Diamond AIRCRAFT

AIRPLANE FLIGHT MANUAL
DA 62

Airworthiness Category : **Normal**
Requirement : **AWM 523**

Serial Number : ________

Registration : ________

Doc. No. : **11.01.05-E**
Date of Issue : **24-October-2019**

This manual must be carried in the aircraft at all times. Scope and revision status can be found in the List of Effective Pages and in the Record of Revisions.

Signature: ANDREAS HARTONO

Authority: A/ Chief Flight Test
Transport Canada Civil Aviation

Date of approval:

This airplane flight manual has been approved by the Canadian Department of Transport in accordance with the Canadian Aviation Regulations. This airplane flight manual is FAA approved for U.S. registered aircraft in accordance with the provisions of 14 CFR Section 21.29, and is required by FAA Type Certificate Data Sheet no.: A00012NY.

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FOREWORD

We congratulate you on the acquisition of your new DIAMOND DA 62.

Skillful operation of an airplane increases both safety and the enjoyment of flying. Please take the time therefore, to familiarize yourself with your new DIAMOND DA 62.

This airplane may only be operated in accordance with the procedures and operating limitations of this Airplane Flight Manual.

Before this airplane is operated for the first time, the pilot must familiarize himself with the complete contents of this Airplane Flight Manual.

In the event that you have obtained your DIAMOND DA 62 second-hand, please let us know your address, so that we can supply you with the publications necessary for the safe operation of your airplane.

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0.1 APPROVAL

The content of approved chapters is approved by Transport Canada Civil Aviation.

0.2 RECORD OF REVISIONS

All revisions of this manual, with the exception of:

- Temporary Revisions,
- updates of the modification level (Section 1.1),
- updated mass and balance information (Section 6.3),
- updates of the Equipment Inventory (Section 6.5), and
- updates of the List of Supplements (Section 9.2)

must be recorded in the following table.

The new or amended text is indicated by a vertical black line at the left hand side of the revised page, with the revision number and date appearing at the bottom of the page.

If pages are revised which contain information valid for your particular serial number (modification level of the airplane, weighing data, Equipment Inventory, List of Supplements), then this information must be transferred to the new pages in hand-writing.

Temporary Revisions, if applicable, are inserted behind the cover page of this manual. Temporary Revisions are used to provide information on systems or equipment until the next 'permanent' revision of the Airplane Flight Manual. When a 'permanent' revision covers a Mandatory Design Change Advisory or Optional Design Change Advisory (MÄM or OÄM), then the corresponding Temporary Revision is superseded. For example: If Revision 1 covers OÄM 62-039, then the Temporary Revision TR OÄM-62-039 is superseded by the 'permanent' Revision 1.

Rev. No.	Reason	Chapter(s)	Page(s)	Date of Revision	Approval
1	FAA approval statement on cover page. Approved fuel grades for operation in USA.	0, 2	0-0, 0-3, 0-4, 0-5, 2-27	24-Oct-2019	ANDREAS HARTONO Chief, Flight Test for Director, National Aircraft Certification TRANSPORT CANADA

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CHAPTER 1
GENERAL

1.1 INTRODUCTION

This Airplane Flight Manual has been prepared in order to provide pilots and instructors with all the information required for the safe and efficient operation of the airplane.

The Airplane Flight Manual includes all the data which must be made available to the pilot according to the AWM 523 requirement. Beyond this, it contains further data and operating instructions which, in the manufacturer's opinion, could be of value to the pilot.

Equipment and modification level (design details) of the airplane may vary from serial number to serial number. Therefore, some of the information contained in this manual is applicable depending on the respective equipment and modification level. The exact equipment of your serial number is recorded in the Equipment Inventory in Section 6.5. The modification level is recorded in the following table (as far as necessary for this manual).

Modification	Source	Installed	
MTOM 2300 kg/5071 lb	MÄM 62-001	☐ yes	☐ no
Maximum Zero Fuel Mass 2200 kg (4850 lb)	MÄM 62-063	☐ yes	☐ no
Engine Software VC33_2P_05_19*	MÄM 62-168	☐ yes	☐ no
Garmin Hard- and Software Upgrade I (Garmin G1000 NXi)	MÄM 62-254	☐ yes	☐ no
Auxiliary Fuel Tanks	OÄM 62-001	☐ yes	☐ no
Continuous Flow Oxygen System (77 cuft cylinder)	OÄM 62-004	☐ yes	☐ no
Garmin GWX 70 Weather Radar	OÄM 62-009	☐ yes	☐ no
Avidyne TAS 600 Series	OÄM 62-011	☐ yes	☐ no
MTOM 1999 kg/4407 lb	OÄM 62-018	☐ yes	☐ no
7 Seated Configuration	OÄM 62-019	☐ yes	☐ no

Modification	Source	Installed	
WX-500 Storm Scope	OÄM 62-021	☐ yes	☐ no
Continuous Flow Oxygen System (50 cuft cylinder)	OÄM 62-028	☐ yes	☐ no
Removal of Unfeathering Akkumulator	OÄM 62-030	☐ yes	☐ no
Heated Static Ports	OÄM 62-037	☐ yes	☐ no
On Top Exhaust System	OÄM 62-038	☐ yes	☐ no
28V Power Outlet Option	OÄM 62-1002	☐ yes	☐ no

* Or later approved software

This Airplane Flight Manual must be kept on board the airplane at all times. Its designated place is the side bag of the forward left seat. The designated place for the Garmin G1000 Cockpit Reference Guide is the bag on the rear side of the forward right seat.

CAUTION

The DA 62 is a twin engine airplane. When the operating limitations and maintenance requirements are complied with, it has the high degree of reliability which is required by the certification basis. Nevertheless, an engine failure is not completely impossible. For this reason it is highly recommended for flights during the night, on top, under IMC, or above terrain which is unsuitable for a landing, to select flight times and flight routes such that reduced performance in case of single engine operation does not constitute a risk.

1.2 CERTIFICATION BASIS

The DA 62 has been approved by Transport Canada in accordance with the Canadian Airworthiness Manual (AWM) Chapter 523, Type Certificate No. A-273

Category of Airworthiness: NORMAL

1.3 WARNINGS, CAUTIONS AND NOTES

Special statements in the Airplane Flight Manual concerning the safety or operation of the airplane are highlighted by being prefixed by one of the following terms:

WARNING

means that the non-observation of the corresponding procedure leads to an immediate or important degradation in flight safety.

CAUTION

means that the non-observation of the corresponding procedure leads to a minor or to a more or less long term degradation in flight safety.

NOTE

draws the attention to any special item not directly related to safety but which is important or unusual.

1.4 DIMENSIONS

NOTE

All dimensions shown below are approximate.

Overall Dimensions

Span	: 14.57 m	47 ft 10 in
Length	: 9.17 m	30 ft 1 in
Height	: 2.82 m	9 ft 3 in

Wing

Airfoil	: Wortmann FX 63-137/20 - W4	
Wing Area	: 17.10 m²	184.1 sq.ft.
Mean aerodynamic chord	: 1.247 m	4 ft 1 in
Aspect ratio	: 12.8	
Dihedral	: 5.2°	
Leading edge sweep	: 1°	

Aileron

Area (total, left + right)	: 0.65 m²	7 sq.ft.

Wing Flaps

Area (total, left + right)	: 2.16 m²	23.25 sq.ft.

Horizontal Tail

Area	: 2.91 m²	31.32 sq.ft.
Elevator area	: 0.82 m²	8.83 sq.ft.
Angle of incidence	: -2° relative to longitudinal axis of airplane	

Vertical Tail

Area	: 2.31 m²	24.86 sq.ft.
Rudder area	: 0.74 m²	7.97 sq.ft.

Landing Gear

Track	: 2.95 m (9 ft 8 in)
Wheelbase	: 1.91 m (6 ft 3 in)
Nose wheel	: 6.00-6, for details refer to AMM
Main wheel	: 6.00-6, for details refer to AMM

1.5 DEFINITIONS AND ABBREVIATIONS

(a) Airspeeds

CAS: Calibrated Airspeed. Indicated airspeed, corrected for installation and instrument errors. CAS equals TAS at standard atmospheric conditions (ISA) at MSL.

IAS: Indicated Airspeed as shown on an airspeed indicator.

KCAS: CAS in knots.

KIAS: IAS in knots.

TAS: True Airspeed. The speed of the airplane relative to the air. TAS is CAS corrected for errors due to altitude and temperature.

v_O: Operating Maneuvering Speed. Full or abrupt control surface movement is not permissible above this speed.

v_{FE}: Maximum Flaps Extended Speed. This speed must not be exceeded with the given flap setting.

v_{LE}: Maximum Landing Gear Extended Speed. This speed may not be exceeded if the landing gear is extended.

v_{LOE}: Maximum Landing Gear Operating Speed for Extension. This speed may not be exceeded during the extension of the landing gear.

v_{LOR}: Maximum Landing Gear Operating Speed for Retraction. This speed may not be exceeded during the retraction of the landing gear.

v_{MCA}: Minimum Control Speed - Airborne. Minimum speed necessary to be able to control the airplane in case of one engine inoperative.

v_{NE}: Never Exceed Speed in smooth air. This speed must not be exceeded in any operation.

v_{NO}: Maximum Structural Cruising Speed. This speed may be exceeded only in smooth air, and then only with caution.

v_R: Rotation Speed.

v_S: Stalling Speed, or the minimum continuous speed at which the airplane is still controllable in the given configuration.

v_{S0}: Stalling Speed, or the minimum continuous speed at which the airplane is still controllable in the landing configuration.

v_{S1}: Stalling Speed, or the minimum continuous speed at which the airplane is still controllable with flaps and landing gear retracted.

v_{SSE}: Minimum Control Speed for Schooling. Minimum speed necessary in case of one engine intentionally inoperative/idle (training purposes).

v_x: Best Angle-of-Climb Speed.

v_y: Best Rate-of-Climb Speed.

v_{YSE}: Best Rate of-Climb Speed for one engine inoperative.

v_{50ft}: Speed at 50 ft above take-off surface.

<u>(b) Meteorological Terms</u>

ISA: International Standard Atmosphere. Conditions at which air is identified as an ideal dry gas. The temperature at mean sea level is 15 °C (59 °F), air pressure at MSL is 1013.25 hPa (29.92 inHg); the temperature gradient up to the altitude at which the temperature reaches -56.5 °C (-69.7 °F) is -0.0065 °C/m (-0.00357 °F/ft), and above this 0 °C/m (0 °F/ft).

MSL: Mean Sea Level.

OAT: Outside Air Temperature.

QNH: Theoretical atmospheric pressure at MSL, calculated from the elevation of the of the measuring point above MSL, and the actual atmospheric pressure at the measuring point.

Density Altitude:
Altitude in ISA conditions at which the air density is equal to the current air density.

Indicated Pressure Altitude:
Altitude reading with altimeter set to 1013.25 hPa (29.92 inHg).

Pressure Altitude:
Altitude indicated by a barometric altimeter, which is set to 1013.25 hPa (29.92 inHg). The Pressure Altitude is the Indicated Pressure Altitude corrected for installation and instrument errors.

In this Airplane Flight Manual, altimeter instrument errors are regarded as zero.

Wind: The wind speeds which are shown as variables in the diagrams and tables in this manual should be regarded as headwind or tailwind components of the measured wind.

(c) Flight Performance and Flight Planning

AGL: Above Ground Level.

Demonstrated Crosswind Component:
The speed of the crosswind component at which adequate maneuverability for take-off and landing has been demonstrated during type certification.

MET: Weather, weather advice.

NAV: Navigation, route planning.

RoC: Rate of Climb.

(d) Mass and Balance

CG: Center of Gravity, also called 'center of mass'. Imaginary point in which the airplane mass is assumed to be concentrated for mass and balance calculations. Its distance from the Datum Plane is equal to the Center of Gravity Moment Arm.

Center of Gravity Moment Arm:
The Moment Arm which is obtained if one divides the sum of the individual moments of the airplane by its total mass.

Center of Gravity Limits:
The Center of Gravity range within which the airplane, at a given mass, must be operated.

DP: Datum Plane; an imaginary vertical plane from which all horizontal distances for center of gravity calculations are measured.

Empty Mass: The mass of the airplane including unusable fuel, all operating fluids and the maximum quantity of oil.

Maximum Take-off Mass:
The maximum permissible mass for take-off.

Maximum Landing Mass:

The highest mass for landing conditions at the maximum descent velocity. This velocity was used in the strength calculations to determine the landing gear loads during a particularly hard landing.

Moment Arm: The horizontal distance from the Datum Plane to the Center of Gravity of a component.

Moment: The mass of a component multiplied by its moment arm.

Usable fuel: The quantity of fuel available for flight planning.

Unusable fuel: The quantity of fuel remaining in the tank which cannot be used for flight.

Useful load: The difference between take-off mass and empty mass.

(e) Engine

EECU: Electr. Engine Control Unit

RPM: Revolutions per minute (rotational speed of the propeller)

Engine starting fuel temperature:

Above this fuel temperature, the engine may be started.

Take-off fuel temperature:

Above this fuel temperature, take-off power setting is permitted.

OEI: One engine inoperative

(f) Designation of the Circuit Breakers on the Instrument Panel

LH MAIN BUS:

COM1	COM Radio No. 1
GPS/NAV1	Global Positioning System and NAV Receiver No. 1
XPDR	Transponder
ENG INST	Engine Instruments
PITOT	Pitot Heating System
DE-ICE	De-Icing System
TAXI/MAP/ACL	Taxi-, Map-, Anti Collision Light
PFD	Primary Flight Display
ADC	Air Data Computer
AHRS	Attitude Heading Reference System
GEAR WRN	Landing Gear Annunciation
GEAR	Landing Gear Control
AUX PUMPS	Aux Fuel Pumps

RH MAIN BUS:

MFD	Multi Function Display
SAM	Standby Altitude Module
STALL WRN	Stall Warning System
FLAP	Flap System
LDG LT/START	Landing Light/Start
NAV LT/FLOOD	Navigation (Position) Light, Flood Light
AV/GDU/FAN	Avionic-, GDU-Cooling Fans
AVIONIC BUS	Avionic Bus
AV CONT	Avionic Control
INST LT	Instrument Light
STATIC HT/PEDALS	Static Heating System/Adjustable Rudder Pedals

AVIONICS BUS:

COM2	COM Radio No. 2
GPS/NAV2	Global Positioning System and NAV Receiver No. 2
AUDIO	Audio Panel
AFCS/ESP/USP	Auto Pilot System
TWX	Lightning Detection System
ADF	Automatic Direction Finder
DME	Distance Measuring Equipment
Wx RDR	Weather Radar
TAS	Traffic Advisory System
DATA LINK	Data Link System
IRIDIUM	Satellite Receiver
EVS	Enhanced Vision System
GCU/FLT STRM	Control Unit (Keypad)/Flight Stream

LH ENG ECU BUS:

ECU BUS	LH ECU Bus
ECU B	LH ECU B
ECU A	LH ECU A

LH BUS:

ALT.LH	LH Alternator
BATT	Battery

LH ENGINE:

FUEL PUMP A	LH ECU A Fuel Pump
FUEL PUMP B	LH ECU B Fuel Pump

RH ENG ECU BUS:

ECU BUS	RH ECU Bus
ECU B	RH ECU B
ECU A	RH ECU A

RH BUS:

ALT.RH	RH Alternator
BATT	Battery

RH ENGINE:

FUEL PUMP A	RH ECU A Fuel Pump
FUEL PUMP B	RH ECU B Fuel Pump

(g) Equipment

ELT:	Emergency Locator Transmitter

(h) Design Change Advisories

MÄM:	Mandatory Design Change Advisory
OÄM:	Optional Design Change Advisory
VÄM:	Variant Design Change Advisory

(i) Miscellaneous

AFM:	Airplane Flight Manual
AMM:	Airplane Maintenance Manual
ATC:	Air Traffic Control
AWM:	Airworthiness Manual
CAR:	Canadian Airworthiness Regulation
CFRP:	Carbon Fiber Reinforced Plastic
DOT:	Department of Transport
EASA:	European Aviation Safety Agency
EPU:	External Power Unit
GIA:	Garmin Integrated Avionics
GFRP:	Glass Fiber Reinforced Plastic
GPS:	Global Positioning System
IFR:	Instrument Flight Rules
JC/VP:	Joint Certification/Validation Procedure
PCA:	Primary Certification Authority
TCCA:	Transport Canada Civil Aviation
VFR:	Visual Flight Rules

1.6 UNITS OF MEASUREMENT

1.6.1 CONVERSION FACTORS

Dimension	SI Units		US Units		Conversion
Length	[mm] [m] [km]	millimeters meters kilometers	[in] [ft] [NM]	inches feet nautical miles	[mm] / 25.4 = [in] [m] / 0.3048 = [ft] [km] / 1.852 = [NM]
Volume	[l] [ml]	liters milliliter	[US gal] [qts] [oz]	US gallons US quarts ounce	[l] / 3.7854 = [US gal] [l] / 0.9464 = [qts] [ml] x 0.033814 = [oz]
Speed	[km/h] [m/s]	kilometers per hour meters per second	[kts] [mph] [fpm]	knots miles per hour feet per minute	[km/h] / 1.852 = [kts] [km/h] / 1.609 = [mph] [m/s] x 196.85 = [fpm] [fpm] / 196.85 = [m/s]
Speed of rotation	[RPM] revolutions per minute				--
Mass	[kg]	kilograms	[lb]	pounds	[kg] x 2.2046 = [lb]
Force, weight	[N]	Newtons	[lbf]	pounds force	[N] x 0.2248 = [lbf]
Pressure	[hPa] [mbar] [bar]	hecto-pascals millibars bars	[inHg] [psi]	inches of mercury pounds per square inch	[hPa] = [mbar] [hPa] / 33.86 = [inHg] [bar] x 14.504 = [psi]
Tempera-ture	[°C]	degrees Celsius	[°F]	degrees Fahrenheit	[°C]x1.8 + 32 = [°F] ([°F] - 32)/1.8 = [°C]

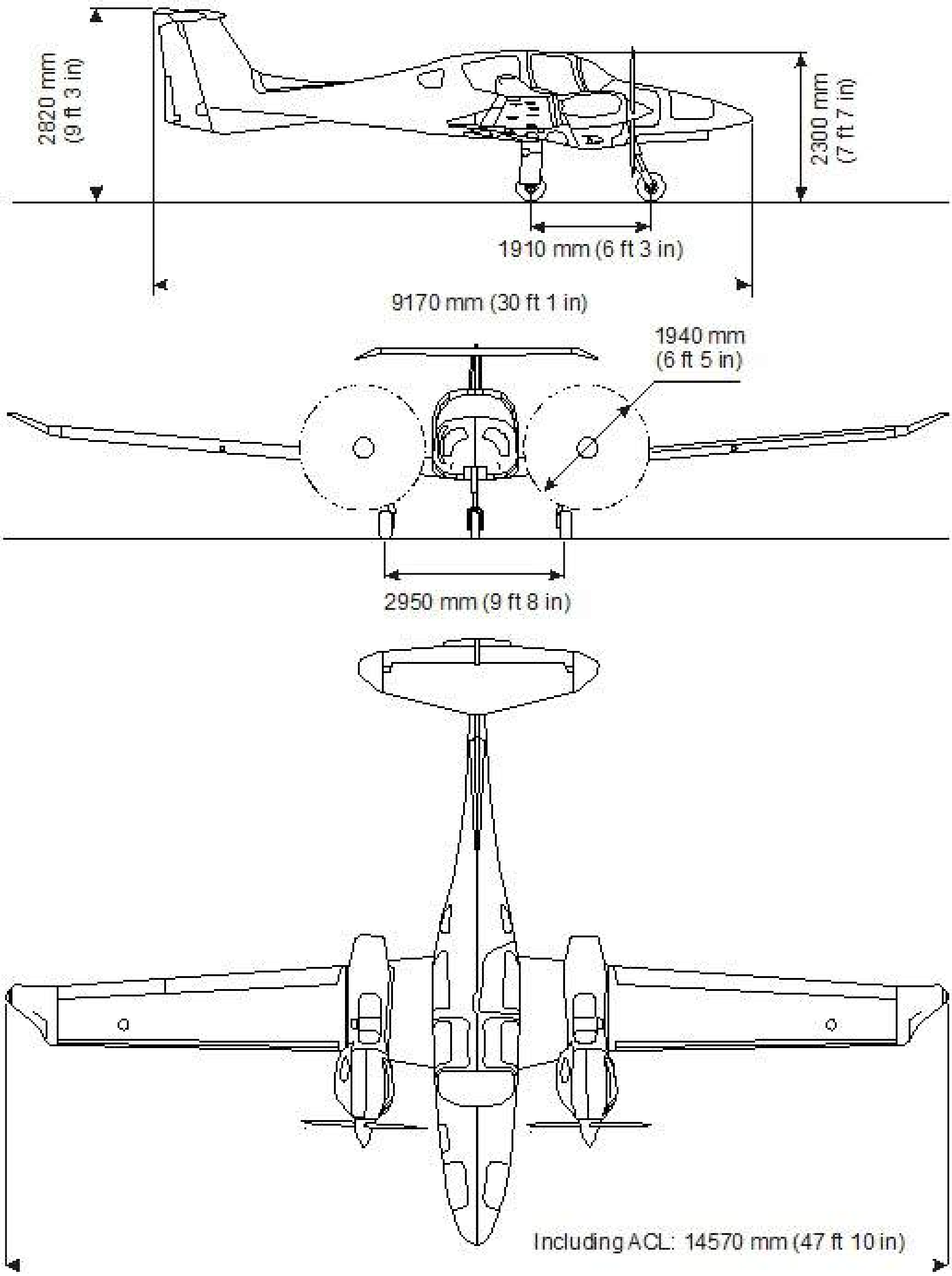
Dimension	SI Units	US Units	Conversion
Intensity of electric current	[A] ampères		--
Electric charge (battery capacity)	[Ah] ampère-hours		--
Electric potential	[V] volts		--
Time	[sec] seconds		--

1.6.2 CONVERSION CHART LITERS / US GALLONS

Liters	US Gallons
5	1.3
10	2.6
15	4.0
20	5.3
25	6.6
30	7.9
35	9.2
40	10.6
45	11.9
50	13.2
60	15.9
70	18.5
80	21.1
90	23.8
100	26.4
110	29.1
120	31.7
130	34.3
140	37.0
150	39.6
160	42.3
170	44.9
180	47.6

US Gallons	Liters
1	3.8
2	7.6
4	15.1
6	22.7
8	30.3
10	37.9
12	45.4
14	53.0
16	60.6
18	68.1
20	75.7
22	83.3
24	90.9
26	98.4
28	106.0
30	113.6
32	121.1
34	128.7
36	136.3
38	143.8
40	151.4
45	170.3
50	189.3

1.7 THREE-VIEW DRAWING



1.8 G1000 AVIONICS SYSTEM

1. The G1000 Integrated Avionics System is a fully integrated flight, engine, communication, navigation and surveillance instrumentation system. The system consists of a Primary Flight Display (PFD), Multi-Function Display (MFD), audio panel, Air Data Computer (ADC), Attitude and Heading Reference System (AHRS), engine sensors and processing unit (GEA), and integrated avionics (GIA) containing VHF communications, VHF navigation, and GPS (Global Positioning System).

2. The primary function of the PFD is to provide attitude, heading, air data, navigation, and alerting information to the pilot. The PFD may also be used for flight planning. The primary function of the MFD is to provide engine information, mapping, terrain information, autopilot operation, and for flight planning. The audio panel is used for selection of radios for transmitting and listening, intercom functions, and marker beacon functions.

3. The primary function of the VHF Communication portion of the G1000 is to enable external radio communication. The primary function of the VOR/ILS Receiver portion of the equipment is to receive and demodulate VOR, Localizer, and Glide Slope signals. The primary function of the GPS portion of the system is to acquire signals from the GPS satellites, recover orbital data, make range and Doppler measurements, and process this information in real-time to obtain the user's position, velocity, and time.

4. If the Garmin GWX 70 weather radar system is installed, it can be used to aid the pilot in avoiding thunderstorms and associated turbulence or for ground mapping. The GWX 70 shall be used to avoid severe weather and not for penetrating severe weather. Pulse type weather radar systems like the GWX 70 detect precipitation only, not clouds or turbulence. The display may indicate clear areas between intense returns, but this does not necessarily mean it is safe to fly between them. As installed on the DA 62, the Garmin GWX 70 has a demonstrated range of 160 nautical miles. Refer to Garmin G1000 Pilot’s Guide for the DA 62, P/N 190-01895-( ) for Garmin G1000 or P/N 190-01904-( ) for G1000 NXi in the latest effective issue for further information.

1.9 SOURCE DOCUMENTATION

This section lists documents, manuals and other literature that were used as sources for the Airplane Flight Manual, and indicates the respective publisher. However, only the information given in the Airplane Flight Manual is valid.

1.9.1 ENGINE

Address:	Austro Engine GmbH Rudolf Diesel-Str. 11 A-2700 Wiener Neustadt AUSTRIA
Phone:	+43-2622-23 000
Fax:	+43-2622-23 000 - 2711
Internet:	www.austroengine.at
Documents:	Operation Manual, E4.01.02, latest revision

1.9.2 PROPELLER

Address:	mt-propeller Airport Straubing Wallmühle D-94348 Atting GERMANY
Phone:	+49-9429-9409-0
E-mail:	sales@mt-propeller.com
Website:	www.mt-propeller.de

Documents: E-124, Operation and Installation Manual
Hydraulically controlled variable pitch propeller
MTV -5, -6, -9, -11, -12, -14, -15, -16, -21, -22, -25

1.9.3 AVIONICS SYSTEM

Address: Garmin International, Inc.
1200 East 151st Street
Olathe, Kansas 66062
USA

Phone: +1-(913)-3978200

Fax: +1-(913)-3978282

Website: www.garmin.com

Documents: G1000 Cockpit Reference Guide
P/N 190-01896-( ), latest revision

G1000 Pilot's Guide
P/N 190-01895-( ), latest revision

G1000 NXi Cockpit Reference Guide
P/N 190-01905-( ), latest revision

G1000 NXi Pilot's Guide
P/N 190-01904-( ), latest revision

CHAPTER 2
OPERATING LIMITATIONS

Page

2.1 INTRODUCTION

Chapter 2 of this Airplane Flight Manual provides operating limitations, instrument markings and placards necessary for the safe operation of the airplane, its powerplants, standard systems and standard equipment.

The limitations included in this Chapter are approved.

WARNING

Operation of the airplane outside of the approved operating limitations is not permissible.

2.2 AIRSPEED

	Airspeed		KIAS	Remarks
v_O	Operating maneuvering speed	above 2200 kg (4850 lb) to 2300 kg (5071 lb)	141 KIAS	Do not make full or abrupt control surface movement above this speed.
		above 2100 kg (4630 lb) to 2200 kg (4850 lb)	138 KIAS	
		above 1999 kg (4407 lb) to 2100 kg (4630 lb)	135 KIAS	
		above 1900 kg (4189 lb) to 1999 kg (4407 lb)	131 KIAS	
		above 1800 kg (3968 lb) to 1900 kg (4189 lb)	128 KIAS	
		up to 1800 kg (3968 lb)	120 KIAS	
v_{FE}	Max. flaps extended speed	LDG	119 KIAS	Do not exceed these speeds with the given flap setting.
		T/O	136 KIAS	
v_{LO}	Max. landing gear operating speed	Extension v_{LOE}	205 KIAS	Do not operate the landing gear above this speed.
		Retraction v_{LOR}	162 KIAS	
v_{LE}	Max. landing gear extended speed		205 KIAS	Do not exceed this speed with the landing gear extended.

	Airspeed		KIAS	Remarks
v_{MCA}	Minimum control speed airborne	T/O	70 KIAS	With one engine inoperative, keep airspeed above this limit.
		UP	76 KIAS	
v_{NO}	Max. structural cruising speed		162 KIAS	Do not exceed this speed except in smooth air, and then only with caution.
v_{NE}	Never exceed speed in smooth air		205 KIAS	Do not exceed this speed in any operation.

2.3 AIRSPEED INDICATOR MARKINGS

Marking	KIAS	Significance
White arc	64 -119 KIAS	Operating range with flaps fully extended.
	If MÄM 62-001 is carried out: 69 - 119 KIAS	
Green arc	70 - 162 KIAS	Normal operating range.
	If MÄM 62-001 is carried out: 73 - 162 KIAS	
Yellow arc	162 - 205 KIAS	‘Caution’ range - “Only in smooth air”.
Blue radial	87 KIAS	Best rate of climb speed, single engine.
	If MÄM 62-001 is carried out: 89 KIAS	
Red radial	76 KIAS	Minimum control speed, single engine.
Red radial	205 KIAS	Maximum speed for all operations - v_{NE}.

2.4 POWER-PLANT LIMITATIONS

a) Number of engines : 2

b) Engine manufacturer : Austro Engine

c) Engine designation : E4P-C

d) RPM limitations (shown as propeller RPM)

Maximum take-off (rpm)	:	2300 RPM
Maximum continuous (rpm)	:	2200 RPM
Maximum overspeed	:	2500 RPM max. 20 sec

e) Engine power

Max. take-off power	:	100% (132 kW) max. 5 min
Max. continuous power	:	95% (126 kW)

f) Oil pressure (absolute)

Minimum < 1500 RPM	:	0.9 bar (13.05 psi)
Minimum ≥ 1500 RPM	:	2.5 bar (36.26 psi)
Maximum	:	6.5 bar (94.25 psi)
Normal range	:	2.5 bar - 6 bar (36.26 psi - 87.02 psi)

g) Oil quantity

Minimum	:	5.0 l (5.28 qts)
Maximum	:	7.0 l (7.40 qts)
Maximum oil consumption	:	0.1 liter/h (0.11 qts/h)

h) Oil temperature

Minimum	:	-30 °C (-22 °F)
Maximum	:	139 °C (282 °F)
Normal range	:	50 °C - 135 °C (122 °F - 275 °F)

i) Gearbox temperature

Minimum	:	-30 °C (-22 ° F)
Minimum (full load)	:	35 °C (95 °F)
Maximum	:	120 °C (248 °F)

NOTE

A cautionary (yellow) gearbox temperature range is not imposed by the engine manufacturer. However, there is a delay between power changes and gearbox temperature. Therefore, a cautionary range has been added to the G1000 gearbox temperature instrument solely to make the pilot attentive to the gearbox temperature approaching the maximum allowable limit. There is no specific time limit associated with operating in the cautionary gearbox temperature range.

j) Coolant temperature

Minimum (at start-up)	:	-30 °C (-22 °F)
Minimum (full load)	:	60 °C (140 °F)
Maximum	:	100 °C (212 °F)

k) Fuel temperature

Minimum	:	-30 °C (-22 °F)
Maximum	:	60 °C (140 °F)

l) Fuel pressure (absolute)

Minimum	:	4 bar (58.0 psi)
Maximum	:	7 bar (101.5 psi)

NOTE

The fuel pressure is not indicated on the G1000; a fuel pressure warning will illuminate on the PFD if the pressure is below limit.

m) Voltage

Minimum	:	24.1 V
Maximum	:	32.0 V

n) Amperage

Maximum	:	70 A
o) Propeller manufacturer	:	mt-Propeller
p) Propeller designation	:	MTV-6-R-C-F/CF 194-80
q) Propeller diameter	:	194 cm (76.38 in)
r) Prop. pitch angle (@ 0.75 R)	:	11° ± 0.2° (low pitch)
		80° ± 1° (feathered position)
s) Governor	:	mt-Propeller P-877-16 electrical governor with feather position

t) Oil specification:

SAE Grade 5W-30:	SHELL HELIX ULTRA
	ADDINOL SUPER POWER MV 0537
	BP VISCO 5000
	REPSOL ELITE COMMON RAIL
	GULF FORMULA GMX
	AEROSHELL Oil Diesel Ultra
	CASTROL Edge 5W-30 A3
	CASTROL Edge Professional A3
	G-Energy F Synth
	TOTAL Quartz 9000 Energy
SAE Grade 5W-40:	SHELL HELIX ULTRA
	LIQUI MOLY LEICHTLAUF HIGH TECH
	MEGOL MOTORENOEL HIGH CONDITION
	PETRONAS Syntium 3000
	LUKOIL LUXE SYNTHETIC
	CASTROL Edge Professional A3
	CASTROL Magnatec Professional A3
	VALVOLINE SynPower HST
	VALVOLINE SynPower
	GULF Formula GX
	AUSTRO ENGINE Aero produced by Liqui Moly recommended by Austro Engine GmbH
SAE Grade 0W-40:	CASTROL SLX PROFESSIONAL LONGTEC
	CASTROL Edge 0W-40 A3/B4
	CASTROL Edge Professional A3
	SHELL Helix Ultra

CAUTION

Only engine oils conforming to MB 229.5 specification are approved by Austro Engine GmbH to be used for operation. Use only one type of approved E4 engine oil for an oil change.

NOTE

It is not recommended to mix different SAE grades.

u) Gearbox oil (propeller gearbox) : SHELL SPIRAX GSX 75W-80
SHELL SPIRAX S6 GXME 75W-80

v) Coolant : Distilled water/cooler protection (BASF Glysantin Protect Plus / G48) 1/1. The freezing point of the coolant is -38°C (-36.4 °F).

CAUTION

If the coolant or gearbox oil level is low the reason must be determined and the problem must be corrected by authorized personnel.

w) Maximum restart altitude : 20,000 ft pressure altitude for immediate restarts
10,000 ft pressure altitude for restarts within two minutes

If MÄM 62-168 (engine software VC33_2P_05_19 or later approved software) is installed: 15,000 ft pressure altitude for immediate restart

Up to 10,000 ft pressure altitude:

OAT		Max. engine OFF time
[° C]	[° F]	[minutes]
below -15	below 5	2
-15 to -5	5 to 23	5
above -5	above 23	10

x) Restart airspeed (starter) : max. 80 KIAS or airspeed for a stationary propeller, whichever is lower.

WARNING

V_{MCA} is 76 KIAS and should be considered when attempting to engine restart with the starter and obtaining a stationary propeller. This limitation should be observed.

Restart airspeed (windmilling) : Maximum: 115 KIAS
Minimum: 110 KIAS below 10,000 ft
100 KIAS above 10,000 ft

y) No intentional shutdown below 3,000 ft AGL and above 10,000 ft pressure altitude.

2.5 ENGINE INSTRUMENT MARKINGS

Engine instrument markings and their color code significance are shown in the tables below.

Indi-cation	Red arc/bar = lower prohibited range	Yellow arc/bar = caution range	Green arc/bar = normal operating range	Yellow arc/bar = caution range	Red arc/bar = upper prohibited range
RPM	--	--	up to 2200 RPM	2200 to 2300 RPM	above 2300 RPM
Oil pressure	below 0.9 bar	0.9 to 2.5 bar	2.5 to 6.0 bar	6.0 to 6.5 bar	above 6.5 bar
Oil temp.	below -30°C	-30° to 50°C	50° to 135°C	135° to 139°C	above 139°C
Coolant temp.	below -30°C	-30° to 60°C	60° to 95°C	95° to 100°C	above 100°C
Gearbox temp.	below -30°C	-30° to 35°C	35° to 115°C	115° to 120°C	above 120°C
Load	--	--	up to 95%	95 - 100%	--
Fuel temp.	below -30°C	--	-30° to 55°C	55° to 60°C	above 60°C
Ammeter	--	--	up to 60A	60 to 70A	above 70A
Volt-meter	below 24.1V	24.1 to 25V	25 to 30V	30 to 32V	above 32V
Fuel qty.	below 1 US gal	--	1 to 25 US gal	--	--

2.6 WARNING, CAUTION AND ADVISORY ALERTS

2.6.1 WARNING, CAUTION AND ADVISORY ALERTS ON THE G1000

NOTE

The alerts described in the following are displayed on the Garmin G1000. Section 7.10 includes a detailed description of the alerts.

The following tables show the color and significance of the warning, caution and advisory alerts lights on the G1000.

Color and Significance of the Warning Alerts on the G1000

Warning Alerts (Red)	Meaning/Cause
WARNING	One of the warnings listed below is being indicated.
L/R ENG TEMP	Left/Right engine coolant temperature is in the upper red range (too high/> 100 °C [212 °F]).
L/R OIL TEMP	Left/Right engine oil temperature is in the upper red range (too high/> 139 °C [282 °F]).
L/R OIL PRES	Left/Right engine oil pressure is in the lower red range (too low/< 0.9 bar [13.05 psi]).
L/R FUEL TEMP	Left/Right fuel temperature is in the upper red range (too high/> 60 °C [140 °F])
L/R GBOX TEMP	Left/Right engine gearbox temperature is in the upper red range (too high/> 120 °C [248 °F]).
L/R FUEL PRESS	Left/Right engine fuel pressure is low.

Warning Alerts (Red)	Meaning/Cause
L/R ALTN AMPS	Left/Right engine alternator output is in the upper red range (too high/> 70 A).
L/R ENG FIRE	Left/Right engine fire detected.
L/R STARTER	Left/Right engine starter is engaged.
L/R DOOR OPEN	Left/Right pilot door is/are not closed and locked.
REAR DOOR OPEN	Passenger door is not closed and locked.
FWD DOOR OPEN	Left/Right baggage door is/are not closed and locked.
ATTITUDE FAIL	The display system is not receiving attitude reference information from the AHRS.
AIRSPEED FAIL	The display system is not receiving airspeed input from the air data computer.
ALTITUDE FAIL	The display system is not receiving altitude input from the air data computer.
VERT SPEED FAIL	The display system is not receiving vertical speed input from the air data computer.
HDG	The display system is not receiving valid heading input from the AHRS.
WARN	RAIM position warning. The nav deviation bar is removed.
Red X or yellow X	A red or yellow (if MÄM 62-254 is installed) X through any display field, such as com frequencies, nav frequencies, or engine data, indicates that the display field is not receiving valid data.

Color and Significance of the Caution Alerts on the G1000

Caution Alerts (Amber)	Meaning/Cause
L/R ECU A FAIL	A fault was detected by the left/right engine ECU A (one reset of minor faults is possible) or ECU A is being tested during FADEC-test procedure during the 'Before Take-Off Check'.
L/R ECU B FAIL	A fault was detected by the left/right engine ECU B (one reset of minor faults is possible) or ECU B is being tested during FADEC-test procedure during the 'Before Take-Off Check'.
L/R FUEL LOW	Left/Right main tank fuel quantity is low.
L/R ALTN FAIL	Left/Right engine alternator has failed.
L/R VOLTS LOW	Left/Right engine bus voltage is too low (< 25 V).
L/R COOL LVL	Left/Right engine coolant level is low.
PITOT FAIL	Pitot heat has failed.
PITOT HT OFF	Pitot heat is OFF.
STAL HT FAIL	Stall warning heat has failed.
STAL HT OFF	Stall warning heat is OFF.
LOI	GPS integrity is insufficient for the current phase of flight.
AHRS ALIGN: Keep Wings Level	The AHRS (Attitude and Heading Reference System) is aligning.
L/R AUX FUEL E	Left/Right auxiliary fuel tank empty (if installed).
CHECK GEAR	Landing gear is not down and locked.
DEICE LVL LO	De-icing fluid level is low (if installed).

Caution Alerts (Amber)	Meaning/Cause
DEIC PRES HI	De-icing pressure is high (if installed).
DEIC PRES LO	De-icing pressure is low (if installed).

Color and Significance of the Advisory Alerts on the G1000

Advisory Alerts (White)	Meaning/Cause
L/R GLOW ON	Left/Right engine glow plug active.
L/R AUXPUMP ON	Fuel transfer from auxiliary to main tank is in progress (if installed).
PFD FAN FAIL	Cooling fan for the PFD is inoperative.
MFD FAN FAIL	Cooling fan for the MFD is inoperative.
GIA FAN FAIL	Cooling fan for the GIAs is inoperative.

2.6.2 OTHER WARNING ALERTS

Warning Alerts on the Instrument Panel

Warning Alert (Red)	Meaning/Cause
GEAR UNSAFE WARNING LIGHT	Illuminates if the landing gear is neither in the final up nor in the down & locked position.

Audible Warning Alerts

Audible Warning Alert	Meaning/Cause
GEAR RETRACTED CHIME TONE (repeating)	Resounds if the landing gear is in retracted configuration and the flaps move into LDG position or when the power lever is placed in a position below approximately 25%.

2.7 MASS (WEIGHT)

<table>
<tr><th colspan="2">Value</th><th colspan="2">Mass (Weight)</th></tr>
<tr><td colspan="2">Minimum flight mass</td><td>1600 kg</td><td>3329 lb</td></tr>
<tr><td colspan="2">Maximum take-off mass (if MÄM 62-001 is carried out)</td><td>2300 kg</td><td>5071 lb</td></tr>
<tr><td colspan="2">Maximum take-off mass
(if MÄM 62-001 is NOT carried out
or if OÄM 62-018 AND MÄM 62-001 are carried out)</td><td>1999 kg</td><td>4407 lb</td></tr>
<tr><td colspan="2">Maximum zero fuel mass</td><td>2036 kg</td><td>4489 lb</td></tr>
<tr><td colspan="2">Maximum landing mass</td><td>2300 kg</td><td>5071 lb</td></tr>
<tr><td colspan="2">Maximum zero fuel mass (if MÄM 62-063 is carried out)</td><td>2200 kg</td><td>4850 lb</td></tr>
<tr><td colspan="2">Max. load in LH nose baggage compartment</td><td>30 kg</td><td>66 lb</td></tr>
<tr><td colspan="2">Max. load in RH nose baggage compartment</td><td>30 kg</td><td>66 lb</td></tr>
<tr><td colspan="2">Max. total load in rear baggage compartment</td><td>120 kg</td><td>265 lb</td></tr>
<tr><td colspan="2">Max. load in section A of rear baggage compartment</td><td>6 kg</td><td>13 lb</td></tr>
<tr><td colspan="2">Max. load in section B of rear baggage compartment</td><td>6 kg</td><td>13 lb</td></tr>
<tr><td colspan="2">Max. load in section C of rear baggage compartment</td><td>68 kg</td><td>150 lb</td></tr>
<tr><td colspan="2">Max. load in section D of rear baggage compartment</td><td>40 kg</td><td>88 lb</td></tr>
<tr><td rowspan="3">If OÄM 62-019 is carried out</td><td>Max. load total load in rear baggage compartment</td><td>46 kg</td><td>101 lb</td></tr>
<tr><td>Max. load in section E of rear baggage compartment</td><td>6 kg</td><td>13 lb</td></tr>
<tr><td>Max. load in section F of rear baggage compartment</td><td>40 kg</td><td>88 lb</td></tr>
</table>

WARNING

Exceeding the mass limits will lead to overstressing of the airplane as well as to degradation of flight characteristics and flight performance.

2.8 CENTER OF GRAVITY

Datum Plane

The datum plane (DP) is a plane which is normal to the airplane's longitudinal axis and in front of the airplane as seen from the direction of flight. The airplane's longitudinal axis is parallel with the floor of the nose baggage compartment. When the floor of the nose baggage compartment is aligned horizontally, the datum plane is vertical. The datum plane is located 2.196 meters (86.46 in) forward of the most forward point of the root rib on the stub wing (refer to figure in Section 6.2).

Center of Gravity Limitations

The center of gravity (CG position) for flight conditions must be between the following limits:

Most forward flight CG:

2.340 m (92.13 in) aft of datum plane at 1600 kg (3527 lb) to 1800 kg (3968 lb)
2.460 m (96.85 in) aft of datum plane at max. take-off mass (see Section 2.7)
linear variation in between

Most rearward flight CG:

2.460 m (96.85 in) aft of datum plane at 1600 kg (3527 lb)
2.510 m (98.82 in) aft of datum plane at 1900 kg (4189 lb) to 1999 kg (4407 lb)
2.530 m (99.61 in) aft of datum plane at MTOM
linear variation in between

Refer to Section 6.4.4 for a graphical illustration of the CG limitations.

WARNING

Exceeding the center of gravity limitations reduces the controllability and stability of the airplane.

2.9 APPROVED MANEUVERS

The airplane is certified in the Normal Category in accordance with AWM 523.

Approved Maneuvers

1) All normal flight maneuvers;
2) Stalling (with the exception of dynamic stalling); and
3) Lazy Eights, Chandelles, as well as steep turns and similar maneuvers, in which an angle of bank of not more than 60° is attained.

CAUTION

Aerobatics, spinning and flight maneuvers with more than 60° of bank are not permitted in the Normal Category. Stalling with asymmetric power or one engine inoperative is not permitted.

CAUTION

Intentional negative-g maneuvers are not permitted.

2.10 MANEUVERING LOAD FACTORS

NOTE

The tables below show structural limitations. The load factor limits for the engine must also be observed. Refer to the corresponding operation manual for the engine.

	at v_O	at v_{NE}	with flaps in APP or LDG position
Positive	3.8	3.8	2.0
Negative	-1.52	0.0	0.0

WARNING

Exceeding the maximum structural load factors will lead to overstressing of the airplane.

CAUTION

Intentional negative-g maneuvers are not permitted.

2.11 OPERATING ALTITUDE

The maximum operating altitude is 20,000 ft (6,096 m) pressure altitude.

2.12 FLIGHT CREW

Minimum crew	:	1 (one person)
Maximum number of occupants	:	5 (five persons)
		7 (seven persons, if OÄM 62-019 is installed)

2.13 KINDS OF OPERATION

Provided that national operational requirements are met, the following kinds of operation are approved:

- daytime flights according to Visual Flight Rules (VFR)
- with the appropriate equipment: night flights according to Visual Flight Rules (NVFR)
- with the appropriate equipment: flights according to Instrument Flight Rules (IFR)
- take-off and landing on paved surfaces
- take-off and landing on grass surfaces

Flights into known or forecast thunderstorms are prohibited.

Flights into known or forecast icing conditions are prohibited.

Minimum Operational Equipment (Serviceable)

The following table lists the minimum serviceable equipment required for operation. Additional minimum equipment for the intended operation may be required by national operating rules and also depends on the route to be flown.

NOTE

Many of the items of minimum equipment listed in the following table are integrated in the G1000.

	For Daytime VFR Flights	In Addition for Night VFR Flights	In Addition for IFR Flights
Flight & navigation instruments	* airspeed indicator (on G1000 PFD or backup) * altimeter (on G1000 PFD or backup) * magnetic compass * 1 headset, used by pilot in command	* vertical speed indicator (VSI) * attitude gyro (artificial horizon; on G1000 PFD or backup) * turn & bank indicator (on G1000 PFD) * directional gyro * VHF radio (COM) * VOR receiver * transponder (XPDR), mode A and mode C * GPS receiver (part of G1000) * second headset	* second airspeed indicator (both, on G1000 PFD and backup) * second altimeter (both, on G1000 PFD and backup) * second attitude gyro (both, on G1000 PFD and backup) * second VHF radio (COM) * VOR-LOC-GP receiver * second GPS receiver (part of G1000)

	For Daytime VFR Flights	In Addition for Night VFR Flights	In Addition for IFR Flights
Engine Instruments	* fuel qty. (2x) * oil press. (2x) * oil temp. (2x) * coolant temp. (2x) * coolant level indicator (2x) * gearbox temp. (2x) * load (2x) * prop. RPM (2x) * fuel temp. left & right tank * fuel flow (2x) * fuel px warning	* ammeter * voltmeter	
Lighting		* position lights * strobe lights (anti collision lights) * landing light * instrument lighting * flood light * flashlight	

	For Daytime VFR Flights	In Addition for Night VFR Flights	In Addition for IFR Flights
Other operational minimum equipment	* stall warning system * alternate means for fuel quantity indication (see Section 7.9) * safety belts for each occupied seat * Airplane Flight Manual * Egress Hammer	* Pitot heating system * alternate static valve	* sufficient charge for the internal battery of the Standby Attitude Module

NOTE

A list of approved equipment can be found in Chapter 6.

Engine Systems and Equipment

All engine systems and equipment must be functional prior to airplane take-off. Any engine system or equipment failure must be corrected before next flight.

2.14 FUEL

Approved fuel grades: JET A, JET A-1 (ASTM D 1655)
TS-1 (Russia, GOST 10227-86)
TS-1 (Ukraine, GSTU 320.00149943.011-99)
RT (Russia, GOST 10227-86)
RT (Ukraine GSTU 320.00149943.007-97)
No. 3 Jet Fuel (China, GB 6537-2006)
JP-8 (F34) (USA, MIL-DTL-83133G-2010)

and blends of the above listed fuel grades.

NOTE

A minimum cetane number of 36 determined acc. to EN ISO 5165/ASTM D613 is recommended.

NOTE

Use only uncontaminated fuel from reliable sources.

NOTE

For aircraft registered in the USA, only JET A and JET A-1 (ASTM D1655) are approved.

Any mixture of the different types of fuel additives is not permitted.

OPERATION WITH ANTI-MICROBIAL LIFE FUEL ADDITIVES

The application of the following additives is permitted:

- KATHON FP 1.5 : max. 100 ppm
- BIOBOR JF : max. 270 ppm for initial treatment
  max. 135 ppm for permanent use after initial treatment

CAUTION

In case of an unknown or an over dosage of the fuel additives the fuel system must be purged until the dosage is within the permitted limits.

NOTE

The specified additives are qualified for the operation with the certified fuel grades.

NOTE

The instructions of the fuel additive supplier must be followed.

OPERATION WITH ANTI-ICING FUEL ADDITIVES

The application of the following additive is permitted:

- PRIST Hi-Flash : max. 1500 ppm

CAUTION

The use of PRIST Hi-Flash fuel additive is only permitted with JET A, JET A-1 (ASTM D 1655) and JP-8 (F34).

NOTE

The instructions of the fuel additive supplier must be followed.

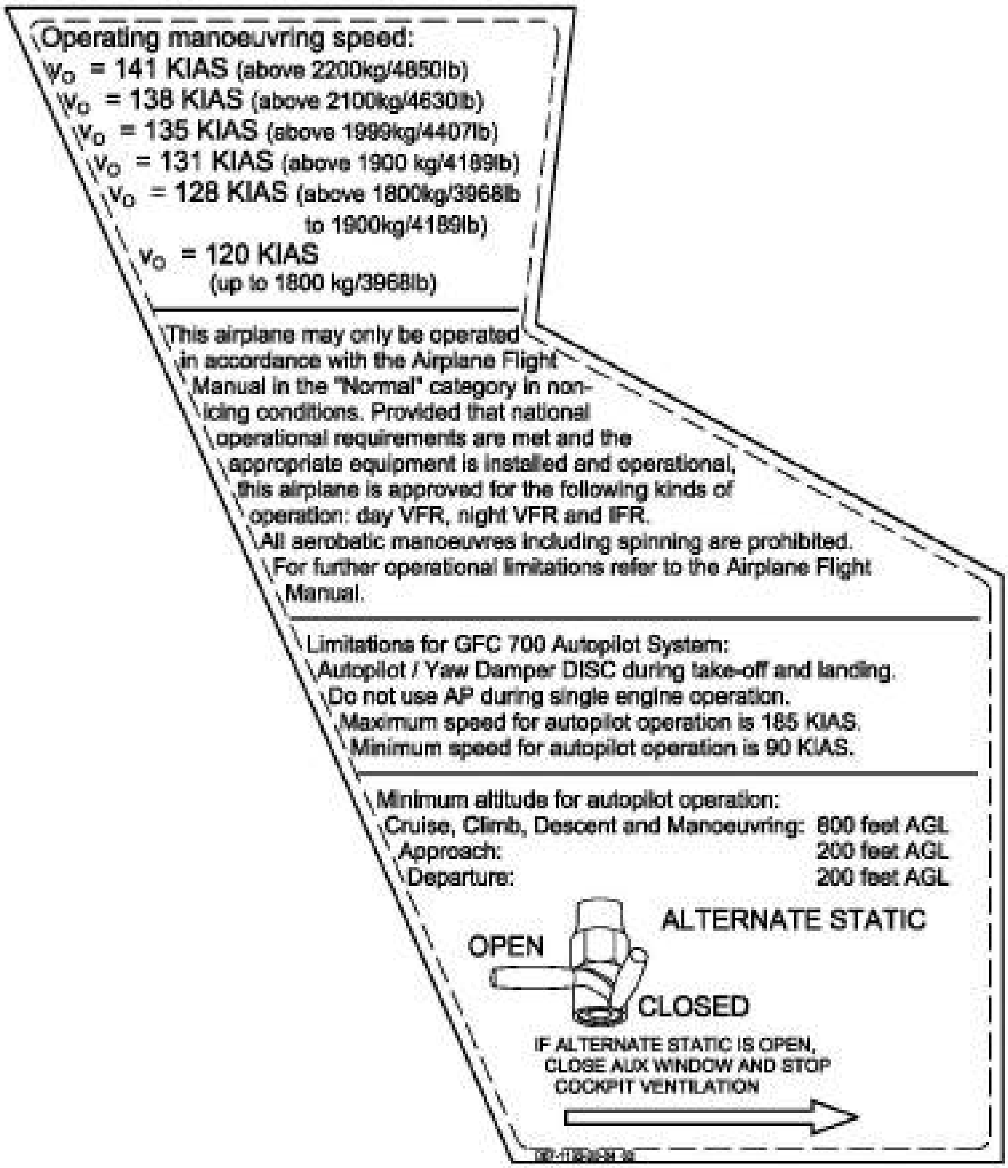
	Main Tanks		Auxiliary Tanks (if installed)		Total	
	US gal	Liter	US gal	Liter	US gal	Liter
Total fuel quantity	2 x 26.0	2 x 98.4	2 x 18.5	2 x 70.0	2 x 44.5	2 x 168.4
Usable fuel	2 x 25.0	2 x 94.6	2 x 18.2	2 x 68.9	2 x 43.2	2 x 163.5
Max. permissible difference LH/RH	5.0	18.9				

2.15 LIMITATION PLACARDS

All *limitation* placards are shown below. A list of *all* placards is included in the Airplane Maintenance Manual (Doc. No. 7.02.25), Chapter 11.

