VCCS) is operating.

SECTION 7-19 COCKPIT ARRANGEMENT

The following paragraph and layout illustration is changed from that in the AFM.

DESCRIPTION

The center console contains the ELT switch, the trim and flap interrupt and alternate stab trim switches, and the engine power controls and flap lever. Further aft are the cockpit and cabin lighting controls. At the top rear of the center console there is a flat area where the Cursor Control Device (CCD) can be installed. The ACS and fuel firewall shutoff valve controls and the Emergency Gear Extension Lever can be found on the aft vertical surface of the console. On the forward right side of the console there is a main OXYGEN lever.



1. HEADSET MIC/PHONE JACKS
2. CONTROL LOCK
3. MASK OXYGEN/MIC JACKS
4. PASSENGER OXYGEN SELECTOR
5. LEFT SIDEWALL CB PANELS
6. UTILITY LIGHT
7. HAND MICROPHONE
8. DIRECT VISION (DV) WINDOW
9. PARKING BRAKE HANDLE
10. CLOCK
11. ECS SIDE AIR OUTLET
12. LOUDSPEAKER
13. DOME LIGHT
14. AIR VENTS
15. OVERHEAD ELECTRICAL CTRL PANEL
16. SUNVISOR
17. EMERG. STANDBY INSTR. SYS (ESIS)
18. PRIMARY FLIGHT DISPLAY (PFD)
19. MASTER CAUTION & WARNING LIGHTS
20. AUDIO/MARKER PANEL
21. PFD & RADIO CONTROL PANEL
22. SITUATION AWARENESS MFD
23. MAGNETIC COMPASS
24. GRAB HANDLE
25. AFCS CONTROL PANEL
26. CO PILOT PFD & RADIO CTRL PANEL
27. CO PILOT AUDIO/MARKER PANEL
28. MASTER CAUTION & WARNING LIGHTS
29. CO PILOT PFD
30. CO PILOT HAND MICROPHONE
31. RIGHT SIDEWALL CB PANELS
32. CO PILOT MASK OXYGEN/MIC JACKS
33. CO PILOT HEADSET MIC/PHONE JACKS
34. MAINTENANCE PANELS
35. CO PILOT MASK MIC/COMMS SWITCH
36. DUAL USB PORT (OPTIONAL)
37. RH POWER JUNCTION BOX
38. FOOT AIR OUTLETS SELECTOR LEVER
39. RUDDER PEDALS
40. RUDDER PEDAL ADJUSTMENT HANDLE
41. CONTOL WHEEL
42. ACS & CPCS CONTROL SWITCHES
43. SYSTEMS MFD
44. MULTI FUNCTION CONTROLLER
45. MAIN OXYGEN LEVER
46. DISPLAY REVERSIONARY CONTROL PANEL
47. FLAP SELECTOR
48. FLAP TRIM INTERRUPT, ALT STAB TRIM SWITCHES
49. ACS FIREWALL SHUTOFF CONTROL
50. EMERGENCY LANDING GEAR RELEASE
51. FUEL FIREWALL SHUTOFF CONTROL
52. CONDITION LEVER
53. COCKPIT/CABIN LIGHTING CONTROLS
54. MANUAL OVERRIDE FUEL CONTROL
55. ELT REMOTE CONTROL PANEL
56. POWER CONTROL LEVER
57. LANDING GEAR HANDLE
58. ICE PROTECTION SWITCHES
59. CONTROL WHEEL
60. LH POWER JUNCTION BOX
61. DUAL USB PORT (OPTIONAL)
62. FLIGHT TIME COUNTER
63. OXYGEN PRESSURE INDICATOR
64. MASK MIC/COMMS SWITCH
65. AURAL INHIBIT SWITCH
66. EMERG FREQ/NORM SWITCH
67. CD STOWAGE BOX
68. HDG/TRK OVERRIDE SWITCH (OPTIONAL)
69. CURSOR CONTROL DEVICE

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Figure 7-19-1. Cockpit - Layout
(Sheet 1 of 2)

SECTION 7-31 MONITOR WARNING SYSTEM

The following is changed from that in the AFM.

CAS CAUTION MESSAGES (AMBER)

X shows Inhibited

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Cru-ise	App-roach
~~Hydraulics~~	~~X~~		~~X~~		~~X~~		~~X~~
Gear Actuator Cntl	X		X				
Invalid Gear Config			X		X	X	X

CAS ADVISORY MESSAGES (CYAN)

X shows Inhibited

Message Text	Stby Bus	Elec Pwr on	Eng Start	Taxi	Take-off	Crui-se	App-roach
Gear Control Fault	X		X		X	X	X

SECTION 8 - HANDLING, SERVICING, AND MAINTENANCE

Page 8-24

HYDRAULIC SYSTEM - DELETED

Page 8-39

CORROSION INSPECTION

Aircraft based/operated in severe climatic areas must be inspected every 14 days as follows:

- Examine the landing gear compartments, especially the landing gear, wheels, tubing clamps, folding strut, overcenter spring and actuators.

SECTION 9 - SUPPLEMENTS

No change.

SECTION 10 - SAFETY AND OPERATIONAL TIPS

No change.

EXTRACT FROM EQUIPMENT LIST REPORT NO. 02047

This extract shows only the items removed (shown ~~strikethrough~~) and items added to the Equipment List.

Mark 'X' if installed	ATA Code	ITEM	PILATUS PART NO.	MASS kg	ARM m
	24	**ELECTRICAL POWER**			
~~X~~		~~Power Junction Box, RH~~	~~957.03.38.143~~	~~5.59~~	~~3.58~~
X		Power Junction Box, RH	974.03.38.145	5.59	3.58
	~~**29**~~	~~**HYDRAULIC**~~			
~~X~~		~~Power Pack, Hydraulic~~	~~960.30.01.154~~	~~9.850~~	~~6.25~~
~~X~~		~~Accumulator~~	~~960.30.01.292~~	~~1.750~~	~~6.25~~
~~X~~		~~Indicator, Pressure (Mechanical)~~	~~965.61.88.101~~	~~0.055~~	~~6.25~~
~~X~~		~~Valve, Landing Gear Selector~~	~~960.30.01.272~~	~~0.540~~	~~3.75~~
~~X~~		~~Handpump, Emergency Landing Gear~~	~~968.85.82.111~~	~~0.790~~	~~4.00~~
~~X~~		~~Valve, Service Selector~~	~~960.30.01.261~~	~~0.500~~	~~6.00~~
~~X~~		~~Actuator, Nose Gear~~	~~960.30.01.111~~	~~0.940~~	~~3.26~~
~~X~~		~~Actuator, Main Gear (2) (ea.)~~	~~960.30.01.105~~	~~6.660~~	~~5.92~~
~~X~~		~~Switch, Hydraulic (N2) Pressure~~	~~973.81.14.306~~	~~0.072~~	~~6.00~~
~~X~~		~~Switch, Low Pressure~~	~~973.81.14.307~~	~~0.072~~	~~6.00~~
	32	**LANDING GEAR**			
X		Actuator, Main Gear (2) (ea)	959.56.01.823	6.00	5.92
X		Actuator, Nose Gear	959.56.01.824	3.55	3.26
X		Landing Gear Control Unit	532.31.12.142	1.06	3.49
X		Landing Gear Relay Unit	532.35.12.111	2.97	6.54

PILOT'S OPERATING HANDBOOK
AND
FOCA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 12
FOR
PC-12/47E AIRCRAFT REGISTERED IN UKRAINE

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E in the Ukraine. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Approved by:

European Aviation Safety Agency (EASA) on behalf of
the State Aviation Administration of Ukraine (SAAU)
Ref: EASA Project Number – 0010009323-001

Date of Approval:

08. Juni 2012

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LIST OF EFFECTIVE PAGES

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LOG OF TEMPORARY REVISIONS

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NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description

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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12-47E aircraft in the Ukraine.

SECTION 2 – LIMITATIONS

FUEL

Anti-icing additives as specified by the basic AFM/POH must be used.

In addition to the fuels listed in the AFM, the following fuels can be used:

GOST 10227 RT
GOST 10227 TS-1
GSTU 320.00149943 RT
GSTU 320.00149943 TS-1

Note: TS-1 is subject to the restrictions given in Pratt & Whitney Canada Service Bulletin No. 14004.

MAXIMUM PASSENGER SEATING LIMITS

Seating configurations above 9 passengers are not allowed.

No passenger is allowed to occupy the right-hand crew seat.

SYSTEMS AND EQUIPMENT LIMITS

A Cockpit Voice Recorder (CVR) must be installed and operational if crew includes two pilots.

A Flight Data Recorder (FDR) must be installed and operational for commercial transportation.

A suitable High Frequency (HF) communication system must be installed and operational for aircraft operations outside the areas of Very High Frequency (VHF) coverage.

OTHER LIMITATIONS

Approved Smoke goggles and the smoke goggles storage box must be installed.

Supplemental Type Certificate (STC) incorporated on the PC-12/47E aircraft require separate State Aviation Administration of Ukraine approval.

SECTION 3 – EMERGENCY PROCEDURES

No change.

SECTION 4 – NORMAL PROCEDURES

No change.

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SECTION 5 – PERFORMANCE

No change

SECTION 6 – WEIGHT AND BALANCE

No change.

SECTION 7 – AIRPLANE AND SYSTEMS DESCRIPTION

No change.

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 13
FOR
PC-12/47E AIRCRAFT REGISTERED IN CHILE

This supplement is approved in accordance with DAR 08 for Chilean registered aircraft and is approved by the DGAC – Chile.

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E in the Chile.

The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

Approved by:
Dirección General de Aeronáutica Civil (DGAC) Chile

Date of Approval:

DIRECCION GENERAL DE AERONAUTICA CIVIL
DEPTO. SEGURIDAD OPERACIONAL

0 1 AGO 2012

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LIST OF EFFECTIVE PAGES

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LOG OF TEMPORARY REVISIONS

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description
1 01.09.2014	9-13-3 thru 9-13-10 9-13-14 9-13-21	LOR Updated for Revision 1. Editorial changes. Additional placard shown. Additional placard shown. The Revision Number 1 to AFM Supplement No. 13 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 23. September 2014.
2 02.03.2016	9-13-3 9-13-7 9-13-10 9-13-11 thru 9-13-24 9-13-23 thru 9-13-24	LOEP updated. LOR updated. Additional placard shown. Effectivity added. Page run on. New pages. The Revision Number 2 to AFM Supplement No. 13 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 02.03. 2016. 16148
3 06.01.2020	9-13-3 9-13-7 9-13-10 9-13-12	LOEP updated. LOR updated. 19880 - Editorial (Changed "cabin door" to "passenger door") 20566 - Editorial (effectivity updated). 19880 - Editorial (Changed "cabin door" to "passenger door") The Revision Number 3 to AFM Supplement No. 13 is approved under the authority of DOA ref. EASA.21J.357. Approval Date: 06.01.2020. 20565

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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12-47E aircraft in the Republic of Chile.

SECTION 2 – LIMITATIONS

On airplanes registered in the Republic of Chile, the necessary equipment for the different kinds of operations must comply with the applicable Chilean Regulations.

EXTERNAL PLACARDS

On exterior of passenger door (MSN 1001 – 1575):

TIRE DE LA MANILLA Y GIRE PARA ABRIR **NO ABRIR LA PUERTA CON EL MOTOR EN MARCHA EXCEPTO EN EMERGENCIA**

ABRIR

On exterior of passenger door (MSN 1576 - 1942):

PRESIONE AQUI PARA ABRIR TIRE DE LA MANILLA Y TIRE DE LA PUERTA HACIA AFUERA **NO ABRIR LA PUERTA CON EL MOTOR EN MARCHA EXCEPTO EN EMERGENCIA**

On exterior of cargo door:

PRESIONE AQUI PARA ABRIR TIRE DE LA MANILLA Y TIRE DE LA PUERTA HACIA AFUERA **NO ABRIR LA PUERTA CON EL MOTOR EN MARCHA EXCEPTO EN EMERGENCIA**

TIRAR PARA ABRIR

On exterior of emergency exit:

SALIDA DE EMERGENCIA

EMPUJE

EMPUJE HACIA ADENTRO DESPUES DE SOLTAR

CABIN PLACARDS

The following placards are installed in all aircraft.