The following limitation placards are in the forward view of the pilot:

Left of the Instrument Panel:



On the Instrument Panel:

LANDING GEAR

v_{LE} / v_{LOE} = 205 KIAS

v_{LOR} = 162 KIAS

On the Emergency Landing Gear Extension Lever:

EMERGENCY

Gear Extension

Max. 162 KIAS

On the Instrument Panel:

Standard Tank:

max. usable fuel: 2 x 25 US gal
max. difference LH/RH tank: 5 US gal

Auxiliary Tank (if installed):

max. usable fuel main tank: 2 x 25 US gal auxiliary tank: 2 x 18.2 US gal
max. difference LH/RH main tank: 5 US gal

(a) Next to Each of the Two Fuel Filler Necks;
(b) In Addition Next to Each of the Two Auxiliary Fuel Filler Necks (if installed):

WARNING

APPROVED FUEL

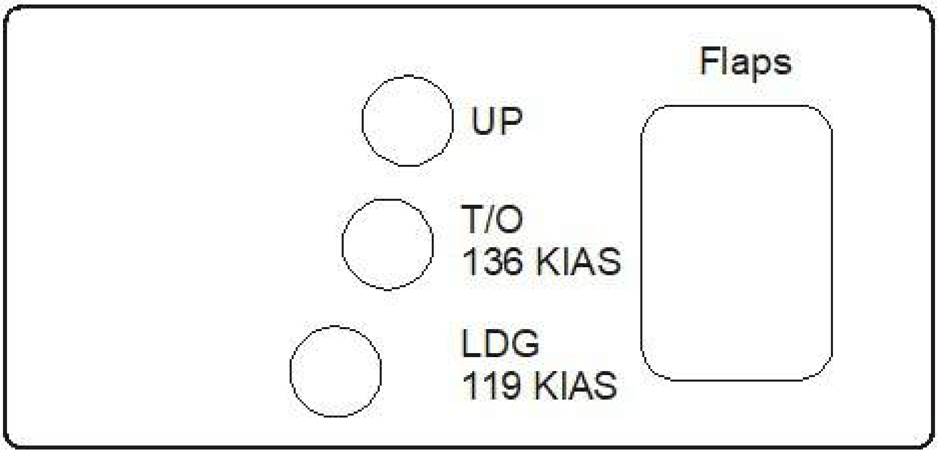
JET-A1,

or see Airplane Flight Manual

In Each Cowling, on the Door for the Oil Filler Neck:

OIL **AUSTRO ENGINE** **Aero** **5W-40** or see Airplane Flight Manual	**OR**	**OIL** **SHELL HELIX** **ULTRA** **5W-30** or see Airplane Flight Manual

<u>Next to the Flap Selector Switch:</u>



<u>In the Nose Baggage Compartments:</u>

LH Nose Baggage Compartment:

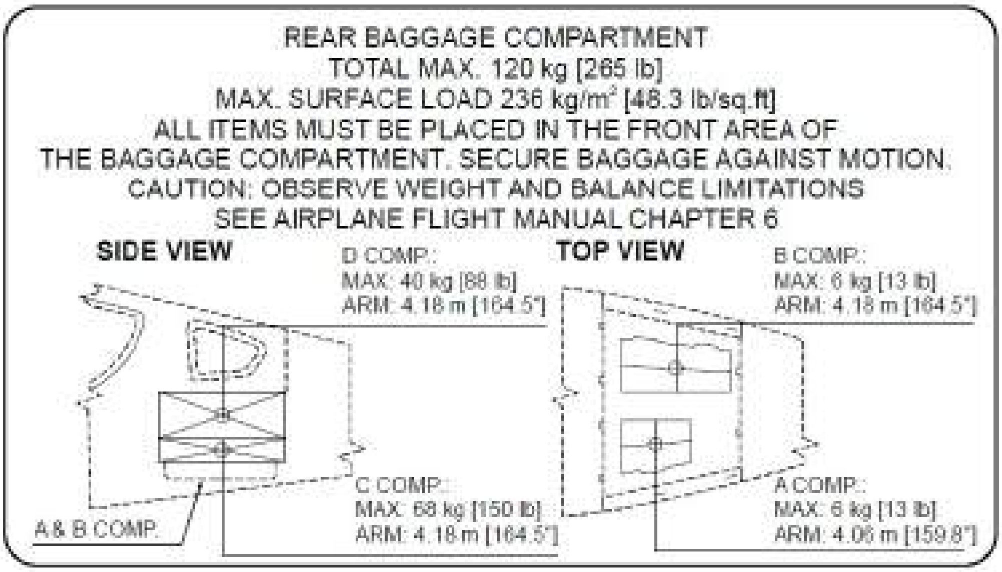
Max. Baggage:
30 kg (66 lb)

RH Nose Baggage Compartment:

Max. Baggage:
30 kg (66 lb)

In the Rear Baggage Compartment:

If OÄM 62-019 is NOT carried out:



If OÄM 62-019 is carried out:

Beside the Door Locking Device Installed in the Passengers' Door:

EMERGENCY EXIT:
The keylock must be
unlocked during flight!

On the Bottom Center of the Instrument Panel:

NO SMOKING

On the Armrest with Integrated Keypad (if OÄM 62-031 is carried out):

STOW FOR TAKE-OFF AND LANDING, IN ALL EMERGENCIES AND ABNORMAL OPERATING PROCEDURES

2.16 OTHER LIMITATIONS

2.16.1 FUEL TEMPERATURE

From -30 °C to 60 °C (from -22 °F to 140 °F).

2.16.2 BATTERY CHARGE

Take-off for a Night VFR or IFR flight with a discharged battery is not permitted.

NOTE

The most common indication of a discharged battery is that the engine cannot be started with battery power.

The use of an external power supply for engine starting with a discharged airplane battery is not permitted if the subsequent flight is intended to be a Night VFR or IFR flight. In this case, the airplane main battery must be charged first.

2.16.3 DOOR LOCKING DEVICE

The LH & RH CREW DOORS and the passenger door must not be blocked by the key lock during operation of the airplane.

2.16.4 ELECTRONIC EQUIPMENT

The use and switching on of electronic equipment other than that which is part of the equipment of the airplane is not permitted, as it could lead to interference with the airplane's avionics.

Examples of undesirable items of equipment are:

- Mobile phones
- Remote radio controls
- Video screens employing CRTs
- Minidisc recorders in record mode

This list is not exhaustive.

The use of laptop and handheld computers, including those with CD-ROM drives, CD and mini-disc players in the replay mode, cassette players and video cameras is permitted. All this equipment however should be switched off for take-off and landing.

NOTE

Refer to the applicable flight authority for the use of electronic equipment associated with electronic flight bag operation.

2.16.5 GARMIN G1000 AVIONICS SYSTEM

1. The Garmin G1000 Cockpit Reference Guide, P/N 190-01896-( ) or Garmin G1000 NXi Cockpit Reference Guide, P/N 190-01905-( ), appropriate revision must be immediately available to the flight crew.

2. The G1000 must utilize the software Garmin 010-01895-00, the Garmin G1000 NXi must utilize the software Garmin 010-01895-04, approved software in accordance with the mandatory service bulletin DAI MSB 62-003, latest version.

Software Part Number	Approved Version	Function
System	for approved version see DAI MSB 62-003 latest version	
010-01895-( )		
Manifest		
006-B0093-( )		GPS1, GPS2
006-B0172-( )		GTX1-GIA1, GTX1-GIA2
006-B0190-( )		GIA1, GIA2
006-B0193-( )		GEA1-GIA1; GEA1-GIA2
006-B0203-( )		GMA1-GIA1, GMA1-GAI2
006-B0223-( )		GRS1-GIA1, GRS1-GIA2
006-B0224-( )		GMU1
006-B0319-( )		PFD1, MFD1
006-B0328-( )		
006-B0329-( )		
006-C0048-( )		GMU1 FPGA
006-C0049-( )		GRS1 FPGA
006-C0055-( )		GDC1 FPGA
006-D0159-( )		GRS1 MV DB
006-D0202-( )		
006-B0261-( )		GDC1-GIA1
006-B0081-( )		COM1, COM2

Software Part Number	Approved Version	Function
006-B0083-()		GS1, GS2
006-B0082-()		NAV1, NAV2

NOTE

The database version is displayed on the MFD power-up page immediately after system power-up and must be acknowledged. The remaining system software versions can be verified on the AUX group sub-page 5, "AUX-SYSTEM STATUS".

3. IFR enroute, oceanic and terminal navigation predicated upon the G1000 GPS receiver is prohibited unless the pilot verifies the currency of the database or verifies each selected way point for accuracy by reference to current approved data.

4. Instrument approach navigation predicated upon the G1000 GPS receiver must be accomplished in accordance with approved instrument approach procedures that are retrieved from the GPS equipment database. The GPS equipment database must incorporate the current update cycle.

NOTE

Not all published approaches are in the FMS database. The pilot must ensure that the planned approach is in the database.

(a) Instrument approaches utilizing the GPS receiver must be conducted in the approach mode, and Receiver Autonomous Integrity Monitoring (RAIM) must be available at the Final Approach Fix.

(b) Accomplishment of ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay with the G1000 GPS receiver is not authorized.

(c) Use of the G1000 VOR/ILS receiver to fly approaches not approved for GPS require VOR/ILS navigation data to be present on the display.

(d) When an alternate airport is required by the applicable operating rules, it must be served by an approach based on other than GPS or Loran-C navigation, the airplane must have the operational equipment capable of using that navigation aid, and the required navigation aid must be operational.

(e) VNAV information may be utilized for advisory information only. Use of VNAV information for Instrument Approach Procedures does not guarantee step-down fix altitude protection, or arrival at approach minimums in normal position to land.

(f) RNAV (GPS) approaches must be conducted utilizing the GPS sensor.

(g) RNP RNAV operations are not authorized, except as noted in Chapter 1 of this AFM.

5. If not previously defined, the following default settings must be made in the "SYSTEM SETUP" menu of the G1000 prior to operation (refer to Pilot's Guide for procedure if necessary):

(a) DIS, SPD : nm, kt (sets navigation units to "nautical miles" and "knots")

(b) ALT, VS : ft, fpm (sets altitude units to "feet" and "feet per minute")

(c) POSITION : deg-min (sets navigation grid units to decimal minutes)

NOTE

Navigation Information is referenced to WGS-84 reference system, and should only be used where the Aeronautical Information Publication (including electronic data and aeronautical charts) conforms to WGS-84 or equivalent.

6. When AHRS is required to meet the items listed in the minimum operational equipment (serviceable) table in Section 2.13 of this AFM, operation is prohibited in the following areas:

   (a) North of 72° N latitude at all longitudes.

   (b) South of 70° S latitude at all longitudes.

   (c) North of 65° N latitude between longitude 75° W and 120° W (Northern Canada).

   (d) North of 70° N latitude between longitude 70° W and 128° W (Northern Canada).

   (e) North of 70° N latitude between longitude 85° E and 114° E (Northern Russia).

   (f) South of 55° S latitude between longitude 120° E and 165° E (Region south of Australia and New Zealand).

   When day VFR operations are conducted in the above areas, the MFD must be in a non-heading up orientation.

7. The fuel quantity, fuel required, and fuel remaining functions of the FMS are supplemental information only and must be verified by the flight crew.

8. The GPS is approved for SBAS operations. Refer to Supplement A33 for SBAS and P-RNAV Operation.

9. The availability of SafeTaxi®, ChartView, or FliteCharts® in electronic form on the G1000 is for information purposes only, it is still mandatory to carry another source of charts on-board the airplane.

2.16.6 AUTOPILOT LIMITATIONS

1. It is the responsibility of the pilot in command to monitor the autopilot when it is engaged. The pilot should be prepared to immediately disconnect the autopilot and to take prompt corrective action in the event of unexpected or unusual autopilot behavior.

2. The autopilot and yaw damper must be disconnected (using the DISC button) during take-off, landing and single engine operation.

3. Following an autopilot or electric trim malfunction, re-engaging the autopilot or manual electric trim, or resetting the AFCS/ESP/USP circuit breaker is prohibited until the cause of the malfunction has been determined and corrected.

4. The Garmin G1000 Cockpit Reference Guide for the Diamond DA 62, P/N 010-01896-( ) or Garmin G1000 NXi Cockpit Reference Guide for the Diamond DA62, P/N 010-01905-( ) approved revision must be immediately available to the flight crew.

5. ILS approaches using the GFC700 / flight director are limited to Category I approaches only.

6. Autopilot maximum airspeed: 185 KIAS
   Autopilot minimum airspeed: 90 KIAS

7. Altitude select captures below 1200 feet AGL are prohibited.

8. The autopilot must be disengaged:
   - below 200 ft AGL during approach,
   - below 200 ft AGL during departure,
   - below 800 ft AGL for all other phases of flight,
   - during single engine operation.

9. Overriding the autopilot to change pitch or roll attitude is prohibited. (Disengage or press CWS while maneuvering.)

10. The GFC 700 AFCS pre-flight test must be successfully completed prior to use of the autopilot, flight director, yaw damper or manual electric trim.

11. A pilot with the seat belt fastened must occupy the left pilot's seat during all operations.

12. The yaw damper is an integral part of the autopilot system and must not be used separately.

2.16.7 SMOKING

Smoking in the airplane is not permitted.

2.16.8 GROUND OPERATION

Take-off and landing has been demonstrated on hard paved surfaces (asphalt, concrete, etc.) and grass runways.

2.16.9 GARMIN GWX 70 WEATHER RADAR OPERATION

WARNING

The Garmin GWX 70 Weather Radar System (if installed) must not be operated on ground except in standby mode during taxiing. If the system is transmitting, it may result in bodily injury if persons are within the minimum safe distance of 2.3 m (7.4 ft). Never operate the radar in a hangar or other enclosure as radiation can be reflected throughout the area.

2.16.10 USE OF THE SUN VISORS

The sun visors (if installed) may only be used during cruise. During all other phases of flight, the sun visors must be locked in the fully upward position.

2.16.11 PDF/MFD CONTROL UNIT (KEYPAD)

The PFD/MFD control unit must be stowed during take-off and landing all emergencies and abnormal operating procedures.

CHAPTER 3
EMERGENCY PROCEDURES

NOTE

Procedures for uncritical system faults are given in Chapter 4B - ABNORMAL OPERATING PROCEDURES.

3.1 INTRODUCTION

3.1.1 GENERAL

This chapter contains checklists as well as the description of recommended procedures to be followed in the event of an emergency. Engine failure or other airplane-related emergencies are most unlikely to occur if the prescribed procedures for pre-flight checks and airplane maintenance are followed.

If, nonetheless, an emergency does arise, the guidelines given in this chapter should be followed and applied in order to clear the problem.

As it is impossible to foresee all kinds of emergencies and cover them in this Airplane Flight Manual, a thorough understanding of the airplane by the pilot is, in addition to his knowledge and experience, an essential factor for the solution of any problems which may arise.

WARNING

In each emergency, control over the flight attitude and the preparation of a possible emergency landing have priority over attempts to solve the current problem ("first fly the airplane"). Prior to the flight, the pilot must consider the suitability of the terrain for an emergency landing for each phase of the flight. For a safe flight, the pilot must constantly keep a safe minimum flight altitude. Solutions for various adverse scenarios should be thought over in advance. This should prevent a situation where the pilot is faced with an emergency he cannot handle calmly and with determination.

3.1.2 CERTAIN AIRSPEEDS IN EMERGENCIES

Event		
One engine inoperative minimum control speed (air) v_{MCA}	Flaps UP	76 KIAS
	Flaps T/O	70 KIAS
One engine inoperative speed for best rate of climb v_{YSE}	87 KIAS up to 1999 kg (4407 lb) 89 KIAS above 1999 kg (4407 lb)	

3.1.3 SELECTING EMERGENCY FREQUENCY

In an in-flight emergency, depressing and holding the Com transfer button ⟷ on the G1000 for 2 seconds will tune the emergency frequency of 121.500 MHz. If the display is available, it will also show it in the "Active" frequency window.

3.2 AIRPLANE-RELATED G1000 WARNINGS

3.2.1 WARNINGS/GENERAL

"Warning" means that the non-observation of the corresponding procedure leads to an immediate or important degradation in flight safety. The warning text is displayed in red color. A warning chime tone of 1.5 seconds duration will sound and repeat without delay until the alarm is acknowledged by the crew.

3.2.2 L/R ENG TEMP

L/R ENG TEMP	Left/Right engine coolant temperature is in the upper red range (too high/above 100 °C)

Coolant temperatures above the limit value of 100 °C can lead to a total loss of power due to engine failure.

- Check G1000 for L/R COOL LVL caution message (low coolant level)

L/R COOL LVL caution message not displayed:

During climb:

- Reduce power on affected engine by 10% or more as required.
- Increase airspeed by 10 KIAS or more as required.
- If the coolant temperature does not reach the green range within 60 seconds, reduce power on affected engine as far as possible and increase airspeed.

CONTINUED

During cruise:

- Reduce power on affected engine.
- Increase airspeed.
- Check coolant temperature in green range.

CAUTION

If high coolant temperature is indicated and the L/R COOL LVL caution message is not displayed, it can be assumed that there is no technical defect in the cooling system and that the above mentioned procedure can decrease the temperature(s). This might not be the case if the coolant temperature does not return to the green range. In this case, perform a precautionary landing on the nearest suitable airfield. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

L/R COOL LVL caution message displayed:

- Reduce power on affected engine.
- Expect loss of coolant.

WARNING

A further increase in coolant temperature must be expected. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

3.2.3 L/R OIL TEMP

L/R OIL TEMP	Left/Right engine oil temperature is in the upper red range (too high/above 139 °C).

Oil temperatures above the limit value of 139 °C can lead to a total loss of power due to engine failure.

- Check oil pressure.

If the oil pressure is outside of the green range (lower limit):

- Reduce power on affected engine.
- Expect loss of engine oil.

WARNING

A further increase in oil temperature must be expected. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

If the oil pressure is within the green range:

- Reduce power on affected engine.
- Increase airspeed.

CONTINUED

CAUTION

If high oil temperature is announced and the oil pressure indication is within the green range, it can be assumed that there is no technical defect in the engine oil system and that the above mentioned procedure can decrease the temperature(s). This might not be the case if the oil temperature does not return to the green range. In this case, perform a precautionary landing on the nearest suitable airfield. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

3.2.4 L/R OIL PRES

L/R OIL PRES	Left/Right engine oil pressure is in the lower red range (too low/below 0.9 bar).

Oil pressures below the limit value of 0.9 bar can lead to a total loss of power due to engine failure.

- Reduce power on affected engine.
- Expect loss of oil.

WARNING

Land at the nearest suitable airfield. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

3.2.5 L/R GBOX TEMP

L/R GBOX TEMP	Left/Right engine gearbox temperature is in the upper red range (too high/above 120 °C).

Gearbox temperatures above the limit value of 120 °C can lead to a total loss of power due to engine failure.

- Reduce power on affected engine.
- Increase airspeed.

CAUTION

At high ambient temperature conditions, and/or at low airspeeds with high power settings, it can be assumed that there is no technical defect in the gearbox and that the above mentioned procedure will decrease the temperature(s). This might not be the case if the gearbox temperature does not return to the green range. In this case, perform a precautionary landing on the nearest suitable airfield. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

3.2.6 L/R FUEL TEMP

L/R FUEL TEMP	Left/Right fuel temperature is in the upper red range (too high/above 60 °C).

Fuel temperatures above the limit value of 60 °C can lead to a noticeable reduction of the high pressure pump efficiency.

- Reduce power on affected engine.
- Increase airspeed.

CAUTION

At high ambient temperature conditions, and/or at low airspeeds with high power settings and low fuel quantities, it can be assumed that the above mentioned procedure will decrease the temperature(s). If the fuel temperature does not return to the green range, perform a precautionary landing on the nearest suitable airfield.

NOTE

Increased fuel temperature may occur when the fuel quantity in the main tank is low. If the auxiliary tank is installed, the fuel temperature can be decreased by transferring fuel from the auxiliary to the main tank.

END OF CHECKLIST

3.2.7 L/R FUEL PRESS

L/R FUEL PRESS	Left/Right engine fuel pressure is low.

1. Fuel quantity . . . . check
2. FUEL SELECTOR of affected engine . . . . . . check ON
3. Fuel pump of affected engine . . . . ON

if L/R FUEL PRESS warning remains:

4. FUEL SELECTOR of affected engine . . . . . . CROSSFEED

if L/R FUEL PRESS warning still remains:

WARNING

Imminent engine failure must be expected. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURE IN FLIGHT.

END OF CHECKLIST

3.2.8 L/R ALTN AMPS

L/R ALTN AMPS	Left/Right engine alternator output is in the upper red range (too high/above 70 A).

Proceed according to:

3.10.2 - HIGH CURRENT

END OF CHECKLIST

3.2.9 L/R ENG FIRE

L/R ENG FIRE	Left/Right engine fire detected.

Engine fire can lead to a total loss of power due to engine failure as well as severe structural damage.

Proceed according to the following procedures as applicable:

3.11.1 - ENGINE FIRE ON GROUND

3.11.2 - ENGINE FIRE DURING TAKE-OFF

3.11.3 - ENGINE FIRE IN FLIGHT

END OF CHECKLIST

3.2.10 L/R STARTER

L/R STARTER	Left/Right engine starter is engaged.

Proceed according to:

3.10.3 - STARTER MALFUNCTION

END OF CHECKLIST

3.2.11 DOOR OPEN

L/R DOOR OPEN	Left/Right door is not closed and locked.
REAR DOOR OPEN	Rear door is not closed and locked.
FWD DOOR OPEN	Left or right baggage door is/are not closed and locked.

Proceed according to:

3.12.2 - UNLOCKED DOORS

END OF CHECKLIST

3.3 AIRPLANE-RELATED G1000 CAUTIONS

3.3.1 L/R ALTN FAIL

L/R ALTN FAIL	Left/Right engine alternator has failed.

(a) One Alternator Failed

Proceed according to:

4B.4.6 - L/R ALTN FAIL

(b) Both Alternators Failed

WARNING

If both alternators fail at the same time, reduce all electrical equipment to a minimum. Expect battery power to last 30 minutes and land the airplane as soon as possible. Expect engine stoppage after this period of time.

1. AVIONICS MASTER . . . . OFF
2. LH/RH Alternator . . . . OFF
3. XPDR . . . . STBY
4. LANDING GEAR . . . . down, when down and locked pull Emergency Release
5. Stall/Pitot/Static Heat . . . . OFF
6. All lights . . . . OFF

END OF CHECKLIST

3.4 G1000 SYSTEM WARNINGS

3.4.1 RED X/YELLOW X

A red or yellow X through any display field, such as COM frequencies, NAV frequencies, or engine data, indicates that display field is not receiving valid data.

3.4.2 ATTITUDE FAIL

ATTITUDE FAIL	The display system is not receiving attitude reference information from the AHRS; accompanied by the removal of sky/ground presentation and a red X over the attitude area.

Revert to the standby attitude indicator, part of the Standby Attitude Module.

3.4.3 AIRSPEED FAIL

AIRSPEED FAIL	The display system is not receiving airspeed input from the air data computer; accompanied by a red X through the airspeed display.

Revert to the standby airspeed indicator, part of the Standby Attitude Module.

3.4.4 ALTITUDE FAIL

ALTITUDE FAIL	The display system is not receiving altitude input from the air data computer; accompanied by a red X through the altimeter display.

Revert to the standby altimeter, part of the Standby Attitude Module.

3.4.5 VERT SPEED FAIL

VERT SPEED FAIL	The display system is not receiving vertical speed input from the air data computer; accompanied by a red or yellow X through the vertical speed display.

Determine vertical speed based on the change of altitude information.

3.4.6 HDG

HDG	The display system is not receiving valid heading input from the AHRS; accompanied by a red X through the digital heading display.

Revert to the emergency compass.

3.5 G1000 FAILURES

3.5.1 NAVIGATION INFORMATION FAILURE

If Garmin G1000 GPS navigation information is not available or invalid, utilize remaining operational navigation equipment as required.

3.5.2 PFD OR MFD DISPLAY FAILURE

1. DISPLAY BACKUP button on audio panel . . PUSH

Automatic Entry of Display Reversionary Mode

If the PFD and MFD have automatically entered reversionary mode, use the following procedure.

(a) DISPLAY BACKUP button on audio panel ...... PUSH (button will be OUT)

NOTE

After automatic entry of reversionary mode, the pilot must press the DISPLAY BACKUP button on the audio panel. After the DISPLAY BACKUP button has been pushed, the system will remain in reversionary mode even if the problem causing the automatic entry of reversionary mode is resolved. A maximum of one attempt to return to normal mode is approved using the following procedure.

CONTINUED

(b) DISPLAY BACKUP button on audio panel ...... PUSH (button will be IN)

- If the system returns to normal mode, leave the DISPLAY BACKUP button IN and continue.
- If the system remains in reversionary mode, or abnormal display behavior such as display flashing occurs, then return the DISPLAY BACKUP button to the OUT position.

END OF CHECKLIST

3.5.3 AHRS FAILURE

NOTE

A failure of the Attitude and Heading Reference System (AHRS) is indicated by a removal of the sky/ground presentation and a red X and a yellow "AHRS FAILURE" shown on the PFD. The digital heading presentation will be replaced with a yellow "HDG" and the compass rose digits will be removed. The course pointer will indicate straight up and course may be set using the digital window.

1. Use standby attitude indicator, emergency compass and navigation map
2. Course . . . . set using digital window

END OF CHECKLIST

3.5.4 AIR DATA COMPUTER (ADC) FAILURE

NOTE

Complete loss of the Air Data Computer is indicated by a red X and yellow text over the airspeed, altimeter, vertical speed, TAS and OAT displays. Some FMS functions, such as true airspeed and wind calculations, will also be lost.

1. Use standby airspeed indicator and altimeter, part of the Standby Attitude Module.

END OF CHECKLIST

3.5.5 ERRONEOUS OR LOSS OF ENGINE AND FUEL DISPLAYS

NOTE

Loss of an engine parameter is indicated by a red or yellow X through the data field. Erroneous information may be identified by indications which do not agree with other system information. Erroneous indications may be determined by comparing a display with other displays and other system information.

1. Set power based on power lever position, engine noise and speed.
2. Monitor other indications to determine the health of the engine.
3. Use known power settings and Section 5.3.2 of the AFM for approximate fuel flow values.
4. Use other system information, such as annunciator messages, GPS fuel quantity and flow to safely complete the flight.

END OF CHECKLIST

3.5.6 ERRONEOUS OR LOSS OF WARNING/CAUTION ANNUNCIATORS

NOTE

Loss of an annunciator may be indicated when engine or fuel displays show an abnormal or emergency situation and the annunciator is not present. An erroneous annunciator may be identified when an annunciator appears which does not agree with other displays or system information.

1. If an annunciator appears, treat it as if the condition exists.
   Refer to Chapter 3 - EMERGENCY PROCEDURES or Chapter 4B - ABNORMAL OPERATING PROCEDURES.
2. If a display indicates an abnormal condition but no annunciator is present, use other system information, such as engine displays, GPS, fuel quantity and flow to determine if the condition exists. If it cannot be determined that the condition does not exist, treat the situation as if the condition exists.
   Refer to Chapter 3 - EMERGENCY PROCEDURES or Chapter 4B - ABNORMAL OPERATING PROCEDURES.

END OF CHECKLIST

3.6 ABNORMAL ENGINE BEHAVIOUR

1. Full power . . . . apply

If the abnormal engine behavior sustains, refer to 3.7 - ONE ENGINE INOPERATIVE PROCEDURES.

END OF CHECKLIST

3.7 ONE ENGINE INOPERATIVE PROCEDURES

WARNING

In certain combinations of airplane weight, configuration, ambient conditions, speed and pilot skill, negative climb performance may result. Refer to Chapter 5 - PERFORMANCE for one engine inoperative performance data.

In any event, the sudden application of power during one-engine inoperative operation makes the control of the airplane more difficult.

3.7.1 DETECTING THE INOPERATIVE ENGINE

NOTE

One engine inoperative means an asymmetric loss of thrust, resulting in uncommanded yaw and roll in direction of the so-called "dead" engine (with coordinated controls). To handle this situation, it is vital to maintain directional control by mainly rudder and additional aileron input. The following mnemonic can help to identify the failed engine:

"Dead foot - dead engine"

This means that, once directional control is re-established, the pilot can feel the control force on the foot pushing the rudder-pedal on the side of the operative engine, while the foot on the side of the failed engine feels no force. Further, the engine instruments can help to analyze the situation.

3.7.2 ENGINE TROUBLESHOOTING

WARNING

Control over the flight attitude has priority over attempts to solve the current problem ("first fly the airplane").

NOTE

With respect to handling and performance, the left-hand engine (pilots view) is considered the "critical" engine.

If both ECU A and ECU B Cautions Appear Simultaneous

- if the indicated LOAD remains unchanged, and
- if the perceived thrust is reduced, and
- if the engine noise level changes or the engine is running rough

1. POWER lever . . . . IDLE for 1 second
2. POWER lever . . . . slowly increase to 1975 RPM

If the engine shows a power loss during the POWER lever increases:

3. POWER lever . . . . IDLE for 1 second
4. POWER lever . . . . slowly increase, stop prior to the former observed engine power loss RPM

CONTINUED

WARNING

Do not increase the POWER lever past the propeller speed of 1975 RPM or the setting determined in step 4. An increase of engine power beyond this setting leads into another power loss.

NOTE

With this power setting the engine can provide up to 65% at the maximum propeller speed of 1975 RPM.

5. Land at the next suitable airfield

<u>Otherwise:</u>

NOTE

If the loss of power was due to unintentional setting of the POWER lever, you may adjust the friction lock and continue flight.

Depending on the situation, the following attempts can be made to restore normal engine operation:

1. Circuit breakers . . . . check/reset if necessary

If normal engine operation is restored, continue flight and land as soon as possible.

Otherwise:

2. VOTER switch . . . . swap between ECU A and B

CONTINUED

If either ECU A or B setting restores normal engine operation, then maintain that ECU setting and land as soon as possible.

Otherwise:

3. VOTER switch . . . . switch back to AUTO to retain ECU redundancy

If normal engine operation is restored continue flight and land as soon as possible.

Otherwise:

4. FUEL SELECTOR of affected engine . . . . CROSSFEED (above 10000 ft turn LH/RH FUEL PUMP to ON before crossfeed operation

If normal engine operation is restored, continue flight. Remain within maximum allowable lateral imbalance.

Otherwise:

5. FUEL SELECTOR of affected engine . . . . . . ON/CROSSFEED as required (above 10000 ft turn LH/RH FUEL PUMP to ON before crossfeed operation)
6. ALTERNATE AIR. . . . . OPEN
7. POWER lever of affected engine. . . . . apply power as required

If normal engine operation is restored, continue flight and land as soon as practicable.

If normal engine operation could not be restored by following the procedures in this section prepare for 3.7.3 - ENGINE SECURING (FEATHERING) PROCEDURE and land as soon as possible.

END OF CHECKLIST

3.7.3 ENGINE SECURING (FEATHERING) PROCEDURE

Shut down and feathering of the affected engine:

1. Affected engine . . . . identify & verify
2. ENGINE MASTER affected engine . . . . OFF

CAUTION

Do not shut down an engine with the FUEL SELECTOR valve. Otherwise the high pressure fuel pump can be damaged.

Securing the feathered engine:

3. Alternator affected engine . . . . OFF
4. Fuel pump . . . . check OFF
5. FUEL SELECTOR affected engine . . . . OFF

NOTE

The remaining fuel in the tank of the secured engine can be used for the remaining engine to extend range and maintain lateral balance by setting the FUEL SELECTOR of the remaining engine in the CROSSFEED position.

If one of the POWER levers is set to low settings, the landing gear warning horn is activated. Set the POWER lever of the secured engine forward as required to mute the warning horn.

END OF CHECKLIST

3.7.4 UNFEATHERING & RESTARTING THE ENGINE IN FLIGHT

If the reason for the shutdown has been ascertained, and there is no indication of malfunction or engine fire, a restart may be attempted.

Restarting the Engine with the Starter

Maximum restart altitude: 10,000 ft pressure altitude for restarts within two minutes.

If MÄM 62-168 (engine software VC33_2P_05_19 or later approved software) is installed: 15,000 ft pressure altitude for immediate restarts

Up to 10,000 ft pressure altitude:

OAT		Max. engine OFF time
[° C]	[° F]	[minutes]
below -15	below 5	2
-15 to -5	5 to 23	5
above -5	above 23	10

Maximum restart airspeed: max. 80 KIAS or airspeed for a stationary propeller, whichever is lower

WARNING

V_{MCA} is 76 KIAS and should be considered when attempting to engine restart with the starter and obtaining a stationary propeller. This limitation should be observed.

CONTINUED

CAUTION

Do not engage the starter when the propeller is windmilling.

NOTE

At airspeeds below 80 KIAS it is possible that the propeller may turn intermittently. If the propeller is turning intermittently, make sure that the starter engagement is timed with the momentarily stationary propeller.

1. POWER lever of affected engine . . . . IDLE
2. FUEL SELECTOR of affected engine . . . . . . check ON
3. Alternate air . . . . as required
4. ALTERNATOR of affected engine. . . . . ON
5. ENGINE MASTER of affected engine . . . . . . ON, propeller un-feathers
6. STARTER of affected engine . . . . engage when propeller is stationary

CAUTION

After the engine has started, the POWER lever should be set to a moderate power setting until engine temperatures have reached the green range.

7. Circuit breakers . . . . check/reset if necessary

END OF CHECKLIST

Restarting the Engine by Windmilling

If the reason for the shutdown has been ascertained, and there is no indication of malfunction or engine fire, a restart may be attempted.

Maximum restart altitude: 20,000 ft pressure altitude for immediate restart.
10,000 ft pressure altitude for restarts within two minutes.

If MÄM 62-168 (engine software VC33_2P_05_19 or later approved software) is installed: 15,000 ft pressure altitude for immediate restarts

Up to 10,000 ft pressure altitude:

OAT		Max. engine OFF time
[° C]	[° F]	[minutes]
below -15	below 5	2
-15 to -5	5 to 23	5
above -5	above 23	10

Minimum restart airspeed: 110 KIAS below 10,000 ft pressure altitude
100 KIAS above 10,000 ft pressure altitude

Maximum restart airspeed: 115 KIAS

CONTINUED

CAUTION

1. Do not engage the starter when the propeller is windmilling.
2. Do not attempt restart below 100 KIAS (above 10,000 ft pressure altitude) or 110 KIAS (below 10,000 ft pressure altitude).
3. Do not attempt restart above 115 KIAS.

NOTE

Below 110 KIAS (below 10,000 ft pressure altitude) or 100 KIAS (above 10,000 ft pressure altitude) it is possible that the propeller may not windmill continuously. Continuous windmilling is required for a successful restart. Above 115 KIAS, a restart can overspeed the propeller.

1. POWER lever of affected engine . . . . IDLE
2. FUEL SELECTOR of affected engine . . . . . . check ON
3. Alternate air . . . . as required
4. ALTERNATOR of affected engine. . . . . ON
5. ENGINE MASTER of affected engine . . . . ON, propeller un-feathers and restarts by windmilling

CAUTION

After the engine has started, the POWER lever should be set to a moderate power setting until engine temperatures have reached the green range.

END OF CHECKLIST

3.7.5 ENGINE FAILURE DURING TAKE-OFF

a) Engine Failure During Ground Roll

- Abort take-off.

1. POWER lever. . . . . IDLE/BOTH
2. Rudder . . . . maintain directional control
3. Brakes . . . . as required

CAUTION

If sufficient time is remaining, the risk of fire in the event of a collision with obstacles can be reduced as follows:

4. ENGINE MASTER . . . . both OFF
5. FUEL SELECTOR . . . . both OFF
6. ELECT. MASTER . . . . OFF

END OF CHECKLIST

b) Engine Failure After Lift Off

If the landing gear is still extended and the remaining runway/surface is adequate:

- Abort the take-off & land straight ahead.

If the remaining runway/surface is inadequate:

- Decide whether to abort or to continue the take-off.

Continued take-off:

WARNING

A continued take-off is not recommended if the steady rate of climb according to Section 5.3.8 - ONE ENGINE INOPERATIVE CLIMB PERFORMANCE is less than 3.3 %. Under certain combinations of ambient conditions, such as turbulence, crosswinds and wind shear as well as pilot skill, the resulting climb performance may nevertheless be insufficient to continue the take-off successfully. Therefore a continued take-off with a failed engine has to be avoided if at all possible.

CONTINUED

1. POWER lever. . . . . MAX
2. Rudder . . . . maintain directional control
3. Airspeed. . . . . v_{YSE} = 87 KIAS up to 1999 kg (4407 lb)
   89 KIAS above 1999 kg (4407 lb)
4. Landing gear . . . . UP to achieve a positive ROC
5. FLAPS . . . . check UP
6. Inoperative engine . . . . secure according to 3.7.3 - ENGINE SECURING (FEATHERING) PROCEDURE

Land as soon as possible according to 3.7.7 - LANDING WITH ONE ENGINE INOPERATIVE. If a diversion is required before landing, continue according to Section 3.7.9 - FLIGHT WITH ONE ENGINE INOPERATIVE.

END OF CHECKLIST

3.7.6 ENGINE FAILURES IN FLIGHT

(a) Engine Failure During Initial Climb

WARNING

As climb is a flight condition which is associated with high power settings, airspeeds lower than v_{MCA} = 76 KIAS (flaps UP) or 70 KIAS (flaps T/O) should be avoided as a sudden engine failure can lead to loss of control. In this case, it is very important to reduce the asymmetry in thrust to regain directional control.

1. Rudder. . . . . maintain directional control
2. Airspeed . . . . v_{YSE} = 87 KIAS up to 1999 kg (4407 lb)
   89 KIAS above 1999 kg (4407 lb)
3. Operative engine . . . . increase power as required if directional control has been established

Establish minimum/zero sideslip condition. (approx. half ball towards good engine; 3° to 5° bank).

4. Inoperative engine . . . . Secure according to 3.7.3 - ENGINE SECURING (FEATHERING) PROCEDURE

Land as soon as possible according to 3.7.7 - LANDING WITH ONE ENGINE INOPERATIVE. If a diversion is required before landing, continue according to Section 3.7.9 - FLIGHT WITH ONE ENGINE INOPERATIVE.

END OF CHECKLIST

(b) Engine Failure During Flight

1. Rudder . . . . maintain directional control
2. Airspeed. . . . . v_{YSE} = 87 KIAS up to 1999 kg (4407 lb)
   89 KIAS above 1999 kg (4407 lb)
3. Operative engine . . . . increase power up to 95% load

Establish minimum/zero sideslip condition. (approx. half ball towards good engine; 3° to 5° bank).

4. Inoperative engine . . . . Secure according to 3.7.3 - ENGINE SECURING (FEATHERING) PROCEDURE.

Land as soon as possible according to 3.7.7 - LANDING WITH ONE ENGINE INOPERATIVE. If a diversion is required before landing, continue according to Section 3.7.9 - FLIGHT WITH ONE ENGINE INOPERATIVE.

END OF CHECKLIST

3.7.7 LANDING WITH ONE ENGINE INOPERATIVE

Preparation:

CAUTION

For emergency landing the adjustable backrests (if installed) must be fixed in the upright position.

1. Adjustable backrests .... adjust to the upright position described by a placard on the roll-over bar and verify proper fixation
2. Safety harnesses...................... check fastened and tightened
3. Landing light .... as required
4. Gear warning horn..................... check function

Operative engine:

5. Fuel pump remaining engine .... ON
6. FUEL SELECTOR..................... check ON

Inoperative engine:

7. Engine .... check secured (feathered) according to 3.7.3 - ENGINE SECURING & FEATHERING PROCEDURE

CONTINUED

Not before being certain of "making the field":

8. Airspeed. . . . . as required to operate landing gear
9. Landing gear . . . . DOWN, check 3 green
10. Trim . . . . as required
11. Airspeed. . . . . reduce as required
12. FLAPS . . . . as required
13. Final approach speed:
    up to 1999 kg (4407 lb) . . . . 91 KIAS (v_{REF}/FLAPS UP)
    88 KIAS (v_{REF}/FLAPS T/O)
    84 KIAS (v_{REF}/FLAPS LDG)
    above 1999 kg (4407 lb) . . . . 95 KIAS (v_{REF}/FLAPS UP)
    91 KIAS (v_{REF}/FLAPS T/O)
    89 KIAS (v_{REF}/FLAPS LDG)

WARNING

One-engine inoperative approaches for landing with flap settings of more than flaps UP are not recommended unless a safe landing is assured ("Making the field"). Higher flap settings increase the loss of altitude during the transition to a one engine inoperative go-around/balked landing.

14. POWER lever. . . . . as required (both POWER levers simultaneously)
15. Trim . . . . as required/directional trim to neutral

CONTINUED

NOTE

Higher approach speeds result in a significantly longer landing distance during flare.

CAUTION

In conditions such as (e.g.) strong wind, danger of wind shear or turbulence a higher approach speed should be selected.

- Perform normal touchdown and deceleration on ground.

END OF CHECKLIST

If the approach to land is not successful you may consider:

3.7.8 GO-AROUND/BALKED LANDING WITH ONE ENGINE INOPERATIVE

CAUTION

The go-around/balked landing is not recommended to be initiated below a minimum of 800 ft above ground.

For performance data with one engine inoperative and flaps and gear UP refer to 5.3.8 - ONE ENGINE INOPERATIVE CLIMB PERFORMANCE.

Under certain combinations of ambient conditions, such as turbulence, cross wind and windshear, as well as pilot skill, the resulting climb performance may nevertheless be insufficient for a successful go-around/balked landing.

1. POWER lever. . . . . MAX
2. Initial pitch attitude . . . . 6° UP
3. Rudder . . . . maintain directional control maintain
4. Airspeed v_{YSE} = 87 KIAS up to 1999 kg (4407 lb)
   89 KIAS above 1999 kg (4407 lb)
5. Landing gear . . . . UP
6. FLAPS . . . . UP

- Establish minimum sideslip and manoeuver for a new attempt to land. Repeat from step 1 of section 3.7.9 - FLIGHT WITH ONE ENGINE INOPERATIVE.

CONTINUED

If a positive rate of climb cannot be established:

- Land so as to keep clear of obstacles.

If time allows the following steps can reduce the risk of fire in an event of collision with obstacles after touchdown:

6. ENGINE MASTER . . . . both OFF
7. FUEL SELECTOR . . . . both OFF
8. FLAPS . . . . T/O or LDG, as required

NOTE

Extending the gear and extending the flaps to LDG will increase drag and incur a high sink rate. Only when the landing area can be reached safely, landing with flaps LDG is advisable.

NOTE

If landing is performed off airfield, depending on the surface condition it may be beneficial to land with the gear UP. Note that the energy absorbing function of the landing gear is lost in such cases.

9. Approach speed:
   up to 1999 kg (4407 lb):. . . . . min. 88 KIAS flaps T/O
   min. 84 KIAS flaps LDG

   above 1999 kg (4407 lb):. . . . . min. 91 KIAS flaps T/O
   min. 89 KIAS flaps LDG

CONTINUED

If landing is assured:

10. FLAPS . . . . LDG

If landing with landing gear extended:

11. LANDING GEAR . . . . DOWN, check 3 green
12. ELECT. MASTER . . . . OFF
13. Touch down . . . . lowest practical speed

If landing with landing gear retracted:

11. LANDING GEAR . . . . UP
12. Touch down . . . . lowest practical speed

Immediately after touch down:

14. ELECT. MASTER . . . . OFF

NOTE

If the ELECT. MASTER is switched OFF before touchdown the landing gear will extend slowly.

END OF CHECKLIST

3.7.9 FLIGHT WITH ONE ENGINE INOPERATIVE

CAUTION

Even if a positive flight performance can be established with one engine inoperative, land as soon as possible at the next suitable airfield/airport.

CAUTION

Prolonged operation with excessive side slip/bank angle may cause fuel starvation, which is normally advised by LOW FUEL indication on the G1000. In this case return to coordinated flight or use CROSSFEED on the affected engine.

1. Airspeed . . . . as required/above v_{YSE} =
   87 KIAS (up to 1999 kg/4407 lb)
   89 KIAS (above 1999 kg/4407 lb)
2. Remaining engine . . . . monitor engine instruments continuously
3. Fuel quantity . . . . monitor continuously
4. FUEL SELECTOR . . . . remaining engine/set CROSSFEED (above 10000 ft turn LH/RH FUEL PUMP to ON before crossfeed operation) or ON so as to keep fuel quantity laterally balanced

CONTINUED

NOTE

If the FUEL SELECTOR is set on CROSSFEED, the engine will be supplied with fuel from the main tank on the opposite side.

This will extend range and helps to keep the wings laterally balanced (see 2.14 - FUEL).

Land as soon as possible according to Section 3.7.7 - LANDING WITH ONE ENGINE INOPERATIVE.

END OF CHECKLIST

3.8 ENGINES OUT LANDING

1. ENGINE MASTER . . . . both OFF
2. Alternator switches . . . . both OFF
3. Fuel pumps . . . . both OFF
4. FUEL SELECTOR . . . . both OFF
5. AVIONIC MASTER . . . . OFF
6. Safety harnesses . . . . check fastened and tightened

When sure of making landing area:

7. FLAPS . . . . T/O or LDG, as required

NOTE

Extending the gear and extending the flaps to LDG will increase drag and incur a high sink rate. Only when the landing area can be reached safely, landing with flaps LDG is advisable.

NOTE

If landing is performed off airfield, depending on the surface condition it may be beneficial to land with the gear UP. Note that the energy absorbing function of the landing gear is lost in such cases.

8. Approach speed
   up to 1999 kg (4407 lb):. . . . . min. 88 KIAS flaps T/O
   min. 84 KIAS flaps LDG

   above 1999 kg (4407 lb):. . . . . min. 91 KIAS flaps T/O
   min. 89 KIAS flaps LDG

CONTINUED

Before landing:

9. FLAPS . . . . LDG

If landing with landing gear extended:

10. LANDING GEAR . . . . DOWN, check 3 green
11. POWER lever. . . . . both IDLE
12. ELECT. MASTER . . . . OFF
13. Touch down . . . . lowest practical speed

If landing with landing gear retracted:

10. LANDING GEAR UP
11. POWER lever. . . . . both IDLE
12. Touch down . . . . lowest practical speed

Immediately after touch down:

14. ELECT. MASTER . . . . OFF

END OF CHECKLIST

3.9 DITCHING

CAUTION

The airplane has NOT been flight tested in actual ditching. The given recovery method is based on the best judgement of Diamond Aircraft.

1. Heavy objects . . . . secure
2. LANDING GEAR . . . . UP

In heavy swell with light wind, ditch parallel to the swell. In heavy wind, ditch into the wind.

3. FLAPS . . . . LDG
4. Final approach speed . . . . V_{REF}=84 KIAS (up to1999 kg)
   V_{REF}=89 KIAS (above 1999 kg)
5. POWER. . . . . 300 ft/min rate-of-descent
6. Touchdown . . . . level attitude

NOTE

Avoid a landing flare because of difficulty in judging height over a water surface. It is expected that the airplane may skip clear of the water once or twice using the technique outlined. On final contact with the water surface, the airplane will experience several seconds of moderate abrupt deceleration, and then will float for only a short time.

7. Airplane . . . . EVACUATE through doors
8. Life vests and raft (if available) . . . . INFLATE when outside

END OF CHECKLIST

3.10 LANDING GEAR SYSTEM FAILURES

3.10.1 LANDING GEAR UNSAFE WARNING

NOTE

The landing gear unsafe warning light illuminates if the landing gear is neither in the final up or down and locked position. Illumination of this light is therefore normal during transit.

If the light remains on for longer than 20 seconds during landing gear retraction/extension:

1. Airspeed . . . . check below v_{LOR} = 162 KIAS
2. Gear selector . . . . re-cycle if continued illumination occurs

If the landing gear cannot be extended to the down & locked position or red light does not extinguish:

- Continue with 3.9.2 - MANUAL EXTENSION OF THE LANDING GEAR.

CONTINUED

NOTE

If the landing gear cannot be retracted to the final up position you may continue the flight with the landing gear extended in the down & locked position. Consider for higher aerodynamic drag, resulting in degraded flight performance, increased fuel consumption and decreased range.

With the landing gear extended and at aft CG-locations, with flaps up and full power applied, the airplane will easily recover from sideslip if the trim is set to neutral (normal procedure). Otherwise, it may require corrective action with a moderate amount of rudder input.

In cold ambient temperatures, it may help to reduce the airspeed below 110 KIAS for landing gear operation.

END OF CHECKLIST

3.10.2 MANUAL EXTENSION OF THE LANDING GEAR

NOTE

In case of a failure of the electrical pump, which is driving the landing gear actuators, the landing gear can be extended manually at speeds up to 162 KIAS. The manual extension of the landing gear may take up to 20 seconds.

The following checks shall be completed before extending the landing gear manually:

1. Gear indicator lights . . . . test/push test button
2. ELECT. MASTER . . . . check ON
3. Bus voltage . . . . check in normal range
4. Circuit breaker . . . . check in/reset if necessary

Manual landing gear extension procedure:

5. Gear selector . . . . select DOWN
6. Manual gear extension handle . . . . pull out

NOTE

The landing gear should now extend by gravity and relief of hydraulic pressure from the system. If one or more landing gear indicator lights do not indicate the gear down and locked after completion of the manual extension procedure steps 1 - 6 reduce airspeed below 110 KIAS and apply moderate yawing and pitching to bring the landing gear into the locked position.

CONTINUED

7. Gear indicator lights . . . . check 3 green lights

NOTE

If the landing gear is correctly extended and locked, as indicated by the 3 green lights, the red light is illuminated additionally if the GEAR circuit breaker is pulled.

If the landing gear cannot be extended to the down and locked position continue according to 3.9.3 - LANDING WITH GEAR UP.

END OF CHECKLIST

3.10.3 LANDING WITH GEAR UP

NOTE

This procedure applies if the landing gear is completely retracted.

1. Approach . . . . with power at normal approach airspeeds and flap settings
2. POWER lever . . . . IDLE just before touchdown

If the time/situation allows, the following steps can help to reduce the risk of fire:

3. ENGINE MASTER . . . . both OFF
4. Fuel pumps . . . . check OFF
5. FUEL SELECTOR . . . . both OFF

Touchdown:

6. Touchdown . . . . contact surface with minimum airspeed
7. On ground . . . . maintain directional control with rudder as long as possible so as to avoid collision with obstacles

Immediately after touchdown:

8. ELECT. MASTER . . . . OFF

NOTE

If the ELECT. MASTER is switched OFF before touchdown the landing gear will extend slowly.

END OF CHECKLIST

3.10.4 LANDING WITH A DEFECTIVE TIRE ON THE MAIN LANDING GEAR

CAUTION

A defective (e.g. burst) tire is not usually easy to detect. The damage normally occurs during take-off or landing, and is hardly noticeable during fast taxiing. It is only during the roll-out after landing or at lower taxiing speeds that a tendency to swerve occurs. Rapid and determined action is then required.

1. Land the airplane at the edge of the runway that is located on the side of the intact tire, so that changes in direction which must be expected during roll-out due to the braking action of the defective tire can be corrected on the runway.

2. Land with one wing low. The wing on the side of the intact tire should be held low.

3. Direction should be maintained using the rudder. This should be supported by use of the brake. It is possible that the brake must be applied strongly - if necessary to the point where the wheel locks. The wide track of the landing gear will prevent the airplane from tipping over a wide speed range. There is no pronounced tendency to tip even when skidding.

END OF CHECKLIST

3.10.5 LANDING WITH DEFECTIVE BRAKES

Consider the greater rolling distance.

1. Safety harness . . . . check fastened and tightened

CAUTION

If sufficient time is remaining, the risk of fire in the event of a collision can be reduced as follows after a safe touch-down:

- ENGINE MASTER . . . . both OFF
- FUEL SELECTOR . . . . both OFF
- ELECT. MASTER. . . . . OFF

END OF CHECKLIST

3.11 FAILURES IN THE ELECTRICAL SYSTEM

3.11.1 COMPLETE FAILURE OF THE ELECTRICAL SYSTEM

1. Circuit breakers . . . . check if all OK (pressed in)

If there is still no electrical power available:

2. Map Light, if necessary . . . . ON
3. POWER. . . . . set based on lever positions and engine noise
4. Prepare landing with flaps in the given position. Refer to 4B.5 - FAILURES IN FLAP OPERATING SYSTEM.
5. Land on the nearest suitable airfield.

WARNING

Engine stoppage may occur, depending on the failure mode. Backup batteries are installed for the ECUs to provide electrical power solely to the ECU and their systems for at least 30 minutes.

NOTE

The landing gear uplock is no longer ensured. The landing gear may slowly extend.

The landing gear can be extended manually according to 3.9.2 - MANUAL EXTENSION OF THE LANDING GEAR.

CONTINUED

NOTE

The Standby Attitude Module will have electrical power for at least 1.0 hours.

Make use of the Standby Attitude Module. Engine power can be set via visual reference of the POWER lever position.

END OF CHECKLIST

3.11.2 HIGH CURRENT

If high current is indicated on the G1000:

1. Circuit breakers . . . . check
2. Reduce electric load to minimum required for continued safe flight.
3. Land on the nearest suitable airfield.

END OF CHECKLIST

3.11.3 STARTER MALFUNCTION

If the starter does not disengage from the engine after starting (starter engaged warning (STARTER L/R) on the G1000 annunciator field illuminates after the engine has started):

On Ground:

1. POWER lever affected engine . . . . IDLE
2. ENGINE MASTER affected engine . . . . OFF
3. ELECT. MASTER . . . . OFF

Terminate flight preparation.

In flight:

Refer to 3.7.4 - UNFEATHERING & RESTARTING THE ENGINE IN FLIGHT.

If restart is not successful:

Refer to 3.7.9 - FLIGHT WITH ONE ENGINE INOPERATIVE.

END OF CHECKLIST

3.12 SMOKE AND FIRE

NOTE

The cabin hand fire extinguisher is located inside the airplane passenger compartment on the RH side of the cabin floor behind the co-pilot seat.

To release the fire extinguisher bottle out of the bracket, it is necessary to catch the bottle at the agent-outlet nozzle near the Y-spring.

3.12.1 ENGINE FIRE ON GROUND

1. ENGINE MASTER . . . . both OFF
2. FUEL SELECTOR . . . . both OFF
3. ELECT. MASTER . . . . OFF

After standstill:

4. Doors . . . . open
5. Airplane . . . . evacuate immediately

END OF CHECKLIST

3.12.2 ENGINE FIRE DURING TAKE-OFF

1. Cabin heat & Defrost . . . . OFF

Proceed according to 3.7.5 - ENGINE FAILURES DURING TAKE-OFF.

END OF CHECKLIST

3.12.3 ENGINE FIRE IN FLIGHT

1. Cabin heat & Defrost. . . . . OFF
2. Emergency Windows . . . . 2 x OPEN

Proceed according to 3.7.6 - ENGINE FAILURES IN FLIGHT and shut down the engine according to 3.7.3 - ENGINE SECURING (FEATHERING) PROCEDURE.

END OF CHECKLIST

3.12.4 ELECTRICAL FIRE ON GROUND

1. ELECT. MASTER . . . . OFF

If the engine is running:

2. POWER lever . . . . both IDLE
3. ENGINE MASTER. . . . . both OFF
4. FUEL SELECTOR . . . . both OFF

When the engine has stopped/after standstill:

5. Doors. . . . . open
6. Airplane . . . . evacuate immediately

END OF CHECKLIST

3.12.5 ELECTRICAL FIRE IN FLIGHT

1. AVIONIC MASTER . . . . OFF
2. ELECT. MASTER . . . . OFF
3. Cabin heat & Defrost . . . . OFF
4. Emergency windows . . . . open if required
5. Land on the next suitable airfield

CAUTION

Switching OFF the ELECT. MASTER will lead to total failure of all electronic and electric equipment. The attitude and heading reference system (AHRS) will also be affected.

However, the internal battery will supply power to the standby attitude module.

END OF CHECKLIST

3.13 OTHER EMERGENCIES

3.13.1 SUSPICION OF CONTAMINATION IN THE CABIN (CARBON MONOXIDE, COOLANT LIQUID ODOUR OR VAPOR)

Carbon Monoxide

Carbon monoxide (CO) is a gas which is developed during the combustion process. It is poisonous and without smell. Increased concentrations of carbon monoxide gas can be fatal. The occurrence of CO in the cabin is possible only due to a defect. If a smell similar to exhaust gases is noticed in the cabin, the following measures should be taken:

1. Cabin heat & Defrost . . . . OFF
2. Ventilation . . . . open
3. Emergency windows . . . . open

END OF CHECKLIST

Coolant Liquid Odour or Vapor

Coolant liquid odour or vapor can enter the airplane cabin through the heating system in case a coolant radiator is leaking due to damage. Coolant liquid odour or vapor is harmful to health and has a product specific smell. If an odour similar to glycol is noticed in the cabin, the following measures should be taken:

1. Cabin heat & Defrost . . . . OFF
2. Ventilation . . . . open
3. Emergency windows . . . . open

END OF CHECKLIST

3.13.2 UNLOCKED DOORS

1. Airspeed . . . . reduce immediately
2. LH & RH Pilot Doors . . . . check visually if closed
3. Passenger door . . . . check visually if closed
4. Front baggage doors . . . . check visually if closed

END OF CHECKLIST

Passenger Door Unlocked

1. Airspeed . . . . below 140 KIAS
2. Land on the next suitable airfield.

WARNING

Do not try to lock the passenger door in flight. The safety latch may disengage and the door opens. Usually this results in a separation of the door from the airplane.

NOTE

If a door has been lost the airplane can be safely flown to the next suitable airfield.

END OF CHECKLIST

Front Baggage Door Open

1. Airspeed . . . . reduce, so that door is in a stable position
2. Land on the next suitable airfield.

WARNING

Separation of the baggage door may damage the propeller and may lead to an engine failure.

END OF CHECKLIST

3.13.3 DEFECTIVE PROPELLER RPM REGULATING SYSTEM

CAUTION

The POWER lever should be moved slowly, in order to avoid over-speeding and excessively rapid RPM changes. The light wooden propeller blades produce more rapid RPM changes than metal blades.

WARNING

In case of a malfunction of the engine control unit, it is possible that the propeller blades will remain in the position of highest pitch. In this case the reduced engine performance should be taken into consideration.

(a) Oscillating RPM

1. POWER setting . . . . change

If the problem does not clear:

2. Garmin G1000 . . . . check L/R ECU A/B FAIL caution

If L/R ECU A FAIL indicated:

3. VOTER switch . . . . ECU B

If L/R ECU B FAIL indicated:

3. VOTER switch . . . . ECU A

CONTINUED

NOTE

If the problem does not clear itself, switch back to AUTO and land on the nearest suitable airfield.

(b) Propeller Overspeed

NOTE

This procedure applies for continued propeller overspeed due to a malfunction in the propeller constant speed unit or a engine control unit malfunction.

1. POWER setting . . . . reduce as required

If the problem does not clear:

2. Garmin G1000 . . . . check L/R ECU A/B FAIL caution

If L/R ECU A FAIL indicated:

3. VOTER switch . . . . ECU B

If L/R ECU B FAIL indicated:

3. VOTER switch . . . . ECU A

CAUTION

If the problem does not clear itself, switch back to AUTO and land on the nearest suitable airfield. Prepare for engine malfunction according to 3.7.6 - ENGINE FAILURES IN FLIGHT.

CONTINUED

<u>(c) Fixed RPM</u>

1. POWER setting . . . . change

If the problem does not clear:

2. Garmin G1000 . . . . check L/R ECU A/B FAIL caution

If L/R ECU A FAIL indicated:

3. VOTER switch . . . . ECU B

If L/R ECU B FAIL indicated:

3. VOTER switch . . . . ECU A

NOTE

If the problem does not clear itself, switch back to AUTO and land on the nearest suitable airfield.

END OF CHECKLIST

3.13.4 UNINTENTIONAL FLIGHT INTO ICING

1. Leave the icing area (by changing altitude or turning back)
2. PITOT HEAT . . . . ON
3. Cabin heat & Defrost . . . . ON
4. POWER lever . . . . increase power, in order to prevent ice build up on the propeller blades, apply power changes periodically
5. ALTERNATE AIR . . . . OPEN
6. Emergency windows . . . . open if required

CAUTION

Ice build-up increases the stalling speed.

7. ATC . . . . advise if an emergency is expected

END OF CHECKLIST

3.13.5 FUEL SUPPLY FAILURE

1. FUEL SELECTOR . . . . CROSSFEED/affected engine (above 10000 ft turn LH/RH FUEL PUMP to ON before crossfeed operation)

WARNING

In case of a fuel supply failure, a fuel pump inspection is required prior to the next flight.

2. Fuel quantity . . . . monitor
3. Fuel pump of affected engine . . . . ON

If fuel supply failure remains:

4. FUEL SELECTOR . . . . ON
5. Fuel pump of affected engine . . . . ON
6. Fuel quantity . . . . monitor

END OF CHECKLIST

3.13.6 RECOVERY FROM AN UNINTENTIONAL SPIN

CAUTION

Spin recovery has NOT been shown during certification as it is NOT required for this airplane category. The given recovery method is based on general experience!

CAUTION

Intentional spins are prohibited in this airplane. In the event a spin is encountered unintentionally, immediate recovery actions must be taken.

CAUTION

Steps 1 to 4 must be carried out **immediately** and **simultaneously**.

1. POWER lever . . . . IDLE
2. Rudder. . . . . full deflection against direction of spin
3. Elevator (control stick) . . . . fully forward
4. Ailerons . . . . neutral
5. FLAPS . . . . UP

When rotation has stopped:

6. Rudder. . . . . neutral
7. Elevator (control stick) . . . . pull carefully
8. Return the airplane from a descending into a normal flight attitude. Do not exceed the 'never exceed speed', v_{NE} = 205 KIAS.

END OF CHECKLIST

3.13.7 EMERGENCY DESCENT

1. FLAPS . . . . UP
2. Gear . . . . DOWN
3. POWER lever. . . . . IDLE
4. Airspeed. . . . . as required

WARNING

Max. structural cruising speed . . . . v_{NO} = 162 KIAS.

Never exceed speed in smooth air. . . . . v_{NE} = 205 KIAS.

END OF CHECKLIST

3.13.8 EMERGENCY EXIT

In case of a roll over of the airplane on ground, any door can be used as exit. In case the doors are blocked, the egress hammer may be used to break through the door windows.

If OÄM 62-019 is installed, a maximum of seven seats may be installed.

In case of an emergency, the passengers on passenger row I must exit the airplane first.

The LH seat backrest of passenger row I can be released by pulling the red emergency handle on the backside of the seat pan. The released backrest can be put away and the passengers of passenger row II can exit the airplane.

3.13.9 AUTOPILOT OR ELECTRIC TRIM MALFUNCTION/FAILURE

NOTE

An autopilot or electric trim malfunction may be recognized by an unexpected deviation from the desired flight path, abnormal flight control or trim wheel movement, or flight director commands which cause unexpected or contradictory information on the other cockpit displays. It may be accompanied by the aural autopilot disconnect tone, a red AFCS, red PTCH, red ROL, red YAW, red AP or yellow AP indication on the PFD, or a yellow CHECK ATTITUDE on the PFD. The autopilot and AHRS monitors normally detect failures and automatically disconnect the autopilot.

Failure of the electric pitch trim, indicated by a red boxed PTRM flashing on the PFD, may not cause the autopilot to disconnect. Be alert to possible autopilot out of trim conditions (see AUTOPILOT OUT OF TRIM procedure below), and expect residual control forces upon disconnect. The autopilot will not re-engage after disconnect with failed pitch trim. If AUTOPILOT OUT OF TRIM ELE indication is present, expect substantial elevator forces on autopilot disconnect.

CONTINUED

NOTE

Accomplish items 1 and 2 simultaneously!

1. Airplane control stick . . . . grasp firmly and regain airplane control
2. AP DISC switch . . . . DEPRESS AND HOLD
3. Trim . . . . retrim airplane manually as required
4. AFCS/ESP/USP circuit breaker . . . . pull
5. AP DISC switch . . . . RELEASE

NOTE

When the AFCS/ESP/USP circuit breaker is pulled, the manual electric trim and autopilot autotrim systems will be disabled.

WARNING

Do not attempt to re-engage the autopilot following an autopilot, autotrim, or manual electric trim malfunction until the cause for the malfunction has been corrected.

END OF CHECKLIST

CHAPTER 4A
NORMAL OPERATING PROCEDURES

4A.1 INTRODUCTION

Chapter 4A contains checklists and describes procedures for the normal operation of the airplane.

NOTE

Readability of the G1000 PFD and MFD displays may be degraded when wearing polarized sunglasses.

NOTE

Normal operating procedures for GFC 700 are described in the Garmin G1000 Cockpit Reference Guide, P/N 190-01896-00 or later and the Garmin G1000 Pilot's Guide for the Diamond DA 62, P/N 190-01895-00 or later. If MÄM 62-254 is installed, normal operating procedures for GFC 700 are described in the Garmin G1000 NXi Cockpit Reference Guide, P/N 190-01905-00 or later and the Garmin G1000 NXi Pilot's Guide for the Diamond DA 62, P/N 190-01904-00 or later.

4A.2 AIRSPEEDS FOR NORMAL OPERATING PROCEDURES

	FLAPS	Speed [KIAS] up to 1999 kg (4407 lb)	Speed [KIAS] above 1999 kg (4407 lb)
Airspeed for rotation (take-off run, v_R)	UP	min. 80	min. 80
	T/O	min. 76	min. 78
Airspeed for take-off climb (best angle-of-climb speed v_x)	T/O	min. 83	min. 86
Airspeed for best rate-of-climb (v_Y)	UP	87	89
	T/O	83	86
Airspeed for cruise climb	UP	min. 93	min. 96
Reference landing approach speed	UP	91	95
	T/O	min. 88	min. 91
Final approach speed	LDG	min. 84	min. 89
Minimum speed during go around	UP	min. 91	min. 95
Max. structural cruising speed Do not exceed this speed except in smooth air, and then only with caution.	UP	162	162
Safe, intentional, one-engine-inoperative speed (V_{SSE}) - a minimum speed to intentionally render the critical engine inoperative.	UP	86	86

4A.3 ADVISORY ALERTS ON THE G1000

The G1000 provides the following advisory-alerts on the PFD in the alert area:

4A.3.1 ADVISORY/GENERAL

CHARACTERISTICS	White color coded text.

4A.3.2 L/R GLOW ON

L/R GLOW ON	Left/Right engine glow plug active.

4A.3.3 PFD/MFD/GIA FAN FAIL

PFD FAN FAIL	Cooling fan for the PFD is inoperative.
MFD FAN FAIL	Cooling fan for the MFD is inoperative.
GIA FAN FAIL	Cooling fan for the GIA is inoperative.

The flight may be continued, but maintenance action is required after landing.

4A.3.4 L/R AUXPUMP ON

L/R AUXPUMP ON	Fuel transfer from auxiliary to main tank is in progress (if installed).

4A.4 FLIGHT CHARACTERISTICS

The DA 62 is to be flown with "the feet on the pedals“, meaning that coordinated flight in all phases and configurations shall be supported by dedicated use of the rudder and ailerons together.

With the landing gear extended and at aft CG-locations, with flaps up and full power applied, the airplane will easily recover from sideslip if the trim is set to neutral (normal procedure), otherwise it may require corrective action with a moderate amount of rudder input.

4A.5 DAILY CHECK

Before the first flight of a day it must be ensured that the following checks are performed.

* On-condition check of the LH and RH pilot door, the passenger door and the baggage compartment doors for cracks and major scratches.
* On-condition check of the hinges for the LH and RH pilot door, the passenger door and the baggage compartment doors.
* Visual inspection of the locking bolts for proper movement with no backlash.
* Tire inflation pressure check (main wheels: 3.8 bar/55 PSI, nose wheel: 3.2 bar/ 46 PSI).
* Visual inspection of both spinners and their attachment.

4A.6 CHECKLISTS FOR NORMAL OPERATING PROCEDURES

4A.6.1 PRE-FLIGHT INSPECTION

I. Cabin check

Preparation:

a)	Parking brake	set ON
b)	MET, NAV, mass and balance	flight planning completed
c)	Airplane documents.	complete and up to date
d)	LH & RH Pilot doors and Passenger door . . .	clean, undamaged, check locking mechanism function
e)	Baggage	stowed and secured
f)	Foreign objects	check
g)	Emergency equipment (egress hammer, first aid kit, fire extinguisher, belt cutter (if OÄM 62-019 is installed)) and equipment necessary by national operation rules.	stowed and secured

Center console:

a)	FUEL SELECTORS.	check ON
b)	POWER levers.	check condition, freedom of movement and full travel/adjust friction, set IDLE

Below instrument panel in front of left seat:

a)	ALTERNATE STATIC SOURCE	check CLOSED
b)	Manual gear extension handle	check pushed in

CONTINUED

Below instrument panel in front of right seat:

a) ALTERNATE AIR . . . . check CLOSED

On the instrument panel:

a) ALTERNATOR . . . . check both ON
b) VOTER switch . . . . check both AUTO
c) PITOT HEAT . . . . check OFF
d) ENGINE MASTER . . . . check both OFF
e) AVIONIC MASTER . . . . check OFF
f) GEAR SELECTOR . . . . check DOWN
g) FLAP SELECTOR . . . . check UP
h) Circuit breakers . . . . set in (if one has been pulled, check reason)
i) All electrical equipment . . . . OFF
j) ELT . . . . armed

Check procedure:

a) ELECT. MASTER . . . . ON

CAUTION

When switching the ELECT. MASTER ON, the electrically driven hydraulic gear pump may activate itself for 5 to 20 seconds in order to restore the system pressure. Should the pump continue to operate continuously or periodically, terminate flight. There is a malfunction in the landing gear system.

CONTINUED

b) Fuel quantity . . . . check indication, verify using alternate means (see Section 7.9.5)

c) Position lights, strobe lights (ACL). . . . . check for correct function

CAUTION

Do not look directly into the anti collision lights.

d) Landing/taxi light . . . . check for correct function

e) Stall warning/stall heat/Pitot heat/
static port heat . . . . check

NOTE

Because the stall warning switch gets slightly warmer on ground, STAL HT FAIL may be indicated on the PFD.

f) Gear warning/
fire detector TEST BUTTON . . . . PUSH check aural alert/fire detection warning and aural alert and CHECK GEAR caution

CAUTION

If the aural alert or the warning on the PFD does not appear, terminate flight. Unscheduled maintenance is necessary.

CONTINUED

g) ELECT. MASTER . . . . OFF

h) Flight controls. . . . . check free and correct movement up to full deflection

i) Trims . . . . check free and correct movement up to full deflection

END OF CHECKLIST

II. Walk-around check, visual inspection

CAUTION

A visual inspection means: examination for damage, cracks, delamination, excessive play, load transmission, correct attachment and general condition. In addition, control surfaces should be checked for freedom of movement.

CAUTION

In low ambient temperatures, the airplane must be completely cleared of ice, snow and similar accumulations. For approved de-icing fluids, refer to Section 8.7 - GROUND DE-ICING.

CAUTION

Prior to flight, remove such items as control surfaces gust lock, Pitot cover, tow bar, etc.

1. Left main landing gear:

a) Landing gear strut and lock . . . . visual inspection, sufficient height (typical visible length of bare piston: at least 5 cm/2.0 in)
b) Down and uplock switches (2 pieces) . . . . . . visual inspection
c) Wear, tread depth of tire . . . . visual inspection
d) Tire, wheel, brake . . . . visual inspection
e) Brake line connection . . . . check for leaks
f) Slip marks . . . . visual inspection
g) Chocks. . . . . remove
h) Landing gear door . . . . visual inspection

CONTINUED

2. Left engine nacelle:

a) 3 air inlets/2 air outlets . . . . clear
b) Engine oil level . . . . check dipstick (inspection hole in the side cowling)
c) Gearbox oil level . . . . check visually (inspection hole in the side cowling)
d) Cowling . . . . visual inspection
e) Gascolator/air inlet . . . . drain off to check for water and sediment (drain until no water comes out)/clear
f) Venting pipe . . . . check for blockage
g) Exhaust . . . . visual inspection

WARNING

The exhaust can cause burns when hot.

h) Propeller. . . . . visual inspection

WARNING

Never move the propeller by hand while the ENGINE MASTER switch is ON! Also do not move the propeller by hand while the ENGINE MASTER is OFF immediately after operation (remaining pressure in the injection system rail). Serious personal injury may result.

CONTINUED

i)	Nacelle underside	check for excessive contamination particularly by oil, fuel, and other fluids
j)	Auxiliary tank drain (if installed)	drain off to check for water and sediment (drain until no water comes out)/visual inspection
k)	Auxiliary tank filler (if installed)	visual inspection, tank filler closed

3. Left wing:

a)	Entire wing surface	visual inspection
b)	Tank air outlet on lower surface	visual inspection
c)	Tank drain/tank air inlet	drain off to check for water and sediment (drain until no water comes out)/visual inspection
d)	Openings on lower surface	check for foreign objects and for traces of fuel (if tank is full, fuel may spill over through the tank vent)
e)	Stall warn device	visual inspection
f)	Tank filler	visual inspection, check closed
g)	Pitot probe	clean, orifices clear, cover removed, no deformation
h)	Vortex generators	undamaged, 10 pieces, clean
i)	Wing tip	visual inspection
j)	Static dischargers	visual inspection
k)	Position light, strobe light (ACL)	visual inspection

CONTINUED

l) Tie-down . . . . check, clear
m) Aileron and linkage cover. . . . . visual inspection
n) Aileron hinges and safety pin. . . . . visual inspection
o) Foreign objects in aileron paddle . . . . visual inspection
p) Flap and linkage covers . . . . visual inspection
q) Flap hinges and safety pin . . . . visual inspection
r) Nacelle underside . . . . visual inspection
s) Step . . . . visual inspection

4. Fuselage, left side, underside:

a) LH Pilot door . . . . visual inspection
b) Passenger door & window . . . . visual inspection
c) Fuselage skin. . . . . visual inspection
d) Antennas . . . . visual inspection
e) Fuselage . . . . check for contamination (hydraulic fluid)
f) Static source . . . . check for blockage

5. Empennage:

a) Stabilizers and control surfaces, elevator tips . . . . visual inspection
b) Hinges . . . . visual inspection
c) Elevator trim tab. . . . . visual inspection, check safetying
d) Rudder trim tab . . . . visual inspection, check safetying
e) Tie-down . . . . check, clear
f) Tail skid and lower fin . . . . visual inspection
g) Static dischargers . . . . visual inspection

CONTINUED

6. Fuselage, right side:

a) Fuselage skin . . . . visual inspection
b) Rear window + window . . . . visual inspection
c) RH Pilot door . . . . visual inspection
d) Static source . . . . check for blockage

7. Right Main Landing Gear:

a) Landing gear strut and lock . . . . visual inspection, sufficient height (typical visible length of bare piston: at least 5 cm/2.0 in)
b) Down and uplock switches (2 pieces) . . . . . . visual inspection
c) Wear, tread depth of tire . . . . visual inspection
d) Tire, wheel, brake . . . . visual inspection
e) Brake line connection . . . . check for leaks
f) Slip marks . . . . visual inspection
g) Chocks. . . . . remove
h) Landing gear door . . . . visual inspection

8. Right wing:

a) Entire wing surface . . . . visual inspection
b) Tank air outlet on lower surface . . . . visual inspection
c) Tank drain/tank air inlet . . . . drain off to check for water and sediment (drain until no water comes out)/visual inspection

CONTINUED

d)	Openings on lower surface	check for foreign objects and for traces of fuel (if tank is full, fuel may spill over through the tank vent)
e)	Tank filler	visual inspection, check closed
f)	Vortex generators	undamaged, 10 pieces, clean
g)	Wing tip	visual inspection
h)	Static dischargers	visual inspection
i)	Position light, strobe light (ACL)	visual inspection
j)	Tie-down	check, clear
k)	Aileron and linkage cover	visual inspection
l)	Aileron hinges and safety pin	visual inspection
m)	Foreign objects in aileron paddle	visual inspection
n)	Flap and linkage covers	visual inspection
o)	Flap hinges and safety pin	visual inspection
p)	Nacelle underside	visual inspection
q)	Step	visual inspection
r)	Cabin vent air inlet	check clear

9. Right engine nacelle:

a)	3 air inlets/2 air outlets	clear
b)	Engine oil level	check dipstick (inspection hole in the side cowling)
c)	Gearbox oil level	check visually (inspection hole in the side cowling)
d)	Cowling	visual inspection
e)	Gascolator/air inlet	drain off to check for water and sediment (drain until no water comes out)/clear

CONTINUED

f) Venting pipe. . . . . check for blockage
g) Exhaust . . . . visual inspection

WARNING

The exhaust can cause burns when hot.

h) Propeller . . . . visual inspection

WARNING

Never move the propeller by hand while the ENGINE MASTER switch is ON! Also do not move the propeller by hand while the ENGINE MASTER is OFF immediately after operation (remaining pressure in the injection system rail). Serious personal injury may result.

i) Nacelle underside . . . . check for excessive contamination particularly by oil, fuel, and other fluids
j) Auxiliary tank drain (if installed) . . . . drain off to check for water and sediment (drain until no water comes out)/visual inspection
k) Auxiliary tank filler (if installed) . . . . visual inspection, tank filler closed

CONTINUED

10. Front fuselage and nose landing gear:

a) Left and right front baggage door .... visual inspection, closed and locked
b) Nose landing gear strut .... visual inspection, sufficient height (typical visible length of bare piston: at least 10 cm/3.9 in)
c) Down & uplock switches .... visual inspection
d) Wear, tread depth of tire .... check
e) Slip marks .... visual inspection
f) Gear door and linkage .... visual inspection
g) If OÄM 62-009 is installed:
Nose cone surface .... visual inspection
h) If OÄM 62-009 is installed:
Nose cone attachment screws .... visual inspection
i) If OÄM 62-009 is installed:
Nose cone lightning protection strips .... visual inspection
j) Chocks.............................. remove
k) OAT sensor .... check
l) EPU connector........................ check
m) Tow bar .... remove

END OF CHECKLIST

4A.6.2 BEFORE STARTING ENGINE

1. Preflight inspection . . . . complete
2. Passengers . . . . instructed

NOTE

Ensure all the passengers have been fully briefed on the location, operation and use

- of the seat belts, doors and backrest folding mechanism,
- of the emergency exits, backrest release, emergency equipment and their placarding,
- and the ban on smoking.

3. Passenger door . . . . closed and locked

CAUTION

When operating the doors, pilots/operators must ensure that there are no obstructions between the doors and the mating frame, for example seat belts, clothing, etc. When operating the locking handle do NOT apply undue force.

A slight downward/inward pressure on the doors may be required to ease the handle operation.

CAUTION

For take-off the adjustable backrests must be fixed in the upright position.

CONTINUED

NOTE

The pilot must ensure that a passenger sitting on a front seat is instructed in the operation of the adjustable backrest and the doors.

4. Adjustable backrests . . . . adjust to the upright position described by a placard on the roll-over bar and verify proper fixation
5. Rudder pedals . . . . adjusted
6. Safety harnesses . . . . all on and fastened
7. POWER lever. . . . . check IDLE
8. Parking brake. . . . . set

CAUTION

If the provisions for tablet mounts are installed on the LH and RH A-column (OÄM 62-033 is installed) and a tablet computer is used, the pilot must ensure that the mount is adjusted to not interfere with the cockpit controls, to provide sufficient view outside and sufficient view for the instruments, and to not interfere with the control sticks in any position.

9. AVIONIC MASTER . . . . check OFF
10. GEAR selector . . . . check DOWN
11. VOTER switch . . . . check both AUTO
12. ALTERNATORS . . . . check both ON
13. Fuel pump LH/RH . . . . check OFF

CONTINUED

14. ELECT. MASTER . . . . ON

CAUTION

When switching the ELECT. MASTER ON, the electrically driven hydraulic gear pump may activate itself for 5 to 20 seconds in order to restore the system pressure. Should the pump continue to operate continuously or periodically, terminate flight preparation. There is a malfunction in the landing gear system.

15. G1000 . . . . wait until power-up completed. Press ENT on MFD to acknowledge.

NOTE

The engine instruments are only available on the MFD after item 16 has been completed.

16. Fuel temperature . . . . check

END OF CHECKLIST

4A.6.3 STARTING ENGINE

NOTE

At ambient temperatures below -22°C, the engine may not start at the first attempt. In this case, wait 60 seconds between the start attempts.

1. Strobe lights (ACL). . . . . ON
2. ENGINE MASTER . . . . ON (L)
3. Annunciations . . . . check "L ENGINE GLOW" ON

NOTE

"L ENGINE GLOW" is indicated only when the engine is cold.

4. Annunciations/Engine/System Page . . . . check OK/normal range

WARNING

Before starting the engine the pilot must ensure that the propeller area is free, and no persons can be endangered.

After the L ENGINE GLOW indication is extinguished:

5. START LEFT button . . . . PRESS as required/release when engine has started

CONTINUED

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds.

At ambient temperatures below -22°C, it is possible that the engine will not start at the first attempt. In this case, wait 60 seconds between the start attempts.

If the "L STARTER" annunciation comes on after the engine has started and the START push button has been released, set the ENGINE MASTER to OFF and investigate the problem.

6. Annunciations/Engine/System Page . . . . check OK/normal range
7. Annunciations/Starter . . . . check OFF
8. Annunciations/Oil pressure . . . . check OK

WARNING

If the oil pressure has not moved from the red range within 3 seconds after starting, set the ENGINE MASTER switch to OFF and investigate problem.

9. Circuit breakers . . . . check all in/as required
10. Idle RPM . . . . check, 710 ± 30 RPM

Repeat with opposite engine.

END OF CHECKLIST

4A.6.4 BEFORE TAXIING

1. AVIONIC MASTER . . . . ON
2. Power lever . . . . as required, max. 50% if engine temperature below green range
3. Electrical equipment. ON as required
4. Flight instruments and avionics . . . . set as required
5. Flood light . . . . ON, test function, as required
6. Pitot and stall warn heating . . . . ON, check annunciation

NOTE

The stall warning switch gets slightly warmer on ground only and STAL HT FAIL is indicated on the PFD.

7. Pitot and stall warn heating . . . . OFF
8. Strobe lights (ACLs). check ON
9. Position lights, landing and taxi lights . . . . . . as required

CAUTION

When taxiing at close range to other airplanes, or during night flight in clouds, fog or haze, the strobe lights should be switched OFF. The position lights must always be switched ON during night flight.

10. Primary flight display (PFD) . . . . NO AUTOPILOT ANNUNCIATIONS
11. Autopilot disconnect tone . . . . NOTE

CONTINUED

NOTE

The AFCS system automatically conducts a preflight self-test upon initial power application. The preflight test is indicated by a white boxed PFT on the PFD. Upon successful completion of the preflight test, the PFT is removed, the red AFCS annunciation is removed, and the autopilot disconnect tone sounds. If AFCS annunciation remains on or a failure of the preflight test is indicated terminate flight preparation and investigate the problem.

12. MANUAL ELECTRIC TRIM - TEST as follows:
    Press the AP DISC button down and hold while commanding trim.
    Manual electric trim should not operate either nose up or nose down.
13. AUTOPILOT . . . . engage by pressing AP button
14. AP DISC switch . . . . press. Verify that the autopilot disconnects.
15. TRIM . . . . set to take-off position manually

END OF CHECKLIST

4A.6.5 TAXIING

1. Parking brake . . . . release
2. Brakes . . . . test on moving off
3. Nose wheel steering. . . . . check for proper function
4. Flight instrumentation and avionics . . . . check for correct indications
5. Fuel pumps LH/RH . . . . check OFF
6. FUEL SELECTOR . . . . CROSSFEED (LH/RH)

CAUTION

The fuel crossfeed function can be tested simultaneously with both engines. Proper function can be tested by running the engines for approx. 30 seconds with CROSSFEED selected. The operation of both engines with both FUEL SELECTORS in CROSSFEED position, other than for this test, is prohibited.

7. FUEL SELECTOR . . . . ON (LH/RH)

CAUTION

When taxiing on a poor surface, select the lowest possible RPM to avoid damage to the propeller from stones or similar items.

END OF CHECKLIST

4A.6.6 BEFORE TAKE-OFF

1. Position airplane into wind if possible.
2. Parking brake . . . . set

CAUTION

For take-off the adjustable backrests must be fixed in the upright position.

3. Adjustable backrests . . . . verify upright position and proper fixation
4. Safety harnesses. . . . . on and fastened
5. Passenger door . . . . check closed and locked

CAUTION

When operating the doors, pilots/operators must ensure that there are no obstructions between the doors and the mating frame, for example seat belts, clothing, etc. When operating the locking handle do NOT apply undue force.

A slight downward/inward pressure on the doors may be required to ease the handle operation.

6. LH & RH Pilot doors . . . . closed and locked
7. Front baggage doors . . . . closed (visual check)
8. Door warning (DOOR OPEN) . . . . check no indication

CONTINUED

9. Annunciations/Engine/System Page . . . . check OK/normal range (except oil oil pressure may be in the yellow range with a warm engine and power lever set to IDLE)
10. Circuit breakers . . . . check pressed in
11. Longitudinal trim. . . . . set T/O

WARNING

Take-off with CROSSFEED selected is prohibited.

12. FUEL SELECTOR . . . . check ON (LH/RH)
13. Directional trim . . . . centered
14. FLAPS . . . . check function & indicator/set T/O
15. Flight controls. . . . . unrestricted free movement, correct sense
16. PITOT HEAT . . . . ON, if required
17. Landing light. . . . . ON, if required

CONTINUED

ECU/fuel pumps test sequence

NOTE

The following test sequence can be executed for both engines simultaneously, or in sequence.

The engine/gearbox oil temperatures have to be in the green range before starting the test sequence. Efficient engine warm up may require higher power settings (max. 50% engine power).

During the test sequence the engines will produce thrust therefore the parking brake must be set.

<u>A. Under 7500 ft</u>

CAUTION

If the L/R ECU A/B FAIL indicators do not illuminate during the test sequence there is a malfunction in the engine control system. Terminate flight preparation.

The whole test procedure must be completed without any error (L/R ECU A/B FAIL extinguished after test completion). In case the test procedure aborts with an error indication (one or both ECU A/B FAIL indicators remain ON) terminate flight preparation, even if the engine seems to run smoothly after the test procedure.

CONTINUED

NOTE

Releasing the ECU TEST BUTTON or manipulating the power lever before the test sequence is completed will abort the test sequence.

During the following ECU and fuel pump test, a shake of the engine might occur.

1. Power lever . . . . IDLE
2. Propeller RPM . . . . check below 1000 rpm
3. Fuel pumps . . . . check OFF

NOTE

By switching between ECU A and B the two independent electrical fuel pumps are switched over as well.

4. VOTER switch . . . . ECU A
5. Engine . . . . check running without a change (shake may occur)
6. VOTER switch . . . . AUTO
7. Engine . . . . check running without a change (shake may occur)
8. VOTER switch . . . . ECU B
9. Engine . . . . check running without a change (shake may occur)
10. VOTER switch . . . . AUTO

CONTINUED

CAUTION

Running the engine with the VOTER switch on ECU A or ECU B, other than for this test or in an emergency is prohibited. The engine control system redundancy is only given with the VOTER switch set to AUTO.

11. Engine/gearbox oil temperature. . . . . check in the green range
12. Parking brake . . . . check set
13. ECU TEST button . . . . press and hold

Annunciations in the following sequence:

ECU A/B FAIL lights . . . . ON
Propeller RPM . . . . increase above 1800 rpm
Propeller RPM . . . . decrease
Propeller RPM . . . . increase above 1800 rpm
Propeller RPM . . . . decrease to idle

At this point, the test transfers from one ECU channel to the other.

Propeller RPM . . . . increase above 1800 rpm
Propeller RPM . . . . decrease
Propeller RPM . . . . increase above 1800 rpm
Propeller RPM . . . . decrease to idle

At this point, control of the engine is returned to the initially active ECU channel. A slight shake of the engine might occur.

ECU A/B FAIL lights . . . . both OFF

CONTINUED

Test sequence completed.

14. ECU TEST button . . . . release
15. Parking brake. . . . . release

Available power check:

1. POWER lever. . . . . MAX for 10 seconds
2. Annunciations . . . . check OK/normal range
3. Instruments . . . . check within normal range
4. RPM. . . . . stabilizes at 2250 to 2300 RPM
5. LOAD indication . . . . stabilizes at 89% to 100%

CAUTION

The load indications in the table below are minimum values to be indicated with the airplane stationary in no wind conditions. If the engine does not stabilize at the target RPM and the required load indication, terminate flight preparation.

CONTINUED

<table>
<tr><th></th><th colspan="9">OAT</th></tr>
<tr><th>Altitude [ft]</th><th>-35°C
-31°F</th><th>-20°C
-4°F</th><th>-10°C
14°F</th><th>0°C
32°F</th><th>10°C
50°F</th><th>20°C
68°F</th><th>30°C
86°F</th><th>40°C
104°F</th><th>50°C
122°F</th></tr>
<tr><td>0</td><td rowspan="4" colspan="5">99%</td><td>97%</td><td>96%</td><td>93%</td><td>91%</td></tr>
<tr><td>2000</td><td>97%</td><td>96%</td><td>93%</td><td></td></tr>
<tr><td>4000</td><td>97%</td><td>96%</td><td>93%</td><td></td></tr>
<tr><td>6000</td><td>97%</td><td>96%</td><td>93%</td><td></td></tr>
<tr><td>8000</td><td colspan="2"></td><td>98%</td><td>98%</td><td>98%</td><td>96%</td><td>95%</td><td>92%</td><td></td></tr>
<tr><td>10000</td><td>98%</td><td>97%</td><td>97%</td><td>95%</td><td>94%</td><td>92%</td><td>89%</td><td></td><td></td></tr>
</table>

6. POWER lever . . . . IDLE
7. Engine instruments . . . . check in green range

NOTE

With the power lever in IDLE the oil pressure may be in the low yellow range. This is acceptable to continue flight preparation.

8. Fuel pumps LH/RH . . . . ON

END OF CHECKLIST

B. Over 7500 ft:

In case of aircraft operation at high elevated airfields (above 7500 ft & below 22.65 inHg), it is possible that the ECU-Test will not start due to increased engine idle power. In this case, proceed instead of the ECU-Test as follows for LH and RH engine:

CONTINUED

Governor Test:

NOTE

During the governor test, the engines will produce maximum thrust, therefore firmly apply brakes. Also verify that the surrounding area is free of debris, dirt, loose stones or pebbles, or any other object that could become a hazard.

1. VOTER switch . . . . ECU A
2. Engine . . . . check running without a change (shake may occur)
3. Power lever . . . . MAX
4. Propeller RPM . . . . stabilizes at 2250 to 2300 RPM
5. Load indication. . . . . stabilizes at 89% to 100% (see table power check)
6. Power lever . . . . IDLE
7. VOTER switch . . . . ECU B
8. Engine . . . . check running without a change (shake may occur)
9. Power lever . . . . MAX
10. Propeller RPM . . . . stabilizes at 2250 to 2300 RPM
11. Load indication. . . . . stabilizes at 89% to 100% (see table power check)
12. Power lever . . . . IDLE
13. VOTER switch . . . . AUTO

END OF CHECKLIST

4A.6.7 TAKE-OFF

a) Standard Procedure (Take-off with Flaps T/O)

1. Transponder . . . . as required
2. POWER lever . . . . MAX

NOTE

The proper and symmetric performance of the engines at MAX should be checked early during the take-off run, so that the take-off can be aborted if necessary.

3. Elevator . . . . neutral
4. Rudder. . . . . maintain direction

NOTE

In strong crosswinds steering can be augmented by use of the toe brakes. It should be noted, however, that this method increases the take-off roll, and should not generally be used.

5. Nose wheel lift-off:. . . . . up to 1999 kg (4407 lb):
   v_R min. 76 KIAS
   above 1999 kg (4407 lb):
   v_R min. 78 KIAS

6. Airspeed for initial climb: . . . . up to 1999 kg (4407 lb):
   min. 83 KIAS
   above 1999 kg (4407 lb):
   min. 86 KIAS

CONTINUED

When safe climb is established:

7. LANDING GEAR . . . . apply brakes; UP, check unsafe light off

NOTE

To avoid damage and excessive wear of the main landing gear wheels, firmly apply brakes before selecting gear up.

8. ALTERNATE AIR. . . . . OPEN; in rain, snow or visible moisture

END OF CHECKLIST

b) Take-off with Flaps UP

1. Transponder. . . . . as required
2. POWER lever. . . . . MAX

NOTE

The proper and symmetric performance of the engines at MAX should be checked early during the take-off run, so that the take-off can be aborted if necessary.

3. Elevator . . . . neutral
4. Rudder . . . . maintain direction

CONTINUED

NOTE

In strong crosswinds, steering can be augmented by use of the toe brakes. It should be noted, however, that this method increases the take-off roll, and should not generally be used.

5. Nose wheel lift-off: . . . . v_R min. 80 KIAS
6. Airspeed for initial climb: . . . . up to 1999 kg (4407 lb): min. 87 KIAS
   above 1999 kg (4407 lb): min. 89 KIAS

When safe climb is established:

7. LANDING GEAR . . . . apply brakes; UP, check unsafe light off

NOTE

To avoid damage and excessive wear of the main landing gear wheels, firmly apply brakes before selecting gear up.

8. ALTERNATE AIR . . . . OPEN; in rain, snow or visible moisture

END OF CHECKLIST

4A.6.8 CLIMB

Initial Climb Check

1. Landing light. . . . . OFF/as required
2. Landing gear . . . . check UP
3. FLAPS . . . . check UP
4. Fuel pumps LH/RH . . . . OFF
5. Airspeeds, best rate-of-climb . . . . up to 1999 kg (4407 lb): 87 KIAS; above 1999 kg (4407 lb): 89 KIAS

   Airspeeds, as required for en route (cruise) climb . . . . up to 1999 kg (4407 lb): 93 KIAS; above 1999 kg (4407 lb): 96 KIAS
6. POWER lever. . . . . up to 95%
7. Trim . . . . as required (ball centered)
8. Annunciations/Engine/System Page . . . . monitor

CAUTION

If the oil temperature and/or coolant temperature reaches the yellow range during climb, flight should be continued with the airspeed increased by 10 kts and power reduced by 10% (reduced climb rate) for better engine cooling.

CONTINUED

NOTE

Operating in the gearbox temperature cautionary range is permitted. However, prolonged operation is not recommended.

END OF CHECKLIST

GFC 700 Operation During Climb

NOTE

The NOSE UP and NOSE DN buttons on the mode controller on the MFD are referenced to airplane movement. The NOSE UP button will increase the reference pitch attitude, increase the reference vertical speed and decrease the reference airspeed. Likewise, the NOSE DN button will decrease the reference pitch attitude, decrease the reference vertical speed, and increase the reference airspeed.

a) Vertical Speed (VS)

1. Altitude preselect . . . . set to desired altitude
2. Mode controller . . . . select VS on mode controller
3. Vertical speed reference . . . . adjust using NOSE UP and NOSE DN buttons
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

If the altitude preselect is not changed before selecting VS, the autopilot may re-capture the current altitude immediately after entering VS mode. Always ensure that the altitude preselect is adjusted prior to selecting VS.

The vertical speed mode is limited to 1500 ft/min climb and 3000 ft/minute descent. Use engine power to maintain appropriate airplane speed. If the CWS switch is used while in VS mode, the VS reference will change to the vertical speed when the CWS switch is released.

END OF CHECKLIST

b) Flight Level Change (FLC)

1. Altitude preselect . . . . set to desired altitude
2. Mode controller . . . . select FLC on mode controller
3. Airspeed speed reference . . . . adjust using NOSE UP and NOSE DN buttons
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

If the altitude preselect is not changed before selecting FLC, the autopilot may re-capture the current altitude immediately after entering FLC mode. Always ensure that the altitude preselect is adjusted prior to selecting FLC.

If the airspeed reference cannot be maintained without deviating away from the selected altitude, the system will maintain level flight until the power or reference is changed to allow climbing or descending towards the selected altitude.

The FLC mode is limited to airspeeds between 90 KIAS and 185 KIAS. Use engine power to maintain appropriate vertical speed. If the CWS switch is used while in FLC mode, the airspeed reference will change to the airspeed when the CWS switch is released.

END OF CHECKLIST

c) To Capture a Selected Altitude

1. Altimeter setting . . . . adjust to appropriate value
2. Altitude preselect . . . . set to desired altitude
3. Vertical mode and reference . . . . select on mode controller
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

NOTE

In ALT mode, the autopilot will maintain the reference altitude shown in the autopilot window of the PFD regardless of the altitude in the altitude preselect window or the altimeter's barometric pressure setting. If the altimeter setting is changed, the autopilot will climb or descend to maintain the reference altitude.

END OF CHECKLIST

d) Navigation Capture and Track

1. Navigation source . . . . select VOR or GPS using CDI button on PFD
2. Course bearing pointer . . . . set using course knob (VOR only)
3. Intercept heading . . . . establish in HDG or ROL mode (if required)
4. Mode controller . . . . select NAV on mode controller
5. Green or white VOR or GPS annunciation . . note on PFD
6. Vertical mode and reference . . . . select on mode controller

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the NAV mode and indicate VOR or GPS in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the NAV button is pressed and annunciate VOR or GPS in green on the PFD.

END OF CHECKLIST

4A.6.9 CRUISE

1. POWER lever. . . . . up to 95%

NOTE

The recommended cruise power setting is 75%.

2. Trim . . . . as required
3. Annunciations/Engine/System Page . . . . monitor

Use of the Auxiliary Fuel Tanks (if installed)

CAUTION

When operating the AUX PUMP LH/RH switch, make sure not to exceed the fuel imbalance limitations given in Section 2.14 - FUEL.

To avoid additional imbalance in the auxiliary tanks both AUX PUMP switches must be operated simultaneously.

1. Transfer the first half of the auxiliary fuel:

As soon as the fuel quantity in each main fuel tank is 15 US gal or less, set both AUX PUMP switches to ON until the main tanks are full again.

Monitor the fuel quantity indicator to verify that fuel is properly transferred to both main fuel tanks (approx. 1 US gal per minute). If the fuel quantity in a main tank does not increase during fuel transfer, proceed according to Section 4B.10 - L/R FUEL TRANSFER FAIL.

CONTINUED

2. Transfer the second half of the auxiliary fuel:

Repeat the procedure described above.

NOTE

Transfer the fuel from the auxiliary tanks to the main tanks as soon as possible. The fuel in the auxiliary tanks must be transferred to the main tanks to become available for the current flight mission.

END OF CHECKLIST

GFC 700 Operation During Cruise

NOTE

The NOSE UP and NOSE DN buttons on the mode controller on the MFD are referenced to airplane movement. The NOSE UP button will increase the reference pitch attitude, increase the reference vertical speed and decrease the reference airspeed. Likewise, the NOSE DN button will decrease the reference pitch attitude, decrease the reference vertical speed, and increase the reference airspeed.

a) Vertical Speed (VS)

1. Altitude preselect . . . . set to desired altitude
2. Mode controller . . . . select VS on mode controller
3. Vertical speed reference . . . . adjust using NOSE UP and NOSE DN buttons
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

If the altitude preselect is not changed before selecting VS, the autopilot may re-capture the current altitude immediately after entering VS mode. Always ensure that the altitude preselect is adjusted prior to selecting VS.

The vertical speed mode is limited to 1500 ft/min climb and 3000 ft/minute descent. Use engine power to maintain appropriate airplane speed. If the CWS switch is used while in VS mode, the VS reference will change to the vertical speed when the CWS switch is released.

END OF CHECKLIST

b) Flight Level Change (FLC)

1. Altitude preselect . . . . set to desired altitude
2. Mode controller . . . . select FLC on mode controller
3. Airspeed speed reference . . . . adjust using NOSE UP and NOSE DN buttons
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

If the altitude preselect is not changed before selecting FLC, the autopilot may re-capture the current altitude immediately after entering FLC mode. Always ensure that the altitude preselect is adjusted prior to selecting FLC.

If the airspeed reference cannot be maintained without deviating away from the selected altitude, the system will maintain level flight until the power or reference is changed to allow climbing or descending towards the selected altitude.

The FLC mode is limited to airspeeds between 90 KIAS and 185 KIAS. Use engine power to maintain appropriate vertical speed. If the CWS switch is used while in FLC mode, the airspeed reference will change to the airspeed when the CWS switch is released.

END OF CHECKLIST

c) To Capture a Selected Altitude

1. Altimeter setting . . . . adjust to appropriate value
2. Altitude preselect . . . . set to desired altitude
3. Vertical mode and reference . . . . select on mode controller
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

In ALT mode, the autopilot will maintain the reference altitude shown in the autopilot window of the PFD regardless of the altitude in the altitude preselect window or the altimeter's barometric pressure setting. If the altimeter setting is changed, the autopilot will climb or descend to maintain the reference altitude.

END OF CHECKLIST

d) Altitude Hold

To maintain a selected altitude:

1. Altimeter setting . . . . adjust to appropriate value
2. Reaching desired altitude . . . . select ALT on mode controller
3. Green ALT . . . . verify on PFD

END OF CHECKLIST

e) Navigation Capture and Track

1. Navigation source . . . . select VOR or GPS using CDI button on PFD
2. Course bearing pointer . . . . set using course knob (VOR only)
3. Intercept heading. . . . . establish in HDG or ROL mode (if required)
4. Mode controller . . . . select NAV on mode controller
5. Green or white VOR or GPS annunciation . . note on PFD
6. Vertical mode and reference . . . . select on mode controller

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the NAV mode and indicate VOR or GPS in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the NAV button is pressed and annunciate VOR or GPS in green on the PFD.

END OF CHECKLIST

4A.6.10 DESCENT

1. POWER lever. . . . . as required
2. Airspeed. . . . . as required
3. Trim . . . . as required
4. Annunciations/Engine/System Page . . . . monitor

END OF CHECKLIST

GFC 700 Operation During Descent

NOTE

The NOSE UP and NOSE DN buttons on the mode controller on the MFD are referenced to airplane movement. The NOSE UP button will increase the reference pitch attitude, increase the reference vertical speed and decrease the reference airspeed. Likewise, the NOSE DN button will decrease the reference pitch attitude, decrease the reference vertical speed, and increase the reference airspeed.

a) Vertical Speed (VS)

1. Altitude preselect . . . . set to desired altitude
2. Mode controller . . . . select VS on mode controller
3. Vertical speed reference . . . . adjust using NOSE UP and NOSE DN buttons
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

If the altitude preselect is not changed before selecting VS, the autopilot may re-capture the current altitude immediately after entering VS mode. Always ensure that the altitude preselect is adjusted prior to selecting VS.

The vertical speed mode is limited to 1500 ft/min climb and 3000 ft/minute descent. Use engine power to maintain appropriate airplane speed. If the CWS switch is used while in VS mode, the VS reference will change to the vertical speed when the CWS switch is released.

END OF CHECKLIST

b) Flight Level Change (FLC)

1. Altitude preselect . . . . set to desired altitude
2. Mode controller . . . . select FLC on mode controller
3. Airspeed speed reference . . . . adjust using NOSE UP and NOSE DN buttons
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

If the altitude preselect is not changed before selecting FLC, the autopilot may re-capture the current altitude immediately after entering FLC mode. Always ensure that the altitude preselect is adjusted prior to selecting FLC.

If the airspeed reference cannot be maintained without deviating away from the selected altitude, the system will maintain level flight until the power or reference is changed to allow climbing or descending towards the selected altitude.

The FLC mode is limited to airspeeds between 90 KIAS and 185 KIAS. Use engine power to maintain appropriate vertical speed. If the CWS switch is used while in FLC mode, the airspeed reference will change to the airspeed when the CWS switch is released.

END OF CHECKLIST

c) To Capture a Selected Altitude

1. Altimeter setting . . . . adjust to appropriate value
2. Altitude preselect . . . . set to desired altitude
3. Vertical mode and reference . . . . select on mode controller
4. White ALT (altitude preselect armed) . . . . . . note on PFD
5. Green ALT . . . . verify upon altitude capture

CONTINUED

NOTE

In ALT mode, the autopilot will maintain the reference altitude shown in the autopilot window of the PFD regardless of the altitude in the altitude preselect window or the altimeter's barometric pressure setting. If the altimeter setting is changed, the autopilot will climb or descend to maintain the reference altitude.

END OF CHECKLIST

d) Navigation Capture and Track

1. Navigation source . . . . select VOR or GPS using CDI button on PFD
2. Course bearing pointer . . . . set using course knob (VOR Only)
3. Intercept heading. . . . . establish in HDG or ROL mode (if required)
4. Mode controller . . . . select NAV on mode controller
5. Green or white VOR or GPS annunciation . . note on PFD
6. Vertical mode and reference . . . . select on mode controller

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the NAV mode and indicate VOR or GPS in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the NAV button is pressed and annunciate VOR or GPS in green on the PFD.

END OF CHECKLIST

4A.6.11 APPROACH & LANDING

Approach:

CAUTION

For landing the adjustable backrests must be fixed in the upright position.

1. Adjustable backrests . . . . adjust to the upright position described by a placard on the roll-over bar and verify proper fixation
2. Safety harnesses . . . . check fastened and tightened
3. Yaw damper. . . . . check OFF
4. Controls . . . . no interference by foreign objects
5. Landing light. . . . . as required
6. Gear warning horn . . . . check function
7. FUEL SELECTOR . . . . check both ON
8. Fuel pumps LH/RH . . . . ON
9. LANDING GEAR . . . . DOWN, check 3 green
10. Parking brake. . . . . check released
11. Trim . . . . as required, directional trim neutral

CONTINUED

Before landing:

12. Airspeeds up to 1999 kg (4407 lb):	min. 91 KIAS with FLAPS UP
	min. 88 KIAS with FLAPS T/O
Airspeeds above 1999 kg (4407 lb):	min. 95 KIAS with FLAPS UP
	min. 91 KIAS with FLAPS T/O
13. FLAPS	as required
14. POWER lever	as required
15. Trim	as required, directional trim neutral
16. Final approach speed	up to 1999 kg (4407 lb):
	min. 84 KIAS with FLAPS LDG
	above 1999 kg (4407 lb)
	min. 89 KIAS with FLAPS LDG

NOTE

Higher approach speeds result in a significantly longer landing distance during flare.

CAUTION

In conditions such as (e.g.) strong wind, danger of wind shear or turbulence a higher approach speed should be selected.

END OF CHECKLIST

GFC 700 Operation During Approach and Landing

a) VOR

1. Navigation source . . . . select VOR using CDI button on PFD
2. Course bearing pointer . . . . set using course knob
3. Intercept heading . . . . establish in HDG or ROL mode (if required)
4. Mode controller . . . . select APR on mode controller
5. Green or white VAPP annunciation . . . . note on PFD
6. Vertical mode and reference . . . . select on mode controller

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the VAPP mode and indicate VAPP in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the VAPP button is pressed and annunciate VAPP in green on the PFD.

END OF CHECKLIST

b) ILS

1. Navigation source . . . . select LOC using CDI button on PFD
2. Course bearing pointer . . . . set using course knob
3. Intercept heading. . . . . establish in HDG or ROL mode (if required)
4. Mode controller . . . . select APR on mode controller
5. Green or white LOC and GS annunciation . . note on PFD
6. Vertical mode and reference . . . . select on mode controller

NOTE

When the selected navigation source is a valid ILS, glideslope coupling is automatically armed when tracking the localizer. The glideslope cannot be captured until the localizer is captured. The autopilot can capture the glideslope from above or below the glideslope.

END OF CHECKLIST

c) GPS

1. Navigation source . . . . select GPS using CDI button on PFD
2. Approach . . . . load in FMS and ACTIVATE
3. Intercept heading . . . . establish in HDG or ROL mode (if required)
4. Mode controller . . . . select APR on mode controller
5. Green or white GPS annunciation . . . . note on PFD
6. Vertical mode and reference . . . . select on mode controller

END OF CHECKLIST

d) Back Course (BC)

1. Navigation source . . . . select LOC using CDI button on PFD
2. Course bearing pointer . . . . set to ILS front Course using course knob
3. Intercept heading . . . . establish in HDG or ROL mode (if required)
4. Mode controller . . . . select NAV on mode controller
5. Green or white BC annunciation . . . . note on PFD

CONTINUED

NOTE

The course pointer must be at least 115° from the current magnetic heading before BC will be annunciated in the lateral mode field. Until that point, LOC will be annunciated.

Selecting NAV mode for back course approaches inhibits the glideslope from coupling.

6. Vertical mode and reference . . . . select on mode controller

END OF CHECKLIST

4A.6.12 GO AROUND

1. POWER lever. . . . . MAX
2. FLAPS . . . . position T/O
3. Airspeed. . . . . up to 1999 kg (4407 lb): min. 88 KIAS
above 1999 kg (4407 lb): min. 91 KIAS

When a positive rate of climb is established:

4. Landing gear . . . . UP, check unsafe light off
5. FLAPS . . . . retract, position UP

When a safe climb is established:

6. Fuel pumps LH/RH . . . . OFF

END OF CHECKLIST

GFC 700 Operation During Go Around

1. Control stick . . . . GRASP FIRMLY
2. GA button . . . . PUSH - verify GA/GA on PFD in lateral and vertical mode fields

NOTE

After the GA button is pressed, the autopilot disconnects (if ESP is not installed) and the flight director indicates a 6° pitch up attitude.