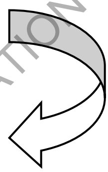
On interior of passenger door:

SALIDA/EXIT
NO UTILIZAR EN VUELO
DO NOT OPERATE IN FLIGHT

NO ABRIR LA PUERTA CON EL MOTOR
EN MARCHA EXCEPTO EN EMERGENCIA
DO NOT OPEN DOOR WHEN ENGINE
IS RUNNING UNLESS IN EMERGENCY

CERRADO
CLOSED

SOLO UNA PERSONA A LA VEZ
EN LAS ESCALERAS
ONLY ONE PERSON ON STAIRS
AT ANY TIME



PARA ABRIR LEVANTAR EL
CERROJO Y ROTAR LA MANILLA
TO OPEN LIFT LATCH
ROTATE HANDLE

ABIERTO
OPEN

PRESIONE BOTON PARA LUZ DE CABINA
PUSH BUTTON FOR COCKPIT DOME LIGHT

On interior of emergency exit:

SALIDA / EXIT

On interior emergency exit handle:

TIRE / PULL

On interior cargo door handle cover:

NO QUITAR LA CUBIERTA EN VUELO DO NOT REMOVE COVER IN FLIGHT

On interior cargo door handle:

LEVANTAR EL SEGURO, TIRAR LA PALANCA Y EMPUJAR LA PUERTA HACIA AFUERA LIFT LOCKING LEVER AND PULL HANDLE PUSH DOOR OUT

On interior of cargo door:

NO ABRIR LA PUERTA CON EL MOTOR EN MARCHA EXCEPTO EN EMERGENCIA DO NOT OPEN DOOR WHEN ENGINE IS RUNNING UNLESS IN EMERGENCY

On the forward and rear cargo door frame:

MAXIMO PESO DE CARGA = 1500 kg / 3300 lb	
Carga Maxima Sobre Rieles de Asientos	**Carga Maxima Sobre Los Paneles De Piso**
1000 kg/m^2 205 lb/ft^2	**600 kg/m^2 125 lb/ft^2**
LA CARGA NO DEBE OBSTRUIR EL ACCESO A LA PUERTA DE CABINA Y SALIDA DE EMERGENCIA	

On lower cargo door frame:

INSTALAR EL SOPORTE DE COLA ANTES DE CARGAR EL AVION INSTALL TAIL SUPPORT STAND BEFORE LOADING CARGO

On cabin to baggage area step:

MANTENGA LIBRE LA REJILLA **KEEP GRILL CLEAR**

Below the Baggage light switch:

LUZ DE **CARGA** **CARGO LIGHT**

Above the baggage area:

MAXIMA CARGA DE EQUIPAJE = 265 lb / 120 kg **MAX BAGGAGE LOAD = 265 lb / 120 kg**

or

MAXIMA CARGA DE EQUIPAJE = 400 lb / 180 kg **MAX BAGGAGE LOAD = 400 lb / 180 kg**

Above the baggage area with large baggage net installed:

MAXIMA CARGA DE EQUIPAJE = 500 lb / 225 kg **(SOLO SI LA RED DE EQUIPAJE 525.25.12.026 ESTA INSTALADA)** **MAX BAGGAGE LOAD = 500 lb / 225 kg** **(ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)**

On the rear of the left cockpit bulkhead:

EL BOTIQUIN DE PRIMEROS AUXILIOS ESTA UBICADO **EN LA CABINA, DETRÁS DEL ASIENTO DEL PILOTO** **FIRST AID KIT LOCATED ON COCKPIT SIDE** **L.H. BULKHEAD BEHIND PILOT SEAT**

EL EXTINTOR DE INCENDIOS **ESTA UBICADO EN LA CABINA,** **DETRAS DEL ASIENTO DEL COPILOTO** **FIRE EXTINQUISHER LOCATED** **ON COCKPIT SIDE R.H.BULK-** **HEAD BEHIND CO-PILOT SEAT**

9 SEAT CORPORATE COMMUTER INTERIOR (Interior Code STD-9S)

The cabin placards plus the following are those required for this interior.

Near each passenger oxygen outlet:

OXIGENO **OXYGEN**

On the rear of the left cockpit bulkhead:

NO FUMAR **NO SMOKING**

On the rear of the left and right cockpit bulkheads:

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO **OXYGEN MASK LOCATED UNDER YOUR SEAT**

On the back of each standard passenger seat (except seat 5):

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO **OXYGEN MASK LOCATED UNDER YOUR SEAT**

On the rear of the left and right cockpit bulkheads, and on the rear of each seat:

PARA DESPEGUE Y ATERRIZAJE **-AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES** **-EL RESPLANDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL** **FOR TAKEOFF AND LANDING** **-FASTEN SEAT LAP AND SHOULDER BELT** **-SEAT BACK MUST BE FULLY UPRIGHT**	or	**PARA DESPEGUE Y ATERRIZAJE** **-EL RESPLANDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL** **-AJUSTAR EL REPOSACABEZAS** **-AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES** **FOR TAKEOFF AND LANDING** **-SEAT MUST BE FULLY UPRIGHT** **-ADJUST HEADREST TO SUPPORT HEAD** **-FASTEN SEAT LAP AND SHOULDER BELT**

On the back of seat 5:

MASCARA DE OXIGENO UBICADA EN PARTE FRONTAL DEBAJO DEL ASIENTO **OXYGEN MASK LOCATED UNDER SEAT IN FRONT**

120414

6 SEAT CORPORATE COMMUTER INTERIOR AND A THREE SEAT BENCH (INTERIOR CODE STD-6S-3B)

The cabin placards, the 9 seat corporate commuter placards and the following replacement/additional placards are required for this interior.

On the rear of seats 5 and 6:

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO OXYGEN MASK LOCATED UNDER YOUR SEAT

On the rear of seat 5:

EL ASIENTO IZQUIERDO DEBE ESTAR TOTALMENTE HACIA ATRAS DURANTE TODO EL VUELO LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

On the left side of the bench seat:

EL ASIENTO IZQUIERDO DEBE ESTAR TOTALMENTE HACIA ATRAS DURANTE TODO EL VUELO LEFT PART OF BENCH SEAT MUST BE FULLY AFT DURING THE ENTIRE FLIGHT

When the large baggage net is installed:

MAXIMA CARGA DE EQUIPAJE = 500 lb / 225 kg (SOLO SI LA RED DE EQUIPAJE 525.25.12.026 ESTA INSTALADA) MAX BAGGAGE LOAD = 500 lb / 225 kg (ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

6 SEAT EXECUTIVE INTERIOR (INTERIOR CODE EX-6S-2)

The cabin placards plus the following are those required for this interior.

Above the baggage area coat rail:

MAX PESO A COLGAR 11 lb / 5 kg **MAX COAT RAIL LOAD 11 lb / 5 kg**

Above the baggage area:

MAXIMA CARGA DE EQUIPAJE = 400 lb / 180 kg **MAX BAGGAGE LOAD = 400 lb / 180 kg**

On the forward left stowage unit:

On the upper drawer

PESO LIMITE **WEIGHT LIMIT 10 lb / 4,5 kg**

On the lower drawer

PESO LIMITE **WEIGHT LIMIT 25 lb / 11,5 kg**

On the forward right stowage unit:

On the upper drawer

PESO LIMITE **WEIGHT LIMIT 5 lb / 2,2 kg**

On the lower drawer

PESO LIMITE **WEIGHT LIMIT 7 lb / 3,2 kg**

On each oxygen mask pocket:

MASCARA DE OXIGENO EN EL INTERIOR **OXYGEN MASK INSIDE**

On the armrest near each passenger oxygen mask:

TIRE DE LA CINTA PARA **LA MASCARA DE OXIGENO** **PULL TAPE FOR** **OXYGEN MASK**	⇨	or	⇦	**TIRE DE LA CINTA PARA** **LA MASCARA DE OXIGENO** **PULL TAPE FOR** **OXYGEN MASK**

Near each Executive seat:

PARA DESPEGUE Y ATERRIZAJE **- EL RESPALDO DEL ASIENTO DEBE ESTAR COMPLETAMENTE VERTICAL MOVER EL ASIENTO HASTA EL TOPE TRASERO Y HASTA EL TOPE PARED** **- AJUSTAR EL REPOSACABEZAS** **- AJUSTAR EL CINTURON DE SEGURIDAD Y EL ARNES** **- PLEGAR Y ASEGURAR LA MESA** **FOR TAKEOFF AND LANDING** **- SEAT MUST BE FULLY UPRIGHT FULLY TO THE REAR OF CABIN AND FULLY OUTBOARD** **- ADJUST HEADREST TO SUPPORT HEAD** **- FASTEN SEAT LAP AND SHOULDER BELT** **- TABLE MUST BE STOWED**

Near each ashtray:

NO FUMAR MIENTRAS SE USE OXIGENO **DO NOT SMOKE WHILE OXYGEN IN USE**

4 SEAT EXECUTIVE AND 4 SEAT CORPORATE COMMUTER (INTERIOR CODE EX-4S-STD-4S)

The cabin placards, the 6 seat executive and the following placard is required for this interior:

On the armrest near Passenger Oxygen Mask for seats 7 and 8:

TIRE DE LA CINTA PARA LA MASCARA DE OXIGENO PULL TAPE FOR OXYGEN MASK	⇨ or ⇦	TIRE DE LA CINTA PARA LA MASCARA DE OXIGENO PULL TAPE FOR OXYGEN MASK

TOILET PLACARDS

The toilet placards are installed in all executive interiors.

On the toilet door #1:

NO FUMAR
EN EL BAÑO
NO SMOKING
IN LAVATORY

NO OCUPAR EL BAÑO DURANTE
DESPEGUE / ATERRIZAJE Y TURBULENCIA
TOILET COMPARTMENT NOT TO BE OCCUPIED DURING
TAKEOFF / LANDING AND TURBULENCE

PARA CERRAR
TIRE AQUI
TO CLOSE
PULL HERE

On the toilet door #3:

PARA CERRAR
TIRE AQUI
TO CLOSE
PULL HERE

Near the toilet seat:

PRESIONE PARA VACIAR PUSH TO FLUSH

LUZ DEL BAÑO LAVATORY LIGHT

On the oxygen mask box:

MASCARA DE OXIGENO EN EL INTERIOR OXYGEN MASK INSIDE

Below the oxygen mask box:

TIRE DE LA CINTA PARA LA MASCARA DE OXIGENO PULL TAPE FOR OXYGEN MASK

8 SEAT EXECUTIVE (Interior Code EX-8S) and 6 SEAT EXECUTIVE and 2 SEAT CORPORATE COMMUTER (Interior Code EX-6S-STD-2S)

The cabin placards, the 6 seat executive placards and the following replacement/additional placards are required for this interior.

Rear of executive passenger seat No. 5, 6, 7 and 8:

DEJAR ESTE ASIENTO DESOCUPADO DURANTE DESPEGUE Y ATERRIZAJE
A MENOS QUE EL ASIENTO DE ENFRENTE ESTE OCUPADO
LEAVE THIS SEAT VACANT DURING TAKE-OFF AND LANDING UNLESS
SEAT IN FRONT IS OCCUPIED

TIRE DE LA CINTA PARA
LA MASCARA DE OXIGENO
PULL TAPE FOR
OXYGEN MASK

or

TIRE DE LA CINTA PARA
LA MASCARA DE OXIGENO
PULL TAPE FOR
OXYGEN MASK

4 SEAT EXECUTIVE and THREE SEAT BENCH (Interior Code EX-4S-3B)

The cabin placards, the 4 seat executive placards and the following replacement/additional placards are required for this interior.

On rear of seats 3 and 4:

MASCARA DE OXIGENO DEBAJO DE SU ASIENTO
OXYGEN MASK LOCATED UNDER YOUR SEAT

PARA DESPEGUE Y ATERRIZAJE
-AJUSTAR EL CINTURON DE
SEGURIDAD Y EL ARNES
-EL RESPLANDO DEL ASIENTO DEBE
ESTAR COMPLETAMENTE VERTICAL

FOR TAKEOFF AND LANDING
-FASTEN SEAT LAP AND SHOULDER BELT
-SEAT BACK MUST BE FULLY UPRIGHT

or

PARA DESPEGUE Y ATERRIZAJE
-EL RESPLANDO DEL ASIENTO DEBE
ESTAR COMPLETAMENTE VERTICAL
-AJUSTAR EL REPOSACABEZAS
-AJUSTAR EL CINTURON DE
SEGURIDAD Y EL ARNES

FOR TAKEOFF AND LANDING
-SEAT MUST BE FULLY UPRIGHT
-ADJUST HEADREST TO SUPPORT HEAD
-FASTEN SEAT LAP AND SHOULDER BELT

On left side of the bench seat and near to the left bench seat on the armrest:

EL ASIENTO IZQUIERDO DEBE ESTAR TOTALMENTE
HACIA ATRAS DURANTE TODO EL VUELO
LEFT PART OF BENCH SEAT MUST BE
FULLY AFT DURING THE ENTIRE FLIGHT

120415

When the large baggage net is installed:

MAXIMA CARGA DE EQUIPAJE = 500 lb / 225 kg
(SOLO SI LA RED DE EQUIPAJE 525.25.12.026 ESTA INSTALADA)
MAX BAGGAGE LOAD = 500 lb / 225 kg
(ONLY IF BAGGAGE NET 525.25.12.026 IS INSTALLED)

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PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 14
FOR
ATC TRANSPONDER SYSTEM WITH ADS-B OUT

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E with an ATC Transponder System with ADS-B Out. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

This Aircraft Flight Manual Supplement is
EASA Approved under Approval Number:
10047484

Date of Approval: 16th December 2013

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LIST OF EFFECTIVE PAGES

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9-14-7	0	9-14-14	0

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NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description

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SECTION 1 – GENERAL

This supplement provides the information necessary to operate the PC-12/47E aircraft fitted with an ATC Transponder System with ADS-B Out (1090 MHz Extended Squitter ADS-B Out).

Service Bulletin 45-011 introduces the Primus Apex operational software Build 8.7 or higher (effectivity: MSN 545, 1001 -1470).

Service Bulletin 45-004 introduces the ADS-B Out functionality option file (effectivity: All).

The KXP 2290A transponder supports the 1090ES equipment operating on the radio frequency of 1090MHz. The 1090MHz is used by TCAS equipment, Mode A/C and S transponders (Mode A aircraft identify-code; Mode C altitude reporting; Mode S identify information assigned by a federal government authority).

The installed ADS-B OUT system has been shown to meet the equipment requirements of 14 CFR 91.227. The installed ADS-B system is compliant with the requirements of:
FAA TSO-C166b
FAA AC 20-165A
EASA ETSO-C166b
CS-ACNS.ADS (1090 MHz Extended Squitter ADS-B Out)
EASA AMC 20-24
CASA AC 21-45(1).

A detailed description of the system operation can be found in the Honeywell PRIMUS APEX Integrated Avionics System for the Pilatus PC-12 NG – Pilots' Guide.

NOTE

It is the operator's responsibility to ensure that the aircraft configuration meets the local airworthiness requirements to obtain operational approval. Be aware that flight in ADS-B equipped airspace is only allowed with ADS-B Out functionality operational.

SECTION 2 – LIMITATIONS

No change.

SECTION 3 – EMERGENCY PROCEDURES

Indication: Amber or removed ADS-B Out annunciation

A. Single Transponder Installation (or single ADS-B Out)
   1. Use the same procedure given in Section 3.22.17 – A. Single Transponder Installation

B. Dual Transponder Installation (both ADS-B Out capable)
   1. Use the same procedure given in Section 3.22.17 – B. Dual Transponder Installation

SECTION 4 – NORMAL PROCEDURES

No change.

SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

No change.

SECTION 7 - AIRPLANE AND SYSTEMS DESCRIPTION

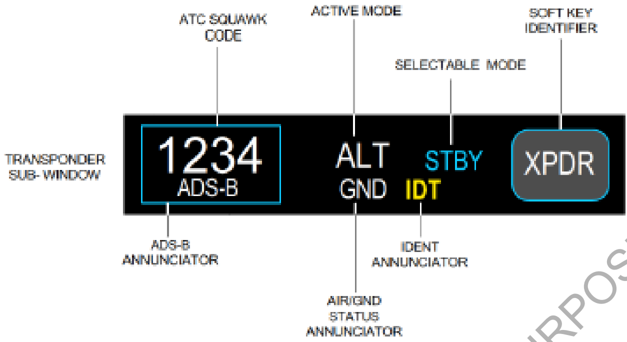
The Transponder KXP 2290A is installed behind the pilot Primary Flight Display (PFD) and is controlled by the PFD controller. The KXP 2290A transponder is electrically and mechanically identical to the previous KXP 2290 transponder, but the new unit supports ADS-B Out functionality. The KXP 2290A transponder can be installed in diversity and non-diversity versions. With the diversity version, an upper and a lower ATC antenna are installed. An optional second transponder can be installed. The KXP 2290A transponder transmits elementary, enhanced and extended squitter data. Each system receives data on ARINC 429 databuses:
For more details refer to Section 7 for the KXP 2290 which works in a similar way to the KXP 2290A.

The transponder ADS-B Out status annunciator is located below the transponder code (see Figure 9-14-1). ADS-B Out status is displayed in white when the transponder indicates ADS-B Out is ON and the Aircraft Personality Module (APM) indicates that ADS-B Out is enabled.

CAUTION

THE ADS-B OUT ANNUNCIATOR MUST BE DISPLAYED IN WHITE TO MEET THE REQUIREMENTS SPECIFIED IN SECTION 1, OTHERWISE FLIGHT IN ADS-B EQUIPPED AIRSPACE IS NOT ALLOWED. THE ADS-B SYSTEM MUST BE ENABLED (SET TO ON) DURING ALL FLIGHT PHASES INCLUDING AIRPORT SURFACE MOVEMENT OPERATIONS.

The ADS-B Out status is displayed in amber when the transponder indicates ADS-B Out is failed and the APM indicates that ADS-B Out is enabled. The ADS-B Out annunciator is removed if the APM indicates that ADS-B Out is not enabled, or the transponder indicates ADS-B Out is OFF, or a failure has occurred.



XPDR Function and Display Location
Figure 9-14-1

ADS-B Out capability can be set ON/OFF on the transponder detail window (see Figure 9-14-2). ADS-B Out is set to ON by default at power on and independent of the STBY, ON or ALT (or TA if TAS or TCAS is installed) mode.

XPDR Detail – With TAS or TCAS1
Figure 9-14-2

Refer to the Honeywell Primus Apex Integrated Avionics System for the Pilatus PC-12 NG – Pilots Guide for further information about the ADS-B Out control and function.

SECTION 8 - HANDLING, SERVICING, AND MAINTENANCE

No change.

SECTION 9 - SUPPLEMENTS

No change.

SECTION 10 - SAFETY AND OPERATIONAL TIPS

No change.

PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 15
FOR
PASSENGER OXYGEN DROP-DOWN MASK SYSTEM

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual when operating the PC-12/47E with a passenger oxygen drop-down mask system. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

This Aircraft Flight Manual Supplement is
EASA Approved under Approval Number:
10058811

Date of Approval: 18 July 2016

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LIST OF EFFECTIVE PAGES

Page No	Rev No.	Page No.	Rev No.
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LOG OF TEMPORARY REVISIONS

The incorporation of temporary revisions into this supplement are to be recorded on the sheet below. Instructions for the removal of temporary revisions will be given in the instruction sheet issued with revisions.

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY
01	Passenger Oxygen Selector System	Jul 27, 2017	

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LOG OF REVISIONS

Revision Number and Date	Page Number	Description

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SECTION 1 - GENERAL

This supplement provides the information necessary to operate the PC-12-47E aircraft with the passenger oxygen drop-down mask system installed.

SECTION 2 - LIMITATIONS

OXYGEN SYSTEM

A minimum oxygen supply of 10 minutes duration for each occupant is required for dispatch for pressurized flight above FL250.

NOTE

Some National Operating Requirements may require that a larger quantity of oxygen be carried on the aircraft.

The oxygen system shut-off valve handle in the cockpit must be selected to ON prior to engine start and throughout the duration of flight.

The oxygen masks for the crew must be connected for all flights.

Paragraph removed.

PLACARDS – COCKPIT

On Cockpit LH Side Panels near oxygen system controls:

Additional placard:

**SET TO ON TO DROP
PASSENGER OXYGEN MASKS**

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

4.4 BEFORE STARTING ENGINE

CAUTION

DO NOT SET THE PASSENGER OXYGEN SELECTOR TO ON. IF THE PASSENGER OXYGEN SELECTOR IS SET TO ON, THE PASSENGER OXYGEN MASKS WILL DEPLOY.

21.	PASSENGER OXYGEN selector	CHECK selector is set to AUTO. SET to OFF if no passengers on board

4.18 SHUTDOWN

8.	Main OXYGEN lever	OFF
9.	PASSENGER OXYGEN selector	CHECK selector is set to AUTO.

4.20 OXYGEN SYSTEM

1.	Oxygen Pressure Gauge	NOTE READING
2.	Outside Air Temperature	NOTE READING
3.	Percentage of Full Bottle	DETERMINE from the "Oxygen Available with Partially Full Bottle" graph, Figure 4-1.
4.	Calculate	Oxygen duration in minutes

a Determine the Oxygen Duration in minutes for a full bottle for the number of passengers and pilots from the "Oxygen Duration with Full Bottle" table, Figure 4-2, Sheet 1 for standard oxygen systems, Sheet 2 for large capacity oxygen systems.

b Multiply the Full Bottle Duration by the percent of Usable Capacity to obtain the available oxygen duration in minutes.

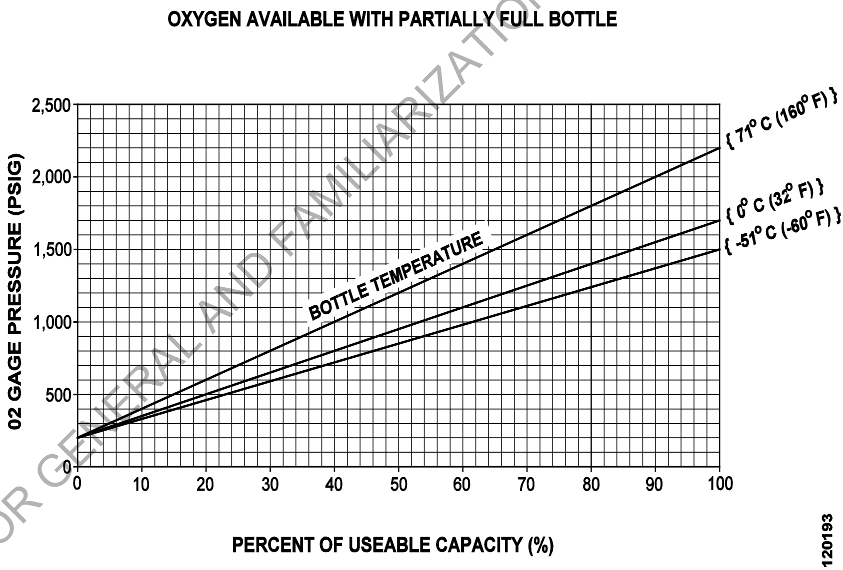

Figure 4-1 Oxygen Available with Partially Full Bottle

No. of Passengers	Oxygen Duration Pax plus 1 Crew Mask on		Oxygen Duration Pax plus 2 Crew Masks on	
	Diluter/ Demand (min)	100 % (min)	Diluter/ Demand (min)	100 % (min)
0	141	59	71	29
1	41	29	32	20
2	31	24	26	17
3	25	20	22	15
4	21	17	19	13
5	18	15	16	12
6	16	14	14	11
7	14	12	13	10
8	13	11	12	10

Figure 4-2 Oxygen Duration with Full Bottle (Standard Oxygen System)

(Sheet 1 of 2)

No. of Passengers	Oxygen Duration Pax plus 1 Crew Mask on		Oxygen Duration Pax plus 2 Crew Masks on	
	Diluter/ Demand (min)	100 % (min)	Diluter/ Demand (min)	100 % (min)
0	477	200	240	98
1	141	100	110	67
2	107	82	88	58
3	86	69	73	52
4	72	60	63	46
5	62	53	55	42
6	54	47	49	38
7	48	42	44	35
8	44	39	40	33

Figure 4-2 Oxygen Duration with Full Bottle (Large Oxygen System)

(Sheet 2 of 2)

SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

No change.

SECTION 7 - AIRPLANE AND SYSTEMS DESCRIPTION

SECTION 7-18 - OXYGEN SYSTEM

GENERAL

A constant flow mask is provided at each passenger seat location in the cabin and the toilet. The masks are stored in the cabin headliner trim panel and are permanently connected for all flights. The masks drop-down automatically from the headliner trim panel. Passenger mask deployment can also be selected manually by the flight crew. The oxygen flow to individual passenger masks is initiated when a passenger pulls the mask towards his/her face.