CONTINUED

3. Balked landing . . . . execute
4. Missed approach procedure . . . . execute (as applicable)
5. Altitude preselelect . . . . set to appropriate altitude

At an Appropriate Safe Altitude:

6. Autopilot mode controller . . . . select appropriate lateral and vertical mode on controller
7. Autopilot . . . . RE-ENGAGE if desired

NOTE

If the missed approach procedure requires tracking the localizer outbound from the airport, use NAV mode to prevent inadvertent coupling to glideslope.

END OF CHECKLIST

4A.6.13 AFTER LANDING

1. POWER lever . . . . IDLE
2. Brakes . . . . as required
3. ALTERNATE AIR . . . . CLOSED
4. PITOT HEAT . . . . OFF
5. Avionics . . . . as required
6. Lights . . . . as required
7. FLAPS . . . . UP
8. Fuel pumps LH/RH . . . . OFF

END OF CHECKLIST

4A.6.14 SHUT-DOWN

1. Parking brake . . . . set
2. POWER lever . . . . up to 10% load for 1 minute
3. Engine/System Page . . . . check
4. ELT . . . . check not activated
5. AVIONIC MASTER . . . . OFF
6. Electrical consumers . . . . OFF
7. ENGINE MASTER . . . . OFF
8. Anti collision lights (ACL) . . . . OFF

CAUTION

After turning the ENGINE MASTER OFF, wait until the G1000 engine indications are red X'd or yellow X'd prior to switching the ELECT. MASTER OFF. This ensures that engine and flight data can be written to non-volatile memory before removing electrical power.

NOTE

During engine shut down at altitudes greater than 7500 ft, it is possible that the propeller will feather due to the increased engine idle power. As the increase in propeller RPM can prevent the propeller start locks from engaging, proceed with steps 9.1 through 9.3.

9.1 Engine Master . . . . ON (5 seconds)
9.2 Propeller . . . . verify start lock position
9.3 Engine Master . . . . OFF

10. ELECT. MASTER . . . . OFF

CONTINUED

CAUTION

Before shut-down the engine must run for at least 1 minute with the power lever up to 10% to avoid heat damage of the turbo charger.

CAUTION

Do not shut down an engine with the FUEL SELECTOR valve. The high pressure fuel pump can otherwise be damaged.

END OF CHECKLIST

4A.6.15 EXIT AIRPLANE

Exit the airplane to the aft on designated areas on the inner wing section LH or RH.

4A.6.16 POST FLIGHT INSPECTION

1. Record any problem found in flight and during the post-flight check in the log book.
2. Park the airplane.
3. If necessary, moor the airplane.

END OF CHECKLIST

4A.6.17 PARKING

1. Parking brake . . . . release, use chocks
2. Airplane . . . . moor, if unsupervised for extended period
3. Pitot probe . . . . cover

END OF CHECKLIST

4A.6.18 FLIGHT IN RAIN

1. ALTERNATE AIR . . . . OPEN

CAUTION

During operation on ground, ALTERNATE AIR must be CLOSED.

NOTE

Performance deteriorates in rain; this applies particularly to the take-off distance and to the maximum horizontal speed. The effect on the flight characteristics is minimal. Flight through very heavy rain should be avoided because of the associated visibility problems.

END OF CHECKLIST

4A.6.19 REFUELING

CAUTION

Before refueling, the airplane must be connected to electrical ground. Grounding points: exhaust, left and right. Refer to Section 2.14 for approved fuel grades.

Use of Fuel Additives

CAUTION

Only approved fuel additives not exceeding the approved concentrations may be used; refer to Section 2.14 FUEL. The instructions of the fuel additive supplier must be followed. Failure to exactly follow the fuel additive mixing procedures during refueling can result in incorrect fuel additive concentrations, fuel system contamination, and possible engine stoppage.

Fuel additives may have been already mixed into the fuel when stored. In this case, make sure that the brand is approved and the concentration does not exceed the approved values.

Anti-microbial life fuel additives may be manually batch-blended into the fuel tanks. In this case, introduce the additive while filling the tank after approximately the half tank is filled.

Anti-icing fuel additives should not be batch-blended into the fuel tank. The fuel additive should be injected into a stream of fuel.

Record the brand and amount of fuel additives in the airplane log every time fuel additives are added.

Typical Dosing Quantities:

(a) KATHON FP 1.5

Fuel Quantity				Fuel Additive * KATHON FP 1.5 (100 ppm)	
Liter	**US gal**	**kg**	**lb**	**mL**	**oz**
50	**13.2**	**40.2**	**88.68**	**3.9**	**0.13**
100	**26.4**	**80.4**	**177.37**	**7.7**	**0.26**
150	**39.6**	**120.6**	**266.05**	**11.6**	**0.39**
200	**52.8**	**160.8**	**354.73**	**15.5**	**0.52**
300	**79.3**	**241.2**	**532.10**	**23.2**	**0.78**

* Densities used for calculation: Fuel: 0.804 kg/L, KATHON FP 1.5: 1.04 kg/L

(b) BIOBOR JF

Fuel Quantity				Fuel Additive BIOBOR JF*			
				135 ppm		**270 ppm**	
Liter	**US gal**	**kg**	**lb**	**mL**	**oz**	**mL**	**oz**
50	**13.2**	**40.2**	**88.68**	**5.2**	**0.18**	**10.4**	**0.35**
100	**26.4**	**80.4**	**177.37**	**10.4**	**0.35**	**20.9**	**0.71**
150	**39.6**	**120.6**	**266.05**	**15.6**	**0.53**	**31.3**	**1.06**
200	**52.8**	**160.8**	**354.73**	**20.9**	**0.71**	**41.8**	**1.42**
300	**79.3**	**241.2**	**532.10**	**31.3**	**1.06**	**62.7**	**2.13**

* Calculation according to SB No. 982, ‘Instructions for use of BIOBOR JF’

Refueling of the Auxiliary Tanks (if installed)

CAUTION

If the auxiliary tanks are used then both tanks must be refueled to the maximum level. Only then the pilot has proper information concerning the fuel quantity in the auxiliary tanks.

If the auxiliary tanks are not in use, make sure that they are empty (refer to Section 6.4 - FLIGHT MASS & CENTER OF GRAVITY).

4A.6.20 FLIGHT AT HIGH ALTITUDE

At high altitudes, the provision of oxygen for the occupants is necessary. Legal requirements for the provision of oxygen should be adhered to.

Also see Section 2.11 - OPERATING ALTITUDE.

4A.6.21 DEMONSTRATION OF ENGINE SHUTDOWN/RESTART

Maximum altitude	10,000 ft pressure altitude
Minimum altitude	3,000 ft above ground level

CAUTION

Do not attempt an in-flight engine restart if the engine has been shutdown for more than two minutes.

NOTE

When demonstrating handling qualities with one engine inoperative, the left engine is the critical engine.

Shutdown and Restarting the Engine with the Starter

Maximum restart airspeed	max. 80 KIAS or airspeed for a stationary propeller, whichever is lower

WARNING

V_{MCA} is 76 KIAS and should be considered when attempting to engine restart with the starter and obtaining a stationary propeller. This limitation should be observed.

CONTINUED

CAUTION

Do not engage the starter when the propeller is windmilling.

NOTE

At airspeeds below 80 KIAS it is possible that the propeller may turn intermittently. If the propeller is turning intermittently, make sure that the starter engagement is timed with the momentarily stationary propeller.

1. Altitude . . . . stabilize in level flight at an altitude within the altitude limits defined above
2. Airspeed . . . . trim to 86 KIAS (V_{SSE})

The following actions must be completed in not more than two minutes.

If MÄM 62-168 (engine software VC33_2P_05_19 or later approved software) is installed refer to the times shown in the table below.

OAT		Max. Engine OFF Time
[° C]	**[° F]**	**[minutes]**
below -15	**below 5**	**2**
-15 to -5	**5 to 23**	**5**
above -5	**above 23**	**10**

1. ENGINE MASTER of selected engine . . . . . . OFF, propeller feathers
2. POWER lever of selected engine . . . . IDLE
3. Attitude . . . . wings level or maximum 5° bank
4. Airspeed . . . . stabilize 80 KIAS
5. ENGINE MASTER of selected engine . . . . . . ON, propeller un-feathers

CONTINUED

6. STARTER of selected engine . . . . engage when propeller is stationary

CAUTION

After the engine has started, the POWER lever should be set to a moderate power setting until engine temperature have reached the green range.

END OF CHECKLIST

CHAPTER 4B
ABNORMAL OPERATING PROCEDURES

Page

4B.1 PRECAUTIONARY LANDING

NOTE

A landing of this type is only necessary when there is a reasonable suspicion that due to operational factors such as fuel shortage, weather conditions, etc. the possibility of endangering the airplane and its occupants by continuing the flight cannot be excluded. The pilot is required to decide whether or not a controlled landing in a field represents a lower risk than the attempt to reach the nearest airfield under all circumstances.

NOTE

If no level landing area is available, a landing on an upward slope should be sought.

1. Select appropriate landing area.
2. Consider wind.
3. Approach:
   If possible, the landing area should be overflown at a suitable height in order to recognize obstacles. The degree of offset at each part of the circuit will allow the wind speed and direction to be assessed.

4. ATC . . . . advise

Perform procedures according to Normal Procedures 4A.6.11 - APPROACH & LANDING.

5. Touchdown . . . . with the lowest possible airspeed

CONTINUED

CAUTION

If sufficient time is remaining, the risk of fire in the event of a collision with obstacles can be reduced as follows after a safe touch-down:

6. ENGINE MASTER . . . . both OFF
7. FUEL SELECTOR . . . . both OFF
8. ELECT. MASTER . . . . OFF

END OF CHECKLIST

4B.2 ENGINE INSTRUMENT INDICATIONS OUTSIDE OF GREEN RANGE ON THE G1000

4B.2.1 RPM

High RPM

1. Reduce power of affected engine.
2. Keep RPM within the green range using the power lever.

If the above mentioned measures do not solve the problem, refer to 3.13.3 - DEFECTIVE PROPELLER RPM REGULATING SYSTEM.

3. Land at the nearest suitable airfield.

END OF CHECKLIST

4B.2.2 COOLANT TEMPERATURE

(a) High Coolant Temperature

Proceed according to:

3.2.2 - L/R ENG TEMP

(b) Low Coolant Temperature

- Check G1000 for L/R COOL LVL caution message (low coolant level).

NOTE

During an extended descent from high altitudes with a low power setting, coolant temperature may decrease. In this case, an increase in power and a decrease in airspeed can help.

L/R COOL LVL Caution Message displayed:

- Reduce power on affected engine.
- Expect loss of coolant.

WARNING

A further decrease in coolant temperature must be expected. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

4B.2.3 OIL TEMPERATURE

(a) High Oil Temperature

Proceed according to:

3.2.3 - L/R OIL TEMP

(b) Low Oil Temperature

NOTE

During an extended descent from high altitudes with a low power setting oil temperature may decrease. In this case an increase in power can help.

- Increase power.
- Reduce airspeed.

END OF CHECKLIST

4B.2.4 OIL PRESSURE

(a) High Oil Pressure

- Check oil temperature.
- Check coolant temperature.

If the temperatures are within the green range:

- Expect false oil pressure indication. Keep monitoring temperatures.

If the temperatures are outside of the green range:

- Reduce power on affected engine.

WARNING

Land at the nearest suitable airfield. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

(b) Low Oil Pressure

Proceed according to:

3.2.4 - L/R OIL PRES

4B.2.5 GEARBOX TEMPERATURE

High Gearbox Temperature

Proceed according to:

3.2.5 - L/R GBOX TEMP

4B.2.6 FUEL TEMPERATURE

(a) High Fuel Temperature

Proceed according to:

3.2.6 - L/R FUEL TEMP

(b) Low Fuel Temperature

- Increase power on affected engine.
- Reduce airspeed.

CAUTION

At low ambient temperature conditions and/or at high airspeeds with low power settings, it can be assumed that the above mentioned procedure will increase the temperature(s). If the fuel temperature does not return to the green range, perform a precautionary landing on the nearest suitable airfield. Prepare for an engine failure in accordance with 3.7.6 - ENGINE FAILURES IN FLIGHT.

END OF CHECKLIST

4B.2.7 VOLTAGE

(a) Low Voltage Indication on the Ground with Engines Running

1. ALTERNATORS . . . . check ON
2. Circuit breakers . . . . check

If LOW VOLTAGE CAUTION (LOW VOLTS/4B.4.5) is still indicated on the G1000:

- Terminate flight preparation.

(b) Low Voltage During Flight

1. ALTERNATORS . . . . check ON
2. Circuit breakers . . . . check
3. Electrical equipment. OFF if not needed

If LOW VOLTAGE CAUTION (LOW VOLTS/4B.4.5) is still indicated on the G1000:

- Follow procedure in 4B.4.6 - L/R ALTN FAIL.

END OF CHECKLIST

4B.3 CAUTION-ALERTS ON THE G1000

The G1000 provides the following CAUTION-alerts on the PFD in the ALERT area.

4B.3.1 CAUTIONS/GENERAL

CHARACTERISTICS	* Amber color coded text. * Single warning chime tone of 1.5 seconds duration.

4B.3.2 L/R ECU A FAIL

L/R ECU A FAIL	* Left/Right engine ECU A has detected a failure or * is being tested during ECU test procedure before take-off check.

Depending on the type of failure, the ECU failure cautions are either ‘non latched', i.e. the caution message disappears after the cause of the caution is no longer present or ‘latched', i.e. the caution massage remains until cleared through maintenance action. A ‘non-latched' caution clears itself only on the active ECU. ‘Non latched' caution messages can be cleared on the passive ECU by switching to that ECU with the voter switch.

(a) ECU A Caution on the Ground

1. VOTER switch . . . . check AUTO
2. ECU B caution . . . . check OFF
3. VOTER switch . . . . ECU A
4. Wait . . . . 5 seconds
5. VOTER switch . . . . AUTO

If the ECU A caution persists: - terminate flight preparation.

(b) ECU A Caution During Flight

NOTE

In case of a failure in the electronic ECU (Engine Control Unit) A, the system automatically switches to ECU B.

CONTINUED

1. ALTERNATE AIR . . . . OPEN
2. Fuel pumps LH/RH . . . . ON
3. Circuit breakers . . . . check/reset if necessary
4. VOTER switch . . . . AUTO

If the ECU A caution remains, the following ECU caution clearing procedure may be used:

WARNING

In case of single engine operation, do not carry out this procedure.

WARNING

When carrying out the clearing procedure be prepared for a loss of engine power.

In case of a negative single engine climb rate, do not carry out this procedure unless a suitable landing site is available within gliding distance.

Depending on the cause of the ECU caution, switching to the passive (failed) ECU may lead to rough engine run, power fluctuation or temporary loss of power. In this case, switch immediately back to AUTO.

CONTINUED

1. Safe altitude . . . . check
2. Airspeed . . . . up to 1999 kg (4407 lb):
   min. 87 KIAS
   above 1999 kg (4407 lb):
   min. 89 KIAS
3. FLAPS . . . . check UP
4. LANDING GEAR . . . . check UP
5. ECU B caution . . . . check OFF
6. VOTER switch . . . . ECU A
7. Wait . . . . 5 seconds
8. VOTER switch . . . . AUTO

If the ECU A caution persists: - land at the next suitable airfield.

NOTE

An ECU FAIL CAUTION is caused by various types of malfunctions. These include internal ECU problems, sensor failures or insufficient performance of air-, fuel-, or electrical supply system (e.g. air filter icing).

NOTE

If additional engine problems are observed refer to 3.7.2 - ENGINE TROUBLESHOOTING.

END OF CHECKLIST

4B.3.3 L/R ECU B FAIL

L/R ECU B FAIL	* Left/Right engine ECU B has detected a failure or * is being tested during ECU test procedure before take-off check.

Depending on the type of failure, the ECU failure cautions are either 'non latched', i.e. the caution message disappears after the cause of the caution is no longer present or 'latched', i.e. the caution massage remains until cleared through maintenance action. A 'non-latched' caution clears itself only on the active ECU. 'Non latched' caution messages can be cleared on the passive ECU by switching to that ECU with the voter switch.

(a) ECU B Caution on the Ground

1. VOTER switch . . . . check AUTO
2. ECU A caution . . . . check OFF
3. VOTER switch . . . . ECU B
4. Wait . . . . 5 seconds
5. VOTER switch . . . . AUTO

If the ECU B caution persists: - terminate flight preparation.

(b) ECU B Caution During Flight

NOTE

In case of a failure in the electronic ECU (Engine Control Unit) B, the system automatically switches to ECU A.

CONTINUED

1. ALTERNATE AIR. . . . . OPEN
2. Fuel pumps LH/RH . . . . ON
3. Circuit breakers . . . . check/reset if necessary
4. VOTER switch . . . . AUTO

If the ECU B caution remains, the following ECU caution clearing procedure may be used:

WARNING

In case of single engine operation, do not carry out this procedure.

WARNING

When carrying out the clearing procedure be prepared for a loss of engine power

In case of a negative single engine climb rate, do not carry out this procedure unless a suitable landing site is available within gliding distance.

Depending on the cause of the ECU caution, switching to the passive (failed) ECU may lead to rough engine run, power fluctuation or temporary loss of power. In this case switch immediately back to AUTO.

CONTINUED

1. Safe altitude . . . . check
2. Airspeed . . . . up to 1999 kg (4407 lb): min. 87 KIAS; above 1999 kg (4407 lb): min. 89 KIAS
3. FLAPS . . . . check UP
3. LANDING GEAR . . . . check UP
4. ECU A caution . . . . check OFF
5. VOTER switch . . . . ECU B
6. Wait . . . . 5 seconds
7. VOTER switch . . . . AUTO

If the ECU B caution persists: - land at the next suitable airfield.

NOTE

An ECU FAIL CAUTION is caused by various types of malfunctions. These include internal ECU problems, sensor failures or insufficient performance of air-, fuel-, or electrical supply system (e.g. air filter icing).

NOTE

If additional engine problems are observed refer to 3.7.2 - ENGINE TROUBLESHOOTING.

END OF CHECKLIST

4B.3.4 L/R FUEL LOW

L/R FUEL LOW	Left/Right engine main tank fuel quantity is low.

1. Fuel quantity . . . . check

CAUTION

As soon as the amount of usable fuel in the main tank is low, a caution message is displayed. The indication is calibrated for straight and level flight. The caution message may be triggered during turns which are flown with slip, or while taxiing in curves.

If L/R FUEL LOW caution is caused by un-coordinated flight:

CAUTION

Prolonged un-coordinated flight can lead to a L/R FUEL LOW caution and subsequent LOW PX warning and L/R ECU FAIL caution and can cause fuel starvation to the engine resulting in a loss of power.

2. Return to coordinated flight (not more than approx. half a ball sideslip, 3°-5° bank)

If LH & RH main tanks show remarkable different fuel quantities in flight:

- Expect loss of fuel on side with lower indication.
- Use crossfeed function to ensure fuel supply.

CONTINUED

2. FUEL SELECTOR . . . . CROSSFEED (engine with LOW FUEL indication); above 10000 ft turn LH/RH FUEL PUMP to ON before crossfeed operation

END OF CHECKLIST

4B.3.5 LOW VOLTAGE CAUTION (LOW VOLTS)

L/R VOLTS LOW	Left/Right engine bus voltage is too low (less than 25 Volts).

Possible reasons are:

- A fault in the power supply.
- ALTERNATORS off.

Continue with 4B.3.7 - VOLTAGE.

CAUTION

If both low voltage indications are ON, expect failure of both alternators and follow 4B.4.6 - L/R ALTN FAIL.

END OF CHECKLIST

4B.3.6 L/R ALTN FAIL

L/R ALTN FAIL	Left/Right engine alternator has failed.

(a) One Alternator Failed

1. ALTERNATOR. . . . . OFF/affected side
2. Bus voltage . . . . monitor
3. Electrical consumers . . . . reduce as practicable

END OF CHECKLIST

(b) Both Alternators Failed

Proceed according to:

3.3.1 - L/R ALTN FAIL

END OF CHECKLIST

4B.3.7 L/R COOL LVL

L/R COOL LVL	Left/Right engine coolant level is low.

A low coolant caution alert may indicate a loss of coolant. This will subsequently lead to decreased engine cooling capability/loss of engine power due to engine failure.

1. Annunciations/Engine instruments . . . . monitor

See 4B.3.2 - COOLANT TEMPERATURE.

NOTE

The indication is calibrated for straight and level flight. The caution message may be triggered during turns which are flown with slip, or while taxiing in curves.

END OF CHECKLIST

4B.3.8 PITOT FAIL/HT OFF

PITOT FAIL	Pitot heating system has failed.
PITOT HT OFF	Pitot heating system is OFF.

1. PITOT HEAT . . . . check ON/as required

NOTE

The PITOT HT OFF caution message is displayed when the Pitot heating is switched OFF, or PITOT FAIL when there is a failure of the Pitot heating system. Prolonged operation of the Pitot heating on the ground can also cause the Pitot heating caution message to be displayed. In this case, it indicates the activation of the thermal switch, which prevents overheating of the Pitot heating system on the ground. This is a normal function of the system. After a cooling period, the heating system will be switched on again automatically.

If in icing conditions:

2. Expect loss of airspeed indicators.
3. Leave icing zone/refer to 3.13.4 - UNINTENTIONAL FLIGHT INTO ICING.

END OF CHECKLIST

4B.3.9 STALL HT FAIL/OFF

STAL HT FAIL	Stall warning heat has failed.
STAL HT OFF	Stall warning heat is OFF.

1. PITOT HEAT . . . . check ON/as required

NOTE

The STAL HT OFF caution message is displayed when the Pitot heating is switched OFF, or STAL HT FAIL when there is a failure of the stall warning heating system. Operation of the stall warning heating on the ground also causes the stall warning heating failed caution message to be displayed. In this case it indicates the activation of the thermal protection relay, which prevents overheating of the stall warning heating system on the ground. This is a normal function of the system.

If in icing conditions:

2. Expect loss of acoustic stall warning.
3. Leave icing zone/refer to 3.13.4 - UNINTENTIONAL FLIGHT INTO ICING.

END OF CHECKLIST

4B.3.10 L/R AUXILIARY FUEL TANK EMPTY (IF INSTALLED)

L/R AUX FUEL E	Left/Right auxiliary fuel tank empty (displayed only when AUX PUMP switch is ON).

The auxiliary fuel tank empty caution message indicates an empty auxiliary fuel tank while the auxiliary fuel pump is switched ON.

1. L/R auxiliary fuel pump . . . . OFF

END OF CHECKLIST

4B.3.11 CHECK GEAR

CHECK GEAR	Landing gear is not down and locked.

1. Landing gear . . . . down/as required

NOTE

The CHECK GEAR caution message is displayed when either the flaps are in LDG position, or one power lever is less than approx. 20%, and the landing gear is not down and locked.

END OF CHECKLIST

4B.3.12 LOI

LOI	GPS integrity is insufficient for the current phase of flight.

(a) Enroute, Oceanic, Terminal, or Initial Approach Phase of Flight

If the LOI annunciation is displayed in the enroute, oceanic, terminal, or initial approach phase of flight, continue to navigate using the GPS equipment or revert to an alternate means of navigation other than the G1000 GPS receiver appropriate to the route and phase of flight. When continuing to use GPS navigation, position must be verified every 15 minutes using the G1000 VOR/ILS receiver or another IFR-approved navigation system.

(b) Final Approach

If the LOI annunciation is displayed while on the final approach segment, GPS based navigation will be aborted.

END OF CHECKLIST

4B.3.13 AHRS ALIGNING - KEEP WINGS LEVEL

AHRS ALIGN: Keep Wings Level	The AHRS (Attitude and Heading Reference System) is aligning.

Keep wings level using standby attitude indicator.

END OF CHECKLIST

4B.4 FAILURES IN FLAP OPERATING SYSTEM

Failure in Position Indication or Function

1. FLAPS position . . . . check visually
2. Airspeed . . . . keep in white sector (max. 119 KIAS)
3. FLAPS switch . . . . re-check all positions

Modified Approach Procedure Depending on the Available Flap Setting

NOTE

Refer to 5.3.10 - LANDING DISTANCES for landing distances with abnormal flap positions.

(a) Only UP available:

Airspeed . . . . up to 1999 kg (4407 lb):
min. 91 KIAS
above 1999 kg (4407 lb):
min. 95 KIAS

Land at a flat approach angle, use power lever to control airplane speed and rate of descent.

(b) Only T/O available:

Airspeed . . . . up to 1999 kg (4407 lb)
min. 88 KIAS
above 1999 kg (4407 lb)
min. 91 KIAS

Land at a flat approach angle, use power lever to control airplane speed and rate of descent.

CONTINUED

(c) Only LDG available:

Perform normal landing.

END OF CHECKLIST

4B.5 FAILURES IN ELECTRICAL RUDDER PEDAL ADJUSTMENT

Runaway of Electrical Rudder Pedal Adjustment

NOTE

The circuit breaker for the rudder pedal adjustment is located on the RH side of the instrument panel.

1. PEDALS circuit breaker . . . . pull

END OF CHECKLIST

4B.6 FAILURES IN HYDRAULIC SYSTEM

4B.6.1 CONTINUOUS HYDRAULIC PUMP OPERATION

1. Landing gear indication lights. . . . . check
2. Prepare for manual landing gear extension. Refer to Section 3.9.2 - MANUAL EXTENSION OF THE LANDING GEAR.

NOTE

The landing gear might extend as the hydraulic system pressure decreases. Consider for higher aerodynamic drag, resulting in degraded flight performance, increased fuel consumption and decreased range.

Unscheduled maintenance action is required after landing.

END OF CHECKLIST

4B.6.2 HYDRAULIC PUMP FAILURE

1. Landing gear indication lights. . . . . check
2. Prepare for manual landing gear extension. Refer to Section 3.10.2 - MANUAL EXTENSION OF THE LANDING GEAR.

NOTE

The landing gear might extend as the hydraulic system pressure decreases. Consider for higher aerodynamic drag, resulting in degraded flight performance, increased fuel consumption and decreased range.

Unscheduled maintenance action is required after landing.

END OF CHECKLIST

4B.7 STARTING ENGINE WITH EXTERNAL POWER

4B.7.1 BEFORE STARTING ENGINE

1. Pre-flight inspection . . . . complete
2. Passengers . . . . instructed

NOTE

Ensure all the passengers have been fully briefed on the use of the seat belts, adjustable back rests, doors and emergency exits and the ban on smoking.

3. Rear door. . . . . closed and locked
4. Front doors . . . . closed and locked
5. Rudder pedals . . . . adjusted
6. Safety harnesses. . . . . all on and fastened
7. POWER lever . . . . check IDLE
8. Parking brake . . . . set
9. AVIONIC MASTER . . . . check OFF
10. GEAR selector. . . . . check DOWN
11. VOTER switch . . . . check AUTO
12. ALTERNATORS . . . . check ON
13. ELECT. MASTER . . . . check OFF
14. ENGINE MASTER. . . . . check OFF
15. PROPELLER . . . . check clear
16. External power. . . . . connect

CONTINUED

CAUTION

When switching the external power unit ON, the electrically driven hydraulic gear pump may activate itself for 5 to 20 seconds in order to restore the system pressure. Should the pump continue to operate continuously or periodically, terminate flight. There is a malfunction in the landing gear system.

NOTE

When switching the external power unit ON, all electrical equipment, connected to the LH and RH main buses is powered.

17. G1000 . . . . wait until power-up completed. Press ENT on MFD to acknowledge.

NOTE

The engine instruments are only available on the MFD after item 17 has been completed.

END OF CHECKLIST

4B.7.2 STARTING ENGINE

1. Strobe lights (ACL) . . . . ON
2. Fuel pumps LH/RH . . . . check OFF
3. ELECT. MASTER . . . . ON
4. ENGINE MASTER. . . . . ON, LH side
5. Annunciations . . . . check "L ENGINE GLOW" ON

NOTE

L ENGINE GLOW is indicated only when the engine is cold.

6. Annunciations/Engine/System Page . . . . check OK/normal range

WARNING

Before starting the engine the pilot must ensure that the propeller area is free, and no persons can be endangered.

After the L ENGINE GLOW indication is extinguished:

7. START LEFT button . . . . PRESS as required/release when engine has started

CONTINUED

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds.

At ambient temperatures below -20°C it is possible that the engine will not run at the first attempt. In this case, wait 60 seconds between the start attempts.

If the L/R STARTER annunciation does not extinguish after the engine has started and the START button has been released, set the ENGINE MASTER to OFF and investigate the problem.

8. Annunciations/Engine/System Page . . . . check OK/normal range
9. Annunciations/Starter. . . . . check OFF
10. Annunciations/Oil pressure . . . . check OK

WARNING

If the oil pressure has not moved from the red range within 3 seconds after starting, set the ENGINE MASTER switch to OFF and investigate problem.

11. Circuit breakers . . . . check all in/as required
12. Idle RPM . . . . check, 710 ± 30 RPM
13. External power. . . . . disconnect
14. RH engine . . . . start with normal procedure

END OF CHECKLIST

4B.8 LIGHTNING STRIKE

1. Airspeed . . . . as low as practicable, do not exceed v_O (refer to Section 2.2)
2. Grasp airplane controls firmly
3. Autopilot. . . . . disengage (check)
4. PFD/backup instruments . . . . verify periodically
5. Continue flight under VMC
6. Land on the next suitable airfield

CAUTION

Due to possible damage to the airplane obey the following instructions:

- Avoid abrupt or full control surface movements.
- Avoid high g-loads on the airframe.
- Avoid high yaw angles.
- Avoid turbulent air as far as possible (e.g. lee effects).
- Do not fly into areas of known or forecast icing.
- Maintain VMC.

END OF CHECKLIST

4B.9 FAILURES IN THE AUTOPILOT SYSTEM

4B.9.1 AUTOPILOT DISCONNECT (Yellow AP Flashing on PFD)

1. AP DISC switch . . . . DEPRESS AND RELEASE (to cancel disconnect tone)
2. Pitch trim . . . . retrim if necessary, using the trim wheel

NOTE

The autopilot disconnect may be accompanied by a red boxed PTCH (pitch) or ROL on the PFD, indicating the axis which has failed. The autopilot cannot be re-engaged with either of these annunciations present.

END OF CHECKLIST

4B.9.2 AUTOPILOT OVERSPEED RECOVERY (yellow MAXSPD on PFD)

1. POWER lever. . . . . reduce power

When overspeed condition is corrected:

2. Autopilot . . . . reselect VERTICAL MODE (if necessary)

NOTE

Overspeed recovery mode provides a pitch up command to decelerate the airplane at or below the maximum autopilot operating speed (185 KIAS). Overspeed recovery is not active in altitude hold (ALT) or glideslope (GS) modes.

END OF CHECKLIST

4B.9.3 LOSS OF NAVIGATION INFORMATION (Yellow VOR, VAPP, GPS or LOC flashing on PFD)

NOTE

If a navigation signal is lost while the autopilot is tracking it, the autopilot will roll the airplane wings level and default to roll mode (ROL).

1. Autopilot . . . . select HDG on mode controller
2. Nav source . . . . select a valid NAV source
3. Autopilot . . . . select NAV on mode controller

If on an instrument approach at the time the navigation signal is lost:

4. Missed approach procedure . . . . EXECUTE (as applicable)

END OF CHECKLIST

4B.9.4 AUTOPILOT OUT OF TRIM (Yellow ←AIL, →AIL, ↑ELE, ↓ELE, ←RUD or →RUD on PFD)

For ↑ELE, or ↓ELE Indication:

WARNING

Do not attempt to overpower the autopilot in the event of a pitch mistrim. The autopilot servos will oppose pilot input and will cause pitch trim to run opposite the direction of pilot input. This will lead to a significant out-of-trim condition resulting in large control stick force when disengaging the autopilot.

CAUTION

Be prepared for significant sustained control forces in the direction of the annunciation arrow. For example, an arrow pointing down indicates nose down control stick force will be required upon autopilot disconnect.

NOTE

Momentary illumination (5 sec or less) of the ↑ELE or ↓ELE indication during configuration or large airspeed changes is normal.

If the annunciation remains:

1. AP DISC switch . . . . DEPRESS AND HOLD while grasping control stick firmly

CONTINUED

2. Airplane attitude . . . . maintain/regain airplane control, use standby attitude indicator if necessary
3. Pitch trim . . . . retrim if necessary, using the trim wheel
4. AFCS/ESP/USP circuit breaker . . . . PULL
5. AP DISC switch . . . . RELEASE

WARNING

Following an autopilot, autotrim or manual electric trim system malfunction, do not engage the autopilot or operate the manual electric trim until the cause of the malfunction has been corrected.

END OF CHECKLIST

For →AIL, ←AIL or →RUD, ←RUD Indication:

1. Rudder trim . . . . VERIFY slip/skid indicator is centered, trim is necessary

NOTE

Observe the maximum fuel imbalance limitation.

CONTINUED

If annunciation remains:

2. Control stick . . . . GRASP FIRMLY with both hands

CAUTION

Be prepared for sustained control forces in the direction of the annunciation arrow. For example, an →AIL indicates that sustained right wing down control stick force or for →RUD sustained right rudder force will be required upon autopilot disconnect.

3. AP DISC switch . . . . DEPRESS
4. Autopilot . . . . RE-ENGAGE if lateral trim is re-established

END OF CHECKLIST

4B.9.5 FLASHING YELLOW MODE ANNUNCIATION

NOTE

Abnormal mode transitions (those not initiated by the pilot or by normal sequencing of the autopilot) will be annunciated by flashing the disengaged mode in yellow on the PFD. Upon loss of a selected mode, the system will revert to the default mode for the affected axis, either ROL or PIT. After 10 seconds, the new mode (PIT or ROL) will be annunciated in green.

Loss of Selected Vertical Mode (FLC, VS, ALT, GS)

1. Autopilot mode controls . . . . select another vertical mode

If on an instrument approach:

2. Autopilot . . . . DISCONNECT and continue manually or execute missed approach

Loss of Selected Lateral Mode (HDG, NAV, GPS, LOC, VAPP, BC):

1. Autopilot mode controls . . . . select another lateral mode

If on an instrument approach:

2. Autopilot . . . . DISCONNECT and continue manually or execute missed approach

END OF CHECKLIST

4B.9.6 EFFECTS OF G1000 LOSSES UPON AUTOPILOT OPERATION

G1000 System Loss	Effect upon Autopilot Operation
AHRS	The autopilot disconnects, and autopilot, yaw damper and flight director are inoperative. Manual electric trim is available.
HDG function of AHRS	The autopilot will remain engaged with the loss of the HDG Mode.
MFD	The autopilot will remain engaged with limited functionality.
PFD	The autopilot disconnects and autopilot and flight director are inoperative. Manual electric trim is available.
GIA No. 1	The autopilot disconnects and autopilot, flight director and manual electric trim are inoperative.
GIA No. 2	The autopilot disconnects and autopilot and manual electric trim are inoperative. Flight director is available.
GPS No. 1 and 2	The autopilot and flight director operates in NAV modes only (LOC, BC, VOR, VAPP) with reduced accuracy.
ADC	The autopilot disconnects, and autopilot is inoperative. The flight director is available except for air data modes (ALT, VS, FLC). Manual electric trim is available.

4B.10 L/R AUX FUEL TRANSFER FAIL (IF AUX. TANKS ARE INSTALLED)

If the fuel quantity in a main tank does not increase during fuel transfer:

1. Switch OFF both AUX PUMPS.
2. Check fuel pump LH/RH OFF.

CAUTION

An imbalance in the auxiliary tanks is approved when the imbalance in the main tanks is less than 1 US gal (3.8 liters).

3. Check fuel imbalance in the main tanks; use CROSSFEED function (above 10000 ft turn LH/RH FUEL PUMP to ON before crossfeed operation) to keep the LH and RH main tank imbalance within the permissible limit of 1 US gal (3.8 liters).
4. Switch the remaining AUX PUMP ON.
5. Use crossfeed function to keep the LH and RH main tank imbalance within the permissible limit of 1 US gal (3.8 liters).

END OF CHECKLIST

CHAPTER 5
PERFORMANCE

5.1 INTRODUCTION

The performance tables and diagrams on the following pages are presented so that, on the one hand, you can see what performance you can expect from your airplane, while on the other hand they allow comprehensive and sufficiently accurate flight planning. The values in the tables and the diagrams were obtained in the framework of the flight trials using an airplane and power-plant in good condition, and corrected to the conditions of the International Standard Atmosphere (ISA = 15 °C/59 °F and 1013.25 hPa/29.92 inHg at sea level).

The performance diagrams and tables do not take into account variations in pilot experience or a poorly maintained airplane. The performances given can be attained if the procedures quoted in this manual are applied, and the airplane has been well maintained.

5.2 USE OF THE PERFORMANCE TABLES AND DIAGRAMS

In order to illustrate the influence of a number of different variables, the performance data is reproduced in the form of tables or diagrams. These contain sufficiently detailed information so that conservative values can be selected and used for the determination of adequate performance data for the planned flight.

For a conversion of units see Chapter 1.6 - UNITS OF MEASUREMENT.

For temperatures, altitudes and weights between those provided, use a linear interpolation between the neighboring values.

For weights below 1800 kg (3968 lb), use data for the lowest weight.

For operation in outside air temperature lower than provided in these tables, use data for lowest temperature shown.

For operation in outside air temperature higher than provided in these tables, use extreme caution.

5.3 PERFORMANCE TABLES AND DIAGRAMS

5.3.1 AIRSPEED CALIBRATION

NOTE

The position of the landing gear (extended/retracted) and flaps (extended/retracted) has no significant influence on the airspeed indicator system.

Airspeed Indicator Calibration	
Indicated Airspeed [KIAS]	**Calibrated Airspeed [KCAS]**
75	74
80	79
85	84
90	89
95	94
100	99
105	104
110	109
115	114
120	119
125	124
130	129
135	134
140	138
150	148
160	158
170	167
180	177
190	186
200	196
205	201

5.3.2 FUEL FLOW DIAGRAM

CAUTION

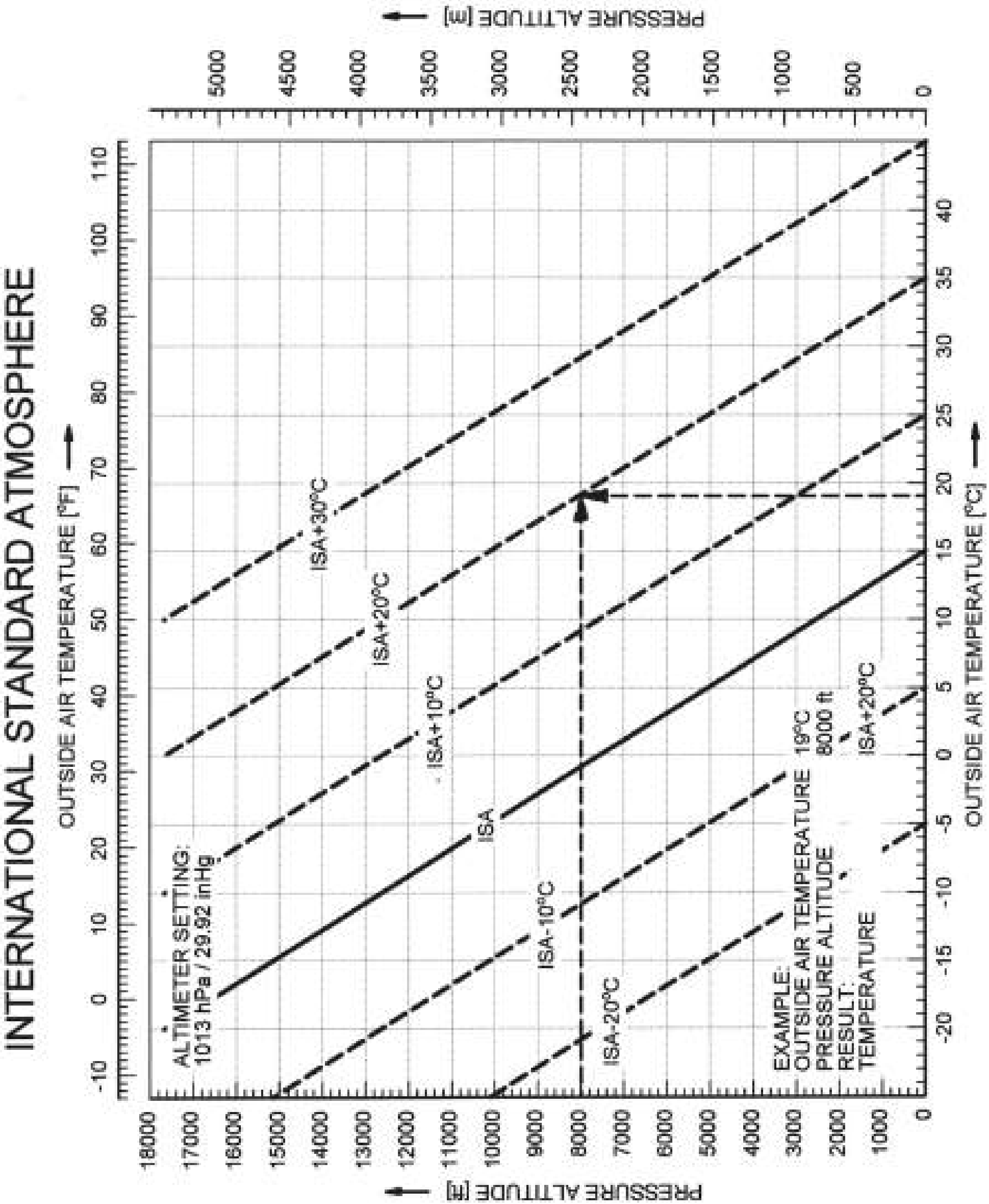
The table shows the fuel flow per hour for one engine.

NOTE

The fuel calculations on the FUEL CALC portion of the G1000 MFD do NOT use the airplane's fuel quantity indicators. The values shown are numbers which are calculated from the last fuel quantity update done by the pilot and actual fuel flow data. Therefore, the endurance and range data is for information only, and must not be used for flight planning.

Fuel Flow		
Power Setting [%]	**Fuel Flow [US gal/h]**	**Fuel Flow [Liter/h]**
30	3.3	12.5
35	3.7	14.0
40	4.1	15.5
45	4.5	17.0
50	4.9	18.5
55	5.4	20.5
60	5.9	22.5
65	6.4	24.5
70	6.9	26.0
75	7.4	28.0
80	7.8	29.5
85	8.3	31.5
90	9.0	34.0
95	9.7	36.5
100	10.3	39.0

5.3.3 INTERNATIONAL STANDARD ATMOSPHERE



5.3.4 STALLING SPEEDS

Stalling Speeds at Various Flight Masses

Airspeeds, most forward CG, power off:

1800 kg (3968 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	68	67	73	72	81	80	96	95
DOWN	T/O	67	66	72	71	80	78	94	93
DOWN	LDG	63	61	67	66	74	73	88	87

1900 kg (4189 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	69	68	74	73	82	81	97	96
DOWN	T/O	68	66	73	71	80	79	95	94
DOWN	LDG	63	62	68	67	75	74	89	88

1999 kg (4407 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	70	69	75	74	83	82	99	98
DOWN	T/O	69	67	74	72	81	80	96	95
DOWN	LDG	64	63	69	68	76	75	90	89

2100 kg (4630 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	71	70	76	75	84	83	100	99
DOWN	T/O	69	68	74	73	82	80	97	96
DOWN	LDG	66	65	71	70	78	77	93	92

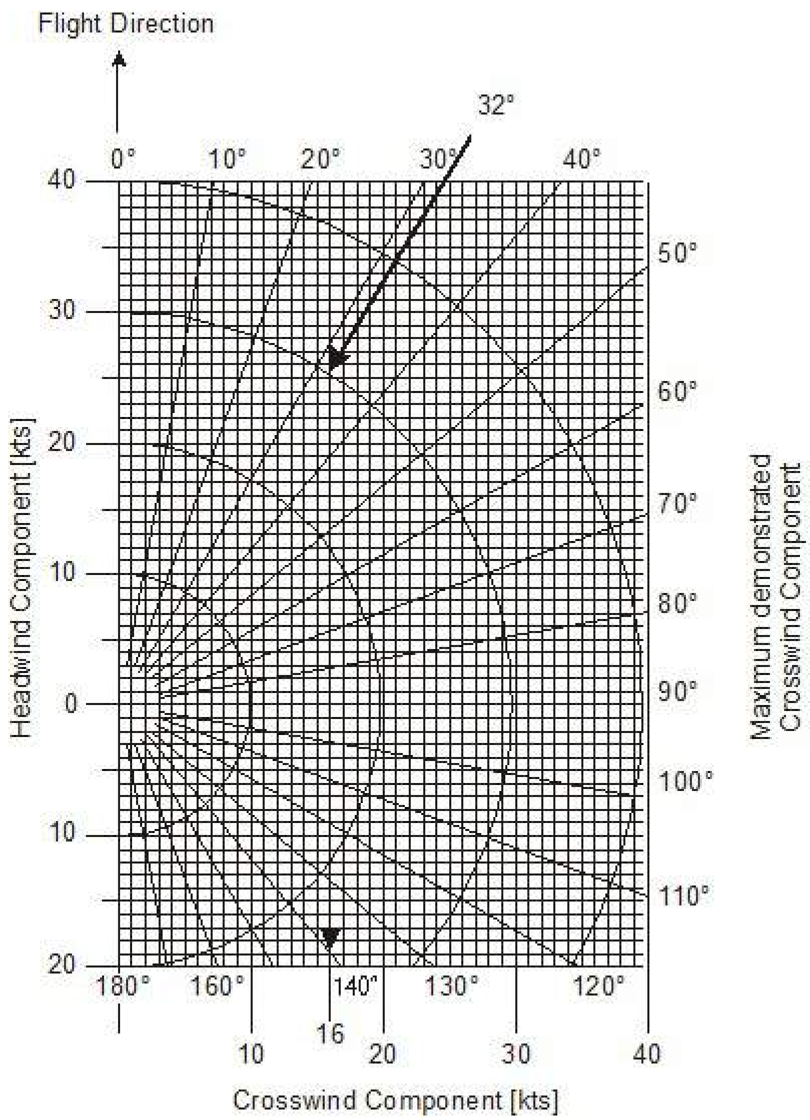
2200 kg (4850 lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	72	71	77	76	85	84	101	100
DOWN	T/O	70	68	75	73	83	81	98	97
DOWN	LDG	68	67	74	73	82	81	97	96

2300 kg (5071lb)		Bank Angle							
		0°		30°		45°		60°	
Gear	Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	UP	73	72	78	77	87	86	103	102
DOWN	T/O	71	69	76	74	83	82	99	98
DOWN	LDG	69	68	74	73	82	81	97	96

NOTE

KIAS values may not be accurate at stall.

5.3.5 WIND COMPONENTS



Example:	Flight direction	:	360°
	Wind	:	32°/30 kts
Result:	Crosswind component	:	16 kts
	Max. demonstrated crosswind component	:	25 kts

5.3.6 TAKE-OFF DISTANCE

Conditions:

- Power lever . . . . both MAX
- Flaps . . . . UP or T/O
- Runway . . . . dry, paved, level
- Nose wheel lift-off . . . . @ v_R
- Airspeed for initial climb . . . . @ v_{50ft}

The following factors are to be applied to the computed take-off distance for the noted condition:

- Headwind:	Decrease by 10% for each 12 kt (6.2 m/s) headwind.
- Tailwind:	Increase by 10% for each 3 kt (1.5 m/s) tailwind.
- Grass runway, dry, 5 cm (2 in) long:	Increase the ground roll by 10%.
- Grass runway, dry, 5 cm (2 in) to 10 cm (3.9 in) long:	Increase the ground roll by 15%.
- Grass runway, dry, 25 cm (9.8 in) long:	Increase the ground roll by 25%.
- Grass runway, longer than 25 cm (9.8 in):	A take-off should not be attempt.
- Grass runway, wet:	Increase the dry grass runway distance calculation by 10%.
- Soft ground:	Increase the ground roll by 45% (in addition to the grass runway distance calculation, if applicable).
- Uphill slope:	Increase the ground roll by 10% for each 1% (1 m per 100 m or 1 ft per 100 ft) slope.

If brakes are not held while applying power, distances apply where full power setting is complete.

WARNING

For a safe take-off, the available runway length must be at least equal to the take-off distance over a 50 ft (15 m) obstacle.

WARNING

Poor maintenance condition of the airplane, deviation from the given procedures, uneven runway, as well as unfavorable external factors (rain, unfavorable wind conditions, including cross-wind) will increase the take-off distance.

CAUTION

The factors in the above corrections are typical values. On wet ground or wet soft grass covered runways, the take-off roll may become significantly longer than stated above. In any case, the pilot must allow for the condition of the runway to ensure a safe take-off.

The above corrections for runway slope should be used with caution since published runway slope data is usually the net slope from one end of the runway to the other. Runways may have positions along their length at greater or lesser slopes than the published slope, lengthening (or shortening) the take-off roll estimated with these tables.

NOTE

The effect of 50% of the headwind component and 150% of the tailwind component is already incorporated in the head- and tailwind factors.

Take-Off Distances (SI/Metric System)

Take-Off Distance - Normal Procedure - 2300 kg/5071 lb								
Weight: 2300 kg/5071 lb					**Flaps:** T/O			
v_R: 78 KIAS					**Power:** MAX			
v_{50ft}: 86 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	450	470	500	540	600	690	480
	15 m/50 ft	780	820	860	930	1050	1200	833
1000 305	**Ground Roll**	470	500	530	570	650	740	503
	15 m/50 ft	820	860	910	980	1120	1290	870
2000 610	**Ground Roll**	500	530	560	610	700	790	528
	15 m/50 ft	860	910	970	1050	1200	1370	910
3000 914	**Ground Roll**	530	560	600	660	750	850	555
	15 m/50 ft	910	960	1020	1120	1290	1470	952
4000 1219	**Ground Roll**	560	600	640	710	810	920	582
	15 m/50 ft	960	1020	1080	1210	1390	1590	996
5000 1524	**Ground Roll**	600	640	680	770	870		613
	15 m/50 ft	1020	1080	1150	1310	1500		1047
6000 1829	**Ground Roll**	650	690	730	840	960		655
	15 m/50 ft	1100	1160	1250	1430	1640		1118
7000 2134	**Ground Roll**	700	740	810	920	1050		700
	15 m/50 ft	1190	1260	1370	1580	1800		1193
8000 2438	**Ground Roll**	760	810	890	1020	1160		749
	15 m/50 ft	1280	1370	1520	1740	1990		1273
9000 2743	**Ground Roll**	820	890	990	1130	1300		802
	15 m/50 ft	1390	1510	1680	1930	2250		1359
10000 3048	**Ground Roll**	900	970	1090	1260			862
	15 m/50 ft	1530	1650	1870	2170			1464

Take-Off Distance - Normal Procedure - 2200 kg/4850 lb								
Weight: 2200 kg/4850 lb					**Flaps:** T/O			
v_R: 78 KIAS					**Power:** MAX			
v_{50ft}: 86 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	**ISA**
SL	**Ground Roll**	420	450	480	510	570	660	457
	15 m/50 ft	730	770	820	870	980	1130	785
1000 305	**Ground Roll**	450	480	510	540	620	710	479
	15 m/50 ft	770	810	860	920	1050	1210	820
2000 610	**Ground Roll**	480	510	540	580	660	750	504
	15 m/50 ft	810	860	910	990	1130	1290	856
3000 914	**Ground Roll**	500	530	570	620	710	810	527
	15 m/50 ft	860	910	960	1060	1210	1380	895
4000 1219	**Ground Roll**	540	570	610	670	770	880	555
	15 m/50 ft	910	960	1020	1140	1300	1490	938
5000 1524	**Ground Roll**	570	600	650	730	830		584
	15 m/50 ft	960	1010	1080	1230	1400		984
6000 1829	**Ground Roll**	620	650	700	800	910		624
	15 m/50 ft	1040	1100	1170	1340	1530		1049
7000 2134	**Ground Roll**	670	710	770	880	1000		667
	15 m/50 ft	1120	1180	1290	1480	1690		1118
8000 2438	**Ground Roll**	720	770	850	970	1100		713
	15 m/50 ft	1200	1280	1420	1630	1860		1192
9000 2743	**Ground Roll**	780	840	940	1070	1230		762
	15 m/50 ft	1300	1410	1570	1800	2090		1275
10000 3048	**Ground Roll**	860	920	1040	1190			820
	15 m/50 ft	1430	1540	1740	2020			1370

Take-Off Distance - Normal Procedure - 2100 kg/4630 lb								
Weight: 2100 kg/4630 lb					**Flaps:** T/O			
v_R: 78 KIAS					**Power:** MAX			
v_{50ft}: 86 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	400	430	450	490	550	620	434
	15 m/50 ft	690	730	770	820	930	1060	739
1000 305	**Ground Roll**	430	450	480	510	590	670	456
	15 m/50 ft	730	760	810	870	990	1140	770
2000 610	**Ground Roll**	450	480	510	550	630	720	478
	15 m/50 ft	760	810	850	930	1060	1210	806
3000 914	**Ground Roll**	480	510	540	590	680	770	502
	15 m/50 ft	810	850	900	990	1130	1290	841
4000 1219	**Ground Roll**	510	540	570	640	730	830	527
	15 m/50 ft	850	900	960	1070	1220	1400	879
5000 1524	**Ground Roll**	540	580	610	690	790		555
	15 m/50 ft	900	950	1020	1150	1310		925
6000 1829	**Ground Roll**	580	620	660	760	860		592
	15 m/50 ft	970	1030	1100	1260	1430		984
7000 2134	**Ground Roll**	630	670	730	830	950		633
	15 m/50 ft	1050	1100	1200	1380	1580		1048
8000 2438	**Ground Roll**	680	730	800	920	1050		675
	15 m/50 ft	1130	1200	1330	1520	1740		1118
9000 2743	**Ground Roll**	740	800	890	1020	1160		724
	15 m/50 ft	1220	1320	1470	1690	1950		1195
10000 3048	**Ground Roll**	810	870	990	1130			779
	15 m/50 ft	1340	1440	1630	1880			1282

Take-Off Distance - Normal Procedure - 1999 kg/4407 lb								
Weight: 1999 kg/4407 lb					**Flaps:** T/O			
v_R: 76 KIAS					**Power:** MAX			
v_{50ft}: 83 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	360	380	400	430	490	550	385
	15 m/50 ft	590	630	660	710	800	910	638
1000 305	**Ground Roll**	380	400	430	460	520	600	405
	15 m/50 ft	630	660	700	750	850	980	664
2000 610	**Ground Roll**	400	430	450	490	560	640	425
	15 m/50 ft	660	700	740	800	910	1040	694
3000 914	**Ground Roll**	430	450	480	530	600	680	444
	15 m/50 ft	690	730	780	850	970	1110	727
4000 1219	**Ground Roll**	450	480	510	570	650	740	468
	15 m/50 ft	730	770	820	920	1050	1200	759
5000 1524	**Ground Roll**	480	510	540	610	700		493
	15 m/50 ft	780	820	880	990	1130		797
6000 1829	**Ground Roll**	520	550	590	670	760		525
	15 m/50 ft	840	880	940	1080	1230		848
7000 2134	**Ground Roll**	560	600	650	740	840		563
	15 m/50 ft	900	950	1030	1180	1350		903
8000 2438	**Ground Roll**	610	650	710	810	930		601
	15 m/50 ft	970	1030	1140	1300	1480		962
9000 2743	**Ground Roll**	660	710	790	900	1030		642
	15 m/50 ft	1050	1130	1260	1440	1660		1025
10000 3048	**Ground Roll**	720	770	870	1000			691
	15 m/50 ft	1150	1230	1390	1600			1100

Take-Off Distance - Normal Procedure - 1900 kg/4189 lb								
Weight: 1900 kg/4189 lb					**Flaps:** T/O			
v_R: 76 KIAS					**Power:** MAX			
v_{50ft}: 83 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	340	360	380	410	460	520	366
	15 m/50 ft	540	570	600	650	740	860	576
1000 305	**Ground Roll**	360	380	400	430	490	560	382
	15 m/50 ft	570	600	640	690	800	920	604
2000 610	**Ground Roll**	380	400	430	460	530	600	402
	15 m/50 ft	600	640	680	750	850	970	636
3000 914	**Ground Roll**	400	430	450	500	570	640	420
	15 m/50 ft	640	680	720	800	910	1040	668
4000 1219	**Ground Roll**	430	450	480	540	610	700	442
	15 m/50 ft	680	720	770	860	980	1120	703
5000 1524	**Ground Roll**	460	480	520	580	660		466
	15 m/50 ft	730	770	820	920	1060		746
6000 1829	**Ground Roll**	490	520	560	640	720		498
	15 m/50 ft	780	830	880	1010	1150		794
7000 2134	**Ground Roll**	530	560	610	700	800		531
	15 m/50 ft	840	890	970	1100	1260		846
8000 2438	**Ground Roll**	570	610	670	770	870		567
	15 m/50 ft	910	970	1060	1210	1380		902
9000 2743	**Ground Roll**	620	670	740	850	970		608
	15 m/50 ft	980	1060	1170	1340	1550		959
10000 3048	**Ground Roll**	680	730	820	950			652
	15 m/50 ft	1070	1150	1300	1490			1026

Take-Off Distance - Normal Procedure - 1800 kg/3968 lb								
Weight: 1800 kg/3968 lb					**Flaps:** T/O			
v_R: 76 KIAS					**Power:** MAX			
v_{50ft}: 83 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	320	340	360	380	430	490	344
	15 m/50 ft	490	510	550	590	670	770	522
1000 / 305	**Ground Roll**	340	360	380	410	470	530	361
	15 m/50 ft	520	540	580	620	720	830	548
2000 / 610	**Ground Roll**	360	380	400	440	500	570	379
	15 m/50 ft	540	570	610	670	770	890	576
3000 / 914	**Ground Roll**	380	400	430	470	540	610	398
	15 m/50 ft	580	610	650	720	830	960	603
4000 / 1219	**Ground Roll**	400	430	450	510	580	660	416
	15 m/50 ft	610	650	690	780	900	1050	631
5000 / 1524	**Ground Roll**	430	450	490	550	620		438
	15 m/50 ft	650	690	740	850	980		666
6000 / 1829	**Ground Roll**	460	490	520	600	680		468
	15 m/50 ft	710	750	800	930	1070		713
7000 / 2134	**Ground Roll**	500	530	580	660	750		501
	15 m/50 ft	760	810	900	1030	1170		764
8000 / 2438	**Ground Roll**	540	580	630	720	820		535
	15 m/50 ft	830	890	990	1130	1290		821
9000 / 2743	**Ground Roll**	590	630	700	800	920		571
	15 m/50 ft	910	990	1090	1250	1440		884
10000 / 3048	**Ground Roll**	640	690	780	890			614
	15 m/50 ft	1000	1080	1210	1390			959

Take-Off Distance - Flaps UP - 2300 kg/5071 lb								
Weight: 2300 kg/5071 lb					Flaps: UP			
v_R: 80 KIAS					Power: MAX			
v_{50ft}: 89 KIAS					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		Outside Air Temperature - [°C]/[°F]						ISA
		0/32	10/50	20/68	30/86	40/104	50/122	
SL	Ground Roll	470	500	530	560	630	730	506
	15 m/50 ft	770	810	850	910	1030	1170	822
1000 / 305	Ground Roll	500	530	560	600	680	780	530
	15 m/50 ft	810	850	900	960	1100	1260	858
2000 / 610	Ground Roll	530	560	590	640	730	830	556
	15 m/50 ft	850	900	950	1030	1170	1330	895
3000 / 914	Ground Roll	560	590	630	690	780	890	584
	15 m/50 ft	900	940	1000	1100	1250	1430	936
4000 / 1219	Ground Roll	590	630	660	740	840	960	611
	15 m/50 ft	950	1000	1060	1180	1350	1540	981
5000 / 1524	Ground Roll	630	670	710	800	910		643
	15 m/50 ft	1000	1060	1130	1280	1450		1027
6000 / 1829	Ground Roll	680	720	770	880	1000		687
	15 m/50 ft	1080	1140	1220	1390	1590		1095
7000 / 2134	Ground Roll	730	780	840	960	1100		733
	15 m/50 ft	1160	1230	1340	1530	1750		1165
8000 / 2438	Ground Roll	790	840	930	1060	1210		783
	15 m/50 ft	1250	1330	1480	1690	1920		1245
9000 / 2743	Ground Roll	860	930	1030	1170	1340		838
	15 m/50 ft	1350	1470	1630	1860	2150		1329
10000 / 3048	Ground Roll	940	1010	1140	1300			902
	15 m/50 ft	1490	1600	1800	2080			1426

Take-Off Distance - Flaps UP - 2200 kg/4850 lb								
Weight: 2200 kg/4850 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 89 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	450	470	500	540	600	690	483
	15 m/50 ft	730	760	810	860	970	1100	776
1000 305	**Ground Roll**	470	500	530	570	650	740	505
	15 m/50 ft	760	800	850	910	1030	1180	809
2000 610	**Ground Roll**	500	530	560	610	690	790	529
	15 m/50 ft	800	840	890	970	1100	1260	845
3000 914	**Ground Roll**	530	560	600	650	740	850	556
	15 m/50 ft	840	890	940	1040	1180	1340	883
4000 1219	**Ground Roll**	560	600	630	700	800	920	582
	15 m/50 ft	890	940	1000	1110	1270	1450	921
5000 1524	**Ground Roll**	600	630	680	760	870		612
	15 m/50 ft	940	1000	1060	1200	1370		968
6000 1829	**Ground Roll**	640	690	730	830	950		653
	15 m/50 ft	1020	1070	1150	1310	1490		1030
7000 2134	**Ground Roll**	700	740	800	920	1040		697
	15 m/50 ft	1090	1160	1260	1440	1640		1097
8000 2438	**Ground Roll**	750	800	880	1010	1150		745
	15 m/50 ft	1180	1260	1380	1580	1800		1171
9000 2743	**Ground Roll**	820	880	980	1110	1270		797
	15 m/50 ft	1270	1370	1530	1750	2010		1248
10000 3048	**Ground Roll**	900	960	1080	1240			857
	15 m/50 ft	1390	1500	1690	1950			1339

Take-Off Distance - Flaps UP - 2100 kg/4630 lb								
Weight: 2100 kg/4630 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 89 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	**ISA**
SL	**Ground Roll**	430	450	480	510	570	650	458
	15 m/50 ft	680	720	760	810	910	1040	729
1000 305	**Ground Roll**	450	480	510	540	620	700	480
	15 m/50 ft	720	760	800	850	970	1110	761
2000 610	**Ground Roll**	480	500	540	580	660	750	503
	15 m/50 ft	760	790	840	910	1040	1180	796
3000 914	**Ground Roll**	510	530	570	620	710	800	527
	15 m/50 ft	800	840	890	970	1110	1260	830
4000 1219	**Ground Roll**	530	570	600	670	760	870	551
	15 m/50 ft	840	880	940	1040	1190	1360	868
5000 1524	**Ground Roll**	570	600	640	720	820		582
	15 m/50 ft	890	940	1000	1130	1280		910
6000 1829	**Ground Roll**	610	650	690	790	900		621
	15 m/50 ft	950	1010	1080	1230	1400		967
7000 2134	**Ground Roll**	660	700	760	870	990		663
	15 m/50 ft	1030	1090	1180	1350	1530		1031
8000 2438	**Ground Roll**	720	760	840	960	1090		708
	15 m/50 ft	1110	1180	1300	1480	1680		1098
9000 2743	**Ground Roll**	780	830	930	1060	1210		759
	15 m/50 ft	1190	1290	1430	1630	1880		1173
10000 3048	**Ground Roll**	850	910	1030	1170			813
	15 m/50 ft	1310	1400	1580	1820			1254

Take-Off Distance - Flaps UP - 1999 kg/4407 lb								
Weight: 1999 kg/4407 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 87 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	410	430	450	480	540	620	434
	15 m/50 ft	610	640	680	720	810	920	652
1000 305	**Ground Roll**	430	450	480	510	580	670	455
	15 m/50 ft	640	670	710	760	860	990	679
2000 610	**Ground Roll**	450	480	510	550	620	710	476
	15 m/50 ft	670	710	750	810	920	1050	709
3000 914	**Ground Roll**	480	510	540	590	670	760	501
	15 m/50 ft	710	750	790	870	990	1120	738
4000 1219	**Ground Roll**	510	540	570	630	720	820	523
	15 m/50 ft	750	790	830	930	1060	1200	771
5000 1524	**Ground Roll**	540	570	610	690	780		550
	15 m/50 ft	790	830	890	1000	1140		809
6000 1829	**Ground Roll**	580	620	660	750	850		589
	15 m/50 ft	850	900	950	1090	1240		859
7000 2134	**Ground Roll**	630	660	720	830	940		629
	15 m/50 ft	920	960	1050	1200	1360		915
8000 2438	**Ground Roll**	680	720	790	910	1030		672
	15 m/50 ft	980	1050	1150	1310	1490		975
9000 2743	**Ground Roll**	730	790	880	1000	1150		717
	15 m/50 ft	1060	1140	1270	1440	1660		1039
10000 3048	**Ground Roll**	800	860	970	1110			772
	15 m/50 ft	1160	1240	1400	1600			1112

Take-Off Distance - Flaps UP- 1900 kg/4189 lb								
Weight: 1900 kg/4189 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 87 KIAS					**Runway:** dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	380	400	430	460	520	590	411
	15 m/50 ft	570	600	640	680	760	870	610
1000 305	**Ground Roll**	410	430	450	480	550	630	430
	15 m/50 ft	600	630	670	720	810	930	639
2000 610	**Ground Roll**	430	450	480	520	590	670	451
	15 m/50 ft	630	670	700	760	860	980	666
3000 914	**Ground Roll**	450	480	510	560	630	720	472
	15 m/50 ft	670	700	740	810	920	1050	694
4000 1219	**Ground Roll**	480	510	540	600	680	780	495
	15 m/50 ft	700	740	780	870	990	1130	726
5000 1524	**Ground Roll**	510	540	570	650	740		520
	15 m/50 ft	740	780	830	940	1070		759
6000 1829	**Ground Roll**	550	580	620	710	810		556
	15 m/50 ft	800	840	900	1020	1160		809
7000 2134	**Ground Roll**	590	630	680	780	880		594
	15 m/50 ft	860	910	980	1120	1270		860
8000 2438	**Ground Roll**	640	680	750	860	970		634
	15 m/50 ft	920	980	1080	1220	1400		914
9000 2743	**Ground Roll**	700	750	830	940	1080		678
	15 m/50 ft	990	1070	1190	1350	1550		974
10000 3048	**Ground Roll**	760	820	920	1050			728
	15 m/50 ft	1090	1160	1310	1500			1045

Take-Off Distance - Flaps UP - 1800 kg/3968 lb								
Weight: 1800 kg/3968 lb					Flaps: T/O			
v_R: 80 KIAS					Power: MAX			
v_{50ft}: 87 KIAS					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		Outside Air Temperature - [°C]/[°F]						ISA
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	360	380	410	430	480	550	387
	15 m/50 ft	520	550	580	620	700	810	557
1000 305	**Ground Roll**	380	400	430	460	520	590	406
	15 m/50 ft	550	580	620	660	750	870	584
2000 610	**Ground Roll**	400	430	450	490	560	630	426
	15 m/50 ft	580	610	650	700	810	920	610
3000 914	**Ground Roll**	430	450	480	530	600	680	445
	15 m/50 ft	610	650	680	760	870	980	637
4000 1219	**Ground Roll**	450	480	510	570	640	730	466
	15 m/50 ft	650	680	730	810	930	1060	668
5000 1524	**Ground Roll**	480	510	540	610	700		492
	15 m/50 ft	690	730	780	880	1000		704
6000 1829	**Ground Roll**	520	550	590	670	760		524
	15 m/50 ft	740	790	840	960	1090		751
7000 2134	**Ground Roll**	560	590	640	730	830		559
	15 m/50 ft	800	850	920	1040	1190		803
8000 2438	**Ground Roll**	600	640	710	810	910		597
	15 m/50 ft	860	920	1010	1150	1300		857
9000 2743	**Ground Roll**	650	710	780	890	1020		638
	15 m/50 ft	930	1000	1110	1260	1450		912
10000 3048	**Ground Roll**	720	770	860	990			686
	15 m/50 ft	1020	1090	1220	1400			977

Take-Off Distances (US/Imperial System)

Take-Off Distance - Normal Procedure - 2300 kg/5071 lb								
Weight:	**2300 kg/5071 lb**				**Flaps:**	**T/O**		
v_R:	**78 KIAS**				**Power:**	**MAX**		
v_{50ft}:	**86 KIAS**				**Runway: dry, paved, level**			
Distances are given in feet [ft]								
Press. Alt.		**Outside Air Temperature - [°C]/[°F]**						
[ft]/[m]		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	**ISA**
SL	**Ground Roll**	1450	1550	1650	1750	2000	2300	1574
	15 m/50 ft	2550	2700	2850	3050	3450	3950	2730
1000 305	**Ground Roll**	1550	1650	1750	1900	2150	2450	1650
	15 m/50 ft	2700	2850	3000	3250	3700	4250	2853
2000 610	**Ground Roll**	1650	1750	1850	2000	2300	2600	1732
	15 m/50 ft	2850	3000	3200	3450	3950	4500	2984
3000 914	**Ground Roll**	1750	1850	1950	2150	2450	2800	1821
	15 m/50 ft	3000	3150	3350	3700	4250	4850	3121
4000 1219	**Ground Roll**	1850	1950	2100	2350	2650	3050	1909
	15 m/50 ft	3150	3350	3550	4000	4550	5250	3268
5000 1524	**Ground Roll**	2000	2100	2250	2550	2900		2011
	15 m/50 ft	3350	3550	3800	4300	4900		3434
6000 1829	**Ground Roll**	2150	2250	2400	2750	3150		2148
	15 m/50 ft	3650	3850	4100	4700	5400		3665
7000 2134	**Ground Roll**	2300	2450	2650	3050	3450		2296
	15 m/50 ft	3900	4150	4500	5200	5900		3912
8000 2438	**Ground Roll**	2500	2650	2950	3350	3800		2455
	15 m/50 ft	4200	4500	5000	5700	6550		4175
9000 2743	**Ground Roll**	2700	2900	3250	3700	4250		2631
	15 m/50 ft	4550	4950	5500	6350	7400		4458
10000 3048	**Ground Roll**	2950	3200	3600	4150			2827
	15 m/50 ft	5000	5400	6150	7100			4803

Take-Off Distance - Normal Procedure - 2200 kg/4850 lb								
Weight: 2200 kg/4850 lb					Flaps: T/O			
v_R: 78 KIAS					Power: MAX			
v_{50ft}: 86 KIAS					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		Outside Air Temperature - [°C]/[°F]						ISA
		0/30	10/50	20/70	30/90	40/110	50/130	
SL	Ground Roll	1400	1500	1600	1700	1900	2150	1499
	15 m/50 ft	2400	2550	2700	2900	3250	3700	2574
1000	Ground Roll	1500	1550	1650	1800	2050	2350	1570
305	15 m/50 ft	2550	2650	2850	3050	3450	4000	2690
2000	Ground Roll	1550	1650	1750	1900	2200	2500	1653
610	15 m/50 ft	2700	2800	3000	3250	3700	4250	2806
3000	Ground Roll	1650	1750	1850	2050	2350	2650	1729
914	15 m/50 ft	2800	3000	3150	3500	3950	4550	2936
4000	Ground Roll	1750	1850	2000	2200	2550	2900	1819
1219	15 m/50 ft	3000	3150	3350	3750	4250	4900	3076
5000	Ground Roll	1900	2000	2150	2400	2750		1916
1524	15 m/50 ft	3150	3350	3550	4050	4600		3227
6000	Ground Roll	2050	2150	2300	2600	3000		2046
1829	15 m/50 ft	3400	3600	3850	4400	5050		3439
7000	Ground Roll	2200	2350	2550	2900	3300		2187
2134	15 m/50 ft	3650	3900	4250	4850	5550		3667
8000	Ground Roll	2350	2550	2800	3200	3650		2339
2438	15 m/50 ft	3950	4200	4650	5350	6100		3909
9000	Ground Roll	2550	2800	3100	3500	4050		2499
2743	15 m/50 ft	4300	4650	5150	5900	6850		4181
10000	Ground Roll	2800	3050	3400	3950			2688
3048	15 m/50 ft	4700	5050	5750	6650			4495

Take-Off Distance - Normal Procedure - 2100 kg/4630 lb								
Weight: 2100 kg/4630 lb					**Flaps:** T/O			
v_R: 78 KIAS					**Power:** MAX			
v_{50ft}: 86 KIAS					**Runway:** dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1350	1400	1500	1600	1800	2050	1424
	15 m/50 ft	2250	2400	2550	2700	3050	3500	2424
1000	**Ground Roll**	1400	1500	1600	1700	1950	2200	1496
305	**15 m/50 ft**	2400	2500	2650	2850	3250	3750	2526
2000	**Ground Roll**	1500	1600	1700	1800	2050	2350	1567
610	**15 m/50 ft**	2500	2650	2800	3050	3450	4000	2642
3000	**Ground Roll**	1600	1700	1800	1950	2250	2550	1644
914	**15 m/50 ft**	2650	2800	2950	3250	3700	4250	2759
4000	**Ground Roll**	1700	1800	1900	2100	2400	2750	1729
1219	**15 m/50 ft**	2800	2950	3150	3500	4000	4600	2884
5000	**Ground Roll**	1800	1900	2000	2300	2600		1820
1524	**15 m/50 ft**	2950	3150	3350	3800	4300		3035
6000	**Ground Roll**	1950	2050	2200	2500	2850		1943
1829	**15 m/50 ft**	3200	3400	3600	4150	4700		3229
7000	**Ground Roll**	2100	2200	2400	2750	3100		2076
2134	**15 m/50 ft**	3450	3650	3950	4550	5200		3437
8000	**Ground Roll**	2250	2400	2650	3000	3450		2213
2438	**15 m/50 ft**	3700	3950	4350	5000	5700		3668
9000	**Ground Roll**	2450	2650	2950	3350	3850		2374
2743	**15 m/50 ft**	4000	4350	4850	5550	6400		3920
10000	**Ground Roll**	2650	2900	3250	3700			2555
3048	**15 m/50 ft**	4000	4750	5350	6200			4205

Take-Off Distance - Normal Procedure - 1999 kg/4407 lb								
Weight: 1999 kg/4407 lb					Flaps: T/O			
v_R: 76 KIAS					Power: MAX			
v_{50ft}: 83 KIAS					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		Outside Air Temperature - [°C]/[°F]						ISA
		0/30	10/50	20/70	30/90	40/110	50/130	
SL	Ground Roll	1200	1250	1350	1450	1600	1850	1263
	15 m/50 ft	1950	2050	2200	2350	2600	3000	2093
1000 305	Ground Roll	1250	1350	1400	1500	1700	1950	1328
	15 m/50 ft	2050	2150	2300	2450	2800	3200	2179
2000 610	Ground Roll	1350	1400	1500	1600	1850	2100	1392
	15 m/50 ft	2150	2300	2400	2650	3000	3400	2277
3000 914	Ground Roll	1400	1500	1600	1750	2000	2250	1456
	15 m/50 ft	2300	2400	2550	2800	3200	3650	2383
4000 1219	Ground Roll	1500	1600	1700	1900	2150	2450	1534
	15 m/50 ft	2400	2550	2700	3000	3450	3950	2490
5000 1524	Ground Roll	1600	1700	1800	2050	2300		1617
	15 m/50 ft	2550	2700	2900	3250	3700		2614
6000 1829	Ground Roll	1700	1800	1950	2200	2500		1722
	15 m/50 ft	2750	2900	3100	3550	4050		2781
7000 2134	Ground Roll	1850	1950	2150	2450	2750		1845
	15 m/50 ft	2950	3150	3400	3900	4450		2962
8000 2438	Ground Roll	2000	2150	2350	2700	3050		1970
	15 m/50 ft	3200	3400	3750	4250	4850		3156
9000 2743	Ground Roll	2150	2350	2600	2950	3400		2104
	15 m/50 ft	3450	3700	4150	4750	5450		3361
10000 3048	Ground Roll	2350	2550	2850	3300			2266
	15 m/50 ft	3750	4050	4550	5250			3608

Take-Off Distance - Normal Procedure - 1900 kg/4189 lb								
Weight: 1900 kg/4189 lb					Flaps: T/O			
v_R: 76 KIAS					Power: MAX			
v_{50ft}: 83 KIAS					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		Outside Air Temperature - [°C]/[°F]						ISA
		0/30	10/50	20/70	30/90	40/110	50/130	
SL	Ground Roll	1100	1200	1250	1350	1500	1750	1199
	15 m/50 ft	1750	1850	2000	2150	2450	2800	1888
1000 / 305	Ground Roll	1200	1250	1350	1450	1650	1850	1253
	15 m/50 ft	1850	1950	2100	2300	2650	3000	1979
2000 / 610	Ground Roll	1250	1350	1400	1550	1750	2000	1318
	15 m/50 ft	2000	2100	2250	2450	2800	3200	2086
3000 / 914	Ground Roll	1350	1400	1500	1650	1850	2150	1377
	15 m/50 ft	2100	2250	2350	2650	3000	3400	2191
4000 / 1219	Ground Roll	1400	1500	1600	1750	2000	2300	1449
	15 m/50 ft	2250	2350	2550	2850	3200	3700	2306
5000 / 1524	Ground Roll	1500	1600	1700	1900	2200		1526
	15 m/50 ft	2400	2550	2700	3050	3450		2445
6000 / 1829	Ground Roll	1600	1700	1850	2100	2400		1632
	15 m/50 ft	2600	2750	2900	3300	3750		2603
7000 / 2134	Ground Roll	1750	1850	2000	2300	2600		1740
	15 m/50 ft	2800	2950	3200	3650	4150		2774
8000 / 2438	Ground Roll	1900	2000	2200	2550	2900		1858
	15 m/50 ft	3000	3200	3500	4000	4550		2958
9000 / 2743	Ground Roll	2050	2200	2450	2800	3200		1992
	15 m/50 ft	3250	3500	3850	4400	5100		3145
10000 / 3048	Ground Roll	2250	2400	2700	3100			2140
	15 m/50 ft	3550	3800	4250	4900			3364

Take-Off Distance - Normal Procedure - 1800 kg/3968 lb								
Weight: 1800 kg/3968 lb					**Flaps:** T/O			
v_R: 76 KIAS					**Power:** MAX			
v_{50ft}: 83 KIAS					**Runway:** dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1050	1100	1200	1250	1450	1650	1129
	15 m/50 ft	1600	1700	1800	1950	2200	2550	1712
1000 305	**Ground Roll**	1100	1200	1250	1350	1550	1750	1183
	15 m/50 ft	1700	1800	1900	2050	2350	2750	1796
2000 610	**Ground Roll**	1200	1250	1350	1450	1650	1850	1243
	15 m/50 ft	1800	1900	2000	2200	2550	2900	1888
3000 914	**Ground Roll**	1250	1350	1400	1550	1750	2000	1303
	15 m/50 ft	1900	2000	2150	2350	2700	3150	1979
4000 1219	**Ground Roll**	1350	1400	1500	1650	1900	2150	1363
	15 m/50 ft	2000	2150	2250	2550	2950	3450	2070
5000 1524	**Ground Roll**	1400	1500	1600	1800	2050		1435
	15 m/50 ft	2150	2250	2450	2800	3250		2185
6000 1829	**Ground Roll**	1550	1600	1750	1950	2250		1533
	15 m/50 ft	2300	2450	2650	3100	3500		2338
7000 2134	**Ground Roll**	1650	1750	1900	2150	2450		1642
	15 m/50 ft	2500	2650	2950	3400	3850		2505
8000 2438	**Ground Roll**	1800	1900	2100	2400	2700		1753
	15 m/50 ft	2750	2950	3250	3750	4250		2692
9000 2743	**Ground Roll**	1950	2100	2300	2650	3000		1872
	15 m/50 ft	3000	3250	3600	4100	4750		2901
10000 3048	**Ground Roll**	2100	2250	2550	2950			2012
	15 m/50 ft	3300	3550	4000	4550			3145

Take-Off Distance - Flaps UP - 2300 kg/5071 lb								
Weight: 2300 kg/5071 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 89 KIAS					**Runway:** dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1550	1650	1750	1850	2100	2400	1660
	15 m/50 ft	2550	2650	2800	3000	3400	3850	2696
1000 305	**Ground Roll**	1650	1750	1850	1950	2250	2550	1739
	15 m/50 ft	2650	2800	2950	3150	3600	4150	2813
2000 610	**Ground Roll**	1750	1850	1950	2100	2400	2750	1823
	15 m/50 ft	2800	2950	3100	3400	3850	4400	2936
3000 914	**Ground Roll**	1850	1950	2050	2250	2600	2950	1914
	15 m/50 ft	2950	3100	3300	3600	4100	4700	3068
4000 1219	**Ground Roll**	1950	2050	2200	2450	2800	3150	2005
	15 m/50 ft	3100	3300	3500	3900	4450	5100	3217
5000 1524	**Ground Roll**	2050	2200	2350	2650	3000		2110
	15 m/50 ft	3300	3500	3700	4200	4800		3369
6000 1829	**Ground Roll**	2250	2350	2550	2900	3300		2252
	15 m/50 ft	3550	3750	4000	4600	5250		3592
7000 2134	**Ground Roll**	2400	2550	2800	3150	3600		2405
	15 m/50 ft	3800	4050	4400	5050	5750		3822
8000 2438	**Ground Roll**	2600	2800	3050	3500	3950		2568
	15 m/50 ft	4100	4400	4850	5550	6300		4084
9000 2743	**Ground Roll**	2850	3050	3400	3850	4400		2749
	15 m/50 ft	4450	4800	5350	6100	7050		4359
10000 3048	**Ground Roll**	3100	3350	3750	4300			2960
	15 m/50 ft	4900	5250	5900	6850			4677

Take-Off Distance - Flaps UP - 2200 kg/4850 lb								
Weight: 2200 kg/4850 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 89 KIAS					**Runway:** dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1500	1550	1650	1750	2000	2250	1584
	15 m/50 ft	2400	2500	2650	2850	3200	3650	2544
1000 305	**Ground Roll**	1550	1650	1750	1900	2150	2450	1657
	15 m/50 ft	2500	2650	2800	3000	3400	3900	2654
2000 610	**Ground Roll**	1650	1750	1850	2000	2300	2600	1736
	15 m/50 ft	2650	2800	2950	3200	3650	4150	2771
3000 914	**Ground Roll**	1750	1850	1950	2150	2450	2800	1821
	15 m/50 ft	2800	2950	3100	3400	3900	4400	2896
4000 1219	**Ground Roll**	1850	1950	2100	2300	2650	3000	1907
	15 m/50 ft	2950	3100	3300	3650	4150	4750	3021
5000 1524	**Ground Roll**	2000	2100	2250	2500	2850		2006
	15 m/50 ft	3100	3300	3500	3950	4500		3173
6000 1829	**Ground Roll**	2100	2250	2400	2750	3150		2140
	15 m/50 ft	3350	3550	3750	4300	4900		3378
7000 2134	**Ground Roll**	2300	2450	2650	3000	3450		2286
	15 m/50 ft	3600	3800	4150	4700	5400		3597
8000 2438	**Ground Roll**	2500	2650	2900	3300	3750		2442
	15 m/50 ft	3900	4150	4550	5200	5900		3839
9000 2743	**Ground Roll**	2700	2900	3200	3650	4200		2615
	15 m/50 ft	4200	4500	5000	5750	6600		4093
10000 3048	**Ground Roll**	2950	3150	3550	4050			2810
	15 m/50 ft	4600	4950	5550	6400			4391

Take-Off Distance - Flaps UP - 2100 kg/4630 lb								
Weight: 2100 kg/4630 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 89 KIAS					**Runway:** dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1400	1500	1600	1700	1900	2150	1501
	15 m/50 ft	2250	2350	2500	2650	3000	3400	2391
1000 305	**Ground Roll**	1500	1550	1650	1800	2050	2300	1575
	15 m/50 ft	2350	2500	2650	2800	3200	3650	2494
2000 610	**Ground Roll**	1550	1650	1750	1900	2150	2450	1648
	15 m/50 ft	2500	2600	2750	3000	3400	3900	2612
3000 914	**Ground Roll**	1650	1750	1850	2050	2350	2650	1728
	15 m/50 ft	2600	2750	2900	3200	3650	4150	2722
4000 1219	**Ground Roll**	1750	1850	2000	2200	2500	2850	1808
	15 m/50 ft	2750	2900	3100	3450	3900	4500	2848
5000 1524	**Ground Roll**	1900	2000	2100	2400	2700		1909
	15 m/50 ft	2950	3100	3300	3700	4200		2985
6000 1829	**Ground Roll**	2000	2150	2300	2600	2950		2036
	15 m/50 ft	3150	3300	3550	4050	4600		3172
7000 2134	**Ground Roll**	2200	2300	2500	2850	3250		2174
	15 m/50 ft	3400	3550	3900	4450	5050		3380
8000 2438	**Ground Roll**	2350	2500	2750	3150	3600		2323
	15 m/50 ft	3650	3850	4250	4850	5550		3603
9000 2743	**Ground Roll**	2550	2750	3050	3450	4000		2488
	15 m/50 ft	3950	4250	4700	5350	6200		3846
10000 3048	**Ground Roll**	2800	3000	3350	3850			2667
	15 m/50 ft	4300	4600	5200	5950			4113

Take-Off Distance - Flaps UP - 1999 kg/4407 lb								
Weight: 1999 kg/4407 lb					**Flaps:** UP			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 87 KIAS					**Runway:** dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1350	1400	1500	1600	1800	2050	1424
	15 m/50 ft	2000	2100	2250	2400	2650	3050	2138
1000 305	**Ground Roll**	1400	1500	1600	1700	1950	2200	1493
	15 m/50 ft	2100	2200	2350	2500	2850	3250	2225
2000 610	**Ground Roll**	1500	1600	1650	1800	2050	2350	1560
	15 m/50 ft	2200	2350	2450	2650	3050	3450	2326
3000 914	**Ground Roll**	1600	1650	1750	1950	2200	2500	1642
	15 m/50 ft	2350	2450	2600	2850	3250	3700	2419
4000 1219	**Ground Roll**	1700	1750	1900	2100	2400	2700	1716
	15 m/50 ft	2450	2600	2750	3050	3500	3950	2528
5000 1524	**Ground Roll**	1800	1900	2000	2250	2550		1803
	15 m/50 ft	2600	2750	2950	3300	3750		2654
6000 1829	**Ground Roll**	1900	2050	2150	2450	2800		1930
	15 m/50 ft	2800	2950	3150	3600	4050		2818
7000 2134	**Ground Roll**	2050	2200	2400	2700	3100		2061
	15 m/50 ft	3000	3150	3450	3950	4450		3002
8000 2438	**Ground Roll**	2250	2400	2600	3000	3400		2202
	15 m/50 ft	3250	3450	3800	4300	4900		3199
9000 2743	**Ground Roll**	2400	2600	2900	3300	3750		2352
	15 m/50 ft	3500	3750	4150	4750	5450		3406
10000 3048	**Ground Roll**	2650	2850	3200	3650			2532
	15 m/50 ft	3800	4100	4600	5250			3648

Take-Off Distance - Flaps UP- 1900 kg/4189 lb								
Weight:	**1900 kg/4189 lb**				**Flaps:**	**UP**		
v_R:	**80 KIAS**				**Power:**	**MAX**		
v_{50ft}:	**87 KIAS**				**Runway:**	**dry, paved, level**		
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1250	1350	1400	1500	1700	1950	1347
	15 m/50 ft	1900	1950	2100	2250	2500	2850	2001
1000 / 305	**Ground Roll**	1350	1400	1500	1600	1800	2050	1409
	15 m/50 ft	2000	2100	2200	2350	2650	3050	2096
2000 / 610	**Ground Roll**	1400	1500	1600	1700	1950	2200	1478
	15 m/50 ft	2100	2200	2300	2500	2850	3250	2183
3000 / 914	**Ground Roll**	1500	1600	1700	1850	2100	2350	1547
	15 m/50 ft	2200	2300	2450	2700	3050	3450	2277
4000 / 1219	**Ground Roll**	1600	1650	1800	2000	2250	2550	1623
	15 m/50 ft	2300	2450	2600	2850	3250	3700	2380
5000 / 1524	**Ground Roll**	1700	1800	1900	2150	2450		1704
	15 m/50 ft	2450	2600	2750	3100	3500		2491
6000 / 1829	**Ground Roll**	1800	1900	2050	2350	2650		1824
	15 m/50 ft	2650	2750	2950	3350	3800		2653
7000 / 2134	**Ground Roll**	1950	2050	2250	2550	2900		1947
	15 m/50 ft	2800	3000	3250	3700	4200		2819
8000 / 2438	**Ground Roll**	2100	2250	2450	2800	3200		2080
	15 m/50 ft	3050	3250	3550	4050	4600		2997
9000 / 2743	**Ground Roll**	2300	2450	2750	3100	3550		2223
	15 m/50 ft	3250	3550	3900	4450	5100		3195
10000 / 3048	**Ground Roll**	2500	2700	3000	3450			2387
	15 m/50 ft	3550	3850	4300	4950			3426

Take-Off Distance - Flaps UP - 1800 kg/3968 lb								
Weight: 1800 kg/3968 lb					**Flaps:** T/O			
v_R: 80 KIAS					**Power:** MAX			
v_{50ft}: 87 KIAS					**Runway:** dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1200	1250	1350	1450	1600	1850	1268
	15 m/50 ft	1700	1800	1900	2050	2300	2650	1825
1000	**Ground Roll**	1250	1350	1400	1500	1700	1950	1332
305	**15 m/50 ft**	1800	1900	2050	2150	2500	2850	1913
2000	**Ground Roll**	1350	1400	1500	1600	1850	2100	1396
610	**15 m/50 ft**	1900	2000	2150	2300	2650	3050	2001
3000	**Ground Roll**	1400	1500	1600	1750	1950	2250	1459
914	**15 m/50 ft**	2050	2150	2250	2500	2850	3250	2087
4000	**Ground Roll**	1500	1600	1700	1850	2100	2400	1529
1219	**15 m/50 ft**	2150	2250	2400	2700	3050	3500	2190
5000	**Ground Roll**	1600	1700	1800	2000	2300		1612
1524	**15 m/50 ft**	2250	2400	2550	2900	3300		2310
6000	**Ground Roll**	1700	1800	1950	2200	2500		1717
1829	**15 m/50 ft**	2450	2600	2750	3150	3550		2462
7000	**Ground Roll**	1850	1950	2100	2400	2750		1832
2134	**15 m/50 ft**	2650	2800	3000	3450	3900		2634
8000	**Ground Roll**	2000	2100	2350	2650	3000		1958
2438	**15 m/50 ft**	2850	3000	3300	3800	4300		2812
9000	**Ground Roll**	2150	2300	2550	2950	3350		2092
2743	**15 m/50 ft**	3050	3300	3650	4150	4750		2990
10000	**Ground Roll**	2350	2550	2850	3250			2249
3048	**15 m/50 ft**	3350	3600	4000	4600			3204

5.3.7 CLIMB PERFORMANCE - TAKE-OFF CLIMB

Conditions:

- Power lever . . . . both 95%
- Flaps . . . . UP or T/O
- Landing gear . . . . retracted
- Airspeed . . . . v_Y

The climb performance tables show the rate of climb. The gradient of climb can be calculated using the following formula:

$$Gradient\ [\%] = \frac{ROC\ [fpm]}{TAS\ [KTAS]} \cdot 0.98$$

NOTE

Rate of climb at MTOM (2300 kg/5071 lb) with a power setting of 100% at MSL and ISA conditions:

- 1075 ft/min (5.5 m/s) with flaps UP

- 1018 ft/min (5.2 m/s) with flaps T/O.

Rate of climb at 1999 kg/4407 lb with a power setting of 100% at MSL and ISA conditions:

- 1317 ft/min (6.7 m/s) with flaps UP

- 1250 ft/min (6.4 m/s) with flaps T/O.

Take-Off Climb - Flaps T/O

Flaps: T/O — Power: 95%

v_Y: 86 KIAS — Gear: retracted

Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 / -4	-10 / 14	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104	50 / 122	
2300/5071	SL		990	980	980	970	960	950	910	810	965
	2000	610	970	960	950	940	930	930	860	760	943
	4000	1219	940	940	930	920	910	880	800	710	919
	6000	1829	920	910	900	890	880	830	740		895
	8000	2438	890	880	870	860	840	760	660		870
	10000	3048	860	850	830	820	770	670			839
	12000	3658	820	810	790	760	660	560			806
	14000	4267	750	730	690	630	510	400			733
	16000	4877	650	630	590	490	390				642
	18000	5486	540	510	470	370	270				540
	20000	6096	440	410	350	240					447
2200/4850	SL		1060	1050	1050	1040	1030	1030	980	870	1037
	2000	610	1040	1030	1020	1020	1010	1000	920	820	1015
	4000	1219	1010	1010	1000	990	980	950	870	770	990
	6000	1829	990	980	970	960	950	900	810		966
	8000	2438	960	950	940	930	910	830	730		941
	10000	3048	930	920	900	890	830	730			910
	12000	3658	890	880	860	820	730	620			876
	14000	4267	820	790	760	690	570	450			801
	16000	4877	720	690	650	550	440				707
	18000	5486	600	570	530	420	320				601
	20000	6096	500	470	410	290					506

Take-Off Climb - Flaps T/O

Flaps: T/O | **Power: 95%**

v_Y: 86 KIAS | **Gear: retracted**

Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
2100/4630	**SL**		1130	1130	1120	1120	1110	1100	1050	940	1114
	2000	610	1120	1110	1100	1090	1080	1080	1000	890	1092
	4000	1219	1090	1080	1070	1060	1060	1030	940	830	1067
	6000	1829	1060	1050	1050	1040	1030	970	880		1043
	8000	2438	1040	1030	1020	1000	980	900	790		1017
	10000	3048	1010	990	980	960	910	800			986
	12000	3658	970	950	930	900	800	680			952
	14000	4267	890	870	830	760	630	510			874
	16000	4877	790	760	720	610	490				777
	18000	5486	670	640	600	480	370				667
	20000	6096	560	530	470	340					569

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

Take-Off Climb - Flaps T/O											
Flaps: T/O									**Power: 95%**		
v_Y: 83 KIAS									**Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
1999/4407	**SL**		1210	1200	1200	1190	1190	1180	1130	1010	1193
	2000	610	1190	1180	1180	1170	1160	1150	1070	960	1172
	4000	1219	1170	1160	1150	1140	1130	1100	1010	900	1146
	6000	1829	1140	1130	1120	1110	1100	1040	950		1120
	8000	2438	1110	1100	1090	1080	1060	970	860		1092
	10000	3048	1080	1070	1060	1040	980	870			1063
	12000	3658	1050	1030	1010	980	870	740			1030
	14000	4267	970	940	910	830	700	580			950
	16000	4877	860	830	790	690	560				851
	18000	5486	740	720	670	550	430				741
	20000	6096	630	610	540	410					644
1900/4189	**SL**		1290	1290	1280	1280	1280	1270	1210	1090	1278
	2000	610	1270	1270	1270	1260	1250	1240	1150	1030	1257
	4000	1219	1250	1250	1240	1230	1220	1190	1090	970	1230
	6000	1829	1230	1220	1210	1200	1190	1120	1020		1204
	8000	2438	1200	1190	1170	1160	1150	1050	930		1176
	10000	3048	1160	1150	1140	1130	1060	940			1147
	12000	3658	1130	1110	1090	1060	940	810			1113
	14000	4267	1050	1020	980	910	770	630			1029
	16000	4877	930	910	870	750	620				926
	18000	5486	810	790	740	610	490				812
	20000	6096	700	680	600	460					711

Take-Off Climb - Flaps T/O											
Flaps: T/O									**Power: 95%**		
v_Y: 83 KIAS									**Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
1800/3968	**SL**		1380	1380	1380	1370	1370	1360	1300	1170	1371
	2000	610	1370	1360	1360	1350	1340	1330	1240	1110	1349
	4000	1219	1350	1340	1330	1320	1310	1280	1170	1040	1322
	6000	1829	1320	1310	1300	1290	1280	1210	1100		1295
	8000	2438	1290	1280	1270	1260	1240	1130	1000		1266
	10000	3048	1250	1240	1230	1220	1150	1020			1237
	12000	3658	1220	1200	1180	1140	1020	880			1202
	14000	4267	1130	1110	1070	990	840	700			1115
	16000	4877	1020	990	950	830	690				1008
	18000	5486	890	860	810	680	540				889
	20000	6096	770	750	670	520					783
For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.											

Take-Off Climb - Flaps UP

Flaps: UP — **Power: 95%**

v_Y: 89 KIAS — **Gear: retracted**

Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min] Outside Air Temperature - [°C]/[°F] -20 / -4	-10 / 14	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104	50 / 122	ISA
2300/5071	SL		1040	1040	1030	1020	1020	1010	960	860	1019
	2000	610	1020	1010	1010	1000	990	990	920	820	1000
	4000	1219	1000	990	980	980	970	940	860	760	979
	6000	1829	980	970	960	950	940	890	800		958
	8000	2438	950	940	930	920	900	820	720		931
	10000	3048	920	910	900	880	830	730			901
	12000	3658	890	870	860	820	730	620			872
	14000	4267	810	790	760	690	570	460			801
	16000	4877	720	690	650	550	450				708
	18000	5486	600	580	540	430	330				604
	20000	6096	500	480	420	300					513
2200/4850	SL		1110	1110	1100	1100	1090	1080	1030	930	1092
	2000	610	1090	1090	1080	1070	1070	1060	980	880	1073
	4000	1219	1070	1060	1060	1050	1040	1020	930	820	1052
	6000	1829	1050	1040	1030	1020	1010	960	870		1031
	8000	2438	1020	1010	1000	990	970	890	790		1003
	10000	3048	990	980	970	960	900	800			974
	12000	3658	960	950	930	890	790	680			944
	14000	4267	880	860	830	760	630	510			870
	16000	4877	780	760	720	610	500				775
	18000	5486	670	640	600	490	380				667
	20000	6096	560	540	480	360					573

Take-Off Climb - Flaps UP											
Flaps: UP									Power: 95%		
v_Y: 89 KIAS									Gear: retracted		
Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
2100/4630	SL		1190	1190	1180	1170	1170	1160	1110	1000	1171
	2000	610	1170	1160	1160	1150	1150	1140	1060	950	1152
	4000	1219	1150	1140	1140	1130	1120	1090	1000	890	1130
	6000	1829	1130	1120	1110	1100	1090	1030	940		1109
	8000	2438	1100	1090	1080	1070	1050	960	850		1081
	10000	3048	1070	1060	1050	1030	980	860			1052
	12000	3658	1040	1020	1010	970	870	740			1021
	14000	4267	960	940	900	830	700	570			945
	16000	4877	860	830	790	680	560				846
	18000	5486	730	710	670	550	430				734
	20000	6096	630	610	540	410					637
For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.											

Take-Off Climb - Flaps UP											
Flaps: UP									**Power: 95%**		
v_Y: 87 KIAS									**Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
1999/4407	**SL**		1270	1270	1260	1260	1250	1240	1190	1070	1254
	2000	610	1250	1250	1240	1230	1230	1220	1130	1020	1233
	4000	1219	1230	1220	1220	1210	1200	1170	1080	960	1210
	6000	1829	1210	1200	1190	1180	1170	1110	1010		1188
	8000	2438	1180	1170	1160	1150	1130	1040	920		1164
	10000	3048	1150	1140	1130	1110	1050	930			1133
	12000	3658	1120	1100	1080	1050	940	810			1101
	14000	4267	1040	1020	980	910	770	630			1022
	16000	4877	930	910	860	750	620				924
	18000	5486	810	780	740	620	490				809
	20000	6096	700	680	610	470					709
1900/4189	**SL**		1360	1350	1350	1340	1340	1330	1270	1150	1340
	2000	610	1340	1330	1330	1320	1310	1310	1220	1090	1320
	4000	1219	1320	1310	1300	1290	1290	1260	1150	1030	1297
	6000	1829	1290	1280	1280	1270	1260	1190	1080		1274
	8000	2438	1270	1260	1250	1240	1220	1120	990		1250
	10000	3048	1240	1220	1210	1200	1130	1010			1218
	12000	3658	1200	1190	1170	1130	1010	880			1185
	14000	4267	1120	1100	1060	980	830	690			1103
	16000	4877	1010	980	940	820	680				1001
	18000	5486	880	850	810	680	550				881
	20000	6096	770	750	670	530					778

Take-Off Climb - Flaps UP											
Flaps: UP									Power: 95%		
v_Y: 87 KIAS									Gear: retracted		
Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
1800/3968	SL		1450	1450	1440	1440	1430	1430	1360	1230	1435
	2000	610	1430	1430	1420	1410	1410	1400	1300	1170	1414
	4000	1219	1410	1400	1400	1390	1380	1350	1240	1110	1390
	6000	1829	1380	1380	1370	1360	1350	1280	1170		1368
	8000	2438	1360	1350	1340	1330	1310	1200	1070		1343
	10000	3048	1330	1320	1300	1290	1220	1090			1310
	12000	3658	1290	1280	1260	1220	1100	950			1276
	14000	4267	1210	1190	1150	1060	910	760			1192
	16000	4877	1090	1070	1020	890	750				1085
	18000	5486	960	930	880	750	610				960
	20000	6096	840	820	740	590					851

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

5.3.8 CLIMB PERFORMANCE - CRUISE CLIMB

Conditions:

- Power lever . . . . both 95%
- Flaps . . . . UP
- Landing gear . . . . retracted
- Airspeed . . . . according table

The climb performance tables show the rate of climb. The gradient of climb can be calculated using the following formula:

$$Gradient\ [\%] = \frac{ROC\ [fpm]}{TAS\ [KTAS]} \cdot 0.98$$

Cruise Climb

Flaps: UP — **Power: 95%**

v_{CLIMB}: 96 KIAS — **Gear: retracted**

Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
2300/5071	**SL**		1050	1040	1040	1030	1030	1020	970	870	1028
	2000	610	1030	1020	1020	1010	1000	990	920	820	1009
	4000	1219	1010	1000	990	980	970	950	860	760	985
	6000	1829	980	970	960	950	940	890	810		961
	8000	2438	960	940	930	920	910	830	720		935
	10000	3048	930	910	900	890	830	730			909
	12000	3658	890	880	860	820	730	610			877
	14000	4267	820	790	760	690	570	450			799
	16000	4877	710	690	640	540	430				702
	18000	5486	590	570	520	420	310				594
	20000	6096	490	470	400	280					498
2200/4850	**SL**		1120	1110	1110	1100	1100	1090	1040	930	1100
	2000	610	1100	1090	1090	1080	1070	1060	990	880	1080
	4000	1219	1080	1070	1060	1050	1050	1020	930	820	1056
	6000	1829	1050	1040	1040	1020	1020	960	870		1032
	8000	2438	1030	1010	1000	1000	980	890	780		1006
	10000	3048	1000	990	970	960	900	790			979
	12000	3658	960	950	930	890	790	670			947
	14000	4267	880	860	820	750	620	500			867
	16000	4877	770	750	710	600	480				766
	18000	5486	650	630	580	470	360				654
	20000	6096	540	520	460	330					555

Cruise Climb											
Flaps: UP **v_{CLIMB}: 96 KIAS**									**Power: 95%** **Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
2100/4630	**SL**		1200	1190	1180	1180	1170	1170	1110	1000	1177
	2000	610	1180	1170	1170	1160	1150	1140	1060	950	1158
	4000	1219	1160	1150	1140	1130	1120	1090	1000	880	1133
	6000	1829	1130	1120	1110	1100	1090	1030	940		1108
	8000	2438	1100	1090	1080	1070	1050	960	850		1082
	10000	3048	1070	1060	1050	1040	970	860			1055
	12000	3658	1040	1020	1000	970	860	730			1022
	14000	4267	960	930	890	820	680	550			939
	16000	4877	840	820	770	660	540				835
	18000	5486	720	690	650	530	410				719
	20000	6096	600	580	510	380					616

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

Cruise Climb											
Flaps: UP									**Power: 95%**		
v_{CLIMB}: 93 KIAS									**Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
1999/4407	**SL**		1280	1270	1270	1260	1260	1250	1200	1080	1261
	2000	610	1260	1250	1250	1240	1240	1230	1140	1020	1242
	4000	1219	1240	1230	1230	1220	1210	1180	1080	960	1220
	6000	1829	1220	1210	1200	1190	1180	1110	1010		1194
	8000	2438	1190	1180	1170	1160	1140	1040	930		1167
	10000	3048	1160	1140	1130	1120	1060	940			1138
	12000	3658	1120	1110	1090	1050	940	800			1110
	14000	4267	1040	1020	980	900	760	620			1024
	16000	4877	930	900	850	740	610				917
	18000	5486	800	770	730	600	470				799
	20000	6096	680	660	590	450					695
1900/4189	**SL**		1360	1360	1350	1350	1340	1340	1280	1150	1346
	2000	610	1340	1340	1330	1330	1320	1310	1220	1090	1327
	4000	1219	1320	1320	1310	1300	1290	1260	1150	1030	1305
	6000	1829	1300	1290	1280	1270	1260	1200	1090		1279
	8000	2438	1270	1260	1250	1240	1220	1120	1000		1250
	10000	3048	1240	1230	1220	1210	1140	1010			1221
	12000	3658	1200	1190	1170	1130	1010	870			1192
	14000	4267	1120	1100	1060	970	820	680			1103
	16000	4877	1000	970	930	810	670				991
	18000	5486	870	840	790	660	530				868
	20000	6096	750	730	650	500					761

Cruise Climb											
Flaps: UP									**Power: 95%**		
v_{CLIMB}: 93 KIAS									**Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
1800/3968	**SL**		1460	1450	1450	1440	1440	1430	1370	1230	1439
	2000	610	1440	1430	1430	1420	1420	1410	1310	1170	1420
	4000	1219	1410	1410	1400	1390	1390	1350	1240	1100	1398
	6000	1829	1390	1380	1370	1360	1350	1280	1170		1370
	8000	2438	1360	1350	1340	1330	1310	1200	1070		1341
	10000	3048	1330	1320	1310	1300	1220	1090			1312
	12000	3658	1290	1280	1260	1220	1090	940			1282
	14000	4267	1210	1180	1140	1050	890	740			1189
	16000	4877	1080	1050	1010	880	730				1072
	18000	5486	940	920	860	720	580				943
	20000	6096	820	800	710	560					831

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

5.3.9 ONE ENGINE INOPERATIVE CLIMB PERFORMANCE

Conditions:

- Remaining engine . . . . 95% load
- Dead engine . . . . feathered and secured
- Flaps . . . . UP
- Landing gear . . . . retracted
- Airspeed . . . . v_{YSE}
- Sideslip . . . . one ball out, max. 5° bank

NOTE

With respect to handling and performance, the left-hand engine (pilots view) is considered the "critical" engine.