DESCRIPTION

The PASSENGER OXYGEN selector, located in the left cockpit sidewall, has three positions to control the operation of the passenger distribution system. The OFF position stops the flow to the passenger masks. The ON position permits flow to the passenger masks and deploys the passenger drop-down masks. The AUTO position will permit automatic pressurization of the passenger oxygen system and will deploy the passenger drop-down masks automatically when the Cabin Pressure Control System (CPCS) senses a cabin altitude above 13,500 feet +/- 500 feet or when in HI FIELD mode the cabin altitude is sensed above takeoff/landing field elevation +2000 ft or 14,500 +/- 500 ft.

The passenger constant flow oxygen masks are stored in the cabin headliner trim panel for use at each seat position and in the toilet compartment.

OPERATION

Normal system operation is with the three-position PASSENGER OXYGEN selector in the AUTO position, to provide oxygen immediately in the event of a depressurization. The crew will don their masks. The passengers will pull the drop-down masks towards them and put their masks on.

The ON position will be selected by the pilot, in the event of smoke or fumes being present in the cabin.

The OFF position will be selected if the aircraft is being flown without passengers or is taken out of service for an extended time in order to conserve oxygen

SECTION 8 - HANDLING, SERVICING, AND MAINTENANCE

No change.

SECTION 9 - SUPPLEMENTS

No change.

SECTION 10 - SAFETY AND OPERATIONAL TIPS

PASSENGER BRIEFINGS

GENERAL

In Sections 3 and 4 there are procedural actions that call for the pilot to brief the passengers. They fall into two categories those forming part of an emergency procedure and the more regular type ones for taxiing prior to takeoff and before landing. Tips for passenger briefings during an emergency cannot be specified as each situation will place a different demand on the pilot. However, much of the content in the Taxiing briefing tips can be used to brief the passengers, if time permits. Tips for the recommended subjects that should be covered for the regular passenger briefings are given in the following list:

TAXIING (Section 4, para 4-7)

For aircraft with an executive cabin interior:

- Stow hand baggage in the seat or cabinet drawers
- Move the seat to the required position for takeoff (as per the placard adjacent to each seat)
- Position the seat headrest to support the head
- Stow the tables, cabinet drawers, seat drawers and leg rests
- Switch off electronic equipment
- Fasten seat lap and shoulder belts, tighten lap strap
- Mention the position of the passenger oxygen masks and that if seats are reclined or rotated, passengers may need to locate their mask before putting the mask on
- Mention the location and usage of the spare oxygen mask located in the lavatory if an individual passenger oxygen mask fails to operate
- Mention how to put on the passenger oxygen masks and start the flow of oxygen to the masks
- Mention the location and usage of the emergency exits
- Mention to remain buckled up during cruise in case of unexpected turbulence, but that the shoulder strap may be released once the fasten seat belt sign has been switched off
- Mention the safety on board cards for more detailed information about the safety features (if available).

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PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 16
FOR
FATA CERTIFIED PC-12/47E AIRPLANES

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual for FATA certified PC-12/47E airplanes. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

This Airplane Flight Manual Supplement is approved by EASA on behalf of the Federal Air Transport Agency (FATA / Rosaviatsiya).

Ref - 2018 (D) Adonis no. 53398 DRO/eve/CT2

Date of Approval: 13 August 2018

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LIST OF EFFECTIVE PAGES

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LOG OF TEMPORARY REVISIONS

The incorporation of temporary revisions into this supplement are to be recorded on the sheet below. Instructions for the removal of temporary revisions will be given in the instruction sheet issued with revisions.

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

NO.	TEMPORARY REVISION TITLE	DATE OF ISSUE	CANCELLED BY

LOG OF REVISIONS

Revision Number and Date	Page Number	Description

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SECTION 1 - GENERAL

The Service Bulletin 04-021 lists the tasks which must be done to have the aircraft compliant to PC-12/47E FATA Type Design.

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SECTION 2 - LIMITATIONS

FUEL

In addition to the fuels listed in the AFM, the following fuels can be used:

- RT
- TS-1.

NOTE

TS-1 is subject to the restrictions given in Pratt & Whitney Canada Service Bulletin SB No. 14004.

FLIGHT CREW LIMITS

Minimum required flight crew is one pilot in the left hand seat.

No passenger shall be allowed to occupy the right crew seat.

For commercial operations two pilots are required.

KINDS OF OPERATION EQUIPMENT LIST

Add the following column for operations in RVSM airspace to the kinds of operation equipment list.

SYSTEM / EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING
Primary Flight Display	1	1	2	2	2
ADF	1	1	1	1	1
DME	1	1	1	1	1
VOR	1	1	1	1	1
ELT 406 MHz	1	1	1	1	1
TAWS Class A or Class B (supporting bank angle callout) + TCAS I	1	1	1	1	1
WX	1	1	1	1	1
ATC Transponder	1	1	1	1	1
CVR	1	1	1	1	1
FDR (commercial operations)	1	1	1	1	1

Aircraft performing flights over hard-to-reach or sparsely populated regions or over vast water areas must be equipped with the emergency VHF radio or with portable ELT operating in the VHF/UHF range, COSPAS-SARSAT system, with a function of the emergency radio.

NOTE

Availability and installation of the emergency radio or of the portable ELT operating in the VHF/UHF range, COSPAS- SARSAT system, with a function of the emergency radio is the responsibility of the Operator.

For flights in areas not covered by VHF communications, the installation of HF Radio (Pilatus Option Part No. 500.21.12.003) is mandatory.

OUTSIDE AIR TEMPERATURE LIMITS

Operation on the ground is prohibited when the aircraft has been exposed to outside air temperatures below minus 35° C for more than 3 hours without the engine running.

OTHER LIMITATIONS

Aircraft operation is limited to dry and wet paved runways and surfaces with a minimum surface hardness of 8 kg/cm2.

Maximum airfield elevation is 14000 feet.

Flights over an expanse of water must be performed within the gliding range of land. Maximum allowed wind value limits:

During taxiing			50 kts	(26 m/s)
For take-off and landings:				
	Tailwind		10 kts	(5 m/s)
	Crosswind	Flap 0°	30 kts	(15 m/s)
		Flap 15°	25 kt	(13 m/s)
		Flap 30°	20 kts	(10 m/s)
		Flap 40°	15 kt	(8 m/s)

During en-route navigation without VOR/DME coverage, in case of GPS data not available, the pilot is required to confirm aircraft position with ATC not less than once each 30 minutes.

The aircraft is approved to fly on routes covered by ATC ground facilities operating transponders in RBS mode.

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

4.6 BEFORE TAXIING

7. PFD, MFD CAS	No flags or red warnings captions. Check PFD is showing metric altitude and baro correction.

4.8 BEFORE TAKEOFF

5. Flap	15° (For reduced Take-off distance flap 30° may be used).

4.10 FLIGHT INTO KNOWN ICING CONDITIONS

WARNING

IF SEVERE ICING CONDITIONS ARE ENCOUNTERED, REQUEST PRIORITY HANDLING FROM AIR TRAFFIC CONTROL TO FACILITATE A ROUTE OR AN ALTITUDE CHANGE TO EXIT THE ICING CONDITIONS.

While exiting the severe icing conditions:

- With flap 0° maintain indicated airspeed above 155 kts
- With flap 15° maintain indicated airspeed above 135 kts
- Manoeuver with bank angles less than 30°
- Avoid sideslip
- Avoid more than half travel of aileron.

SECTION 5 - PERFORMANCE

The total landing distance obtained from the landing charts should be factored as follows:

Primary airfield	1.67
Secondary airfield	1.43.

SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in Section 6 of the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

SECTION 7 - AIRPLANE AND SYSTEMS DESCRIPTION

PRIMUS APEX

The avionics window on the Systems MFD provides the pilot with the capability to configure the barometric format to HPA and to enable the metric altitude digital readouts on the ADI and HSI. This is done by selecting the AVIONICS page on the Systems MFD lower left window and then on the SET UP tab selecting BARO CORRECTION to HPA and METRIC ALTITUDE to ENABLE.

PRIMUS APEX – MONITOR WARNING SYSTEM

NOTE

For normal operation the AURAL WARN INHBIT switch should not be selected to INHIBIT.

SECTION 8 - HANDLING, SERVICING AND MAINTENANCE

PARKING

For wind strengths greater than 30 m/s (53 kts) the aircraft must be parked in an area protected from the wind.

SECTION 9 - SUPPLEMENTS

No change.

SECTION 10 - SAFETY AND OPERATIONAL TIPS

No change.

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PILOT'S OPERATING HANDBOOK
AND
EASA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT

REPORT NO. 02474

FOR

GERMAN PLACARDS

This supplement must be attached to the Pilot's Operating Handbook and EASA Approved Airplane Flight Manual for the EASA certified PC-12 airplanes. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and EASA Approved Airplane Flight Manual.

This Airplane Flight Manual Supplement is approved under the authority of DOA No. EASA.21J.357.

Date of Approval: 21 November 2019

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Front Matter

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List of Effective Data Modules

All DMC are preceded with PC-12-C but for clarity this has been left out

C = Changed data module

N = New data module

	Data module code (DMC)	Document title	N/C	Issue date
	A15-00-2474-00A-002A-A	List of Effective Data Modules	N	21.11.2019
	A15-00-2474-00A-003B-A	Log of Revisions	N	21.11.2019
	A15-00-2474-00A-002B-A	Log of Temporary Revisions	N	21.11.2019
	A15-00-2474-01A-010A-A	General	N	21.11.2019
*	A15-10-2474-02A-043A-A	Limitations	N	21.11.2019

* Authority Approved

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Log of Revisions

1 Issue 001 - Revision 00 - Dated: 21 November 2019

Initial Issue of the PC-12 AFM Supplement 02474.

The Issue 001 Revision 00 of the AFM Supplement ref. 02474 is approved under the authority of DOA No. EASA.21J.357.

Approval date: 21.11.2019

Table 1: Issue 001 - Revision 00 - List of changes

Section	PTS Number	Description of Change
All	20084	AFM Supplement ref. 02474 - Aircraft with German Placards installed.

12-C-A15-00-2474-00A-003B-A

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Log of Temporary Revisions

No.	Temporary Revision Title	Date of Issue	Cancelled by

12-C-A15-00-2474-00A-002B-A

No.	Temporary Revision Title	Date of Issue	Cancelled by

SECTION 1

General

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General

1 General

This supplement provides the information necessary to operate the PC-12 aircraft with placards in the German language installed.

This Supplement must be attached to Pilot's Operating Handbook Report No.:

- 01973-001
- 02211
- 02277
- 02406

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SECTION 2

Limitations (EASA Approved)

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Limitations

CABIN PLACARDS

The following placards are installed in all aircraft.

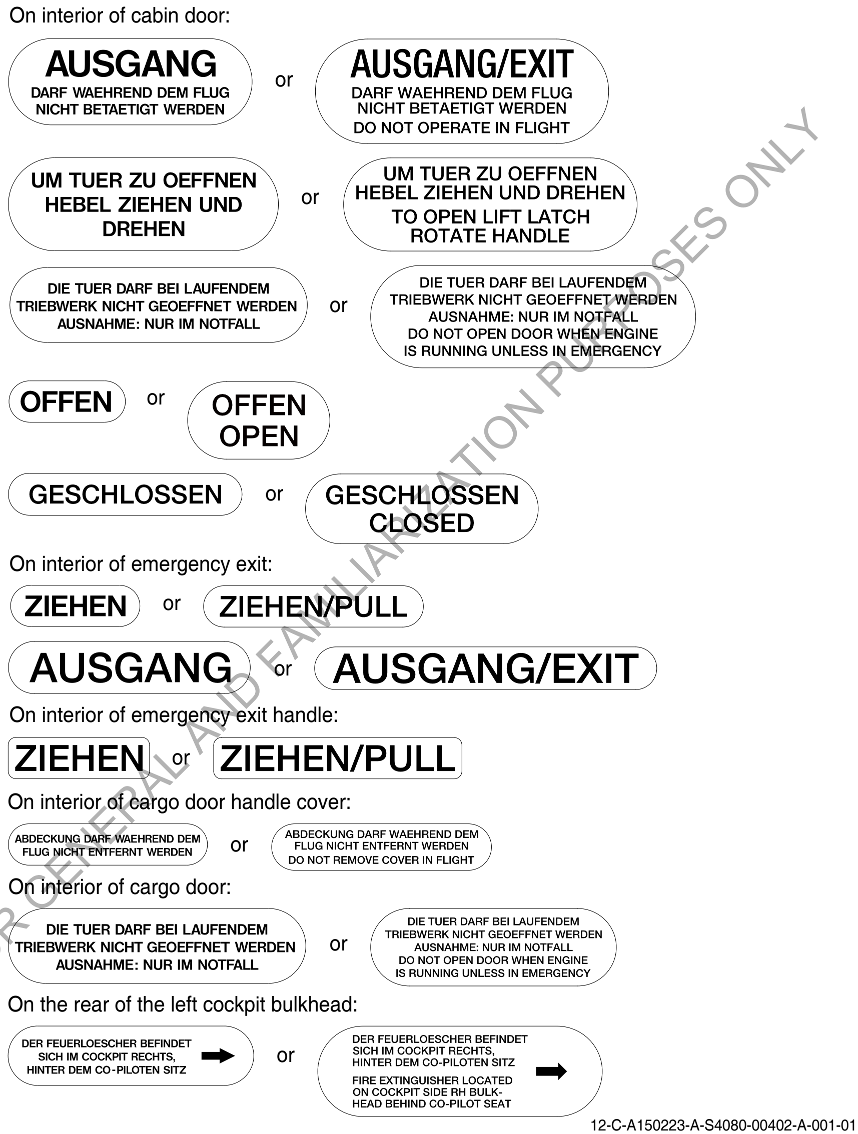

Figure 2-1: Placards - Cabin - German

12-C-A15-10-2474-02A-043A-A

9 SEAT CORPORATE COMMUTER INTERIOR (Interior Code STD-9S)

The cabin placards plus the following are those required for the interior.