The climb performance tables show the rate of climb. The gradient of climb can be calculated using the following formula:

$$Gradient\,[\%] = \frac{ROC\,[fpm]}{TAS\,[KTAS]} \cdot 0.98$$

One Engine Inoperative Climb

Flaps: UP — Power: 95%

v_{YSE}: 89 KIAS — Gear: retracted

Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 / -4	-10 / 14	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104	50 / 122	
2300/5071	SL		200	190	180	170	160	150	130	95	163
	2000	610	180	170	160	145	135	125	105	70	146
	4000	1219	160	145	135	125	115	100	75	40	128
	6000	1829	135	125	115	100	90	70	40		110
	8000	2438	115	100	85	75	60	35	0		88
	10000	3048	85	70	60	45	20	-15			65
	12000	3658	55	40	25	0	-35	-75			41
	14000	4267	10	-10	-35	-70	-120	-160			-5
	16000	4877	-55	-75	-105	-145	-190				-61
	18000	5486	-125	-145	-175	-215	-255				-124
	20000	6096	-190	-210	-240	-285					-181
2200/4850	SL		240	230	220	210	200	190	170	130	204
	2000	610	220	210	200	190	180	170	145	105	187
	4000	1219	200	190	175	165	155	140	110	75	170
	6000	1829	175	165	155	145	130	110	80		151
	8000	2438	155	140	130	115	100	75	35		130
	10000	3048	130	115	100	85	60	25			107
	12000	3658	100	85	70	45	5	-40			83
	14000	4267	50	30	5	-30	-80	-130			37
	16000	4877	-15	-35	-65	-110	-155				-21
	18000	5486	-85	-105	-135	-180	-225				-85
	20000	6096	-150	-170	-205	-250					-143

One Engine Inoperative Climb											
Flaps: UP									**Power: 95%**		
v_{YSE}: 89 KIAS									**Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
2100/4630	**SL**		280	275	260	250	245	235	210	170	247
	2000	610	265	250	240	230	220	210	185	145	231
	4000	1219	245	230	220	210	200	185	155	110	213
	6000	1829	220	210	200	185	175	150	120		196
	8000	2438	200	185	175	160	145	115	75		174
	10000	3048	175	160	145	130	105	60			151
	12000	3658	145	130	115	90	45	-5			128
	14000	4267	95	75	50	10	-45	-95			81
	16000	4877	30	5	-20	-70	-120				22
	18000	5486	-45	-65	-95	-140	-185				-44
	20000	6096	-115	-130	-165	-220					-103

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

One Engine Inoperative Climb											
Flaps: UP								Power: 95%			
v_{YSE}: 87 KIAS								Gear: retracted			
Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
1999/4407	SL		325	320	310	300	290	280	255	210	294
	2000	610	310	300	290	280	270	260	225	185	277
	4000	1219	290	280	265	255	245	230	195	150	259
	6000	1829	265	255	245	235	225	200	160		241
	8000	2438	245	235	220	210	195	160	115		222
	10000	3048	220	205	190	180	150	105			199
	12000	3658	190	175	160	135	90	40			175
	14000	4267	140	120	95	55	0	-55			127
	16000	4877	75	55	25	-25	-75				69
	18000	5486	0	-20	-50	-100	-145				2
	20000	6096	-65	-85	-120	-175					-58
1900/4189	SL		375	365	355	345	335	330	300	255	342
	2000	610	360	345	335	325	315	305	275	225	326
	4000	1219	335	325	315	305	295	280	240	190	308
	6000	1829	315	305	295	285	270	245	205		290
	8000	2438	295	280	270	255	240	205	155		271
	10000	3048	270	255	240	225	195	150			248
	12000	3658	240	225	210	185	135	80			224
	14000	4267	190	170	145	100	40	-15			175
	16000	4877	120	100	70	15	-40				115
	18000	5486	45	25	-5	-60	-110				46
	20000	6096	-25	-45	-80	-140					-15

One Engine Inoperative Climb											
Flaps: UP									Power: 95%		
v_{YSE}: 87 KIAS									Gear: retracted		
Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 / -4	-10 / 14	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104	50 / 122	
1800/3968	SL		425	415	410	400	390	380	350	300	393
	2000	610	410	400	390	380	370	360	320	270	377
	4000	1219	390	380	365	355	345	330	290	235	360
	6000	1829	365	355	345	335	325	295	250		342
	8000	2438	345	335	320	310	295	250	200		323
	10000	3048	320	305	295	280	245	195			300
	12000	3658	290	275	260	235	180	125			276
	14000	4267	240	220	195	150	85	20			226
	16000	4877	170	150	115	60	0				164
	18000	5486	90	70	40	-20	-75				93
	20000	6096	20	0	-40	-100					29

For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.

5.3.10 TIME, FUEL & DISTANCE TO CLIMB

Conditions:

- Power lever . . . . both 95%
- Flaps . . . . UP
- Landing gear . . . . retracted
- Airspeed . . . . v_{climb}

NOTE

Distances shown are based on zero wind. Fuel for start, taxi and take-off not included. Add 10% to the time, fuel and distance for each 10° C (12° F) increase in OAT. The climb rates (ROC) are the average climb rates from sea level to the altitude indicated in the tables.

Example:

OAT at take-off . . . . 11°C (52°F)
Airfield pressure altitude . . . . 2000 ft (600 m)
Initial climb weight . . . . 1900 kg (4189 lb)
OAT at cruise . . . . -17° C (2° F)
Cruise altitude . . . . 16000 ft (4900 m)

Time, fuel and distance to climb at airfield: 2 min, 0.5 US gal and 2 NM (1)

Time, fuel and distance to climb at cruise: 14 min, 4.2 US gal and 22 NM (2)

Subtract (1) from (2) to obtain time, fuel and distance to climb from airfield to cruise:

Time to cruise altitude: 14 min - 2 min = 12 min

Fuel to cruise altitude: 4.2 US gal - 0.5 US gal = 3.7 US gal

Distance to cruise altitude: 22 NM - 2 NM = 20 NM

Time, Fuel and Distance to Climb										
Flaps: UP v_{climb}: 96 KIAS								Power: 95% Gear: retracted		
Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	OAT [°C]	OAT [°F]	TAS [kt]	RoC [ft/min]	RoC [m/s]	Time [min]	Fuel [US gal]	Dist-ance [NM]
2300/5071	**SL**		15	59	95	1030	5.2	0	0.0	0
	2000	600	11	52	96	1015	5.1	2	0.7	3
	4000	1219	7	45	97	1005	5.1	4	1.3	6
	6000	1829	3	38	99	995	5.0	7	2.0	9
	8000	2438	-1	30	100	980	4.9	9	2.7	13
	10000	3048	-5	23	102	970	4.9	11	3.4	17
	12000	3658	-9	16	104	955	4.8	13	4.1	21
	14000	4267	-13	9	105	940	4.7	15	4.8	26
	16000	4877	-17	2	107	915	4.6	18	5.6	31
	18000	5486	-21	-5	109	885	4.5	21	6.4	36
	20000	6096	-25	-12	111	850	4.3	24	7.3	43
2200/4850	**SL**		15	59	95	1100	5.6	0	0.0	0
	2000	600	11	52	96	1090	5.5	2	0.6	2
	4000	1219	7	45	97	1075	5.4	4	1.2	6
	6000	1829	3	38	99	1065	5.4	6	1.9	9
	8000	2438	-1	30	100	1055	5.3	8	2.5	12
	10000	3048	-5	23	102	1040	5.2	10	3.1	16
	12000	3658	-9	16	104	1025	5.2	12	3.8	20
	14000	4267	-13	9	105	1010	5.1	14	4.5	24
	16000	4877	-17	2	107	985	5.0	17	5.2	28
	18000	5486	-21	-5	109	955	4.8	19	6.0	34
	20000	6096	-25	-12	111	920	4.6	22	6.7	40

Time, Fuel and Distance to Climb											
Flaps: UP									**Power: 95%**		
v_{climb}: 96 KIAS									**Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**OAT [°C]**	**OAT [°F]**	**TAS [kt]**	**RoC [ft/min]**	**RoC [m/s]**	**Time [min]**	**Fuel [US gal]**	**Dist-ance [NM]**
2100/4630	**SL**		15	59	95	1175	6.0	0	0.0	0
	2000	600	11	52	96	1165	5.9	2	0.6	2
	4000	1219	7	45	97	1155	5.8	4	1.2	5
	6000	1829	3	38	99	1140	5.8	6	1.7	8
	8000	2438	-1	30	100	1130	5.7	8	2.3	11
	10000	3048	-5	23	102	1115	5.6	9	2.9	15
	12000	3658	-9	16	104	1105	5.6	11	3.5	18
	14000	4267	-13	9	105	1085	5.5	13	4.2	22
	16000	4877	-17	2	107	1060	5.4	16	4.9	26
	18000	5486	-21	-5	109	1030	5.2	18	5.5	31
	20000	6096	-25	-12	111	995	5.0	21	6.2	37

Time, Fuel and Distance to Climb											
Flaps: UP v_{climb}: 93 KIAS									Power: 95% Gear: retracted		
Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	OAT [°C]	OAT [°F]	TAS [kt]	RoC [ft/min]	RoC [m/s]	Time [min]	Fuel [US gal]	Dist-ance [NM]
1999/4407	**SL**		15	59	92	1260	6.4	0	0.0	0
	2000	600	11	52	93	1250	6.3	2	0.6	2
	4000	1219	7	45	94	1240	6.3	4	1.1	5
	6000	1829	3	38	96	1230	6.2	5	1.6	7
	8000	2438	-1	30	97	1215	6.1	7	2.2	10
	10000	3048	-5	23	99	1200	6.1	9	2.7	13
	12000	3658	-9	16	100	1190	6.0	11	3.3	16
	14000	4267	-13	9	102	1170	5.9	12	3.9	20
	16000	4877	-17	2	104	1145	5.8	14	4.5	24
	18000	5486	-21	-5	105	1115	5.6	17	5.1	28
	20000	6096	-25	-12	107	1075	5.4	19	5.8	33
1900/4189	**SL**		15	59	92	1345	6.8	0	0.0	0
	2000	600	11	52	93	1335	6.7	2	0.5	2
	4000	1219	7	45	94	1325	6.7	4	1.0	4
	6000	1829	3	38	96	1315	6.6	5	1.5	7
	8000	2438	-1	30	97	1300	6.6	7	2.0	9
	10000	3048	-5	23	99	1285	6.5	8	2.6	12
	12000	3658	-9	16	100	1275	6.4	10	3.1	15
	14000	4267	-13	9	102	1255	6.3	12	3.6	18
	16000	4877	-17	2	104	1230	6.2	14	4.2	22
	18000	5486	-21	-5	105	1195	6.0	16	4.8	26
	20000	6096	-25	-12	107	1155	5.8	18	5.4	30

Time, Fuel and Distance to Climb											
Flaps: UP **v_{climb}: 93 KIAS**									**Power: 95%** **Gear: retracted**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**OAT [°C]**	**OAT [°F]**	**TAS [kt]**	**RoC [ft/min]**	**RoC [m/s]**	**Time [min]**	**Fuel [US gal]**	**Dist-ance [NM]**	
1800/3968	**SL**		15	59	92	1440	7.3	0	0.0	0	
	2000	600	11	52	93	1425	7.2	2	0.5	2	
	4000	1219	7	45	94	1415	7.2	3	1.0	4	
	6000	1829	3	38	96	1405	7.1	5	1.4	6	
	8000	2438	-1	30	97	1390	7.0	6	1.9	9	
	10000	3048	-5	23	99	1380	7.0	8	2.4	11	
	12000	3658	-9	16	100	1365	6.9	9	2.9	14	
	14000	4267	-13	9	102	1345	6.8	11	3.4	17	
	16000	4877	-17	2	104	1320	6.7	13	3.9	21	
	18000	5486	-21	-5	105	1285	6.5	15	4.4	24	
	20000	6096	-25	-12	107	1245	6.3	17	5.0	28	

5.3.11 CRUISE PERFORMANCE

Conditions:

- Flaps . . . . UP
- Landing gear . . . . retracted
- Weight . . . . up to1999 kg/above 1999 kg

For conversion of OAT to delta-ISA temperatures refer to Chapter 5.3.3 - INTERNATIONAL STANDARD ATMOSPHERE.

Cruise Performance up to 1999 kg (4407 lb)															
Press. Alt. [ft]/[m]	**Outside Air Temperature - [°C]**														
	ISA-10			**ISA**			**ISA+10**			**ISA+20**			**ISA+30**		
	Pwr [%]	**FF [US gal/h]**	**TAS [kt]**	**Pwr [%]**	**FF [US gal/h]**	**TAS [kt]**	**Pwr [%]**	**FF [US gal/h]**	**TAS [kt]**	**Pwr [%]**	**FF [US gal/h]**	**TAS [kt]**	**Pwr [%]**	**FF [US gal/h]**	**TAS [kt]**
2000 610	95	19.3	172	95	19.3	174	95	19.3	176	95	19.3	177	95	19.2	179
	75	14.8	156	75	14.8	158	75	14.8	160	75	14.8	162	75	14.8	163
	60	11.8	143	60	11.8	145	60	11.8	146	60	11.8	148	60	11.8	149
	45	9.0	126	45	9.0	127	45	9.0	128	45	9.0	130	45	9.0	131
4000 1219	95	19.3	175	95	19.3	177	95	19.3	179	95	19.3	181	95	19.2	182
	75	14.8	159	75	14.8	161	75	14.8	163	75	14.8	165	75	14.8	166
	60	11.8	146	60	11.8	147	60	11.8	149	60	11.8	150	60	11.8	152
	45	9.0	128	45	9.0	129	45	9.0	131	45	9.0	132	45	9.0	133
6000 1829	95	19.3	178	95	19.3	180	95	19.3	182	95	19.3	184	95	19.3	186
	75	14.8	162	75	14.8	164	75	14.8	166	75	14.8	168	75	14.8	170
	60	11.8	148	60	11.8	150	60	11.8	152	60	11.8	153	60	11.8	155
	45	9.0	130	45	9.0	132	45	9.0	133	45	9.0	134	50	9.8	143
8000 2438	95	19.3	182	95	19.3	184	95	19.3	186	95	19.3	188	95	19.2	190
	75	14.8	166	75	14.8	168	75	14.8	169	75	14.8	171	75	14.8	173
	60	11.8	151	60	11.8	153	60	11.8	155	60	11.8	156	60	11.8	158
	45	9.0	133	45	9.0	134	50	9.8	142	50	9.8	144	50	9.8	145
10000 3048	95	19.3	185	95	19.3	188	95	19.3	190	95	19.3	191	95	18.8	192
	75	14.8	169	75	14.8	171	75	14.8	173	75	14.8	175	75	14.8	176
	60	11.8	154	60	11.8	156	60	11.8	157	60	11.8	159	60	11.8	161
	45	8.9	135	50	9.8	144	50	9.8	145	50	9.8	146	50	9.8	148
12000 3658	95	19.3	189	95	19.3	191	95	19.2	193	95	18.8	194	95	18.1	194
	75	14.8	172	75	14.8	174	75	14.8	176	75	14.8	178	75	14.8	180
	60	11.8	157	60	11.8	159	60	11.8	160	60	11.8	162	60	11.8	164
	50	9.7	145	50	9.7	146	50	9.7	148	50	9.7	149	50	9.7	150
14000 4267	95	18.7	190	95	18.5	192	95	18.1	193	85	16.7	191	80	15.6	188
	75	14.8	175	75	14.8	177	75	14.8	179	75	14.8	181	75	14.8	183
	60	11.8	160	60	11.8	162	60	11.8	163	60	11.8	165	60	11.8	167
	50	9.7	147	50	9.7	149	50	9.7	150	50	9.7	152	55	10.7	160
16000 4877	95	17.3	190	87	17.1	192	85	16.7	192	80	15.7	190	-	-	-
	75	14.8	179	75	14.8	181	75	14.8	183	75	14.8	185	75	14.8	187
	60	11.8	163	60	11.8	165	60	11.8	166	60	11.8	168	60	11.8	170
	50	9.7	150	50	9.7	151	55	10.7	160	55	10.7	162	55	10.7	163
18000 5486	80	15.7	187	80	15.7	189	80	15.7	191	-	-	-	-	-	-
	75	14.8	182	75	14.8	184	75	14.8	186	75	14.8	188	75	14.8	190
	60	11.8	166	60	11.8	168	60	11.8	170	60	11.8	171	60	11.8	173
	55	10.7	159	55	10.7	161	55	10.7	163	55	10.7	164	55	10.7	166
20000 6096	75	14.8	186	75	14.8	188	70	13.9	185	70	13.9	187	70	13.9	189
	60	11.8	169	60	11.8	171	60	11.8	173	60	11.8	174	60	11.8	176

Cruise Performance above 1999 kg (4407 lb) up to 2300 kg (5071 lb)															
Press. Alt. [ft]/[m]	Outside Air Temperature - [°C]														
	ISA-10			ISA			ISA+10			ISA+20			ISA+30		
	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]	Pwr [%]	FF [US gal/h]	TAS [kt]
2000 610	95	19.3	170	95	19.3	172	95	19.3	174	95	19.3	176	95	19.2	177
	75	14.8	154	75	14.8	156	75	14.8	158	75	14.8	159	75	14.8	161
	60	11.8	140	60	11.8	142	60	11.8	143	60	11.8	145	60	11.8	146
	45	9.0	121	45	9.0	122	45	9.0	124	45	9.0	125	45	9.0	126
4000 1219	95	19.3	173	95	19.3	175	95	19.3	177	95	19.3	179	95	19.2	180
	75	14.8	157	75	14.8	159	75	14.8	161	75	14.8	162	75	14.8	164
	60	11.8	143	60	11.8	144	60	11.8	146	60	11.8	147	60	11.8	148
	45	9.0	123	45	9.0	124	45	9.0	125	45	9.0	127	45	9.0	128
6000 1829	95	19.3	176	95	19.3	179	95	19.3	180	95	19.3	182	95	19.3	184
	75	14.8	160	75	14.8	162	75	14.8	164	75	14.8	165	75	14.8	167
	60	11.8	145	60	11.8	147	60	11.8	148	60	11.8	150	60	11.8	151
	45	9.0	125	45	9.0	126	45	9.0	127	45	9.0	128	50	9.8	138
8000 2438	95	19.3	180	95	19.3	182	95	19.3	184	95	19.3	186	95	19.2	187
	75	14.8	163	75	14.8	165	75	14.8	167	75	14.8	168	75	14.8	170
	60	11.8	148	60	11.8	149	60	11.8	151	60	11.8	152	60	11.8	154
	45	9.0	127	45	9.0	128	50	9.8	137	50	9.8	139	50	9.8	140
10000 3048	95	19.3	183	95	19.3	185	95	19.3	187	95	19.3	189	95	18.8	189
	75	14.8	166	75	14.8	168	75	14.8	170	75	14.8	171	75	14.8	173
	60	11.8	150	60	11.8	152	60	11.8	153	60	11.8	155	60	11.8	156
	45	8.9	129	50	9.8	138	50	9.8	140	50	9.8	141	50	9.8	142
12000 3658	95	19.3	187	95	19.3	189	95	19.2	191	95	18.8	191	95	18.1	191
	75	14.8	169	75	14.8	171	75	14.8	173	75	14.8	175	75	14.8	176
	60	11.8	153	60	11.8	154	60	11.8	156	60	11.8	157	60	11.8	159
	50	9.7	139	50	9.7	140	50	9.7	142	50	9.7	143	50	9.7	144
14000 4267	95	18.7	188	95	18.5	190	95	18.1	191	85	16.7	187	80	15.6	184
	75	14.8	172	75	14.8	174	75	14.8	176	75	14.8	178	75	14.8	179
	60	11.8	155	60	11.8	157	60	11.8	159	60	11.8	160	60	11.8	161
	50	9.7	141	50	9.7	142	50	9.7	144	50	9.7	145	55	10.7	154
16000 4877	95	17.3	187	87	17.1	189	85	16.7	189	80	15.7	186	-	-	-
	75	14.8	175	75	14.8	177	75	14.8	179	75	14.8	181	75	14.8	182
	60	11.8	158	60	11.8	160	60	11.8	161	60	11.8	163	60	11.8	164
	50	9.7	143	50	9.7	144	55	10.7	154	55	10.7	155	55	10.7	156
18000 5486	80	15.7	184	80	15.7	186	80	15.7	188	-	-	-	-	-	-
	75	14.8	178	75	14.8	180	75	14.8	182	75	14.8	184	75	14.8	186
	60	11.8	161	60	11.8	162	60	11.8	164	60	11.8	165	60	11.8	166
	55	10.7	153	55	10.7	155	55	10.7	156	55	10.7	157	55	10.7	158
20000 6096	75	14.8	182	75	14.8	184	70	13.9	180	70	13.9	181	70	13.9	183
	60	11.8	163	60	11.8	165	60	11.8	166	60	11.8	167	60	11.8	169

5.3.12 LANDING DISTANCES

Conditions:

- Power lever . . . . both IDLE
- Flaps . . . . LDG, T/O or UP
- Runway . . . . dry, paved, level
- Approach speed . . . . v_{REF}

The following factors are to be applied to the computed landing distance for the noted condition:

- Headwind:	Decrease by 10% for each 20 kt (10.3 m/s) headwind.
- Tailwind:	Increase by 10% for each 3 kt (1.5 m/s) tailwind.
- Paved runway, wet:	Increase by 15%.
- Grass runway, dry, 5 cm (2 in) long:	Increase the ground roll by 10%.
- Grass runway, dry, 5 cm (2 in) to 10 cm (3.9 in) long:	Increase the ground roll by 15%.
- Grass runway, dry, longer than 10 cm (3.9 in):	Increase the ground roll at least by 25%.
- Grass runway, wet or soft runway:	Increase the ground roll by 10%.
- Downhill slope:	Increase the ground roll by 20% for each 1% (1 m per 100 m or 1 ft per 100 ft) of slope.

WARNING

For a safe landing, the available runway length must be at least equal to the landing distance over a 50 ft (15 m) obstacle.

WARNING

Poor maintenance condition of the airplane, deviation from the given procedures, uneven runway, as well as unfavorable external factors (rain, unfavorable wind conditions, including cross-wind) will increase the landing distance.

CAUTION

The factors in the above corrections are typical values. On wet ground or wet soft grass covered runways, the landing distance may become significantly longer than stated above. In any case, the pilot must allow for the condition of the runway to ensure a safe landing.

The above corrections for runway slope should be used with caution since published runway slope data is usually the net slope from one end of the runway to the other. Runways may have positions along their length at greater or lesser slopes than the published slope, lengthening (or shortening) the landing roll estimated with these tables.

NOTE

The effect of 50% of the headwind component and 150% of the tailwind component is already incorporated in the head- and tailwind factors.

Landing Distances (SI/Metric System)

Landing Distance - Flaps LDG - 2300 kg/5071 lb								
Weight:	**2300 kg/5071 lb**				**Flaps:**	**LDG**		
v_{REF}:	**89 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	420	440	450	470	510	560	441
	15 m/50 ft	750	770	790	810	880	960	779
1000 305	**Ground Roll**	440	450	470	480	530	580	453
	15 m/50 ft	770	790	810	840	920	1000	796
2000 610	**Ground Roll**	460	470	490	510	560	620	469
	15 m/50 ft	800	820	840	870	960	1050	817
3000 914	**Ground Roll**	510	530	550	580	640	700	526
	15 m/50 ft	860	890	910	960	1050	1150	879
4000 1219	**Ground Roll**	570	590	610	650	720	790	577
	15 m/50 ft	920	950	970	1040	1140	1250	936
5000 1524	**Ground Roll**	610	640	660	720	790		621
	15 m/50 ft	970	1000	1030	1120	1220		985
6000 1829	**Ground Roll**	660	680	700	770	850		659
	15 m/50 ft	1020	1050	1080	1190	1300		1029
7000 2134	**Ground Roll**	720	740	770	860	940		715
	15 m/50 ft	1090	1120	1170	1290	1410		1091
8000 2438	**Ground Roll**	810	840	890	980	1080		802
	15 m/50 ft	1190	1230	1290	1420	1560		1183
9000 2743	**Ground Roll**	940	970	1040	1150	1260		922
	15 m/50 ft	1320	1370	1460	1600	1750		1309
10000 3048	**Ground Roll**	1090	1130	1220	1350			1070
	15 m/50 ft	1490	1530	1660	1820			1463

Landing Distance - Flaps LDG - 2200 kg/4850 lb								
Weight:	**2200 kg/4850 lb**				**Flaps:**	**LDG**		
v_{REF}:	**89 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	410	420	430	450	490	540	423
	15 m/50 ft	740	760	780	800	870	950	770
1000 305	**Ground Roll**	420	430	450	460	510	560	434
	15 m/50 ft	760	780	800	830	900	990	787
2000 610	**Ground Roll**	440	450	470	490	540	590	450
	15 m/50 ft	790	810	830	860	950	1030	807
3000 914	**Ground Roll**	490	510	530	560	620	680	504
	15 m/50 ft	850	870	900	940	1040	1130	867
4000 1219	**Ground Roll**	540	560	580	630	690	760	553
	15 m/50 ft	910	930	960	1020	1120	1230	922
5000 1524	**Ground Roll**	590	610	630	690	760		595
	15 m/50 ft	960	990	1010	1100	1210		969
6000 1829	**Ground Roll**	630	650	670	740	810		632
	15 m/50 ft	1010	1040	1070	1170	1280		1012
7000 2134	**Ground Roll**	690	710	740	820	900		688
	15 m/50 ft	1070	1110	1150	1260	1380		1073
8000 2438	**Ground Roll**	780	800	850	940	1040		769
	15 m/50 ft	1170	1210	1270	1400	1530		1163
9000 2743	**Ground Roll**	910	940	1010	1110	1220		892
	15 m/50 ft	1310	1350	1440	1580	1730		1293
10000 3048	**Ground Roll**	1060	1100	1190	1310			1043
	15 m/50 ft	1470	1520	1640	1800			1449

Landing Distance - Flaps LDG - 2100 kg/4630 lb								
Weight:	**2100 kg/4630 lb**				**Flaps:**	**LDG**		
v_{REF}:	**89 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	390	400	410	430	470	510	404
	15 m/50 ft	730	750	770	790	860	940	760
1000 305	**Ground Roll**	400	420	430	440	490	530	416
	15 m/50 ft	750	770	790	820	890	970	777
2000 610	**Ground Roll**	420	430	450	470	510	560	430
	15 m/50 ft	780	800	820	850	930	1020	797
3000 914	**Ground Roll**	470	490	500	530	590	640	482
	15 m/50 ft	840	860	880	930	1020	1110	854
4000 1219	**Ground Roll**	520	540	550	590	660	720	529
	15 m/50 ft	890	920	940	1010	1100	1200	907
5000 1524	**Ground Roll**	560	580	600	650	720		564
	15 m/50 ft	940	970	990	1080	1180		950
6000 1829	**Ground Roll**	600	620	640	710	780		600
	15 m/50 ft	990	1020	1040	1150	1260		991
7000 2134	**Ground Roll**	660	680	710	780	860		655
	15 m/50 ft	1050	1080	1130	1240	1360		1052
8000 2438	**Ground Roll**	740	770	820	910	1000		737
	15 m/50 ft	1150	1190	1250	1380	1510		1144
9000 2743	**Ground Roll**	880	910	970	1070	1170		863
	15 m/50 ft	1290	1330	1420	1560	1710		1276
10000 3048	**Ground Roll**	1030	1060	1160	1270			1010
	15 m/50 ft	1460	1500	1620	1780			1432

Landing Distance - Flaps LDG - 1999 kg/4407 lb								
Weight:	**1999 kg/4407 lb**				**Flaps:**	**LDG**		
v_{REF}:	**84 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	370	390	390	410	440	490	383
	15 m/50 ft	680	700	720	740	800	870	706
1000 305	**Ground Roll**	390	390	410	420	460	510	394
	15 m/50 ft	700	720	740	760	830	910	722
2000 610	**Ground Roll**	400	410	420	440	490	540	408
	15 m/50 ft	720	740	760	790	870	950	740
3000 914	**Ground Roll**	450	460	480	500	560	610	456
	15 m/50 ft	780	800	820	860	950	1040	793
4000 1219	**Ground Roll**	490	510	530	560	620	680	500
	15 m/50 ft	830	850	880	940	1030	1120	842
5000 1524	**Ground Roll**	530	550	570	620	680		537
	15 m/50 ft	880	900	930	1000	1100		885
6000 1829	**Ground Roll**	570	590	610	670	740		570
	15 m/50 ft	920	950	970	1070	1170		923
7000 2134	**Ground Roll**	620	650	670	750	820		622
	15 m/50 ft	980	1010	1050	1160	1270		981
8000 2438	**Ground Roll**	710	740	790	870	960		709
	15 m/50 ft	1080	1110	1170	1290	1410		1073
9000 2743	**Ground Roll**	850	880	940	1030	1130		834
	15 m/50 ft	1220	1260	1340	1470	1610		1204
10000 3048	**Ground Roll**	1010	1030	1120	1230			988
	15 m/50 ft	1390	1420	1540	1690			1364

Landing Distance - Flaps LDG - 1900 kg/4189 lb								
Weight:	**1900 kg/4189 lb**				**Flaps:**	**LDG**		
v_{REF}:	**84 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	350	360	380	390	420	460	366
	15 m/50 ft	670	690	710	730	790	860	697
1000 305	**Ground Roll**	360	380	390	400	440	490	376
	15 m/50 ft	690	710	730	750	820	900	712
2000 610	**Ground Roll**	380	390	410	420	470	510	389
	15 m/50 ft	710	730	750	780	860	930	731
3000 914	**Ground Roll**	430	440	460	480	530	580	435
	15 m/50 ft	770	790	810	850	930	1020	781
4000 1219	**Ground Roll**	470	490	500	530	590	650	477
	15 m/50 ft	820	840	860	920	1010	1100	828
5000 1524	**Ground Roll**	510	520	540	590	650		512
	15 m/50 ft	860	880	910	980	1080		869
6000 1829	**Ground Roll**	540	560	580	640	700		539
	15 m/50 ft	900	930	950	1040	1140		904
7000 2134	**Ground Roll**	590	610	640	710	780		590
	15 m/50 ft	960	990	1030	1130	1240		961
8000 2438	**Ground Roll**	680	710	750	830	910		678
	15 m/50 ft	1060	1090	1150	1270	1390		1055
9000 2743	**Ground Roll**	810	850	910	1000	1090		802
	15 m/50 ft	1200	1240	1320	1450	1580		1187
10000 3048	**Ground Roll**	980	1000	1090	1200			960
	15 m/50 ft	1370	1410	1520	1670			1351

Landing Distance - Flaps LDG - 1800 kg/3968 lb								
Weight:	**1800 kg/3968 lb**				**Flaps:**	**LDG**		
v_{REF}:	**84 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10/**50	**20/**68	**30/**86	**40/**104	**50/**122	
SL	**Ground Roll**	330	350	360	370	400	440	348
	15 m/50 ft	660	680	700	720	770	850	687
1000 305	**Ground Roll**	350	360	370	380	420	460	358
	15 m/50 ft	680	700	720	740	810	880	702
2000 610	**Ground Roll**	360	370	380	400	440	490	367
	15 m/50 ft	700	720	740	770	840	920	719
3000 914	**Ground Roll**	400	410	430	460	500	550	410
	15 m/50 ft	750	770	790	840	920	1000	767
4000 1219	**Ground Roll**	440	460	470	510	560	610	449
	15 m/50 ft	800	820	840	900	990	1080	811
5000 1524	**Ground Roll**	480	490	510	550	610		482
	15 m/50 ft	840	870	890	960	1050		851
6000 1829	**Ground Roll**	510	520	540	600	660		513
	15 m/50 ft	880	910	930	1020	1120		886
7000 2134	**Ground Roll**	560	580	610	670	740		559
	15 m/50 ft	940	970	1010	1110	1210		941
8000 2438	**Ground Roll**	650	670	720	790	870		643
	15 m/50 ft	1040	1070	1130	1240	1360		1033
9000 2743	**Ground Roll**	780	810	870	960	1050		776
	15 m/50 ft	1180	1220	1310	1430	1560		1173
10000 3048	**Ground Roll**	950	980	1060	1170			934
	15 m/50 ft	1360	1400	1510	1660			1339

Landing Distance - Abnormal Flap Position - 2300 kg/5071 lb								
Weight:	**2300 kg/5071 lb**					**Flaps:**	**T/O or UP**	
v_{REF}:	**91 KIAS (Flaps T/O)** **95 KIAS (Flaps UP)**					**Power:**	**IDLE**	
						Runway: dry, paved, level		
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	**ISA**
SL	**Ground Roll**	570	580	600	620	670	740	587
	15 m/50 ft	920	950	970	1000	1080	1180	955
1000 305	**Ground Roll**	580	600	620	640	710	780	603
	15 m/50 ft	950	970	1000	1030	1130	1230	977
2000 610	**Ground Roll**	610	630	650	680	750	820	626
	15 m/50 ft	980	1010	1030	1070	1180	1290	1005
3000 914	**Ground Roll**	710	730	760	800	880	970	725
	15 m/50 ft	1090	1120	1150	1210	1330	1450	1110
4000 1219	**Ground Roll**	800	830	860	920	1020	1120	818
	15 m/50 ft	1190	1220	1260	1350	1480	1620	1209
5000 1524	**Ground Roll**	890	920	950	1030	1140		898
	15 m/50 ft	1280	1320	1360	1470	1610		1295
6000 1829	**Ground Roll**	960	990	1030	1140	1250		967
	15 m/50 ft	1360	1400	1440	1590	1740		1370
7000 2134	**Ground Roll**	1070	1110	1160	1280	1410		1070
	15 m/50 ft	1480	1520	1590	1750	1920		1479
8000 2438	**Ground Roll**	1240	1290	1360	1500	1650		1235
	15 m/50 ft	1660	1710	1800	1990	2180		1650
9000 2743	**Ground Roll**	1490	1550	1660	1830	2010		1474
	15 m/50 ft	1920	1980	2120	2330	2550		1899
10000 3048	**Ground Roll**	1850	1910	2070	2280			1820
	15 m/50 ft	2290	2350	2550	2790			2252

Landing Distance - Abnormal Flap Position - 2200 kg/4850 lb								
Weight:	**2200 kg/4850 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**91 KIAS (Flaps T/O)** **95 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	540	560	580	590	650	710	562
	15 m/50 ft	910	940	960	990	1070	1170	945
1000 305	**Ground Roll**	560	580	600	610	680	750	578
	15 m/50 ft	940	960	990	1010	1110	1220	966
2000 610	**Ground Roll**	580	600	620	650	710	780	600
	15 m/50 ft	970	1000	1020	1060	1160	1270	994
3000 914	**Ground Roll**	680	700	720	760	840	930	694
	15 m/50 ft	1070	1100	1130	1190	1310	1430	1094
4000 1219	**Ground Roll**	770	800	820	880	970	1070	783
	15 m/50 ft	1170	1200	1240	1320	1450	1590	1190
5000 1524	**Ground Roll**	850	870	900	990	1090		860
	15 m/50 ft	1260	1290	1330	1440	1580		1272
6000 1829	**Ground Roll**	910	950	980	1080	1190		920
	15 m/50 ft	1330	1370	1410	1560	1710		1342
7000 2134	**Ground Roll**	1020	1060	1110	1220	1340		1022
	15 m/50 ft	1450	1490	1550	1710	1870		1450
8000 2438	**Ground Roll**	1190	1230	1310	1450	1590		1182
	15 m/50 ft	1630	1680	1770	1960	2140		1619
9000 2743	**Ground Roll**	1450	1500	1610	1780	1950		1428
	15 m/50 ft	1900	1960	2090	2300	2520		1875
10000 3048	**Ground Roll**	1820	1860	2020	2220			1783
	15 m/50 ft	2270	2330	2530	2770			2238

Landing Distance - Abnormal Flap Position - 2100 kg/4630 lb								
Weight:	2100 kg/4630 lb				Flaps:	T/O or UP		
v_{REF}:	91 KIAS (Flaps T/O) 95 KIAS (Flaps UP)				Power:	IDLE		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		Outside Air Temperature - [°C]/[°F]						
		0/32	10/50	20/68	30/86	40/104	50/122	ISA
SL	Ground Roll	520	530	550	570	610	680	537
	15 m/50 ft	900	930	950	980	1050	1150	934
1000 305	Ground Roll	530	550	570	580	650	710	552
	15 m/50 ft	930	950	980	1000	1100	1200	955
2000 610	Ground Roll	560	580	590	620	680	750	574
	15 m/50 ft	960	980	1010	1050	1150	1260	982
3000 914	Ground Roll	650	660	690	730	800	880	659
	15 m/50 ft	1050	1080	1110	1170	1290	1410	1076
4000 1219	Ground Roll	730	760	780	840	920	1020	743
	15 m/50 ft	1150	1180	1220	1300	1430	1560	1167
5000 1524	Ground Roll	800	830	860	940	1030		816
	15 m/50 ft	1230	1270	1300	1410	1550		1246
6000 1829	Ground Roll	870	900	930	1030	1130		880
	15 m/50 ft	1310	1340	1380	1520	1670		1317
7000 2134	Ground Roll	970	1010	1050	1160	1280		974
	15 m/50 ft	1420	1460	1520	1680	1840		1420
8000 2438	Ground Roll	1140	1180	1250	1390	1520		1137
	15 m/50 ft	1600	1650	1740	1920	2100		1593
9000 2743	Ground Roll	1400	1460	1560	1720	1880		1392
	15 m/50 ft	1870	1940	2070	2270	2480		1857
10000 3048	Ground Roll	1770	1830	1990	2170			1742
	15 m/50 ft	2260	2320	2520	2750			2221

Landing Distance - Abnormal Flap Position - 1999 kg/4407 lb								
Weight:	**1999 kg/4407 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**88 KIAS (Flaps T/O) 91 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	490	510	530	540	590	640	513
	15 m/50 ft	850	870	890	920	990	1090	879
1000 305	**Ground Roll**	510	530	540	560	610	680	527
	15 m/50 ft	870	900	920	940	1030	1130	899
2000 610	**Ground Roll**	530	550	560	590	650	720	543
	15 m/50 ft	900	920	950	990	1080	1180	923
3000 914	**Ground Roll**	610	630	650	690	770	840	627
	15 m/50 ft	990	1020	1050	1100	1210	1320	1012
4000 1219	**Ground Roll**	690	720	740	800	880	960	706
	15 m/50 ft	1080	1110	1140	1220	1340	1460	1097
5000 1524	**Ground Roll**	760	790	820	890	980		774
	15 m/50 ft	1160	1190	1230	1330	1460		1171
6000 1829	**Ground Roll**	830	860	880	980	1080		834
	15 m/50 ft	1230	1270	1300	1430	1570		1237
7000 2134	**Ground Roll**	920	960	1000	1110	1220		924
	15 m/50 ft	1340	1380	1430	1580	1730		1336
8000 2438	**Ground Roll**	1090	1130	1200	1330	1470		1085
	15 m/50 ft	1510	1560	1650	1820	1990		1506
9000 2743	**Ground Roll**	1360	1410	1510	1670	1830		1349
	15 m/50 ft	1790	1850	1980	2180	2380		1776
10000 3048	**Ground Roll**	1750	1790	1940	2130			1715
	15 m/50 ft	2190	2240	2430	2660			2153

Landing Distance - Abnormal Flap Position - 1900 kg/4189 lb								
Weight:	**1900 kg/4189 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**88 KIAS (Flaps T/O)** **91 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in meter [m]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]**/[°F]						
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	**ISA**
SL	**Ground Roll**	470	480	500	510	560	610	484
	15 m/50 ft	840	860	880	910	980	1070	867
1000 305	**Ground Roll**	480	500	510	530	580	640	499
	15 m/50 ft	860	880	910	930	1020	1120	886
2000 610	**Ground Roll**	500	520	540	560	620	680	518
	15 m/50 ft	890	910	940	970	1070	1170	911
3000 914	**Ground Roll**	580	600	620	660	730	790	597
	15 m/50 ft	980	1000	1030	1090	1190	1300	997
4000 1219	**Ground Roll**	660	680	700	760	830	910	667
	15 m/50 ft	1060	1090	1120	1200	1310	1440	1075
5000 1524	**Ground Roll**	720	750	780	840	930		732
	15 m/50 ft	1130	1170	1200	1300	1430		1146
6000 1829	**Ground Roll**	780	810	840	920	1010		789
	15 m/50 ft	1200	1240	1270	1400	1530		1209
7000 2134	**Ground Roll**	880	910	950	1050	1160		879
	15 m/50 ft	1310	1350	1400	1540	1690		1308
8000 2438	**Ground Roll**	1050	1080	1150	1270	1400		1043
	15 m/50 ft	1490	1530	1620	1780	1960		1482
9000 2743	**Ground Roll**	1320	1370	1470	1620	1760		1303
	15 m/50 ft	1780	1830	1960	2150	2350		1754
10000 3048	**Ground Roll**	1720	1760	1910	2090			1688
	15 m/50 ft	2180	2240	2420	2650			2149

Landing Distance - Abnormal Flap Position - 1800 kg/3968 lb			
Weight:	**1800 kg/3968 lb**	**Flaps:**	**T/O or UP**
v_{REF}:	**88 KIAS (Flaps T/O)** **91 KIAS (Flaps UP)**	**Power:**	**IDLE**
		Runway:	**dry, paved, level**

Distances are given in meter [m]

Press. Alt. [ft]/[m]		Outside Air Temperature - [°C]/[°F]						ISA
		0/32	**10**/50	**20**/68	**30**/86	**40**/104	**50**/122	
SL	**Ground Roll**	440	460	470	480	530	580	460
	15 m/50 ft	830	850	870	890	970	1060	855
1000 305	**Ground Roll**	460	470	490	500	550	610	474
	15 m/50 ft	850	870	890	920	1010	1100	875
2000 610	**Ground Roll**	480	490	510	530	580	640	489
	15 m/50 ft	880	900	920	960	1050	1150	898
3000 914	**Ground Roll**	550	570	590	620	680	750	563
	15 m/50 ft	960	990	1010	1070	1170	1280	979
4000 1219	**Ground Roll**	620	640	660	710	780	860	629
	15 m/50 ft	1040	1070	1100	1170	1290	1410	1053
5000 1524	**Ground Roll**	680	710	730	790	870		690
	15 m/50 ft	1110	1140	1170	1270	1390		1120
6000 1829	**Ground Roll**	740	760	790	870	960		744
	15 m/50 ft	1170	1210	1240	1360	1500		1181
7000 2134	**Ground Roll**	830	860	900	990	1100		827
	15 m/50 ft	1280	1320	1370	1510	1650		1276
8000 2438	**Ground Roll**	1000	1030	1100	1210	1340		995
	15 m/50 ft	1460	1500	1590	1750	1920		1454
9000 2743	**Ground Roll**	1280	1330	1420	1570	1710		1261
	15 m/50 ft	1760	1820	1940	2130	2320		1735
10000 3048	**Ground Roll**	1690	1740	1880	2060			1668
	15 m/50 ft	2180	2240	2420	2650			2152

Landing Distances (US/Imperial System)

Landing Distance - Flaps LDG - 2300 kg/5071 lb								
Weight:	**2300 kg/5071 lb**				**Flaps:**	**LDG**		
v_{REF}:	**89 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	**ISA**
SL	**Ground Roll**	1400	1450	1500	1550	1650	1850	1446
	15 m/50 ft	2500	2550	2600	2700	2900	3150	2555
1000 305	**Ground Roll**	1450	1500	1550	1600	1750	1950	1486
	15 m/50 ft	2550	2600	2700	2750	3000	3300	2611
2000 610	**Ground Roll**	1500	1550	1600	1700	1850	2050	1538
	15 m/50 ft	2650	2700	2750	2850	3150	3450	2680
3000 914	**Ground Roll**	1700	1750	1800	1900	2100	2300	1723
	15 m/50 ft	2850	2900	3000	3150	3450	3750	2882
4000 1219	**Ground Roll**	1850	1950	2000	2150	2350	2600	1893
	15 m/50 ft	3050	3100	3200	3400	3750	4100	3069
5000 1524	**Ground Roll**	2000	2100	2150	2350	2600		2036
	15 m/50 ft	3200	3300	3400	3650	4050		3231
6000 1829	**Ground Roll**	2150	2250	2300	2550	2800		2162
	15 m/50 ft	3350	3450	3550	3900	4300		3375
7000 2134	**Ground Roll**	2350	2450	2550	2800	3100		2345
	15 m/50 ft	3600	3700	3850	4250	4650		3577
8000 2438	**Ground Roll**	2650	2750	2900	3250	3550		2629
	15 m/50 ft	3900	4050	4250	4700	5100		3880
9000 2743	**Ground Roll**	3100	3200	3400	3750	4150		3025
	15 m/50 ft	4350	4500	4800	5250	5750		4295
10000 3048	**Ground Roll**	3600	3700	4050	4450			3509
	15 m/50 ft	4900	5050	5450	5950			4799

Landing Distance - Flaps LDG - 2200 kg/4850 lb								
Weight:	**2200 kg/4850 lb**				**Flaps:**	**LDG**		
v_{REF}:	**89 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1350	1400	1450	1500	1600	1750	1385
	15 m/50 ft	2450	2500	2600	2650	2850	3150	2524
1000 305	**Ground Roll**	1400	1450	1500	1550	1700	1850	1424
	15 m/50 ft	2500	2600	2650	2700	3000	3250	2580
2000 610	**Ground Roll**	1450	1500	1550	1600	1800	1950	1475
	15 m/50 ft	2600	2650	2750	2850	3100	3400	2647
3000 914	**Ground Roll**	1600	1700	1750	1850	2050	2250	1652
	15 m/50 ft	2800	2850	2950	3100	3400	3700	2842
4000 1219	**Ground Roll**	1800	1850	1900	2050	2250	2500	1814
	15 m/50 ft	3000	3050	3150	3350	3700	4050	3022
5000 1524	**Ground Roll**	1950	2000	2100	2250	2500		1952
	15 m/50 ft	3150	3250	3350	3600	3950		3178
6000 1829	**Ground Roll**	2050	2150	2200	2450	2700		2073
	15 m/50 ft	3300	3400	3500	3850	4200		3319
7000 2134	**Ground Roll**	2250	2350	2450	2700	2950		2255
	15 m/50 ft	3550	3650	3750	4150	4550		3520
8000 2438	**Ground Roll**	2550	2650	2800	3100	3400		2523
	15 m/50 ft	3850	3950	4200	4600	5050		3816
9000 2743	**Ground Roll**	3000	3100	3300	3650	4000		2927
	15 m/50 ft	4300	4450	4750	5200	5700		4240
10000 3048	**Ground Roll**	3500	3600	3900	4300			3419
	15 m/50 ft	4850	5000	5400	5900			4753

Landing Distance - Flaps LDG - 2100 kg/4630 lb								
Weight:	**2100 kg/4630 lb**				**Flaps:**	**LDG**		
v_{REF}:	**89 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1300	1350	1350	1400	1550	1700	1324
	15 m/50 ft	2400	2500	2550	2600	2800	3100	2492
1000 305	**Ground Roll**	1350	1350	1400	1450	1600	1750	1362
	15 m/50 ft	2500	2550	2600	2700	2950	3200	2547
2000 610	**Ground Roll**	1400	1450	1500	1550	1700	1850	1411
	15 m/50 ft	2550	2650	2700	2800	3050	3350	2614
3000 914	**Ground Roll**	1550	1600	1650	1750	1950	2100	1580
	15 m/50 ft	2750	2850	2900	3050	3350	3650	2801
4000 1219	**Ground Roll**	1700	1800	1800	1950	2150	2350	1735
	15 m/50 ft	2950	3000	3100	3300	3650	3950	2974
5000 1524	**Ground Roll**	1850	1900	1950	2150	2350		1850
	15 m/50 ft	3100	3200	3250	3550	3900		3116
6000 1829	**Ground Roll**	1950	2050	2100	2350	2550		1966
	15 m/50 ft	3250	3350	3450	3750	4150		3252
7000 2134	**Ground Roll**	2150	2250	2350	2550	2850		2146
	15 m/50 ft	3450	3550	3700	4050	4450		3452
8000 2438	**Ground Roll**	2450	2550	2700	3000	3300		2418
	15 m/50 ft	3800	3900	4100	4550	4950		3752
9000 2743	**Ground Roll**	2900	3000	3200	3500	3850		2831
	15 m/50 ft	4250	4400	4650	5150	5600		4186
10000 3048	**Ground Roll**	3400	3500	3800	4200			3312
	15 m/50 ft	4800	4900	5350	5850			4697

Landing Distance - Flaps LDG - 1999 kg/4407 lb								
Weight:	**1999 kg/4407 lb**				**Flaps:**	**LDG**		
v_{REF}:	**84 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1250	1250	1300	1350	1450	1600	1257
	15 m/50 ft	2250	2300	2350	2450	2650	2850	2317
1000 305	**Ground Roll**	1250	1300	1350	1400	1550	1700	1292
	15 m/50 ft	2300	2350	2450	2500	2750	3000	2367
2000 610	**Ground Roll**	1300	1350	1400	1450	1600	1750	1337
	15 m/50 ft	2400	2450	2500	2600	2850	3100	2428
3000 914	**Ground Roll**	1450	1500	1550	1650	1850	2000	1494
	15 m/50 ft	2550	2650	2700	2850	3100	3400	2602
4000 1219	**Ground Roll**	1600	1700	1750	1850	2050	2250	1638
	15 m/50 ft	2750	2800	2900	3100	3400	3700	2763
5000 1524	**Ground Roll**	1750	1800	1900	2050	2250		1760
	15 m/50 ft	2900	2950	3050	3300	3600		2902
6000 1829	**Ground Roll**	1850	1950	2000	2200	2450		1868
	15 m/50 ft	3000	3100	3200	3500	3850		3028
7000 2134	**Ground Roll**	2050	2150	2200	2450	2700		2040
	15 m/50 ft	3250	3300	3450	3800	4150		3217
8000 2438	**Ground Roll**	2350	2450	2600	2850	3150		2324
	15 m/50 ft	3550	3650	3850	4250	4650		3520
9000 2743	**Ground Roll**	2800	2900	3100	3400	3700		2736
	15 m/50 ft	4000	4150	4400	4850	5300		3950
10000 3048	**Ground Roll**	3300	3400	3700	4050			3239
	15 m/50 ft	4550	4650	5050	5550			4472

Landing Distance - Flaps LDG - 1900 kg/4189 lb								
Weight:	**1900 kg/4189 lb**				**Flaps:**	**LDG**		
v_{REF}:	**84 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1150	1200	1250	1300	1400	1550	1198
	15 m/50 ft	2200	2300	2350	2400	2600	2850	2286
1000 305	**Ground Roll**	1200	1250	1300	1350	1450	1600	1233
	15 m/50 ft	2300	2350	2400	2450	2700	2950	2336
2000 610	**Ground Roll**	1250	1300	1350	1400	1550	1700	1276
	15 m/50 ft	2350	2400	2500	2550	2800	3050	2396
3000 914	**Ground Roll**	1400	1450	1500	1600	1750	1900	1425
	15 m/50 ft	2500	2600	2650	2800	3050	3350	2562
4000 1219	**Ground Roll**	1550	1600	1650	1750	1950	2150	1562
	15 m/50 ft	2700	2750	2850	3000	3300	3600	2716
5000 1524	**Ground Roll**	1650	1700	1800	1950	2150		1679
	15 m/50 ft	2850	2900	3000	3250	3550		2851
6000 1829	**Ground Roll**	1750	1850	1900	2100	2300		1766
	15 m/50 ft	2950	3050	3150	3450	3750		2963
7000 2134	**Ground Roll**	1950	2000	2100	2350	2600		1936
	15 m/50 ft	3150	3250	3400	3750	4100		3152
8000 2438	**Ground Roll**	2250	2350	2450	2700	3000		2225
	15 m/50 ft	3500	3600	3800	4150	4550		3460
9000 2743	**Ground Roll**	2700	2800	3000	3300	3600		2630
	15 m/50 ft	3950	4050	4350	4800	5200		3892
10000 3048	**Ground Roll**	3200	3300	3600	3950			3149
	15 m/50 ft	4500	4650	5000	5500			4431

Landing Distance - Flaps LDG - 1800 kg/3968 lb								
Weight:	**1800 kg/3968 lb**				**Flaps:**	**LDG**		
v_{REF}:	**84 KIAS**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1100	1150	1200	1200	1300	1450	1139
	15 m/50 ft	2200	2250	2300	2350	2550	2800	2254
1000 305	**Ground Roll**	1150	1200	1200	1250	1400	1500	1173
	15 m/50 ft	2250	2300	2350	2400	2650	2900	2304
2000 610	**Ground Roll**	1200	1200	1250	1300	1450	1600	1202
	15 m/50 ft	2300	2350	2450	2550	2750	3050	2357
3000 914	**Ground Roll**	1300	1350	1400	1500	1650	1800	1342
	15 m/50 ft	2500	2550	2600	2750	3000	3300	2514
4000 1219	**Ground Roll**	1450	1500	1550	1700	1850	2000	1471
	15 m/50 ft	2650	2700	2800	2950	3250	3550	2661
5000 1524	**Ground Roll**	1600	1650	1700	1850	2000		1581
	15 m/50 ft	2750	2850	2900	3150	3450		2789
6000 1829	**Ground Roll**	1700	1750	1800	2000	2200		1681
	15 m/50 ft	2900	3000	3050	3350	3700		2907
7000 2134	**Ground Roll**	1850	1900	2000	2200	2450		1832
	15 m/50 ft	3100	3200	3300	3650	4000		3085
8000 2438	**Ground Roll**	2150	2200	2350	2600	2850		2108
	15 m/50 ft	3400	3500	3700	4100	4450		3388
9000 2743	**Ground Roll**	2600	2700	2900	3150	3450		2546
	15 m/50 ft	3900	4000	4300	4700	5150		3847
10000 3048	**Ground Roll**	3150	3200	3500	3850			3064
	15 m/50 ft	4500	4600	4950	5450			4393

Landing Distance - Abnormal Flap Position - 2300 kg/5071 lb								
Weight:	**2300 kg/5071 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**91 KIAS (Flaps T/O)** **95 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature -** [°C]/**[°F]**						
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	**ISA**
SL	**Ground Roll**	1850	1900	2000	2050	2200	2450	1925
	15 m/50 ft	3050	3100	3200	3300	3550	3900	3133
1000 305	**Ground Roll**	1900	2000	2050	2100	2350	2550	1978
	15 m/50 ft	3100	3200	3300	3350	3700	4050	3205
2000 610	**Ground Roll**	2000	2050	2150	2250	2450	2700	2052
	15 m/50 ft	3200	3300	3400	3550	3900	4250	3297
3000 914	**Ground Roll**	2350	2400	2500	2650	2900	3200	2376
	15 m/50 ft	3550	3650	3800	4000	4350	4800	3640
4000 1219	**Ground Roll**	2650	2750	2850	3050	3350	3700	2683
	15 m/50 ft	3900	4000	4150	4400	4850	5300	3966
5000 1524	**Ground Roll**	2900	3000	3100	3400	3750		2946
	15 m/50 ft	4200	4350	4450	4850	5300		4248
6000 1829	**Ground Roll**	3150	3250	3400	3750	4100		3173
	15 m/50 ft	4500	4600	4750	5200	5750		4495
7000 2134	**Ground Roll**	3500	3650	3800	4200	4650		3508
	15 m/50 ft	4850	5000	5200	5750	6300		4851
8000 2438	**Ground Roll**	4100	4250	4450	4950	5450		4049
	15 m/50 ft	5450	5600	5900	6500	7150		5412
9000 2743	**Ground Roll**	4900	5100	5450	6000	6600		4836
	15 m/50 ft	6300	6500	6950	7650	8350		6230
10000 3048	**Ground Roll**	6100	6300	6800	7500			5970
	15 m/50 ft	7500	7750	8350	9200			7386

Landing Distance - Abnormal Flap Position - 2200 kg/4850 lb								
Weight:	**2200 kg/4850 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**91 KIAS (Flaps T/O) 95 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway:	**dry, paved, level**		
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1800	1850	1900	1950	2150	2350	1842
	15 m/50 ft	3000	3100	3150	3250	3500	3850	3098
1000 305	**Ground Roll**	1850	1900	1950	2050	2250	2450	1895
	15 m/50 ft	3100	3150	3250	3350	3650	4000	3169
2000 610	**Ground Roll**	1900	2000	2050	2150	2350	2600	1966
	15 m/50 ft	3200	3250	3350	3500	3850	4200	3260
3000 **914**	**Ground Roll**	2250	2300	2400	2500	2750	3050	2276
	15 m/50 ft	3500	3600	3700	3900	4300	4700	3589
4000 1219	**Ground Roll**	2550	2600	2700	2900	3200	3500	2569
	15 m/50 ft	3850	3950	4050	4350	4750	5200	3902
5000 1524	**Ground Roll**	2800	2850	2950	3250	3600		2820
	15 m/50 ft	4150	4250	4350	4750	5200		4173
6000 1829	**Ground Roll**	3000	3100	3250	3550	3950		3018
	15 m/50 ft	4400	4500	4650	5100	5600		4401
7000 2134	**Ground Roll**	3350	3500	3650	4000	4400		3351
	15 m/50 ft	4750	4900	5100	5600	6150		4754
8000 2438	**Ground Roll**	3900	4050	4300	4750	5200		3876
	15 m/50 ft	5350	5500	5850	6450	7050		5311
9000 2743	**Ground Roll**	4750	4950	5300	5850	6400		4684
	15 m/50 ft	6250	6450	6900	7550	8250		6150
10000 3048	**Ground Roll**	5950	6100	6650	7300			5850
	15 m/50 ft	7450	7650	8300	9100			7340

Landing Distance - Abnormal Flap Position - 2100 kg/4630 lb								
Weight:	**2100 kg/4630 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**91 KIAS (Flaps T/O) 95 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature - [°C]/[°F]**						
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	**ISA**
SL	**Ground Roll**	1700	1750	1800	1850	2050	2250	1760
	15 m/50 ft	2950	3050	3150	3200	3450	3800	3062
1000 305	**Ground Roll**	1750	1800	1900	1950	2150	2350	1811
	15 m/50 ft	3050	3150	3200	3300	3600	3950	3133
2000 610	**Ground Roll**	1850	1900	1950	2050	2250	2500	1881
	15 m/50 ft	3150	3250	3300	3450	3800	4150	3222
3000 914	**Ground Roll**	2150	2200	2250	2400	2650	2900	2160
	15 m/50 ft	3450	3550	3650	3850	4250	4650	3529
4000 1219	**Ground Roll**	2400	2500	2550	2750	3050	3350	2437
	15 m/50 ft	3750	3900	4000	4250	4700	5100	3828
5000 1524	**Ground Roll**	2650	2750	2850	3100	3400		2676
	15 m/50 ft	4050	4150	4300	4650	5100		4087
6000 1829	**Ground Roll**	2900	2950	3050	3400	3700		2886
	15 m/50 ft	4300	4400	4550	5000	5500		4319
7000 2134	**Ground Roll**	3200	3300	3450	3850	4200		3195
	15 m/50 ft	4650	4800	5000	5500	6050		4659
8000 2438	**Ground Roll**	3750	3900	4100	4550	5000		3729
	15 m/50 ft	5250	5400	5700	6300	6900		5225
9000 2743	**Ground Roll**	4600	4800	5150	5650	6200		4564
	15 m/50 ft	6150	6350	6800	7450	8150		6093
10000 3048	**Ground Roll**	5850	6000	6550	7150			5715
	15 m/50 ft	7400	7650	8250	9050			7285

Landing Distance - Abnormal Flap Position - 1999 kg/4407 lb								
Weight:	**1999 kg/4407 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**88 KIAS (Flaps T/O)** **91 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway:	**dry, paved, level**		
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature -** [°C]/**[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1600	1700	1750	1750	1950	2150	1680
	15 m/50 ft	2800	2850	2950	3000	3250	3550	2883
1000 305	**Ground Roll**	1700	1750	1800	1850	2050	2250	1728
	15 m/50 ft	2850	2950	3000	3100	3400	3700	2949
2000 610	**Ground Roll**	1750	1800	1850	1950	2150	2350	1780
	15 m/50 ft	2950	3050	3100	3250	3550	3900	3026
3000 914	**Ground Roll**	2000	2100	2150	2300	2500	2750	2055
	15 m/50 ft	3250	3350	3450	3650	4000	4350	3320
4000 1219	**Ground Roll**	2300	2350	2450	2650	2900	3150	2315
	15 m/50 ft	3550	3650	3750	4000	4400	4800	3599
5000 1524	**Ground Roll**	2500	2600	2700	2900	3200		2538
	15 m/50 ft	3800	3900	4050	4350	4800		3842
6000 1829	**Ground Roll**	2750	2850	2900	3200	3550		2734
	15 m/50 ft	4050	4150	4300	4700	5150		4058
7000 2134	**Ground Roll**	3050	3150	3300	3650	4000		3031
	15 m/50 ft	4400	4550	4700	5200	5700		4383
8000 2438	**Ground Roll**	3600	3700	3950	4400	4800		3558
	15 m/50 ft	5000	5150	5400	6000	6550		4940
9000 2743	**Ground Roll**	4450	4650	5000	5500	6000		4423
	15 m/50 ft	5900	6100	6500	7150	7800		5827
10000 3048	**Ground Roll**	5750	5900	6400	7000			5627
	15 m/50 ft	7200	7350	8000	8750			7062

Landing Distance - Abnormal Flap Position - 1900 kg/4189 lb								
Weight:	**1900 kg/4189 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**88 KIAS (Flaps T/O) 91 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway: dry, paved, level			
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature -** [°C]/**[°F]**						
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	**ISA**
SL	**Ground Roll**	1550	1600	1650	1700	1850	2000	1588
	15 m/50 ft	2750	2850	2900	3000	3200	3500	2842
1000 305	**Ground Roll**	1600	1650	1700	1750	1900	2100	1635
	15 m/50 ft	2850	2900	3000	3050	3350	3650	2907
2000 610	**Ground Roll**	1650	1700	1750	1850	2050	2250	1697
	15 m/50 ft	2900	3000	3100	3200	3500	3850	2989
3000 914	**Ground Roll**	1900	2000	2050	2150	2400	2600	1958
	15 m/50 ft	3200	3300	3400	3550	3900	4300	3269
4000 1219	**Ground Roll**	2150	2250	2300	2500	2750	3000	2188
	15 m/50 ft	3500	3600	3700	3950	4300	4700	3527
5000 1524	**Ground Roll**	2400	2450	2550	2750	3050		2399
	15 m/50 ft	3700	3850	3950	4250	4700		3758
6000 1829	**Ground Roll**	2600	2650	2750	3050	3350		2586
	15 m/50 ft	3950	4050	4200	4600	5050		3966
7000 2134	**Ground Roll**	2900	3000	3100	3450	3800		2881
	15 m/50 ft	4300	4450	4600	5050	5550		4291
8000 2438	**Ground Roll**	3450	3550	3800	4150	4600		3421
	15 m/50 ft	4900	5050	5350	5850	6400		4861
9000 2743	**Ground Roll**	4350	4500	4800	5300	5800		4275
	15 m/50 ft	5850	6050	6450	7050	7700		5755
10000 3048	**Ground Roll**	5650	5800	6300	6850			5536
	15 m/50 ft	7150	7350	7950	8700			7048

Landing Distance - Abnormal Flap Position - 1800 kg/3968 lb								
Weight:	**1800 kg/3968 lb**				**Flaps:**	**T/O or UP**		
v_{REF}:	**88 KIAS (Flaps T/O) 91 KIAS (Flaps UP)**				**Power:**	**IDLE**		
					Runway:	**dry, paved, level**		
Distances are given in feet [ft]								
Press. Alt. [ft]/[m]		**Outside Air Temperature -** [°C]/**[°F]**						**ISA**
		0/**30**	10/**50**	20/**70**	30/**90**	40/**110**	50/**130**	
SL	**Ground Roll**	1450	1500	1550	1600	1750	1900	1508
	15 m/50 ft	2700	2800	2850	2950	3200	3450	2805
1000 305	**Ground Roll**	1500	1550	1600	1650	1800	2000	1554
	15 m/50 ft	2800	2850	2950	3000	3300	3600	2870
2000 610	**Ground Roll**	1600	1600	1700	1750	1950	2100	1602
	15 m/50 ft	2900	2950	3050	3150	3450	3800	2945
3000 914	**Ground Roll**	1800	1900	1950	2050	2250	2450	1846
	15 m/50 ft	3150	3250	3350	3500	3850	4200	3210
4000 1219	**Ground Roll**	2050	2100	2200	2350	2600	2850	2062
	15 m/50 ft	3400	3500	3600	3850	4250	4650	3454
5000 1524	**Ground Roll**	2250	2350	2400	2600	2850		2261
	15 m/50 ft	3650	3750	3850	4200	4600		3674
6000 1829	**Ground Roll**	2450	2500	2600	2850	3150		2439
	15 m/50 ft	3850	3950	4100	4500	4900		3874
7000 2134	**Ground Roll**	2750	2850	2950	3250	3600		2713
	15 m/50 ft	4200	4350	4500	4950	5450		4186
8000 2438	**Ground Roll**	3300	3400	3600	4000	4400		3264
	15 m/50 ft	4800	4950	5250	5750	6300		4769
9000 2743	**Ground Roll**	4200	4400	4650	5150	5600		4137
	15 m/50 ft	5750	5950	6350	7000	7650		5691
10000 3048	**Ground Roll**	5550	5700	6200	6750			5473
	15 m/50 ft	7150	7350	7950	8700			7060

5.3.13 GO-AROUND CLIMB PERFORMANCE

Conditions:

- Power lever . . . . both MAX
- Flaps . . . . LDG
- Landing gear . . . . extended
- Airspeed: . . . . v_{REF}

The climb performance charts show the rate of climb. The gradient and angle of climb can be calculated using the following formula:

$$Gradient\ [\%] = \frac{ROC\ [fpm]}{TAS\ [KTAS]} \cdot 0.98$$

NOTE

The angles of climb at MSL and ISA condition are:

2.7 ° for Maximum Take-Off Mass (2300 kg/5071 lb)

4.3 ° for 1999 kg/4407 lb

Go-Around Climb Performance											
Flaps: LDG								Power: MAX			
v_{REF}: 89 KIAS								Gear: extended			
Weight [kg]/[lb]	Press. Alt. [ft]	Press. Alt. [m]	Rate of Climb - [ft/min]								
			Outside Air Temperature - [°C]/[°F]								ISA
			-20 -4	-10 14	0 32	10 50	20 68	30 86	40 104	50 122	
2300/5071	SL		460	445	435	420	395	355	310	240	413
	2000	610	435	420	405	390	365	325	265	200	387
	4000	1219	405	390	370	355	325	280	220	150	360
	6000	1829	370	355	335	320	285	230	170		331
	8000	2438	335	315	300	275	225	165	95		301
	10000	3048	300	280	240	195	145	70			261
2200/4850	SL		505	490	480	465	440	400	350	275	459
	2000	610	480	465	450	435	410	365	305	240	432
	4000	1219	450	435	415	400	370	320	255	180	405
	6000	1829	415	400	380	365	330	270	205		375
	8000	2438	380	360	345	320	265	200	130		345
	10000	3048	345	320	280	240	185	105			305
2100/4630	SL		555	540	530	515	485	445	395	315	507
	2000	610	530	515	500	480	455	410	350	275	480
	4000	1219	500	480	465	450	420	365	295	220	453
	6000	1829	465	445	430	410	375	315	240		423
	8000	2438	430	410	390	365	310	240	165		392
	10000	3048	390	370	325	280	225	140			351
For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.											

Go-Around Climb Performance											
Flaps: LDG									**Power: MAX**		
v_{REF}: 84 KIAS									**Gear: extended**		
Weight [kg]/[lb]	**Press. Alt. [ft]**	**Press. Alt. [m]**	**Rate of Climb - [ft/min]**								
			Outside Air Temperature - [°C]/[°F]								**ISA**
			-20 -4	**-10** 14	**0** 32	**10** 50	**20** 68	**30** 86	**40** 104	**50** 122	
1999/4407	**SL**		675	660	650	640	615	575	525	440	633
	2000	610	650	640	625	615	590	550	480	395	612
	4000	1219	625	615	600	585	555	500	425	335	589
	6000	1829	600	585	565	545	510	445	370		559
	8000	2438	565	545	525	500	450	375	295		528
	10000	3048	525	505	465	425	370	280			489
1900/4189	**SL**		735	720	710	695	670	630	575	485	691
	2000	610	710	695	685	670	650	605	530	445	670
	4000	1219	685	670	660	640	610	555	475	380	646
	6000	1829	660	640	620	605	570	495	415		616
	8000	2438	620	600	585	555	505	425	340		584
	10000	3048	580	560	520	480	420	320			545
1800/3968	**SL**		795	785	770	760	735	695	635	535	754
	2000	610	775	760	745	735	710	665	585	490	733
	4000	1219	750	735	720	705	670	610	525	425	709
	6000	1829	720	705	685	665	630	550	465		678
	8000	2438	685	665	645	615	560	475	385		645
	10000	3048	645	620	580	535	475	370			604
For the rate of climb in [m/s] divide by 196.8 or multiply by 0.00508.											

5.3.14 APPROVED NOISE DATA

Max. Flight Mass 1999 kg (4407 lb)

ICAO Annex 16 Chapter X, App.6. . . . . 73.9 dB(A)

Max. Flight Mass 2300 kg (5071 lb)

ICAO Annex 16 Chapter X, App.6. . . . . 77.5 dB(A)

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CHAPTER 6
MASS AND BALANCE

Page

6.1 INTRODUCTION

In order to achieve the performance and flight characteristics described in this Airplane Flight Manual and for safe flight operation, the airplane must be operated within the permissible mass and balance envelope.

The pilot is responsible for adhering to the permissible values for loading and center of gravity (CG). In this, he should note the movement of the CG due to fuel consumption. The permissible CG range during flight is given in Chapter 2.

The procedure for determining the flight mass CG position is described in this chapter. Additionally, a comprehensive list of the equipment approved for this airplane exists (Equipment List). The set of items marked as 'installed' constitutes the *Equipment Inventory*.

Before the airplane is delivered, the empty mass and the corresponding CG position are determined and entered in Section 6.3 - MASS AND BALANCE REPORT.

NOTE

Following equipment changes, the new empty mass and the corresponding CG position must be determined by calculation or by weighing.

Following repairs or repainting, the new empty mass and the corresponding CG position must be determined by weighing.

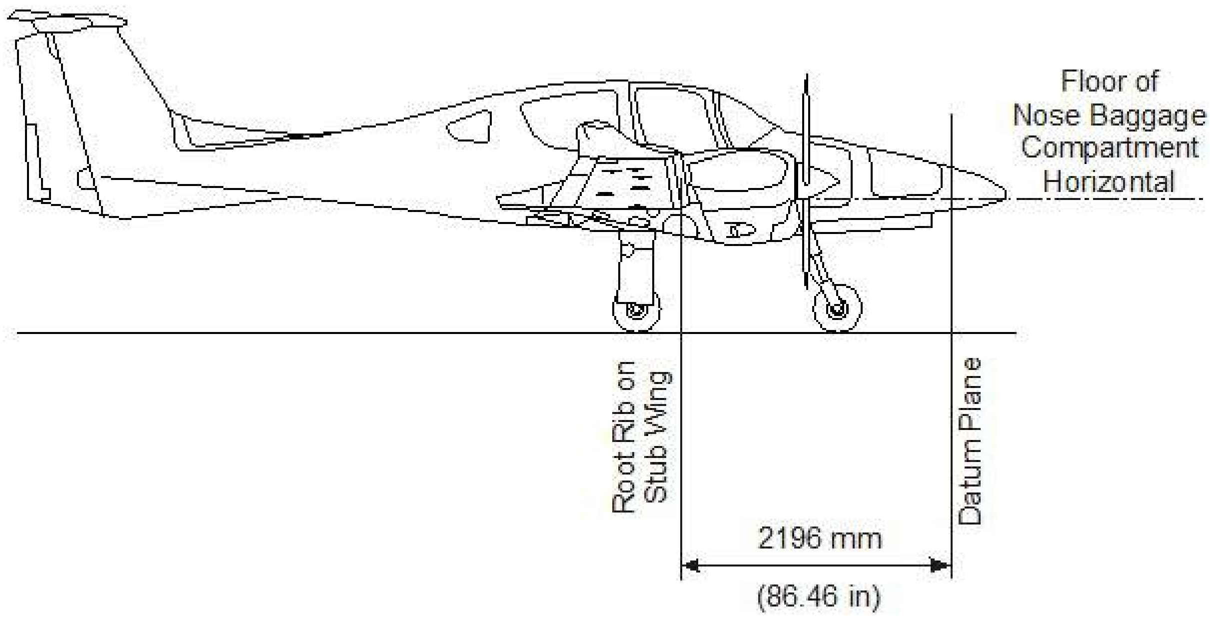
Empty mass, empty mass CG position, and the empty mass moment must be certified in the Mass and Balance Report by authorized personnel.

NOTE

Refer to Section 1.6 - UNITS OF MEASUREMENT for conversion of SI units to US units and vice versa.

6.2 DATUM PLANE

The Datum Plane (DP) is a plane which is normal to the airplane's longitudinal axis and in front of the airplane as seen from the direction of flight. The airplane's longitudinal axis is parallel with the floor of the nose baggage compartment. When the floor of the nose baggage compartment is aligned horizontally, the Datum Plane is vertical. The Datum Plane is located 2.196 meters (86.46 in) forward of the most forward point of the root rib on the stub wing.



6.3 MASS AND BALANCE REPORT

The empty mass and the corresponding CG position established before delivery are the first entries in the Mass and Balance Report. Every change in permanently installed equipment, and every repair to the airplane which affects the empty mass or the empty mass CG must be recorded in the Mass and Balance Report.

For the calculation of flight mass and corresponding CG position (or moment), the *current* empty mass and the corresponding CG position (or moment) in accordance with the Mass and Balance Report must always be used.

Condition of the airplane for establishing the empty mass:

- Equipment as per Equipment Inventory (see Section 6.5)
- Including the following operating fluids:
  brake fluid
  hydraulic fluid (for the retractable landing gear)
  engine oil (2 x 7 liters = 2 x 7.4 qts)
  coolant (2 x 7.5 liters = 2 x 7.93 qts)
  gearbox oil (2 x 2.1 liters = 2 x 2.22 qts)
  unusable fuel in main fuel tanks (2 x 1 US gal = 2 x 3.79 liters)
  unusable fuel in auxiliary fuel tanks (2 x 0.29 US gal = 2 x 1.1 liters)

MASS AND BALANCE REPORT

DA 62				Serial No.:			Registration:			Page No.:		
Date	Entry No.:		Description of part or Modification	Changes in mass						Current empty mass		
				Addition (+)			Subtraction (-)					
				Mass	Moment Arm	Moment	Mass	Moment Arm	Moment	Mass	Moment Arm	Moment
	IN	OUT										
			Upon delivery									

6.4 FLIGHT MASS AND CENTER OF GRAVITY

The following information enables you to operate your DA 62 within the permissible mass and balance limits. For the calculation of the flight mass and the corresponding CG position, the following tables and diagrams are required:

6.4.1 - MOMENT ARMS
6.4.2 - LOADING DIAGRAM
6.4.3 - CALCULATION OF LOADING CONDITION
6.4.4 - PERMISSIBLE CENTER OF GRAVITY RANGE
6.4.5 - PERMISSIBLE MOMENT RANGE

The diagrams should be used as follows:

1. Take the empty mass and the empty mass moment of your airplane from the Mass and Balance Report, and enter the figures in the appropriate boxes under the column marked ‘Your DA 62' in Table 6.4.3 - CALCULATION OF LOADING CONDITION.

2. Read the fuel quantity indicators to determine the fuel quantity in the main fuel tanks.

3. Determine the fuel quantity in the auxiliary fuel tanks:

   If MÄM 62-254 is NOT installed:

   To verify an empty auxiliary fuel tank, set the ELECT. MASTER switch and the AUX PUMP switch to ON and check the PFD for the L/R AUX FUEL E caution message.

   To verify a full auxiliary fuel tank open the auxiliary fuel tank filler and check fuel level.

   If the auxiliary fuel tank quantity is in between empty and full, the exact quantity cannot be determined. If possible, transfer all fuel to the main fuel tank by setting the ELECT. MASTER switch and the AUX PUMP switch to ON until the L/R AUX FUEL E caution message appears on the PFD. During this procedure, ground power must be used or at least one engine must be running. The fuel transfer will take a maximum of 10 minutes.

CAUTION

If the auxiliary tanks are in use, both tanks must be refueled to the maximum level to provide proper information to the pilot about the fuel quantity in the auxiliary fuel tanks.

If the auxiliary tanks are not in use, the pilot must ensure that they are empty.

If MÄM 62-254 is installed:

Set the ELECT. MASTER switch and the AUX PUMP switch to ON and read the auxiliary fuel tank quantities (LH and RH).

CAUTION

If the auxiliary fuel tank quantities are not displayed, the auxiliary fuel tanks must be operated as described under 'If MÄM 62-254 is NOT installed'.

4. Multiply the individual masses by the moment arms quoted to obtain the moment for every item of loading and enter these moments in the appropriate boxes in Table 6.4.3 - CALCULATION OF LOADING CONDITION.

5. Add up the masses and moments in the respective columns. The CG position is calculated by dividing the total moment by the total mass (using row 11 for the condition with empty fuel tanks, and row 14 for the pre take-off condition). The resulting CG position must be inside the limits.

   As an illustration, the total mass and the CG position are entered on Diagram 6.4.4 - PERMISSIBLE CENTER OF GRAVITY RANGE. This checks graphically that the current configuration of the airplane is within the permissible range.

6. Graphical method:

   Diagram 6.4.2 - LOADING DIAGRAM is used to determine the moments. The masses and moments for the individual items of loading are added. Then Diagram 6.4.5 - PERMISSIBLE MOMENT RANGE is used to check whether the total moment associated with the total mass is in the permissible range.

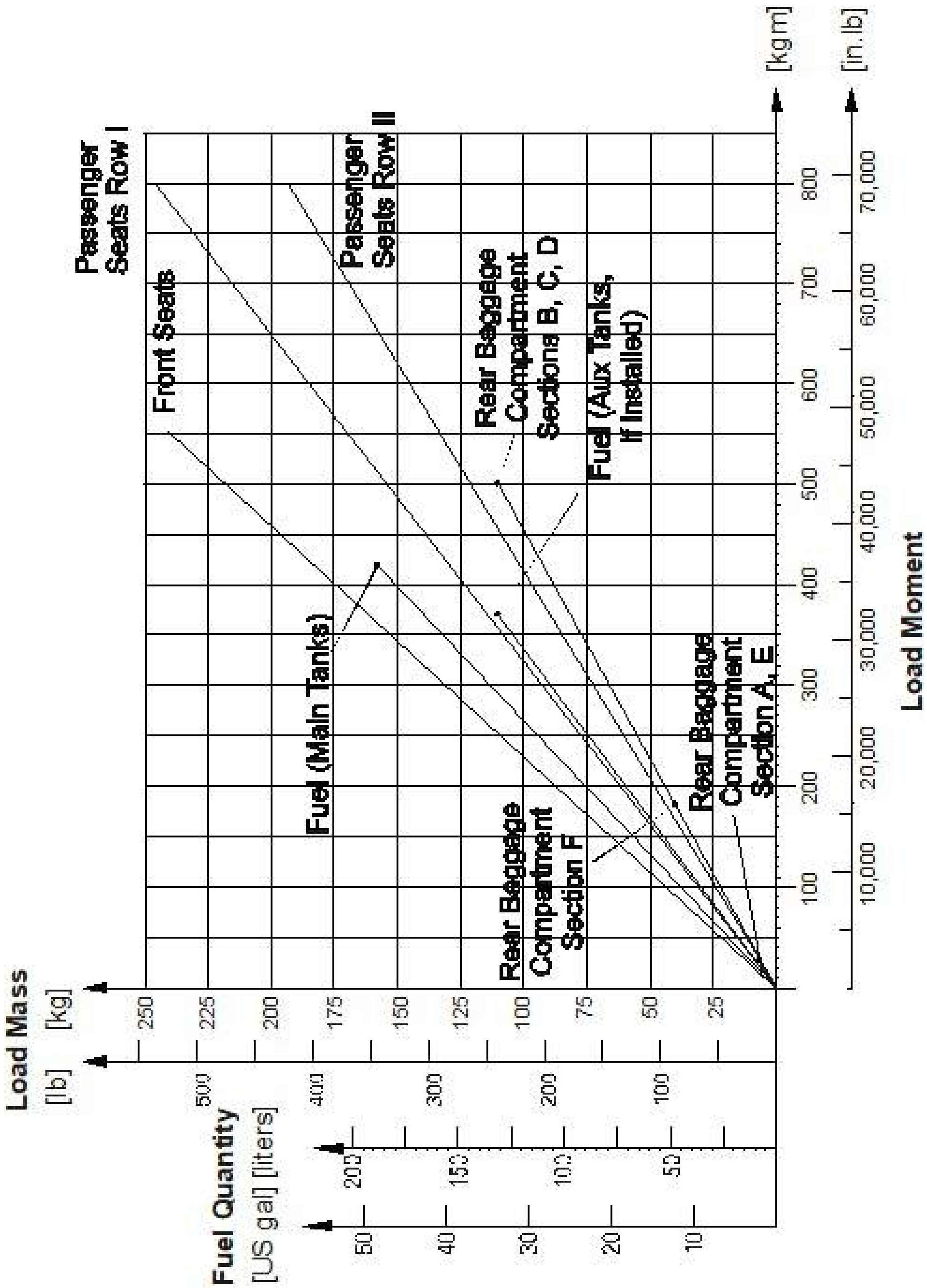
   The result found with the graphical method is however inaccurate. In doubtful cases the result must be verified using the exact method given above.

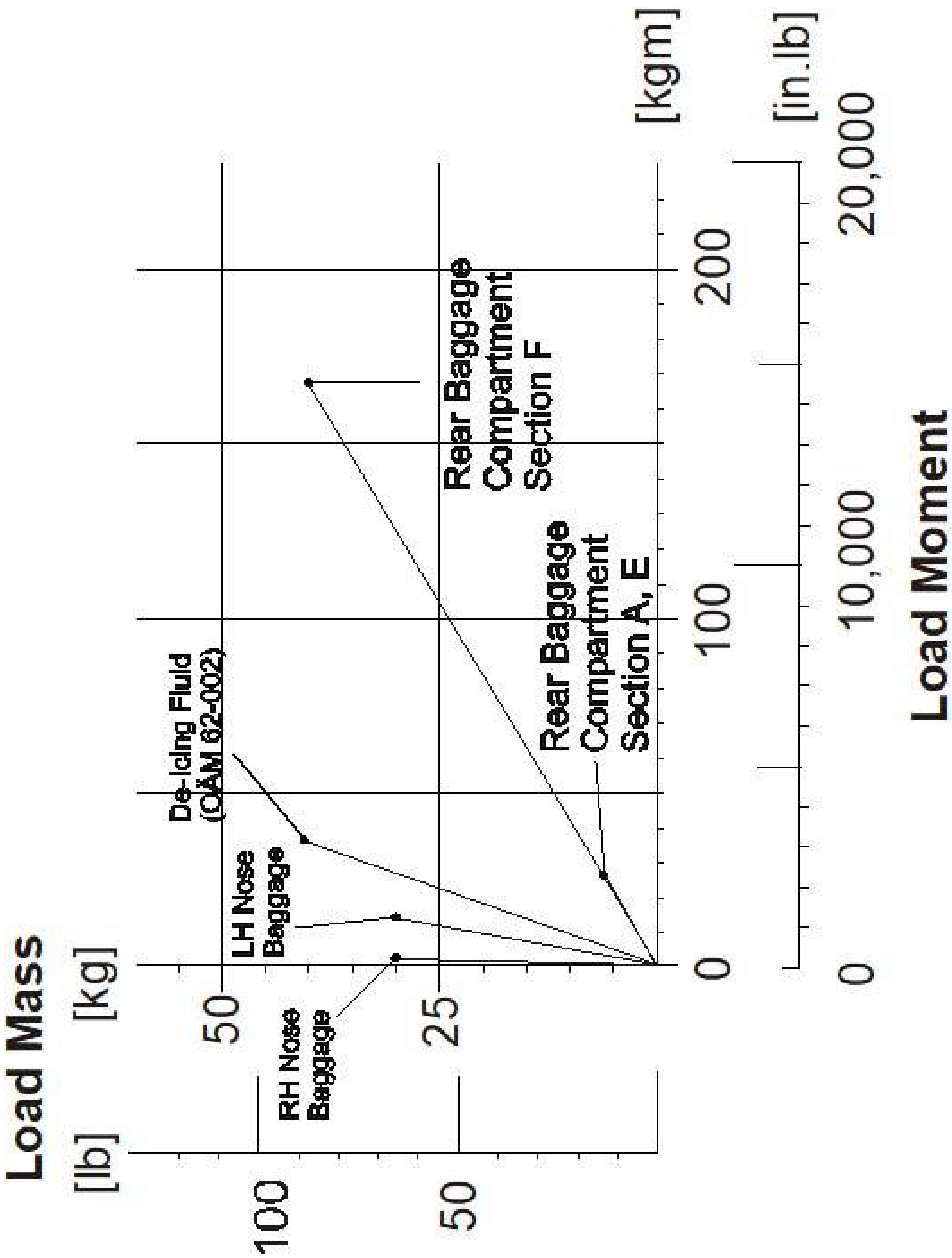
6.4.1 MOMENT ARMS

The most important lever arms aft of the Datum Plane:

Item		Lever Arm	
		[m]	[in]
Occupants on front seats		2.30	90.6
Occupants on rear seats, row I		3.25	128.0
Occupants on rear seats, row II (if OÄM 62-019 is installed)		4.15	163.4
Fuel	in main tanks	2.63	103.5
	in auxiliary tanks	3.20	126.0
De-Icing fluid	tank in LH nose baggage compartment	0.90	35.4
Baggage in compartments	LH Nose baggage compartment	0.47	18.5
	RH Nose baggage compartment	0.05	2.0
	Rear baggage compartment (Section A, if OÄM 62-019 is NOT installed)	4.06	159.8
	Rear baggage compartment (Sections B, C, D, if OÄM 62-019 is NOT installed)	4.18	164.4
	Rear baggage compartment (Section E, if OÄM 62-019 is installed)	4.41	173.6
	Rear baggage compartment (Section F, if OÄM 62-019 is installed)	4.18	164.4

6.4.2 LOADING DIAGRAMS




Load Mass
[lb]
[kg]
50
25
100
50
0
Load Moment
[kgm]
[in.lb]
0
100
200
0
10,000
20,000
RH Nose Baggage
LH Nose Baggage
De-Icing Fluid (OÄM 62-002)
Rear Baggage Compartment Section A, E
Rear Baggage Compartment Section F

6.4.3 CALCULATION OF LOADING CONDITION

1. Complete the form on the next page.
2. Divide the total moments from rows 11 and 14 by the related total mass to obtain the CG positions.

In our example:	empty tanks:	5003.65 kgm/2035 kg = 2.459 m *434,297 in.lb/4486 lb = 96.81 in*
	with fuel in tanks:	5611.55 kgm/2241 kg = 2.504 m *487,061 in.lb/4940 lb = 98,60 in*

3. Locate the values in the diagram in Section 6.4.4 - PERMISSIBLE CENTER OF GRAVITY RANGE. If the CG positions and related masses fall into the permitted area, the loading condition is allowable.

   Our example shows allowable loading conditions.

NOTE

If the optional de-icing system OÄM 62-002 is installed, the following must be observed:

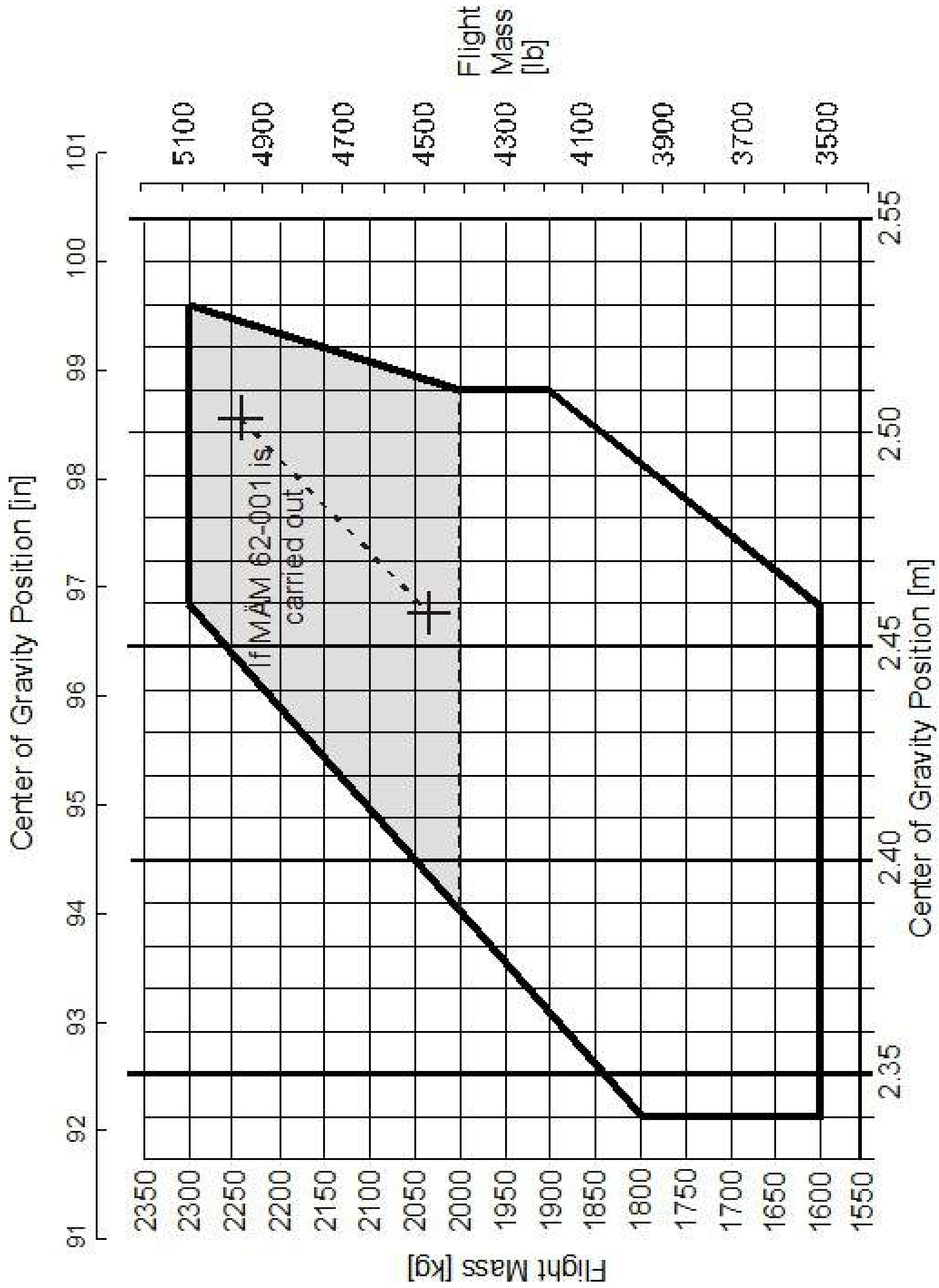
The consumption of fuel causes a forward movement of the CG. The consumption of de-icing fluid causes a rearward movement of the CG. Depending on the fuel flow and de-icing fluid flow, the overall movement of the CG can be a forward or a rearward movement. In order to cover all possible cases, the following table must be completed twice: with (as shown in the example) and without considering the on-board de-icing fluid. All four CG positions (fuel tank full/empty, de-icing fluid tank full/empty) must fall into the permitted area.

CALCULATION OF LOADING CONDITION		DA 62 (Example)		Your DA 62	
		Mass [kg] [lb]	Moment [kgm] [in.lb]	Mass [kg] [lb]	Moment [kgm] [in.lb]
1.	Empty mass (from Mass and Balance Report)	1600 *3528*	3885.0 *337,203*		
2.	Front seats Lever arm: 2.30 m *(90.6 in)*	160 *353*	368.0 *31,941*		
3.	Passenger seats row I Lever arm: 3.25 m *(128.0 in)*	140 *308*	455.0 *39,492*		
4.	Passenger seats row II Lever arm: 4.15 m *(163.4 in)*	60 *132*	249.0 *21,612*		
5.	LH Nose baggage compt. Lever arm: 0.47 m *(18.5 in)*	30 *66*	14.1 *1,224*		
6.	RH Nose baggage compt. Lever arm: 0.05 m *(2.0 in)*	30 *66*	1.5 *130*		
7.	Rear baggage compt. (Section A) Lever arm: 4.06 m *(159.8 in)*	0 *0*	0.0 *0*		
8.	Rear baggage compt. (Sections B, C, D, F) Lever arm: 4.18 m *(164.5 in)*	0 *0*	0.0 *0*		
9.	Rear baggage compt. (Section E) Lever arm: 4.41 m *(173.6 in)*	5 *11*	22.05 *1,914*		
10.	De-Icing fluid (1.1 kg/L *(9.02 lb/US gal)*) Lever arm: 0.90 m *(35.4 in)*	10 *22*	9.0 *781*		
11.	Total mass & total moment with empty fuel tanks (Total of 1.-10.)	2035 *4486*	5003.65 *434,297*		
12.	Usable fuel, main tanks (0.84 kg/liter) *(7.01 lb/US gal)* Lever arm: 2.63 m *(103.5 in)*	90 *198*	236.7 *20,545*		

CALCULATION OF LOADING CONDITION	DA 62 (Example)		Your DA 62	
	Mass [kg] [lb]	Moment [kgm] [in.lb]	Mass [kg] [lb]	Moment [kgm] [in.lb]
13. Usable fuel, auxiliary tanks (if installed), (0.84 kg/liter) *(7.01 lb/US gal)* Lever arm: 3.2 m *(126 in)*	116 *256*	371.2 *32,219*		
14. Total mass & total moment with fuel (Total of 11. - 13.)	2241 *4940*	5611.55 *487,061*		

The CG's shown in the following diagrams are those from the example in Section 6.4.3 - CALCULATION OF LOADING CONDITION, rows 11 and 14.

6.4.4 PERMISSIBLE CENTER OF GRAVITY RANGE



The flight CG position must be within the following limits:

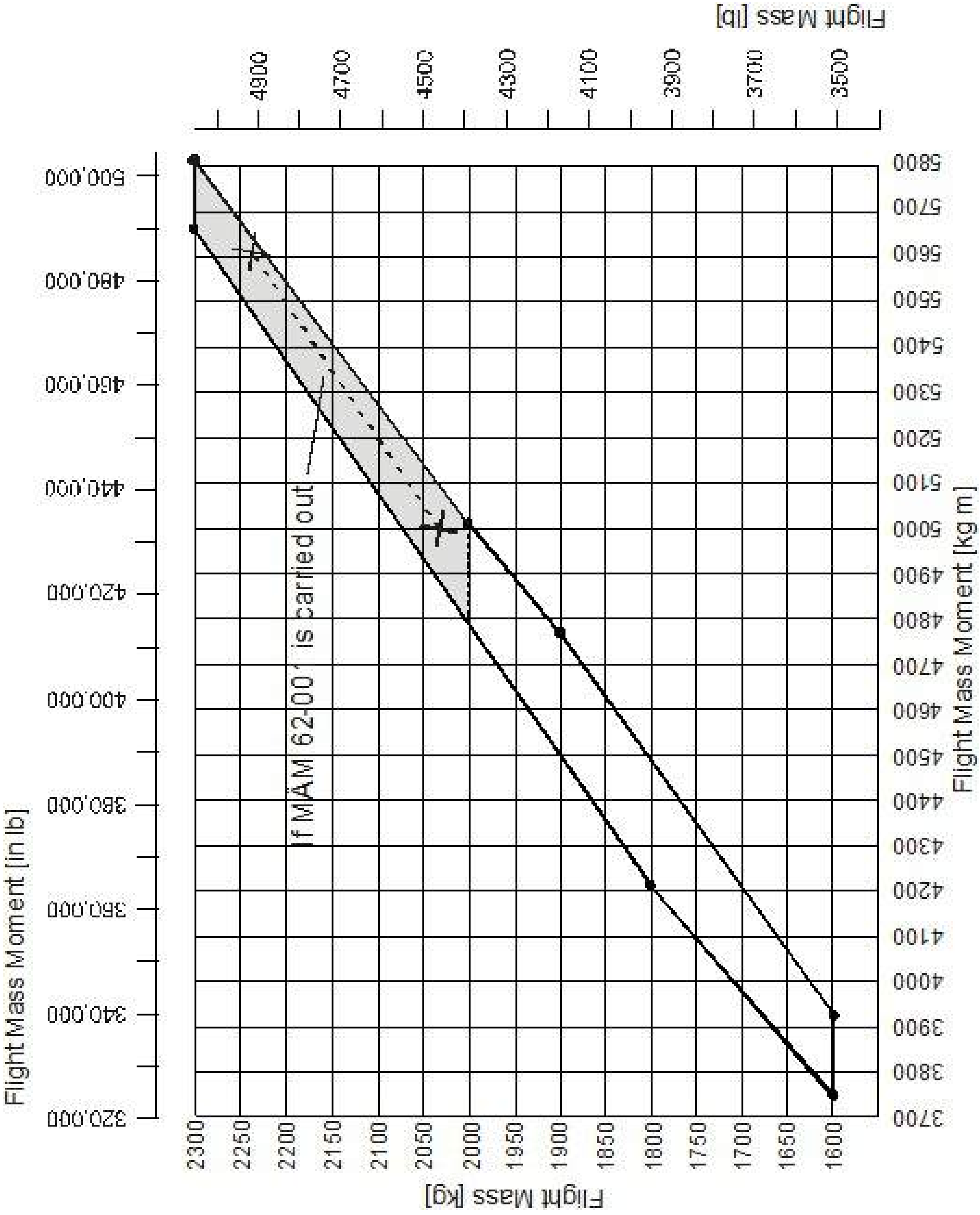
Most forward flight CG:

2.340 m (92.13 in) aft of datum plane at 1600 kg (3527 lb) to 1800 kg (3968 lb)
2.460 m (96.85 in) aft of datum plane at max. take-off mass (see Section 2.7)
linear variation in between

Most rearward flight CG:

2.460 m (96.85 in) aft of datum plane at 1600 kg (3527 lb)
2.510 m (98.82 in) aft of datum plane at 1900 kg (4189 lb) to 1999 kg (4407 lb)
2.530 m (99.61 in) aft of datum plane at MTOM
linear variation in between

6.4.5 PERMISSIBLE MOMENT RANGE



The flight mass moments shown in the diagram are those from the example in Table 6.4.3 - CALCULATION OF LOADING CONDITION, rows 11 and 14.

6.5 EQUIPMENT LIST AND EQUIPMENT INVENTORY

All equipment that is approved for installation in the DA 62 is shown in the *Equipment List* below.

NOTE

The equipment listed below cannot be installed in any arbitrary combination. The airplane manufacturer must be contacted before removing or installing equipment, with the exception of replacing a unit by an identical unit.

The items of equipment installed in your particular airplane are indicated in the appropriate column. The set of items marked as 'installed' constitutes the *Equipment Inventory*.

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
AVIONICS COOLING									
Avionics cooling fan # 1	SAFE 328	305 467-00	Sandia Aerospace						
Avionics cooling fan # 2	SAFE 328	305 467-00	Sandia Aerospace						
PFD cooling fan	SAFE 128	305 468-00	Sandia Aerospace						
MFD cooling fan	SAFE 128	305 468-00	Sandia Aerospace						
AUTOPILOT SYSTEM									
Pitch servo	GSA 81	011-00878-20	Garmin						
Pitch servo mount	GSM 86	011-01904-03	Garmin						
Pitch clutch cartridge		011-02147-11	Garmin						
Roll servo	GSA 81	011-00878-20	Garmin						
Roll servo mount	GSM 86	011-01904-03	Garmin						
Roll clutch cartridge		011-02147-09	Garmin						
Pitch trim servo	GSA 81	011-00878-20	Garmin						
Pitch trim servo mount	GSM 86	011-01904-03	Garmin						
Pitch trim clutch cartridge		011-02147-09	Garmin						
Yaw servo	GSA 80	011-00877-20	Garmin						
Yaw servo mount	GSM 86	011-01904-03	Garmin						
Yaw clutch cartridge		011-02147-03	Garmin						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
ELECTRICAL POWER									
Main battery	RG24-15		Concorde						
Emergency battery		D60-2560-91-00	Diamond Aircraft						
ECU backup battery LH (2 pcs.)	LC-R127R2P		Panasonic						
ECU backup battery RH (2 pcs.)	LC-R127R2P		Panasonic						
Additional Alternator		ES-10024B-2	Kelly Aerospace						
Alternator Pulley		D64-2416-00-761	Diamond Aircraft						
Gear Box Fan Assy		D44-2416-20-00	Diamond Aircraft						
Prop. Flange Pulley Support		D44-2416-00-52_1	Diamond Aircraft						
Additional Alternator V-belt		ISO 4184 XPZL987	Diamond Aircraft						
Additional Alternator Regulator		VR2000_28-1	Electrosystems Inc.						
OXYGEN SYSTEM									
Oxygen cylinder (empty) incl. pressure regulator		4110-122-3-11	Aerox			13.76	6.24	31.9	0.81
Oxygen cylinder 50 cuft (empty) incl. pressure regulator		4110-136-02-5	Aerox			8.60	3.90	27.8	0.70
Single outlet manifold, Pax row I		4110-401-2-01	Aerox			0.22	0.10	111.0	2.82
Double outlet manifold, Pilot / copilot		4110-400-2	Aerox			0.42	0.19	103.9	2.64
Double outlet manifold, Pax Row I		4110-400-2	Aerox			0.42	0.19	111.0	2.82
Double outlet manifold, Pax Row II		4110-400-2	Aerox			0.42	0.19	153.5	3.90
Filling block		4110-405-2	Aerox			0.46	0.21	16.5	0.42
Pressure gauge		4110-486	Aerox			0.11	0.05	66.9	1.70
Push / pull control knob		4110-495	Aerox			0.27	0.12	66.1	1.68

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
CABIN COOLING SYSTEM									
Cabin cooling central unit		D44-2153-00-00	Diamond Aircraft			47.8	21.7	194.9	4.95
EQUIPMENT									
Safety belt, pilot	5-01-() Series	5-01-2Y07( )	Schroth			2.110	0.960	92.520	2.350
Safety belt, co-pilot	5-01-() Series	5-01-2Y57( )	Schroth			2.110	0.960	92.520	2.350
Safety belt, LH pax row I	5-02-() Series	5-02-BJ57( )	Schroth			2.250	1.020	126.800	3.220
Safety belt, RH pax row I	5-02-() Series	5-02-BK57( )	Schroth			2.250	1.020	126.800	3.220
Safety belt, Center pax row I	5-02-() Series	5-02-BL57( )	Schroth			2.250	1.020	126.800	3.220
Safety belt, LH pax row II	5-02-() Series	5-02-BP57( )	Schroth			2.250	1.020	126.800	3.220
Safety belt, RH pax row II	5-02-() Series	5-02-BP07( )	Schroth			2.250	1.020	126.800	3.220
ELT unit	406 AF-Compact	S1840501-01	Kannad			1.874	0.874	179.700	4.565
ELT remote switch	RC 200	S1820513-11	Kannad						
ELT antenna	ANT300	0124220	Kannad			0.330	0.150	152.800	3.880
ELT antenna	AV-300	0146151	Kannad						
SAFETY EQUIPMENT									
Fire extinguisher		HAL 1	AIR TOTAL						
Fire extinguisher		HAL 1,2	AIR TOTAL						
First aid kit									
Egress Hammer		D67-2560-80-50	Diamond						
Belt Cutter		D67-9025-60-01	Woodway / Dhelen						
FLIGHT CONTROLS									
Lift detector		C-99701-1	Safe Flight Instr.						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
HYDRAULIC									
Motor pump unit		X11-0001-00-00.00/A	Hydraulik Mayer						
Hydraulic fluid tank		X11-0002-00-00.00	Hydraulik Mayer						
Hydraulic control unit		X11-0003-00-00.00/A	Hydraulik Mayer						
High pressure filter		X11-0004-00-00.00	Hydraulik Mayer						
Hydraulic pressure accumulator		X11-0005-00-00.00	Hydraulik Mayer						
MLG hydraulic cylinder, LH		X11-0006-00-00.00/1R0	Hydraulik Mayer						
MLG hydraulic cylinder, RH		X11-0006-00-00.00/1R0	Hydraulik Mayer						
NLG hydraulic cylinder		X11-0006-00-00.00/3	Hydraulik Mayer						
Brake master cylinder (4 pcs.)		10-54A	Cleveland						
Parking valve		60-5D	Cleveland						
Brake assembly		30-233 E	Cleveland						
INDICATING / REC. SYSTEM									
Primary flight display (PFD)	GDU 1040	011-00972-03	Garmin						
Multi function display (MFD)	GDU 1045	011-00819-04	Garmin						
Primary flight display (PFD)	GDU 1040	011-00972-10	Garmin						
Multi function display (MFD)	GDU 1045	011-00819-10	Garmin						
Primary flight display (PFD)	GDU 1050	011-03470-00	Garmin						
Multi function display (MFD)	GDU 1055	011-03470-80	Garmin						
Control unit	GCU 476	011-01237-10	Garmin						
Control unit	GCU 476	011-04476-00	Garmin						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	Type	Part No.	Manufacturer	S/N	installed	lb	kg	in	m
LANDING GEAR									
Main landing gear LH		D67-3211-01-00	Diamond Aircraft						
Main landing gear RH		D64-3212-01-00	Diamond Aircraft						
Nose landing gear assy		D67-3220-01-00_01	Diamond Aircraft						
Nose landing gear assy		D67-3220-01-00_02	Diamond Aircraft						
LIGHTS									
Area Dome light		CL 13 625-1	Birk Aerosystems						
Strobe / Pos. light assy LH		D67-5731-29-01	Birk Aerosystems						
Strobe / Pos. light assy RH		D67-5732-29-01	Birk Aerosystems						
Map / Reading lights (4 pcs.)		RL6961-1	Birk Aerosystems						
Cabin Light		RL6980-1	Birk Aerosystems						
Taxi light	Xenon D1S		Aero Vision Int.						
Taxi light power supply		XV4D-35	XeVision						
Landing light	Xenon D1S		Aero Vision Int.						
Landing light power supply		XV4D-35	XeVision						
Glareshield lamp assy		DA4-3311-10-02	Diamond Aircraft						
Glareshield light inverter		APVL328-4-1-L-5QF	Quantaflex						
Placards inverter		APVL328-4-1-L-15QF	Quantaflex						
Flood light LH		D67-3311-10-01	Diamond Aircraft						
Flood light RH		D67-3311-10-02	Diamond Aircraft						
Map / Reading Light		RL6980-1	Birk Aerosystems						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
COMMUNICATION / NAVIGATION									
COMM #1 antenna	CI 2580-200		Comant						
COMM #2 antenna	CI 292-2		Comant						
Audio panel / Marker / ICS	GMA 1347	011-00809-00	Garmin						
Handmic	100 TRA	62800-001	Telex						
Pitot / Static probe, heated	AN5814-2	PST-305	Aeroinstruments						
Static port electrically heated LH/RH		ST-333-1	Aerosonic						
Alternate static valve		DA4-3111-51-00	Diamond Aircraft						
Backup altimeter		5934PD-3	United Instruments						
Backup airspeed indicator	8030	8030-B.	United Instruments						
Backup artificial horizon	4300	4300-206	Mid Continent Instr.						
Standby Attitude Module	MD302	6420302-1	Mid Continent Instr						
Magnetic compass		PG2C-28V	SIRS Navigation						
Magnetic compass		NV2C-28V	SIRS Navigation						
OAT probe	GTP 59	011-00978-00	Garmin						
Digital air data system	GDC74A	011-00882-00	Garmin						
Digital air data system	GDC 74A	011-00882-10	Garmin						
Digital air data system	GDC 72	011-03734-00	Garmin						
Integrated avionics #1	GIA 63 W	011-01105-20	Garmin						
Integrated avionics #2	GIA 63 W	011-01105-20	Garmin						
Integrated avionics #1	GIA 63W	011-01105-01	Garmin						
Integrated avionics #2	GIA 63W	011-01105-01	Garmin						
Transponder	GTX 33 ES	011-00779-30	Garmin						
Transponder	GTX 335 R	011-03301-00	Garmin						
Attitude / Heading reference system GRS 77	GRS 77	011-00868-10	Garmin						
Attitude / Heading reference system	GRS 79	011-03732-00	Garmin						
TAS processor	TAS 600	70-2420-x TAS600	Avidyne						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
TAS processor	TAS 605	70-2420-x TAS605	Avidyne						
TAS processor	TAS 610	70-2420-x TAS610	Avidyne						
TAS processor	TAS 615	70-2420-x TAS615	Avidyne						
TAS processor	TAS 620	70-2420-x TAS620	Avidyne						
TAS processor	9900BX	70-2420-x	Avidyne						
Transponder coupler		70-2040	Avidyne						
TAS antenna, top		S72-1750-31L	Sensor Systems						
TAS antenna, bottom		S72-1750-32L	Sensor Systems						
Magnetometer	GMU 44	011-00870-00	Garmin						
Magnetometer	GMU 44	011-00870-10	Garmin						
Dual VOR / dual GS duplexer	CI 1125		Comant						
LH: VOR / LOC / GS antenna	CI120-1		Comant						
RH: VOR / LOC / GS antenna	CI120-1		Comant						
VOR / LOC / GS PWR combiner	CI120-3		Comant						
Transponder antenna	KA 61	071-00221-0010	Bendix/King						
Marker antenna	CI 102		Comant						
GPS #1 antenna	GA 36	013-00244-00	Garmin						
GPS #2 antenna	CI 2580-200		Comant						
DME	KN 63	066-1070-01	Bendix/King						
DME antenna	KA 61	071-00221-0010	Bendix/King						
Weather radar	GWX 70	011-01768-00	Garmin						
Weather radar antenna		117-00254-00	Garmin						
Stormscope	WX-500	805-11500-001	L-3 Communications						
Stormscope antenna	NY-163	805-10930-001	L-3 Communications						
Satellite Transceiver	GSR 56	011-02268-00	Garmin						
Iridium Antenna	CI 490-1		Comant						
Iridium Antenna	CI 490-490		Comant						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
ADF receiver	RA 3502-(01)	0505.757-912	Becker						
ADF / RMI converter	AC 3504-(01)	0856.010-912	Becker						
ADF antenna	AN 3500	0832.601-912	Becker						
EMI filter LH		D64-3454-10-00	Diamond Aircraft						
EMI filter RH		D64-3454-10-00	Diamond Aircraft						
ICE PROTECTION SYSTEM									
Porous Panel, outer wing, LH, outboard		15502-01	CAV Aerospace						
Porous Panel, outer wing, RH, outboard		15502-02	CAV Aerospace						
Porous Panel, outer wing, LH, inboard		15502-03	CAV Aerospace						
Porous Panel, outer wing, RH, inboard		15502-04	CAV Aerospace						
Porous Panel, horizontal tail, LH		15502-09	CAV Aerospace						
Porous Panel, horizontal tail, RH		15502-10	CAV Aerospace						
Porous Panel, vertical tail		15502-11	CAV Aerospace						
Inlet strainer		D67-9030-03-01_01	FTEU						
Spray bar		12124-10	CAV Aerospace						
Metering pump 1		9513T-1	CAV Aerospace			4.16	1.89	41.5	1.05
Metering pump 2		9513U-1	CAV Aerospace			4.16	1.89	35.7	0.91
De-icing fluid tank		D67-3003-13-01	Diamond Aircraft			7.72	3.50	37.4	0.95
Fluid filter		F932	Diamond Aircraft			1.83	0.83	45.3	1.15
Solenoid valve		FV158H-28V	CAV Aerospace			0.86	0.39	30.7	0.87
High pressure switch		P041ED 1500	CAV Aerospace						
Proportioning unit, nacelle, LH		PU303DW225	CAV Aerospace						
Proportioning unit, nacelle, RH		PU303DW226	CAV Aerospace						
Tail bracket assembly		15532-01	CAV Aerospace			1.37	0.62	292.8	7.44
Windshield pump		WP209A	CAV Aerospace			0.66	0.30	34.80	0.89
De-ice control box		DAI-9030-00-01	Diamond Aircraft						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
ENGINE									
LH engine	E4P-C	E4PC-00-000-000	Austro Engine						
RH engine	E4P-C	E4PC-00-000-000	Austro Engine						
LH engine control unit	EECU-E4-01	E4A-92-100-000	Austro Engine						
RH engine control unit	EECU-E4-01	E4A-92-100-000	Austro Engine						
ECU software		Refer to DAI Service Bulletin MSB-62-002, latest revision	Austro Engine						
ENGINE STARTING									
Glow plug control unit LH/RH		E4A-94-200-000	Austro Engine						
Starter LH / RH		E4A-93-000-000	Austro Engine						
ELECTRICAL POWER									
LH alternator		E4A-91-400-000	Austro Engine						
RH alternator		E4A-91-400-000	Austro Engine						
LH alternator regulator		E4A-91-200-000	Austro Engine						
RH alternator regulator		E4A-91-200-000	Austro Engine						
ENGINE FUEL PUMPS									
LH fuel pumps (2x)		0-580-054-001	Bosch						
RH fuel pumps (2x)		0-580-054-001	Bosch						
ENGINE FIRE WARNING									
LH overheat detector		X 2003-2	Control Products, Inc.						
RH overheat detector		X 2003-2	Control Products, Inc.						
LH overheat detector		X 2003-506	Control Products, Inc.						
RH overheat detector		X 2003-506	Control Products, Inc.						
ENGINE INDICATING									
Engine / Airframe unit	GEA 71	011-00831-00	Garmin						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
ENGINE EXHAUST									
LH Exhaust pipe with muffler		D67-7806-01-00	Diamond Aircraft						
RH Exhaust pipe with muffler		D67-7806-01-00	Diamond Aircraft						
PROPELLER									
Propeller LH	MTV-6-R-C-F/CF194-80		mt-propeller						
Propeller RH	MTV-6-R-C-F/CF194-80		mt-propeller						
Unfeathering accumulator LH		X11-0007-00-00	Hydraulik Mayer						
Unfeathering accumulator RH		X11-0007-00-00	Hydraulik Mayer						
Unfeathering accumulator LH		P-893-3	mt-propeller						
Unfeathering accumulator RH		P-893-3	mt-propeller						
Governor LH		P-877-16	mt-propeller						
Governor RH		P-877-16	mt-propeller						
FUEL TANK SYSTEM									
Fuel probe assy., LH inboard		D60-2817-13-00_1	Diamond Aircraft						
Fuel probe assy., RH inboard		D60-2817-13-00_1	Diamond Aircraft						
Fuel probe assy., LH outboard		D60-2817-14-00_1	Diamond Aircraft						
Fuel probe assy., RH outboard		D60-2817-14-00_1	Diamond Aircraft						
Alternate means for fuel qty.		D60-2817-90-00	Diamond Aircraft						
Alternate means for fuel qty. II		D60-2817-90-00_01	Diamond Aircraft						
AUX FUEL SYSTEM									
LH auxiliary fuel pump		PX375-TC-28V-G2	Adair						
RH auxiliary fuel pump		PX375-TC-28V-G2	Adair						

Airplane Serial No.:		Registration:		Date:		Mass		Lever Arm	
Description	**Type**	**Part No.**	**Manufacturer**	**S/N**	**installed**	**lb**	**kg**	**in**	**m**
LH fuel inline filter		FX375-MK	Adair						
RH fuel inline filter		FX375-MK	Adair						
LH solenoid valve		VE 131,4 GV	Parker						
RH solenoid valve		VE 131,4 GV	Parker						
Aux tank fuel probe		D67-2814-70-00	Diamond Aircraft						
AIRPLANE FLIGHT MANUAL		Doc. No. 11.01.05-E	Diamond Aircraft						

Place: ______________________ Date: __________________________ Signature: _____________________________

CHAPTER 7
DESCRIPTION OF THE AIRPLANE
AND ITS SYSTEMS

Page

7.1 INTRODUCTION

Chapter 7 contains a description of the airplane and its systems, together with operating instructions.