Near each passenger oxygen outlet:

SAUERSTOFF or **SAUERSTOFF OXYGEN**

On the rear of the left cockpit bulkhead:

RAUCHEN VERBOTEN or **RAUCHEN VERBOTEN NO SMOKING**

SAUERSTOFFMASKE BEFINDET SICH UNTER DEM SITZ or SAUERSTOFFMASKE BEFINDET SICH UNTER DEM SITZ OXYGEN MASK LOCATED UNDER YOUR SEAT

WAEHREND START UND LANDUNG BEACHTEN
-SITZLEHNE MUSS AUFRECHT SEIN
-KOPFSTUETZE AN KOPF ANPASSEN
-BECKEN - UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN

or

WAEHREND START UND LANDUNG BEACHTEN
- SITZLEHNE MUSS AUFRECHT SEIN
- KOPFSTUETZE AN KOPF ANPASSEN
- BECKEN- UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN

FOR TAKEOFF AND LANDING
- SEAT MUST BE FULLY UPRIGHT
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT

On the rear of the right cockpit bulkhead:

SAUERSTOFFMASKE BEFINDET SICH UNTER DEM SITZ or SAUERSTOFFMASKE BEFINDET SICH UNTER DEM SITZ OXYGEN MASK LOCATED UNDER YOUR SEAT

On the back of the standard passenger seat (except seat 5):

WAEHREND START UND LANDUNG BEACHTEN
-SITZLEHNE MUSS AUFRECHT SEIN
-KOPFSTUETZE AN KOPF ANPASSEN
-BECKEN - UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN

or

WAEHREND START UND LANDUNG BEACHTEN
- SITZLEHNE MUSS AUFRECHT SEIN
- KOPFSTUETZE AN KOPF ANPASSEN
- BECKEN- UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN

FOR TAKEOFF AND LANDING
- SEAT MUST BE FULLY UPRIGHT
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT

SAUERSTOFFMASKE BEFINDET SICH UNTER DEM SITZ or SAUERSTOFFMASKE BEFINDET SICH UNTER DEM SITZ OXYGEN MASK LOCATED UNDER YOUR SEAT

On the back of seat 5:

WAEHREND START UND LANDUNG BEACHTEN
-SITZLEHNE MUSS AUFRECHT SEIN
-KOPFSTUETZE AN KOPF ANPASSEN
-BECKEN - UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN

or

WAEHREND START UND LANDUNG BEACHTEN
- SITZLEHNE MUSS AUFRECHT SEIN
- KOPFSTUETZE AN KOPF ANPASSEN
- BECKEN- UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN

FOR TAKEOFF AND LANDING
- SEAT MUST BE FULLY UPRIGHT
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT

SAUERSTOFFMASKE BEFINDET SICH UNTER DEM VORDEREN SITZ or SAUERSTOFFMASKE BEFINDET SICH UNTER DEM VORDEREN SITZ OXYGEN MASK LOCATED UNDER SEAT IN FRONT

12-C-A150223-A-S4080-00403-A-001-01

Figure 2-2: Placards - Cabin - 9 Seat corporate commuter (Interior code STD-9S) - German

6 SEAT EXECUTIVE INTERIOR (Interior Code EX-6S-2)

The cabin placards plus the following are those required for the interior.

On each oxygen mask pocket:

ENTHAELT SAUERSTOFFMASKE

or

ENTHAELT SAUERSTOFFMASKE
OXYGEN MASK INSIDE

On the armrest near each passenger oxygen mask:

FUER SAUERSTOFFMASKE
BAND ZIEHEN →

or

FUER SAUERSTOFFMASKE
BAND ZIEHEN →
PULL TAPE FOR OXYGEN MASK

or

← FUER SAUERSTOFFMASKE
BAND ZIEHEN

or

← FUER SAUERSTOFFMASKE
BAND ZIEHEN
PULL TAPE FOR OXYGEN MASK

Near each executive seat:

WAEHREND START UND LANDUNG BEACHTEN
-SITZLEHNE MUSS AUFRECHT SEIN
-SITZ MUSS BEZUEGLICH KABINE GANZ HINTEN UND AUSSEN POSITIONIERT SEIN
-KOPFSTUETZE AN KOPF ANPASSEN
-BECKEN - UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN
-TISCH MUSS SICHER VERSTAUT SEIN

or

WAEHREND START UND LANDUNG BEACHTEN
- SITZLEHNE MUSS AUFRECHT SEIN
- SITZ MUSS BEZUEGLICH KABINE GANZ HINTEN UND AUSSEN POSITIONIERT SEIN
- KOPFSTUETZE AN KOPF ANPASSEN
- BECKEN- UND SCHULTERGURT MUESSEN ANGELEGT UND GESCHLOSSEN SEIN
- TISCH MUSS SICHER VERSTAUT SEIN

FOR TAKEOFF AND LANDING
- SEAT MUST BE FULLY UPRIGHT, FULLY TO THE REAR OF CABIN AND FULLY OUTBOARD
- ADJUST HEADREST TO SUPPORT HEAD
- FASTEN SEAT LAP AND SHOULDER BELT
- TABLE MUST BE STOWED

BEI GEBRAUCH VON SAUERSTOFF
RAUCHEN VERBOTEN

or

BEI GEBRAUCH VON SAUERSTOFF
RAUCHEN VERBOTEN
DO NOT SMOKE WHILE OXYGEN IN USE

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Figure 2-3: Placards - Cabin - 6 Seat executive (Interior code EX-6S-2) - German

12-C-A15-10-2474-02A-043A-A

8 SEAT EXECUTIVE INTERIOR (Interior Code EX-8S)

The cabin placards, the 6 seat executive and the following replacement/additional placards are required for this interior.

Rear of executive passenger seat No. 5, 6, 7 and 8:

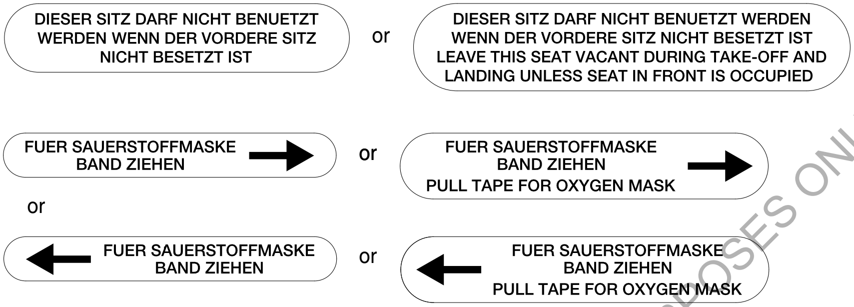

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Figure 2-4: Placards - Cabin - 8 Seat executive (Interior code EX-8S) - German

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TOILET PLACARDS

The toilet placards are installed in all executive interiors.

On the toilet door #1:

ZUM SCHLIESSEN ZIEHEN or ZUM SCHLIESSEN ZIEHEN TO CLOSE PULL HERE

TOILETTENABTEIL WAEHREND START, LANDUNG UND TURBULENZ NICHT BELEGEN or TOILETTENABTEIL WAEHREND START, LANDUNG UND TURBULENZ NICHT BELEGEN TOILET COMPARTMENT NOT TO BE OCCUPIED DURING TAKEOFF / LANDING AND TURBULENCE

AUF DER TOILETTE RAUCHEN VERBOTEN or AUF DER TOILETTE RAUCHEN VERBOTEN NO SMOKING IN LAVATORY

On the toilet door #3:

ZUM SCHLIESSEN ZIEHEN or ZUM SCHLIESSEN ZIEHEN TO CLOSE PULL HERE

Near the toilet seat:

FUER TOILETTENSPUELUNG HIER DRUECKEN or FUER TOILETTENSPUELUNG HIER DRUECKEN PUSH TO FLUSH

TOILETTENBELEUCHTUNG or TOILETTENBELEUCHTUNG LAVATORY LIGHT

On the oxygen mask box:

ENTHAELT SAUERSTOFFMASKE or ENTHAELT SAUERSTOFFMASKE OXYGEN MASK INSIDE

Below the oxygen mask box:

FUER SAUERSTOFFMASKE BAND ZIEHEN → or FUER SAUERSTOFFMASKE BAND ZIEHEN PULL TAPE FOR OXYGEN MASK →

12-C-A150223-A-S4080-00406-A-001-01

Figure 2-5: Placards - Cabin - Toilet - German

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SECTION 10

SAFETY AND OPERATIONAL TIPS

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GENERAL

This section provides information for the operation of the airplane.

SAFETY TIPS

Pilots who fly above 10,000 feet should be aware of the need for physiological training. It is recommended that this training be taken before flying above 10,000 feet and receive refresher training every two or three years.

Information on the location of flammable materials, pressure vessels and equipment locations for crash-fire-rescue purposes is given in Figure 1.

OPERATIONAL TIPS

ANTI-COLLISION LIGHTS

Anti-collision strobe lights should not be operating when flying through cloud, fog, or haze. Reflected light can produce spatial disorientation.

CROSSWIND OPERATION

Takeoff

It is possible, if required, to hold the aircraft stationary with the brakes while the engine is at max takeoff power. When the brakes are released rapid and aggressive use of the rudder and possibly some small application of brake is necessary to establish and maintain the centerline but, once rolling, directional control is easy with rudder only. Holding the elevator neutral will keep the nosewheel on the ground and assist in maintaining directional control.

In strong crosswinds the aircraft establishes a drift angle of up to 10° while accelerating to rotation speed.

In gusty conditions it is recommended to rotate at V_R + 10 Kts. On rotation the aircraft yaws considerably further into wind and automatically establishes the heading necessary to track the runway centerline.

Landing

It is recommended to use the wing down technique. At approximately 100 to 200 ft on approach to the runway, apply rudder to align the longitudinal axis of the aircraft to the runway and put on bank in the opposite direction to maintain the runway centerline. The aircraft is then flown in a sideslip to touch down initially on one wheel. As soon as one wheel touches, lower the other two to the runway and immediately select either the condition lever to ground idle or the PCL to beta or reverse. Once the aircraft is established on the runway it can be stopped as normal with brakes or reverse power without difficulty. Do not attempt heavy braking in a strong crosswind as the into wind wheel will tend to lock more easily.

In conditions of strong turbulence it is recommended, if runway length permits, to fly the approach with reduced flap deflection to increase IAS and aileron efficiency. It is also recommended to increase the approach speed for the chosen flap setting by 50% of the difference between the wind mean speed and max gust speed, to give a greater speed margin over the stall.

BEHAVIOR AFTER HIGH MASS/HIGH SPEED BRAKING

In the case of heavy braking, soft brake pedals and/or fusible plug release may occur during following taxi. Limitation in Section 2 applies.

If any signs of soft brake pedals are observed it is highly recommended to stop immediately, shut down the engine and ask for ground assistance. If a decision is taken to continue taxiing, use caution and taxi slowly. Use Beta and/or reverse thrust to control taxi speed only. Pedal fall through (brake failure) and/or fusible plug release can occur anytime when soft pedals are observed.

FLAMMABLE MATERIALS, PRESSURE VESSELS AND EQUIPMENT LOCATIONS

Refer to Figure 10-1 for the location of these items.

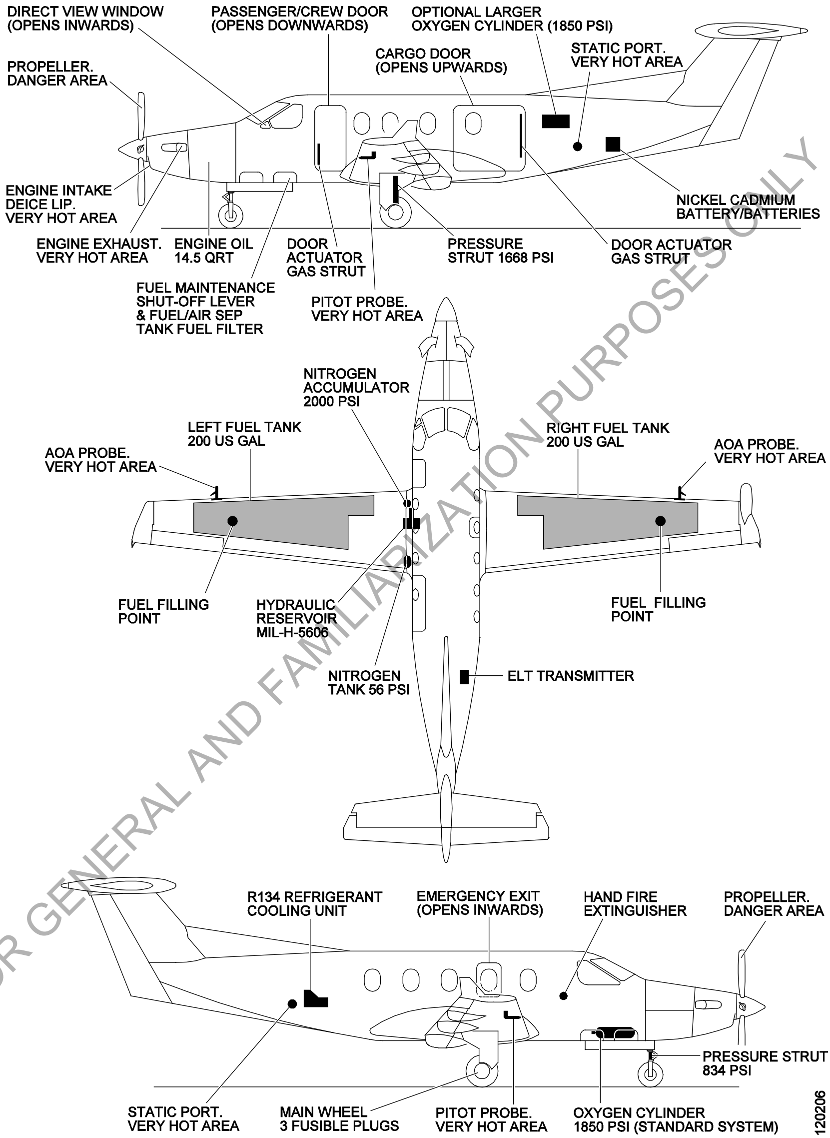


Figure 10-1. Flammable Materials, Pressure Vessels and Equipment Locations

REMOVAL OF SNOW, ICE AND FROST FROM THE AIRCRAFT

1. GENERAL

Flight crews are responsible for ensuring the aircraft is free of ice, snow or any contaminants. Ground icing may occur whenever there is high humidity with temperatures of +10°C (+50°F) or colder.

Approved de-icing/anti-icing fluids must be used during the de-icing/anti-icing procedure.

The aircraft must be clear of all deposits of snow, ice and frost adhering to the lifting and control surfaces immediately prior to take-off. The clean aircraft concept is essential for safe flight operations. The pilot in command of the aircraft has the ultimate responsibility to determine if the aircraft is clean and in a condition for safe flight.

Manual methods of de-icing provide a capability in clear weather to clean the aircraft to allow a safe take-off and flight. De-icing/anti-icing fluids can be used to quickly remove frost and to assist in melting and removal of snow. In inclement cold weather conditions, the only alternative may be limited to placing the aircraft in a hangar to perform the cleaning process. Manual methods are described in more detail in paragraph 5.

It is recommended that flight crews familiarize themselves seasonally with the following publications for expanded de-ice and anti-ice procedures:

- FAA Advisory Circular AC135-17 (small aircraft)
- AEA Recommendations for De-icing/Anti-icing Aeroplanes on the Ground
- FAA and Transport Canada Holdover Timetables

Pilatus recommend that ground de-icing/anti-icing is done with the engine shutdown to minimize fluid ingestion into the engine and bleed air ducting.

The ACS BLEED AIR switch must remain set to INHIBIT for approximately five minutes after the de-icing/anti-icing procedure has been completed.

The de-icing/anti-icing crew must be instructed not to direct fluid at the propeller or engine.

De-icing with the engine running may result in a strong and unpleasant smell inside the aircraft, as the engine bleed system carries the odors to the passengers and crew.

Propwash from operating the propeller can cause rapid flow-off of de-icing/anti-icing fluid from the wing and other surfaces within the slip stream.

During the de-icing/anti-icing procedure, the ground crew may have to request the pilot to power down the engine in order to reduce propwash, or to stop the aircraft from sliding forward on a slippery surface.

DE-ICING/ANTI-ICING FLUIDS

Various de-icing fluids are commercially available.

Clariant fluids were rigorously tested on PC-12 aircraft with no detrimental effect identified. Clariant fluids are therefore recommended by Pilatus for use on PC-12 aircraft.

NOTE

For de-icing the temperature of all heated fluids should be at least 60°C (140°F) at the nozzle. The aircraft skin maximum temperature limit is 70°C (158°F).

As part of a two-step procedure, cold Type IV fluids shall only be used within 3 minutes after the surface has been de-iced with heated water or heated Type I fluid as cold Type IV fluids significantly reduce the aircraft lift and increase control forces.

The following de-icing/anti-icing fluids are recommended for use on the PC-12:

Fluid	International Standard	Primary Use	Description
SAE Type I	AMS 1424	De-Icing	Type I fluids are water/glycol mixtures with a glycol content of at least 80%, which contain a corrosion inhibitor package. These fluids have been used for many years to remove ice, snow and frost (de-icing). They offer only limited protection against further icing due to freezing precipitation.
ISO Type I	ISO 11075		
SAE Type II	AMS 1428	Anti-Icing	Type II fluids contain at least 50% of glycol and a corrosion inhibition package. Furthermore, they contain a pseudoplastic thickener system which additionally protects against re-freezing (anti-icing) due to its film-forming properties.
SAE Type III	AMS 1428	Anti-Icing	Type III fluids are used for de-icing/anti-icing and offer longer “holdover” performance than Type I fluids.
SAE Type IV	AMS 1428	Anti-Icing	Type IV fluids contain at least 50% of glycol and a corrosion inhibition package. Furthermore, they contain a pseudoplastic thickener system which additionally protects against re-freezing (anti-icing) due to its film-forming properties.

2. HEALTH EFFECTS

Pilots must be aware of the potential health problems of de-icing/anti-icing fluids to ensure the correct precautions are taken when a de-icing/anti-icing procedure is done, and to better ensure the wellbeing of the passengers and crew.

3. PRE-FLIGHT CHECKS FOR ICE, SLUSH, SNOW OR FROST THAT ADHERES TO THE AIRCRAFT

To establish the need for aircraft de-icing, a pre-flight check is required to identify any contamination that adheres to the aircraft surface and to direct any required de-icing/anti-icing operations.

NOTE

This check should normally be done by the flight crew when they do a walk around pre-flight check.

Ice can build up on aircraft surfaces during flight through dense clouds or precipitation. When ground OAT at the destination is low, it is possible for flaps and other moveable surfaces to be treated but accumulations of ice may remain undetected between stationary and moveable surfaces. It is important that these areas are checked before departure and any frozen deposits removed.

4. SELECTING THE DE-ICING ONLY OR DE-ICING/ANTI-ICING METHOD

Ice, slush and snow must be removed from all aircraft surfaces before dispatch or before anti-icing.

Any contamination found on components of the aircraft that are critical to safe flight must be removed by de-icing.

When freezing precipitation exists, and the precipitation is adhering to the surfaces at the time of dispatch, the aircraft surfaces must be de-iced/anti-iced.

If both de-icing and anti-icing are required, the procedure may be performed in one or two steps.

The selection of one or two-step processes depends on the weather conditions, available equipment, available fluids and the holdover time to be achieved.

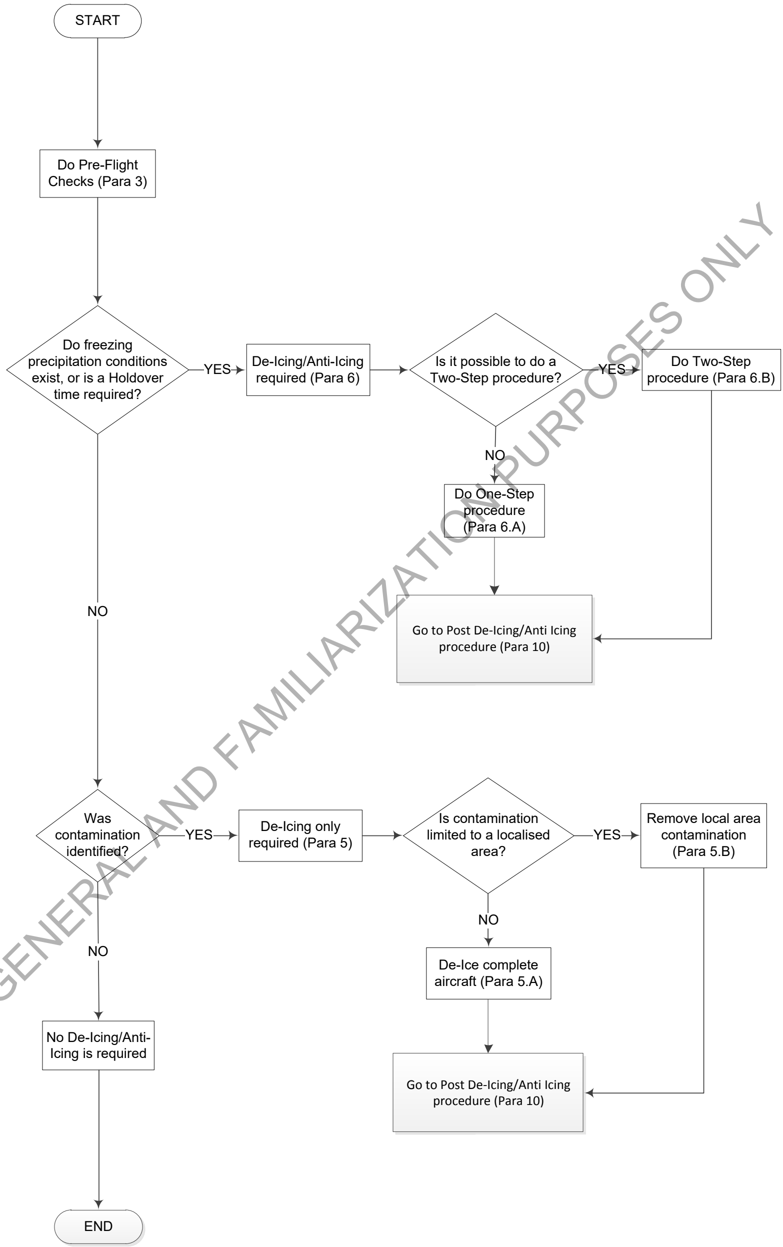


Figure 10-2 Selection of De-Icing Only or De-Icing/Anti-Icing Method Flowchart

5. DE-ICING ONLY PROCEDURE

To reduce the quantity of de-icing fluid required, a manual method can be used as a pre-step process, before the de-icing process, in order to remove large amounts of frozen contamination, for example, snow, slush or ice

Ice, slush, snow or frost may be removed from aircraft surfaces by manual methods or fluids.

Manual methods of de-icing such as brooms, brushes, ropes, squeegees etc. can be used to remove dry snow accumulations and to remove the bulk of wet snow deposits. These manual methods require that caution be exercised to prevent damage to the aircraft skin or components.

A. DE-ICING OF THE COMPLETE AIRCRAFT

Ground support equipment is required and must have the capability to heat the water and/or de-icing fluids to 60ºC (140ºF) or more at the nozzle. However, the temperature of the de-icing/anti-icing fluids in contact with the aircraft surfaces must be limited to less than 70ºC (158ºF). Refer to Paragraph 6.A.

B. REMOVAL OF LOCAL AREA ICE CONTAMINATION

CAUTION

THE AIRCRAFT MUST BE TREATED SYMMETRICALLY, THAT IS, LEFT HAND AND RIGHT HAND SIDES SHALL RECEIVE THE SAME AND COMPLETE TREATMENT. AERODYNAMIC PROBLEMS COULD RESULT IF THIS REQUIREMENT IS NOT MET.

When the presence of frost and/or ice is limited to localized areas on the surfaces of the aircraft and no precipitation is falling or expected, it is not necessary to apply de-icing/anti-icing fluids to the complete aircraft.

If no holdover time or only de-icing is required, only the contaminated areas will require treatment, then a “local area” de-icing may be done. The affected area(s) must be sprayed with de-icing fluid.

6. DE-ICING/ANTI-ICING

CAUTION

THE APPLICATION OF TYPE II, III OR IV FLUIDS, MAY CAUSE RESIDUES TO COLLECT IN AERODYNAMICALLY QUIET AREAS, CAVITIES AND GAPS.
DRIED RESIDUES MAY REHYDRATE AND FREEZE FOLLOWING A PERIOD OF HIGH HUMIDITY AND/OR RAIN.
THIS MAY IMPEDE FLIGHT CONTROLS. THESE RESIDUES MUST BE REMOVED BY HOT WATER WASHING BEFORE THE NEXT FLIGHT.
WHENEVER POSSIBLE, USE HEATED WATER AND/OR TYPE I FLUID TO DE-ICE THE AIRCRAFT.

A. ONE STEP DE-ICING/ANTI-ICING

Heated SAE Type I, II or III Fluid may be used to remove ice, slush and snow from the aircraft prior to departure, and to provide minimal anti-icing protection as given in the applicable Fluid holdover timetable.

B. TWO STEP DE-ICING/ANTI-ICING

CAUTION

WHERE RE-FREEZING OCCURS FOLLOWING THE INITIAL TREATMENT, BOTH FIRST AND SECOND STEPS MUST BE REPEATED.

Step 1 – De-icing with heated water and/or heated SAE Type I de-icing fluids.

Step 2 – Anti-icing: A separate over-spray of cold SAE Type II, III or IV anti-icing fluids may be applied within three minutes (if necessary, area by area) to completely cover the first step fluid in a sufficient amount of second step fluid. The fluid used and it’s concentration must be chosen with respect to the desired holdover time, which is dictated by the OAT wing temperature and the weather conditions.

7. APPLICATION OF DE-ICING/ANTI-ICING FLUID

A. GENERAL

Flight crew should supervise the de-icing and anti-icing of the aircraft to ensure proper application of the fluid.

When ice, snow or slush is removed from aircraft surfaces, care must be taken to prevent entry and accumulation of the ice, snow or slush in intakes or control surface hinge areas.

All doors and windows shall be closed.

De-icing and anti-icing fluids must not be directed towards the static ports, pitot heads, AOA transmitters, cockpit windows, air intakes, brakes, wheels, engine inlet or exhaust ports.

NOTE

De-icing or anti-icing fluid that may splash onto heated surfaces (exhaust ducts, AOA transmitters, etc.) will produce significant smoke/vapor.

Fluid must always be sprayed from the front of the aircraft. Fluid sprayed from the rear can force fluid into aerodynamically quiet areas where it may not be able to drain. Refer to Essential Aircraft De-Icing/Anti- Icing Areas, Figures 10-3 and 10-4.

Any forward area from which fluid may blow back onto the windscreen during taxi or subsequent take-off shall be free of fluid residues prior to departure.

NOTE

If fluid is sprayed or runs onto the windscreen during application, it must be removed prior to taxi and take-off.

De-icing and anti-icing fluid can be removed by rinsing with approved cleaner and a soft cloth.

The first area to be de-iced/anti-iced should be easily visible from the cockpit and must be used to provide a conservative estimate for unseen areas of the aircraft before a take-off roll is initiated.

Anti-icing of the lower side of the wings and/or horizontal stabilizer and elevator is not normally expected. However, if these surfaces must be de-iced, the freezing point of the de-icing fluid must be low enough to prevent refreezing.

B. DE-ICING/ANTI-ICING THE WINGS, TAIL AND FUSELAGE

The wings are the main lifting surfaces of the aircraft and must be free of snow and ice to operate efficiently. De-icing/anti-icing of the wings should begin at the leading edge wing tip with the flaps retracted, sweeping in the aft and inboard direction.

Tail surfaces should be de-iced/anti-iced in a similar manner to the wing. Move the horizontal stabilizer to nose down for a better visual check. The area adjacent to the elevator balance horns and the horizontal stabilizer must be thoroughly inspected.

Passenger and cargo doors must be de-iced to ensure correct operation. All door hinges, locks and seals must be inspected to make sure that they are free from contamination.

C. PROPELLER AND ENGINE AREA DE-ICING

WARNING

ICE DEPOSITS SHED FROM THE PROPELLER MAY CAUSE SERIOUS INJURY TO PERSONNEL

CAUTION

DE-ICING/ANTI-ICING SPRAY DIRECTED INTO THE ENGINE CAN CAUSE A FLAMEOUT OR OTHER PROBLEMS, DEPENDING ON THE AMOUNT OF DE-ICING/ANTI-ICING FLUID INGESTED.

The propeller must be thoroughly de-iced while static. **DO NOT** start the engine until it has been ascertained that all ice deposits have been removed from the propeller.

If the engine is required to run while de-icing/anti-icing:

- Set the ACS BLEED AIR switch to INHIBIT
- Set the INERT SEP switch to OPEN
- Apply the brakes
- Set the engine to GROUND IDLE.

If needed, minimal amounts of de-icing/anti-icing fluid can be used to de-ice the engine external cowling area. The engine inlet area must be avoided. Fluid residue on the engine compressor blades can reduce engine performance or cause a stall or surge. This will also minimize the ingestion of fluid vapors into the engine air bleed system.

Engine intake areas must be inspected for the presence of ice immediately after shutdown. Any accumulation must be removed while the engine is still warm and before the installation of the intake covers.

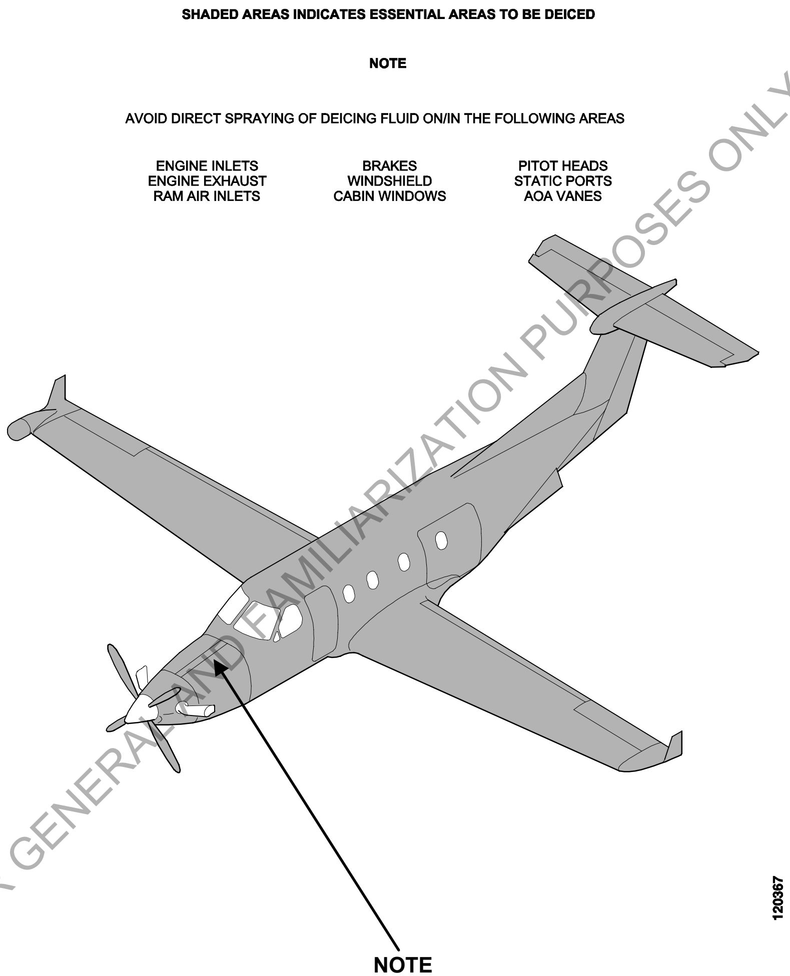
D. LANDING GEAR AND WHEEL BAYS DE-ICING

The application of de-icing fluid in this area must be kept to a minimum. De-icing fluid must not be directed onto the brakes and wheels.

Landing gear and wheel bays must be kept free from a buildup of slush, ice or accumulation of blown snow. Deposits can be removed by brush etc. Where deposits have bonded to surfaces, these can be removed by spraying with de-icing fluids.

E. CLEAR ICE PRECAUTIONS

Clear ice can form on aircraft surfaces below a layer of snow or slush. It is important that surfaces are closely examined after each de-icing operation to make sure that all deposits have been removed.



Any forward area from which fluid may blow back onto the windscreen during taxi or take-off must be free of fluid residues prior to departure.

Figure 10-3 Essential Aircraft De-Icing Areas

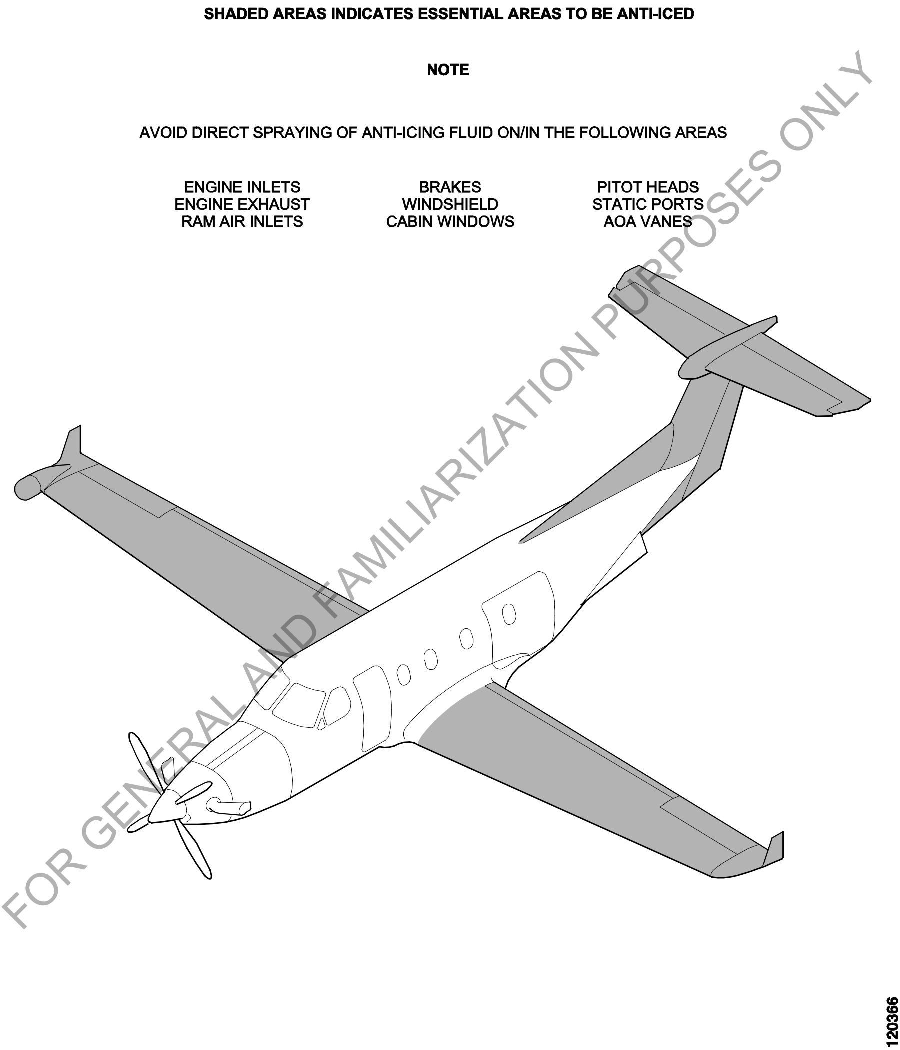


Figure 10-4 Essential Aircraft Anti-Icing Areas

8. SPRAYING TECHNIQUE

A. ONE STEP DE-ICING/ANTI-ICING

Heated water and/or heated fluid must be sprayed on the aircraft in a manner which minimizes heat loss on the aircraft. If spraying is carried out with the engine running, the engine must be at Idle with all engine bleed air turned off.

For de-icing, the temperature of all heated fluids must be at least 60°C (140°F) at the nozzle. The aircraft skin maximum temperature limit is 70°C (158°F).

If possible, fluid should be sprayed in a solid cone pattern of large, coarse droplets.

The fluid must be sprayed as close as possible to the aircraft surface, but not closer than 3 m (10 feet) if a high pressure nozzle is used. Refer to Essential Aircraft De-Icing / Anti- Icing Areas, Figures 10-3 and 10-4.

B. TWO STEP DE-ICING/ANTI-ICING

The application technique for SAE Type II, III and IV fluids are the same as for SAE Type I fluid, except that as the aircraft surface is already de-iced, the application lasts only long enough to coat the aircraft surfaces. Refer to Essential Aircraft De-Icing/Anti-Icing Areas, Figures 10-3 and 10-4.

9. HOLDOVER TIMETABLES

Holdover Timetables are only estimates and vary depending on many factors such as temperature, precipitation type, precipitation rate, wind, and airplane skin temperature. Holdover times are based on the mixture ratio of fluid/water.

For a one step De-icing/Anti-icing procedure, the holdover time begins at the start of the treatment.

For a two step De-icing/Anti-icing procedure, the holdover time begins at the start of the second step (anti-icing).

10. POST DE-ICING/ANTI-ICING PROCEDURE

CAUTION

AIRCRAFT OPERATORS ARE SOLELY RESPONSIBLE FOR ENSURING HOLDOVER TIMETABLES CONTAIN CURRENT DATA.

TABLES ARE FOR USE IN DEPARTURE PLANNING ONLY AND MUST BE USED IN CONJUNCTION WITH PRE TAKE-OFF CONTAMINATION PROCEDURES.

A. POST DE-ICING/ANTI-ICING CHECK

The areas that follow must be checked for any contamination that may still remain after the de-icing/anti-icing procedure has been done:

- Wing leading edges, upper and lower surfaces and aileron including the wing seals
- Horizontal stabilizer leading edges, upper and lower surfaces and the elevator surfaces, particularly the balance horns
- Vertical stabilizer and rudder surfaces
- Flaps
- Propeller
- Engine oil cooler and ECS air intakes
- Inertial separator and screen
- Fuselage
- Static ports, pitot heads, AOA vanes and temperature probes
- Fuel tank vents
- Landing gear

A thorough pre-flight inspection is more important in extreme temperatures, as this may affect the aircraft and/or its performance.

B. PRE-TAKEOFF CONTAMINATION CHECK

CAUTION

UNDER NO CIRCUMSTANCES SHALL AN AIRCRAFT THAT HAS BEEN ANTI-ICED RECEIVE A FURTHER COATING OF ANTI-ICING FLUID DIRECTLY ON TOP OF THE CONTAMINATED FILM.
IF AN ADDITIONAL TREATMENT IS REQUIRED BEFORE FLIGHT, A COMPLETE DE-ICING/ANTI-ICING PROCEDURE MUST BE PERFORMED.
MAKE SURE THAT ALL RESIDUES FROM ANY PREVIOUS TREATMENTS ARE FLUSHED OFF.
ANTI-ICING ONLY IS NOT PERMITTED.

A pre-take-off check must be done by the flight crew before take-off and within the holdover time. This check is normally done from within the cockpit. It may be accomplished by the continuous assessment of the conditions that affect holdover times, and should include the assessment and adjustment of holdover times.

When freezing precipitation exists, aerodynamic surfaces must be checked just before the aircraft taxis onto the active runway or initiates the take-off roll, to make sure that they are free of ice, slush and snow or frost (Refer to Figures 10-3 and 10-4). This is most important when severe conditions are experienced. When adhering deposits are in evidence, de-icing of the aircraft must be repeated.

C. FLIGHT CONTROL CHECK

After the de-icing/anti-icing procedure has been done, and before the take-off roll has started, the flaps must be fully extended and then retracted to the 15 degree position. During control checks, the controls may feel heavier than normal.

11. TAKE-OFF PERFORMANCE – SAE TYPE II, TYPE III AND TYPE IV FLUIDS

CAUTION

ANTICIPATE A HEAVIER THAN NORMAL ELEVATOR FORCE AT ROTATION. EVEN WITH THE INCREASED PULL FORCE, THE AIRCRAFT MAY ROTATE SLOWER THEN NORMAL. THE ELEVATOR FORCES WILL RETURN TO NORMAL SHORTLY AFTER TAKE-OFF.

THE TAKE-OFF CORRECTION FACTOR IS APPROXIMATE. ACTUAL CONDITIONS MAY REQUIRE DISTANCES GREATER THAN THOSE DETERMINED.

For take-off after a de-icing/anti-icing procedure has been done, PUSHER ICE MODE must be used, with the flaps set to 15 degrees, and the rotational speed increased by 10 KIAS (as specified in Section 5 Performance). As a result, the take-off ground roll distance can be increased by up to 30% and the total distance by up to 31%.

12. PERIODIC INSPECTION – TYPE II, III AND IV FLUIDS

Operators who use SAE Type II, III or IV anti-icing fluids are recommended to carry out periodic inspections for anti-icing fluid residues. The visual inspection must include:

- Along the wing rear spar area with flaps extended.
- Around the perimeter of the aileron surface.
- The gaps around the elevator and elevator trim tab.
- The gaps around the rudder and rudder trim tab.
- Inside the drain hole located at the base of the rudder

Any identified residues must be removed by cleaning with warm water or an approved fluid.

If the aircraft is washed, or if SAE Type I fluid is used for de-icing, the frequency of inspection may be reduced.

Initially, the inspections must be carried out after a maximum of three applications of SAE Type II, III or IV anti-icing fluids.

The operator must determine the frequency of inspections based on the results of residue inspections, the frequency of de-icing/anti-icing operations as well as the frequency of aircraft washing.

OPERATIONS FROM PREPARED UNPAVED SURFACES

The aircraft is constructed for operations from prepared unpaved surfaces.

Prepared unpaved surfaces are taxi-ways and runways that are prepared and approved for aircraft operations with a surface other than tarmac or concrete.

CAUTION

PREPARED UNPAVED SURFACES SUITABLE FOR AIRCRAFT OPERATIONS VARY GREATLY AND SOME MAY NOT BE SUITABLE FOR OPERATIONS. IT IS THE RESPONSIBILITY OF THE PILOT IN COMMAND TO MAKE SURE THAT EACH TAXI-WAY AND RUNWAY SURFACE IS FIT FOR USE AT THE INTENDED AIRCRAFT WEIGHT BEFORE COMMENCING OPERATIONS ON IT.

The following factors should be considered when deciding if a surface is fit for operation or when operating from prepared unpaved surfaces:

SURFACE HARDNESS

A prepared unpaved surface may be hard after a period of dry weather but after rain can become soft. The wheels of a heavy aircraft can sink into soft surfaces causing a large increase in drag. This can make taxiing difficult or impossible and increase the takeoff ground roll distance considerably, sometimes to the point where V_R cannot be achieved. How deep the wheels sink in, varies with aircraft weight and surface condition. It may be possible to operate a light weight aircraft when it is not possible to operate it at maximum take off weight.

SURFACE ROUGHNESS

The taxi-way and runway surface should be smooth. Undulations, depression or bumps can cause longitudinal pitching of the aircraft which may cause a significant reduction in propeller ground clearance. Particular care should be exercised in long grass which can conceal hard objects and depressions and also at the borders between grass and concrete surfaces.

SURFACE TYPE

Loose stones or gravel can cause propeller or airframe damage. The propeller creates turbulence which lifts stones into the air which then are struck by following blades or are accelerated rearwards to hit the airframe. The risk of damage is reduced if the aircraft is allowed to accelerate forwards before high power is selected and if reverse thrust is not used below 30 kts forward speed.

Wet or fresh grass on a hard surface is slippery and has a lower coefficient of friction than short dry grass. Takeoff and stopping distances may increase. On a soft surface landing ground roll may decrease but takeoff ground roll may increase.

On sandy or dusty surfaces, or where loose grass is present, reverse thrust can cause a loss of forward visibility and particles ingested into the air intake can cause increased engine wear.

INERTIAL SEPARATOR

When operating from any surface where there is a risk of dust, sand or other material entering the engine intake, it is recommended to open the inertial separator.

On takeoff from hot and high airfields with the inertial separator open it may not be possible to obtain maximum takeoff power (44 psi) and the takeoff performance will consequently deteriorate.

AIRCRAFT INSPECTION

When operating from prepared unpaved surfaces where there are loose stones, gravel, grit, sand, dust or cut grass etc. there is always a risk of propeller or airframe damage or blockage of air inlets. After operations from prepared unpaved surfaces, where a risk of damage or contamination exists, the aircraft should be thoroughly inspected.

BEFORE STARTING ENGINE

Make sure the area under and adjacent to the propeller is clear of loose stones or other objects which could damage the propeller or enter the engine or oil cooler air inlets.

TAXIING

1. Use minimum power to prevent stone damage particularly when moving away from rest and when turning.
2. Be alert for surface unevenness or obstructions which could cause propeller damage.
3. To turn the aircraft on soft or slippery surfaces using nosewheel steering assisted by brake will help to keep the power low. (Reducing the risk of damage to the propeller or runway surface). If possible avoid making small radius turns.

TAKEOFF

When aligned for takeoff set a low power before brake release. After brake release, as the aircraft begins to accelerate, move the power lever steadily forwards to achieve Takeoff power. This procedure will reduce the risk of damaging the propeller by loose stones on the ground.

LANDING

CAUTION

BEFORE LANDING ON A PREPARED UNPAVED RUNWAY CHECK THAT THE SURFACE IS FIT FOR OPERATION AT THE INTENDED WEIGHT.

PASSENGER BRIEFINGS

GENERAL

In Sections 3 and 4 there are procedural actions that call for the pilot to brief the passengers. They fall into two categories those forming part of an emergency procedure and the more regular type ones for taxiing prior to takeoff and before landing. Tips for passenger briefings during an emergency cannot be specified as each situation will place a different demand on the pilot. However, much of the content in the Taxiing briefing tips can be used to brief the passengers, if time permits. Tips for the recommended subjects that should be covered for the regular passenger briefings are given in the following lists:

TAXIING (Section 4, para 4-7)

For aircraft with a standard cabin interior:

- Stow hand baggage under the seats
- Put the seat back in the upright position
- Position the seat headrest to support the head
- Switch off electronic equipment
- Fasten seat lap and shoulder belts, and tighten lap strap
- Mention how to locate, remove and put on the passenger oxygen masks
- Mention the location and usage of the emergency exits
- Mention to remain buckled up during cruise in case of unexpected turbulence, but that the shoulder strap may be released (if releasable type) when airborne and permission has been given
- Mention the safety on board cards for more detailed information about the safety features (if available)

For aircraft with an executive cabin interior:

- Stow hand baggage in the seat or cabinet drawers
- Move the seat to the required position for takeoff (as per the placard adjacent to each seat)
- Position the seat headrest to support the head
- Stow the tables, cabinet drawers, seat drawers and legrests
- Switch off electronic equipment
- Fasten seat lap and shoulder belts, tighten lap strap
- Mention how to locate, remove and put on the passenger oxygen masks
- Mention the location and usage of the emergency exits
- Mention to remain buckled up during cruise in case of unexpected turbulence, but that the shoulder strap may be released once the fasten seat belt sign has been switched off
- Mention the safety on board cards for more detailed information about the safety features (if available)

BEFORE LANDING (Section 4, para 4-14)

For aircraft with a standard cabin interior:

- Stow hand baggage under the seats
- Put the seat back in the upright position
- Position the seat headrest to support the head
- Switch off electronic equipment
- Fasten seat lap and shoulder belts, tighten lap strap
- Remain seated and buckled until the aircraft has come to a standstill and the engine is turned off

For aircraft with an executive cabin interior:

- Stow hand baggage in the seat or cabinet drawers
- Move the seat to the required position for landing (as per the placard adjacent to each seat)
- Position the seat headrest to support the head
- Stow the tables, cabinet drawers, seat drawers and legrests
- Switch off electronic equipment
- Fasten seat lap and shoulder belts, tighten lap strap
- Remain seated and buckled until the aircraft has come to a standstill and the engine is turned off.