For details about optional equipment, see Chapter 9.

7.2 AIRFRAME

Fuselage

The CFRP fuselage is of semi monocoque molded construction. The center wing is attached to the fuselage with bolts. The two main spars and both nacelles are part of the center wing. The two main spars are CFRP items. The engine compartment in each nacelle is separated from the other structure with a firewall. The fire protection on the firewall is of a special fire-resistant matting, which is covered on the engine side by stainless steel cladding.

Wings

The wings have a front and rear spar; each wing has a top shell and a bottom shell; the whole wing is ‘fail-safe‘ design. The wings, as well as the ailerons and flaps, are made of GFRP/CFRP, and are principally of sandwich construction. An aluminum fuel tank is installed in each of the wings.

Empennage

The airplane has a ‘T’ tail of GFRP/CFRP semi monocoque construction. Both the stabilizers have twin spars. Rudder and elevator are of sandwich construction.

7.3 FLIGHT CONTROLS

The ailerons, elevator and wing flaps are operated through control rods, while the rudder is controlled by cables. The flaps are electrically operated. Elevator forces can be balanced by a trim tab on the elevator, which is operated by a Bowden cable. Rudder forces can be balanced by a trim tab on the rudder, which is also operated by a Bowden cable.

Ailerons

Construction: GFRP/CFRP composite sandwich.

Hinges: There are 4 hinges, which are hinge pins mounted in an aluminum bracket. They are secured in position by a roll pin. The absence of this roll pin can lead to the loss of the hinge pin and a consequent loss of flight safety.

Operation: Each aileron is connected with a aileron control horn to the push rods of the aileron control system. A rod end bearing is screwed into a steel push rod and locked by means of a jam nut which has locking varnish applied to it. Damage to this varnish can indicate a twisting and thus a change to the adjustment. The connection between the rod end bearing and the control horn is a bolt, the nut of which is likewise sealed with locking varnish. The aileron control horn is fully covered by a fairing mounted to the aileron control horn with three screws.

The aluminum control horn is attached to the aileron with 3 screws.

Flaps

The flaps are a two piece construction. The inner part of the flap is mounted to the center wing and the outer part to the wing. Both parts are connected to each other with a form fit connection.

Construction: GFRP/CFRP composite sandwich.

Hinges: There are 6 hinges at the outer part and 4 hinges at the inner part of the flap. These hinges are hinge pins mounted in an aluminum bracket. They are secured in position by a roll pin. The absence of this roll pin can lead to the loss of the hinge pin and a consequent loss of flight safety.

Operation: Each part is connected with a flap control horn to the push rods of the flap control system. A rod end bearing is screwed into a steel push rod and locked by means of a jam nut which has locking varnish applied to it. Damage to this varnish can indicate a twisting and thus a change to the adjustment. The connection between the rod end bearing and the control horn is a bolt, the nut of which is likewise sealed with locking varnish. The flap control horn is fully covered by a fairing mounted to the flap control horn with three screws in the outer wings and four screws in the center wing.

Each flap control horn is attached to the flap part with 3 screws.

The flaps are driven by an electric motor and have 3 settings:

- Cruise (UP), totally retracted
- Take-Off (T/O), and
- Landing (LDG).

The flaps are operated by means of a 3-position flap selector switch on the instrument panel. The positions of the switch correspond to the positions of the flaps, the Cruise position of the switch being at the top. If the switch is moved to another position, the flaps continue to travel automatically until they have reached the position selected on the switch. The UP and LDG positions are additionally protected by a limit switch to guard against over-running the end positions.

The electrical flap drive has an automatic circuit breaker which can also be operated manually.

Flap Position Indicator:

The current flap position is indicated by means of three lights beside the flap selector switch.

When the upper light (green) is illuminated, the flaps are in the Cruise position (UP);

when the center light (white) is illuminated, the flaps are in Take-Off position (T/O);

when the lower light (white) is illuminated, the flaps are in Landing position (LDG).

When two lights are illuminated simultaneously, the flaps are between the two indicated positions. This is the case only when the flaps are in transition.

Elevator

Construction: GFRP sandwich.

Hinges: 5 hinges.

Operation: Steel pushrods;

Two of the bellcrank bearings are accessible for visual inspection next to the lower hinge of the rudder. The elevator horn and its bearing, as well as the connection to the pushrod, can be visually inspected at the upper end of the rudder.

<u>Rudder</u>

Construction: GFRP sandwich.

Hinges: Upper hinge: One bolt.

Lower hinge: Bearing bracket including rudder stops, held by 4 screws to the rear web of the vertical stabilizer. The mating part on the rudder is a bracket which is attached to the rudder by 2 bolts. The bolts and nuts are accessible to visual inspection.

Operation: Steel cables, the eyes of which are connected to the bolts on the bracket.

Elevator Trim

The trim control is a black wheel in the center console to the rear of the power lever. To guard against overrotating, the trim wheel incorporates a friction device. A mark on the wheel shows the take-off (T/O) position.

Turn wheel to the front	=	nose down
Turn wheel to the rear	=	nose up

Rudder Trim

The trim control is a black wheel in the center console below the instrument panel. A mark on the wheel shows the center position and the direction of movement.

Turn wheel to the right	=	right turn
Turn wheel to the left	=	left turn

Electrical Pedal Adjustment

NOTE

The pedals may only be adjusted on the ground!

The pedals are adjusted using a rocker switch, located on the outboard sides of the instrument panel. The related circuit breaker is located on the right side of the instrument panel.

Forward Adjustment:

To move the pedals forward, depress upper side of switch. When pedals are in correct position, release switch.

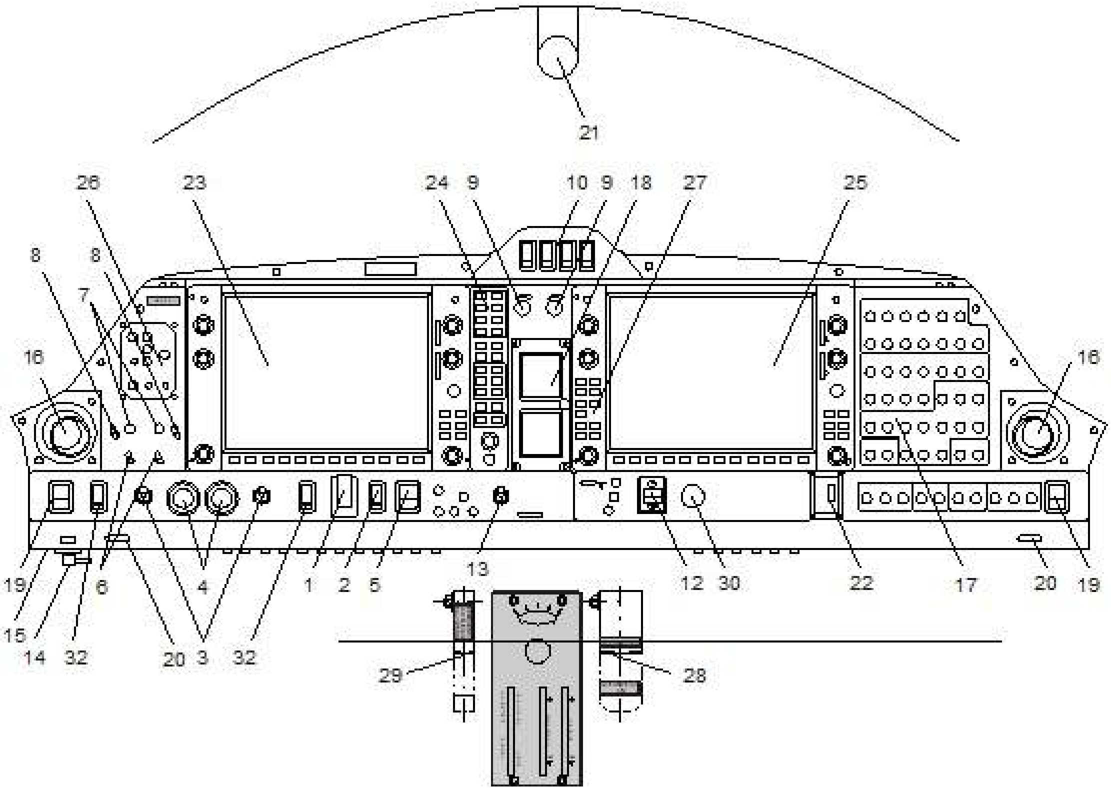
Rearward Adjustment:

To move the pedals in the rearward direction, depress lower side of switch. When pedals are in correct position, release switch.

Locking:

Upon release, the switch moves automatically to the ‘power off’ position, so locking the pedals in the present position.

7.4 INSTRUMENT PANEL



CAUTION

Do not inadvertently operate the VOTER switch when adjusting the LH instrument panel ventilation nozzle. In case of inadvertent switch operation, bring the switch back to the desired position, typically AUTO.

Cockpit Ventilation

Ventilation in the front is provided by spherical ventilation nozzles (16) in the instrument panel. Furthermore there are spherical nozzles on the central console above the pilot's and passengers' heads. The spherical nozzles are opened and closed by twisting.

Major Instruments and Controls			
1	Electric master switch	17	Circuit breakers*
2	Avionic master switch	18	Standby attitude module
3	Engine master switches	19	Rudder pedal switches
4	Start button	20	USB charging ports
5	Pitot-/Static-/Stall warning heat switch	21	Emergency compass
6	Alternator switches	22	ELT control unit
7	ECU test buttons	23	Primary flight display (PFD)
8	VOTER switches	24	Audio amplifier/intercom/marker beacon receiver
9	Rotary buttons for instrument lighting and flood light	25	Multi function display (MFD)
10	Light switches	26	De-Ice control panel
11	-	27	Autopilot control unit (part of MFD)
12	Flap selector switch	28	Alt air lever
13	Landing gear switch	29	Landing gear emergency extension lever
14	Alternate static valve	30	Oxygen pressure indicator
15	Microphone socket	31	-
16	Ventilation nozzles	32	Fuel pump switches

*) Designations and abbreviations used to identify the circuit breakers are explained in Section 1.5 - DEFINITIONS AND ABBREVIATIONS.

NOTE

The figure above shows the typical DA 62 installation position for the equipment. The actual installation may vary due to the approved equipment version.

7.5 LANDING GEAR

The landing gear is a fully retractable, hydraulically operated, tricycle landing gear. Struts for the landing gear are air oil assemblies.

The hydraulic pressure for the landing gear operation is provided by an electrically powered hydraulic pump, which is activated by a pressure switch, when the required pressure is too low. Electrically actuated hydraulic valves, which are operated with the gear selector switch, provide the required hydraulic pressure for the movement of the landing gear. The gear selector switch is located on the instrument panel. The switch must be pulled out before it is moved to UP or DOWN position. Gear extension normally takes 6-10 seconds.

When the landing gear is retracted, the main wheels retract inboard into the center wing and the nose wheel retracts forward into the nose section. Hydraulic pressure on the actuators keeps the landing gear in the retracted position. A pressurized gas container acts as an accumulator which keeps the system pressure constant by replacing the volume lost due to the normal actuator leakages. This prevents a permanent starting of the hydraulic pump in flight.

Springs assist the hydraulic system in gear extension and locking the gear in the down position. After the gears are down and the downlock hooks engage, springs maintain force on each hook to keep it locked until it is released by hydraulic pressure.

The three green lights directly next to the landing gear operating switch illuminate to indicate that each gear is in the correct position and locked. If the gear is in neither the full up nor the full down position, a red warning light on the instrument panel illuminates.

Should one power lever be placed in a position below 25% while the landing gear is retracted, a warning horn sounds to alert the pilot that the gear is retracted. Additionally, a CHECK GEAR caution is indicated on the PFD. The same warning appears if the flaps move into LDG position (fully extended) while the gear is retracted.

To test the gear warning system (refer to 4A.6.1 - PRE-FLIGHT INSPECTION) push the test button near the gear selector switch. The aural gear alert should appear.

CAUTION

If the aural alert does not appear, unscheduled maintenance is necessary.

To prevent inadvertent gear retraction on ground, an electric squat switch prevents the hydraulic valve from switching if the master switch is on and the gear extension switch is placed in the UP position.

After take-off, the gear should be retracted before an airspeed of 162 KIAS is exceeded. The landing gear may be extended at any speed up to 205 KIAS.

The landing gear is designed to be manually operated in the event of failure. Since the gear is held in the retracted position by hydraulic pressure, gravity will allow the gear to extend if the system fails for any reason. To extend and lock the gears in the event of failure, it is only necessary to relieve the hydraulic pressure by means of the emergency gear extension lever, which is located under the instrument panel to the left of the center console. Pulling this lever releases the hydraulic pressure and allows the gear to fall free. Before pulling the emergency gear extension lever, place the gear selector switch in the DOWN position.

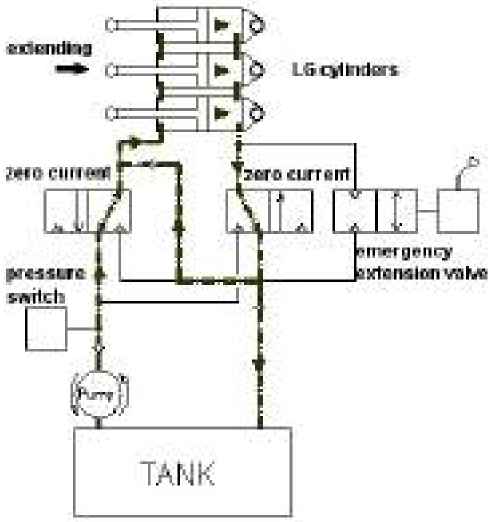
NOTE

If the emergency gear extension has been pulled due to an emergency, the system has to be checked before pushing the lever in again.

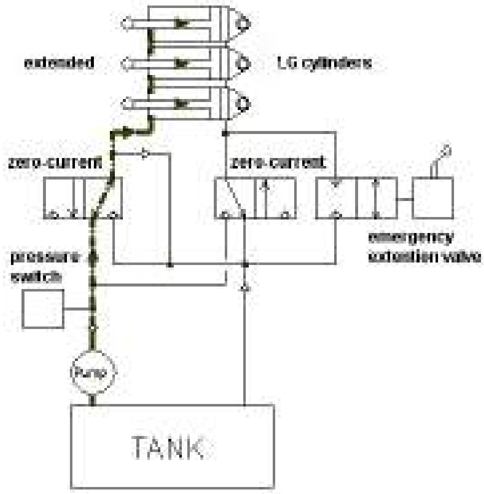
The nose gear is steerable by the use of full rudder pedal travel. A gear damping element, incorporated in the nose gear steering system, prevents shimmy tendencies. When the gear is retracted, the nose wheel centers as it enters the wheel well, and the steering linkage disengages to reduce pedal loads in flight.

Hydraulic Gear Extension System Schematic

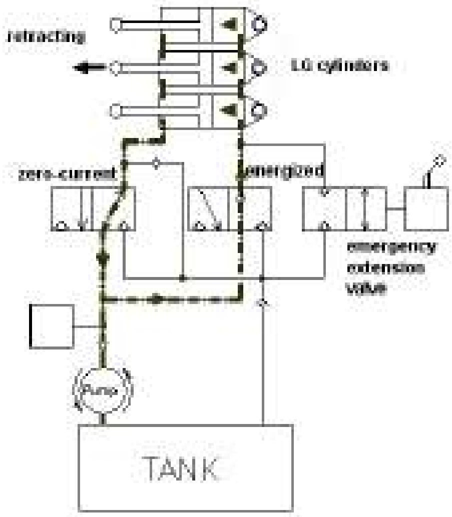
The main landing gear of the DA 62 is extended with three hydraulic cylinders. The following schematic figures show the system conditions for each operating mode. The first figure below shows the extension of the landing gear is shown. To reduce the amount of pumped hydraulic fluid during this operation, the return flow is partly led into the feeding flow of the system.



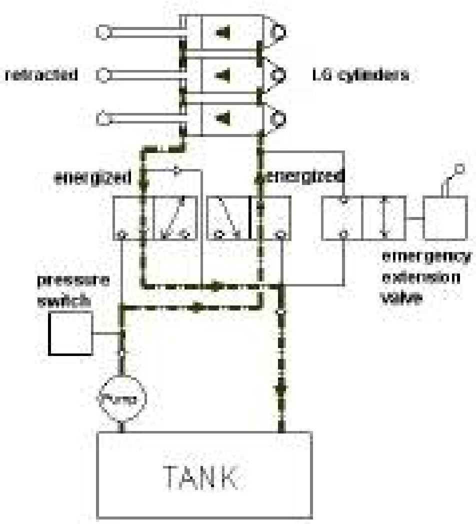
The figure below shows the system status when the landing gear is extended. All hydraulic cylinders are under high pressure.



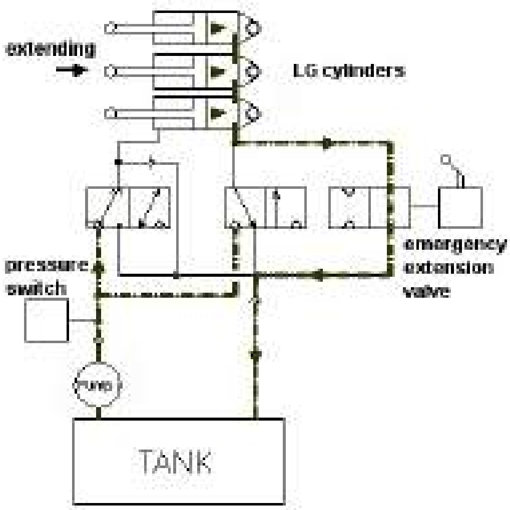
The operating mode for the retraction of the landing gear is shown in the next figure. While energizing the right hydraulic valve, the fluid flow in the hydraulic system is started due to different piston areas of the landing gear cylinders, although the pressure on both sides of the system is equal.



While the landing gear is retracted, both valves are energized and excess hydraulic fluid on one side is drained into the tank. This configuration of the system is shown in the following figure.



For an emergency extension of the landing gear, the hydraulic fluid can pass through an emergency extension valve so that the gear is extended by gravity. The condition of the system is shown in the figure below.

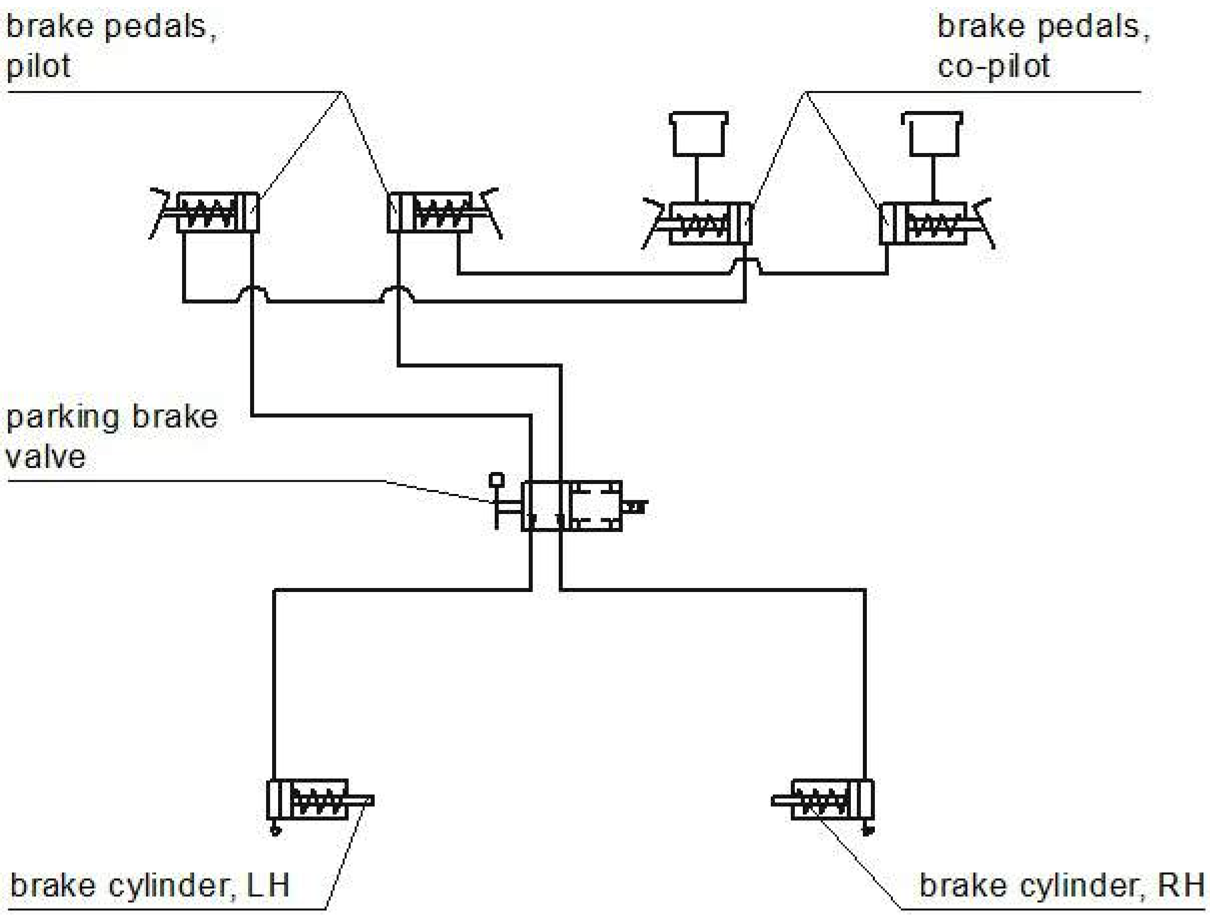


Wheel Brakes

Hydraulically operated disk brakes act on the wheels of the main landing gear. The wheel brakes are individually operated by means of toe pedals.

Parking Brake

The lever is located on the small center console under the instrument panel and is in the upper position when the brakes are released. To operate the parking brake, pull the lever downwards until it catches. Brake pressure is built up by multiple operation of the toe brake pedals, and is maintained until the parking brake is released. To release, the lever is pushed upwards.



7.6 SEATS AND SAFETY HARNESSES

To increase passive safety, the seats are constructed using a carbon fiber/Kevlar hybrid material and GFRP. The seats are removable to allow maintenance and inspection of the underlying controls. Covers on the control sticks prevent loose objects from falling into the area of the controls.

The seats have removable furnishings and are equipped with energy-absorbing foam elements.

The seats are fitted with three-part safety harnesses. The harnesses are fastened by inserting the end of the belts in the belt lock, and are opened by pressing the red release on the belt lock.

The backrest of the passenger seats row I can be laid forward after pulling upwards the release lever.

If OÄM 62-019 is installed, the two passenger seats of row II may be installed. The backrest of the passenger seats row II can be laid forward after pulling the release lever upwards. In case of an emergency, the LH seat backrest can be released by pulling the red handle on the back side of the seat pan of the LH passenger seat of row I.

The front seats have adjustable backrests installed. The angle of the backrests and the lumbar can be adjusted for best comfort. The backrest release button is situated on the upper side of the seat´s side frame. However, during take-off, landing and emergency landing the backrests must be fixed in the upright position designated by a placard.

The lumbar support can be adjusted by operating the lumbar support lever mounted on the outboard side of the seat pan.

CAUTION

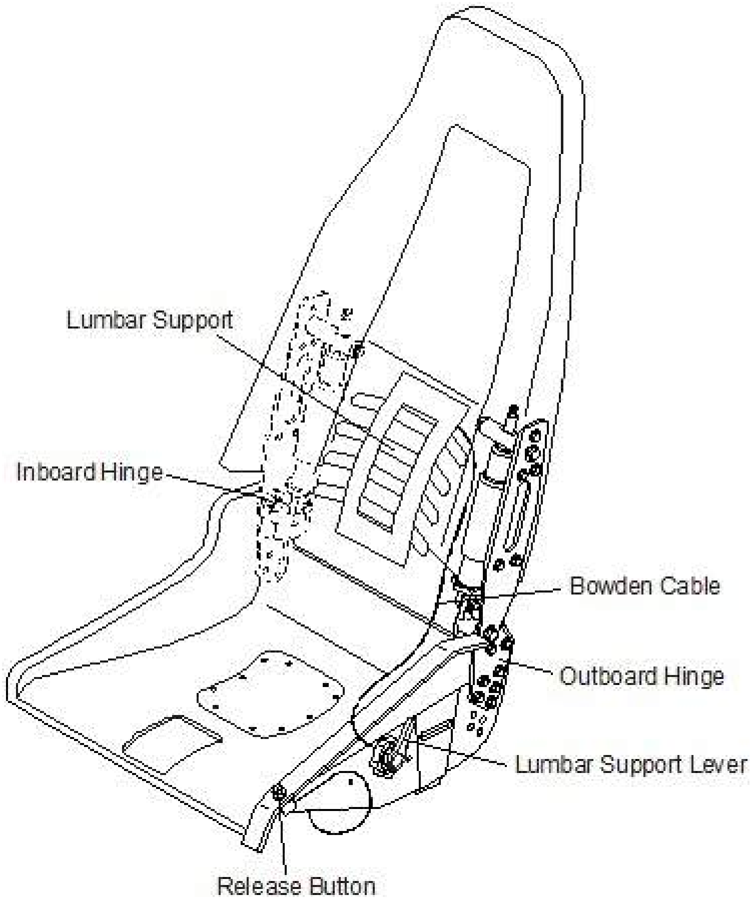
Before adjusting the angle, lean against the backrest to counteract the spring load; otherwise the backrest may slap forward.

CAUTION

Don not apply a load of more than 90 daN (202 lbf) to the top of the backrest. Otherwise damage of the adjustment mechanism may result.

For adjustment, press the button and bend the backrest forward or backward to the desired backrest angle. For fixing the position, release the button.

In case of a malfunction of the release button, the backrest can be moved into the upright position by pulling the backrest (480 N) in flight (FWD) direction.



7.7 BAGGAGE COMPARTMENTS

7.7.1 NOSE BAGGAGE COMPARTMENTS

There are two nose baggage compartments, one LH and one RH. They are located in the nose section of the airplane and are accessible through the LH and RH baggage doors respectively.

7.7.2 REAR BAGGAGE COMPARTMENT

There is a rear baggage compartment aft of the passenger seats row 1. The rear baggage compartment is accessible via the passenger door on the LH side of the airplane. The compartment is divided into 4 zones, A, B, C and D, as described on limitation placard. Zones A and B are boxes below floor level. The hatches of the boxes must be closed during flight.

Zone C is the volume from the floor level up to the upper edge of the forward compartment bulkhead. Forward shifting of items is prevented by the bulkhead.

Place heavy items in Zone C.

Zone D is the volume above Zone C up to the ceiling.

Baggage must be secured at all times by means of the approved baggage net. Only baggage net attachment configuration in accordance with Figures 1 through 3 may be used. Always use the most suitable baggage net configuration to secure the baggage against shifting.

In case additional straps are used to secure the baggage from shifting, the maximum pre-tension on a single D-Ring is 8 kg (17.6 lbs).

If OÄM 62-019 is carried out, the rear baggage compartment consists of Zones E and F. Zone F is the volume from the folded backrest of passenger row II up to the ceiling. Zone E is the baggage tray below floor level.

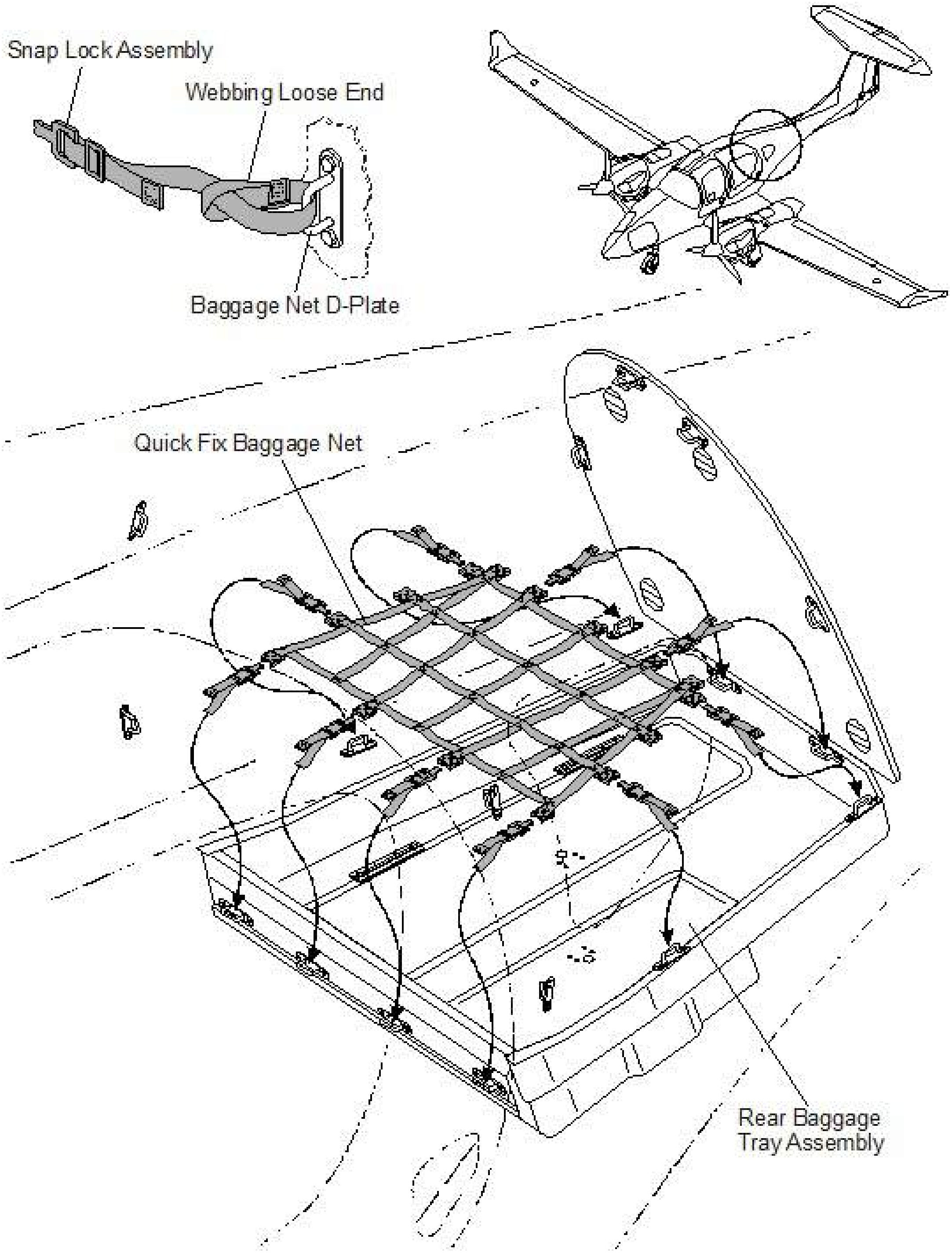


Figure 1: Rear Baggage Compartment I

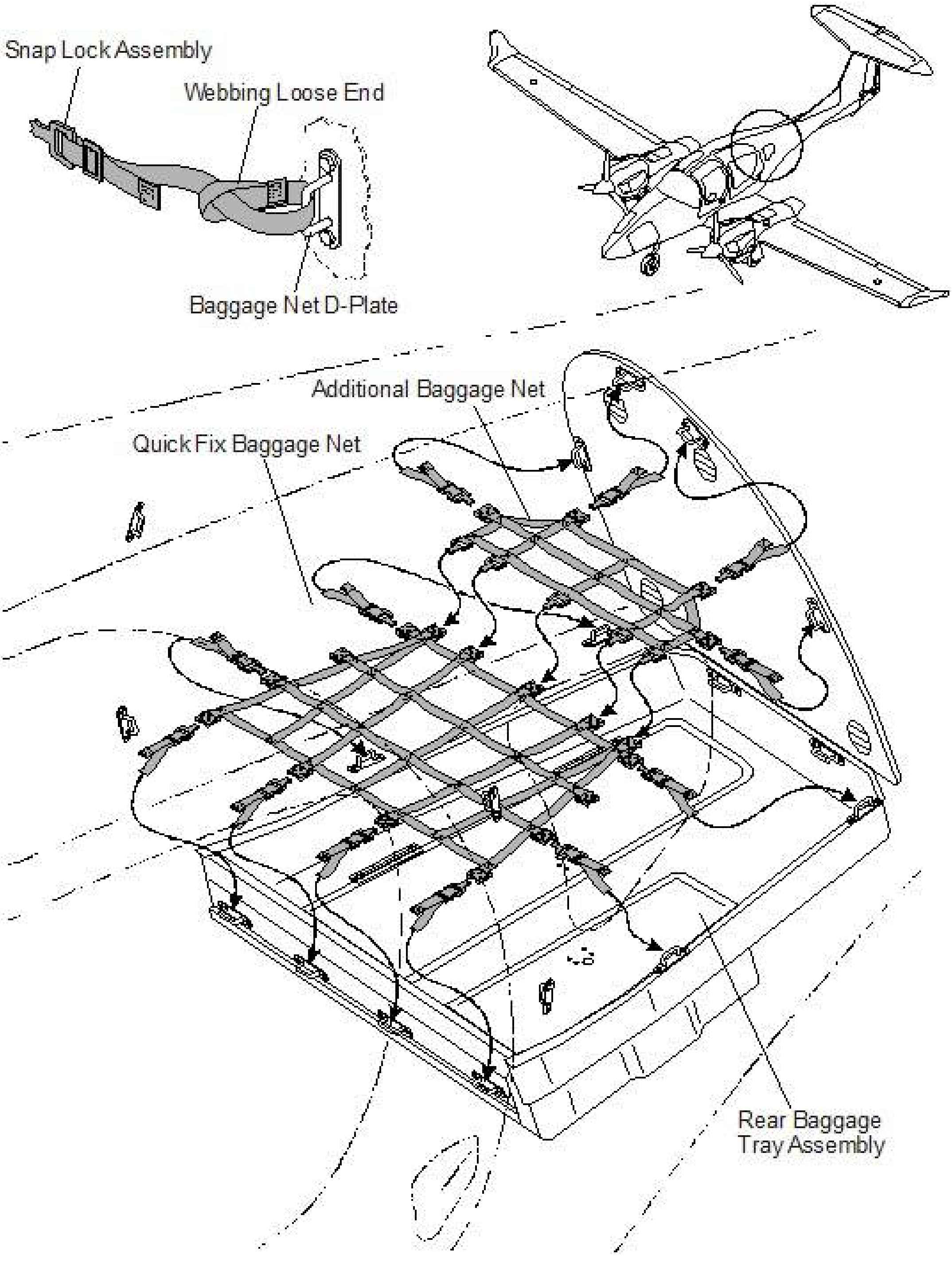


Figure 2: Rear Baggage Compartment II

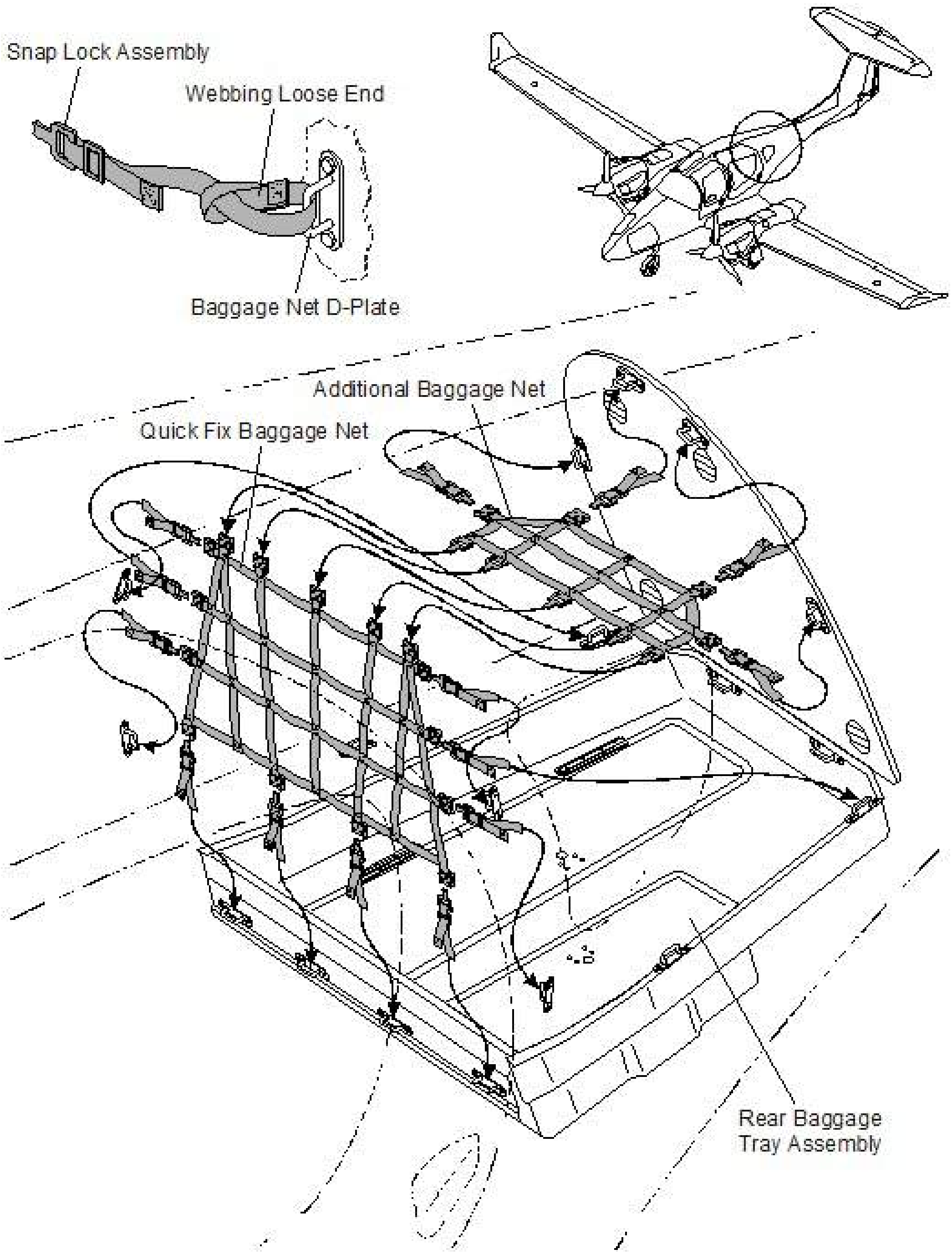


Figure 3: Rear Baggage Compartment III

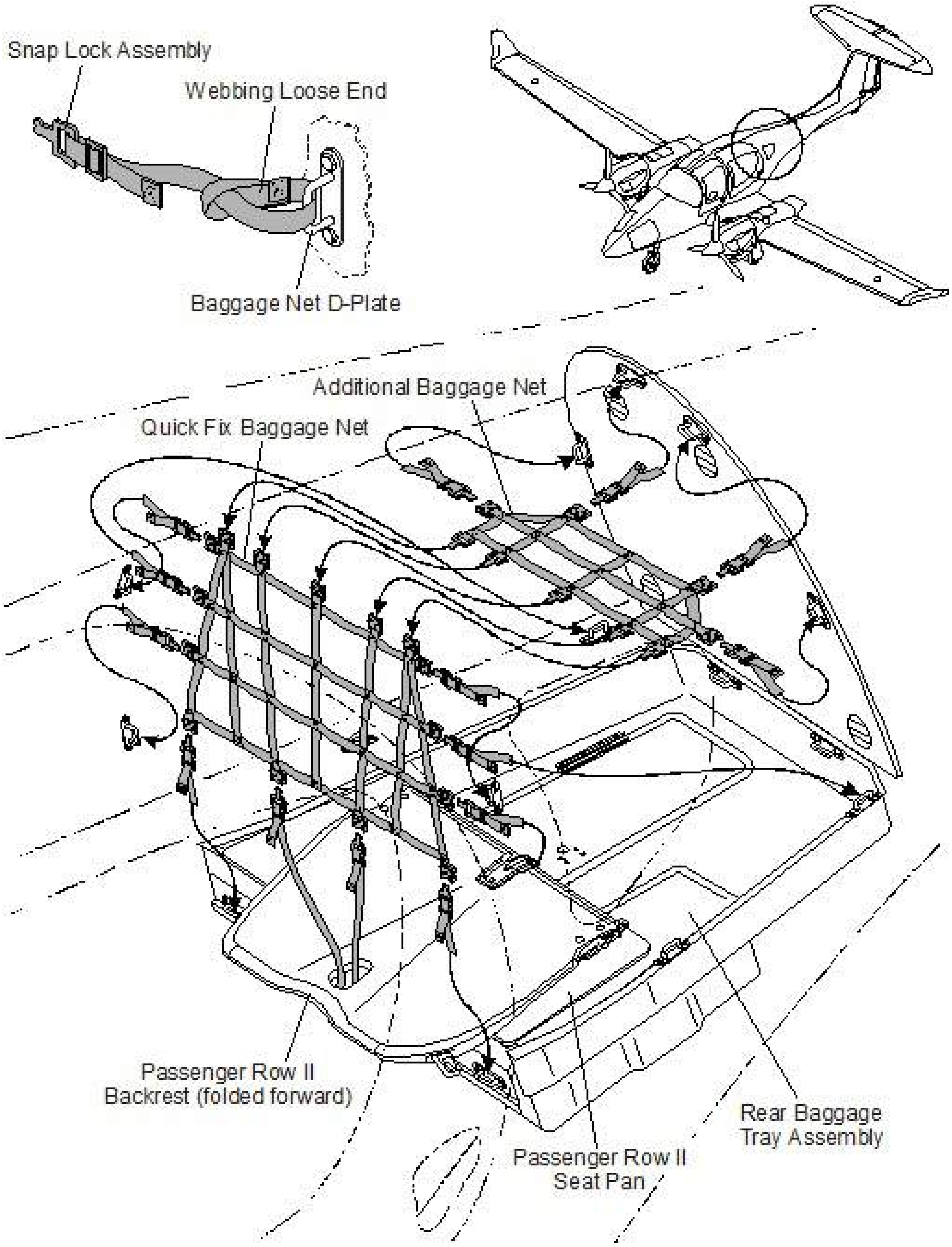


Figure 4: Rear Baggage Compartment IV (if OÄM 62-019 is carried out)

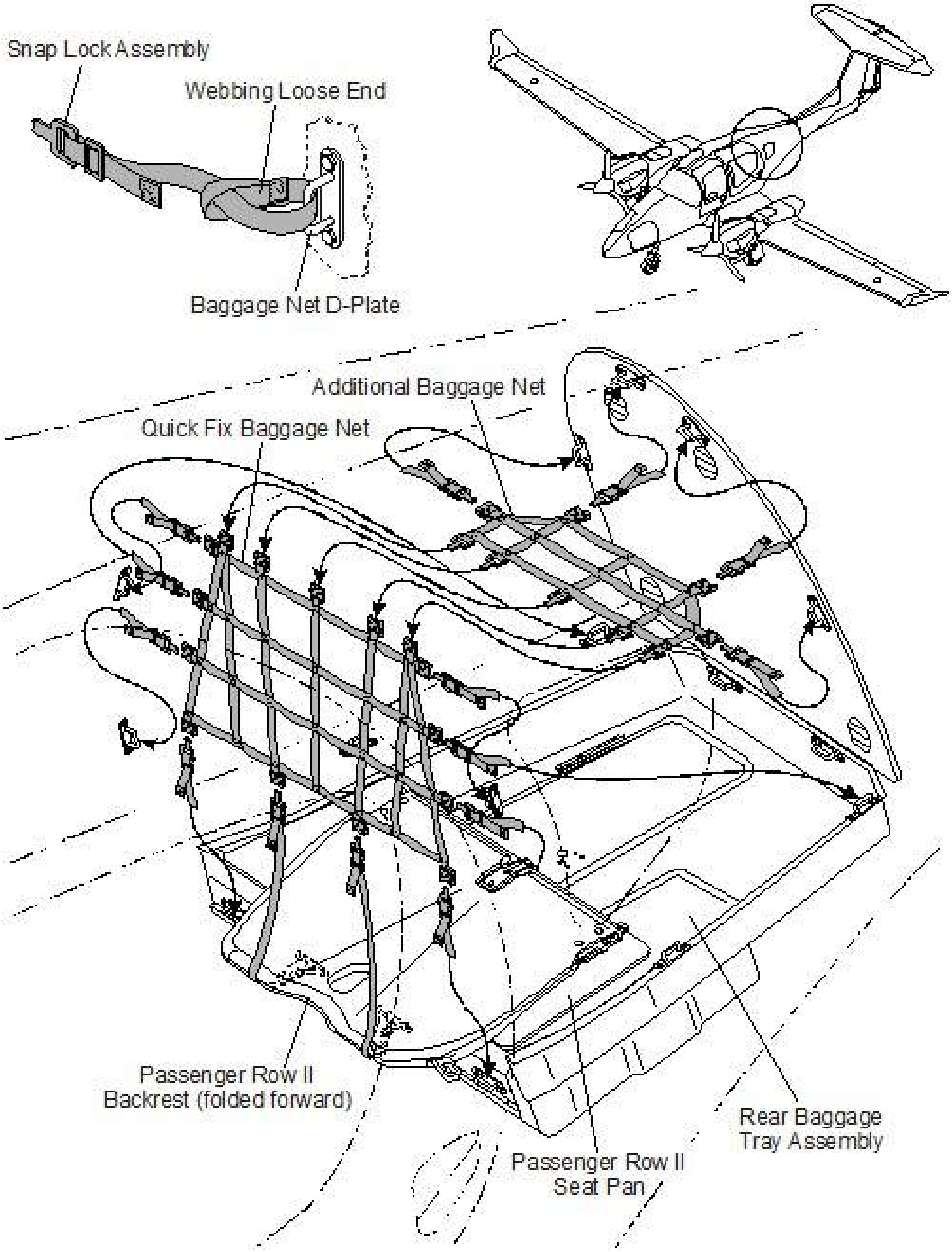


Figure 5: Rear Baggage Compartment V (if OÄM 62-019 is carried out)

7.8 FRONT DOORS, REAR DOOR AND CABIN INTERIOR

LH & RH PILOT DOORS

The LH & RH pilot doors are closed by pulling down on a handle, which are located between the window and the frame. The doors are locked separately by means of a lever on each frame. On locking, steel bolts lock into mating holes in polyethylene blocks. A gas pressure damper prevents each pilot door from dropping; in strong winds the assemblies must be securely held.

The pilot doors can be blocked by a locking device on the each side near the opening levers by turning the key clockwise. The closed and blocked doors can be opened from inside by pulling the levers inside the opening handle.

A window on the each pilot door can be opened for additional ventilation, or as an emergency window.

Passenger Door

The passenger door is closed in the same way, by pulling down on the handle and locking it with the lever. A gas pressure damper prevents the door from dropping; in strong winds the assembly must be securely held. The passenger door is protected against unintentional opening by an additional lever.

The door can be blocked by a locking device on the left side near the external door opening lever by turning the key clockwise. The closed and blocked door can be opened from inside by pulling the lever inside the opening handle.

WARNING

Do not block the door with the locking key before flight in order to assure emergency access from outside.

Heating and Ventilation

Heating and ventilation are operated using two levers located on the small center console under the instrument panel.

Right lever:	up	=	HEATING ON (seats, floor)
	down	=	HEATING OFF
Center lever :	up	=	DEFROST ON (airflow to windscreen)
	down	=	DEFROST OFF

The heat of the RH engine is used for the front seats and floor, the heat of the LH engine is used to defrost the windscreen.

The air inlet for the ventilation system is placed on the underside of the RH wing, inboard of the engine nacelle. The air is distributed within the cabin via 4 nozzles (2 on the instrument panel LH/RH side, 2 on the overhead panel. The jet direction of each cone can be changed easily and the jet intensity can be regulated by rotation of the nozzle.

CAUTION

Do not inadvertently operate the VOTER switch when adjusting the LH instrument panel ventilation nozzle. In case of inadvertent switch operation, bring the switch back to the desired position, typically AUTO.

Egress Hammer

An Egress Hammer is installed on the floor panel behind the co-pilot's seat.

If the doors can not be opened in case of an emergency use the Egress Hammer to break through the door windows.

WARNING

Make sure not to harm other persons by using the Egress Hammer.

WARNING

Beware of sharp edges and fragments of the broken window.

7.9 POWER PLANT

7.9.1 ENGINES, GENERAL

There are two Austro Engine E4P-C engines installed, which have the following specifications:

- Liquid-cooled four-cylinder four-stroke engine with wet sump lubrication
- Inline construction
- Common rail direct injection
- Propeller speed reducing gear 1:1.69
- Digital engine control with integrated propeller governor (separate oil system)
- Turbo charger with intercooler

Displacement:

Max. power: 132.0 kW (177.0 DIN-HP) at 2300 RPM at sea level and ISA

Max. continuous power: 126 kW (169.0 DIN-HP) at sea level and ISA

The indications for monitoring important engine parameters during operation are integrated within the Garmin G1000 display. Each engine can only be operated with the ENGINE MASTER switch ON. Each engine has an own ECU (Electrical Engine Control Unit) which receives its electrical power from the generator when at least one engine is running. When both engines are at standstill, the ECU receives its electrical power from the battery.

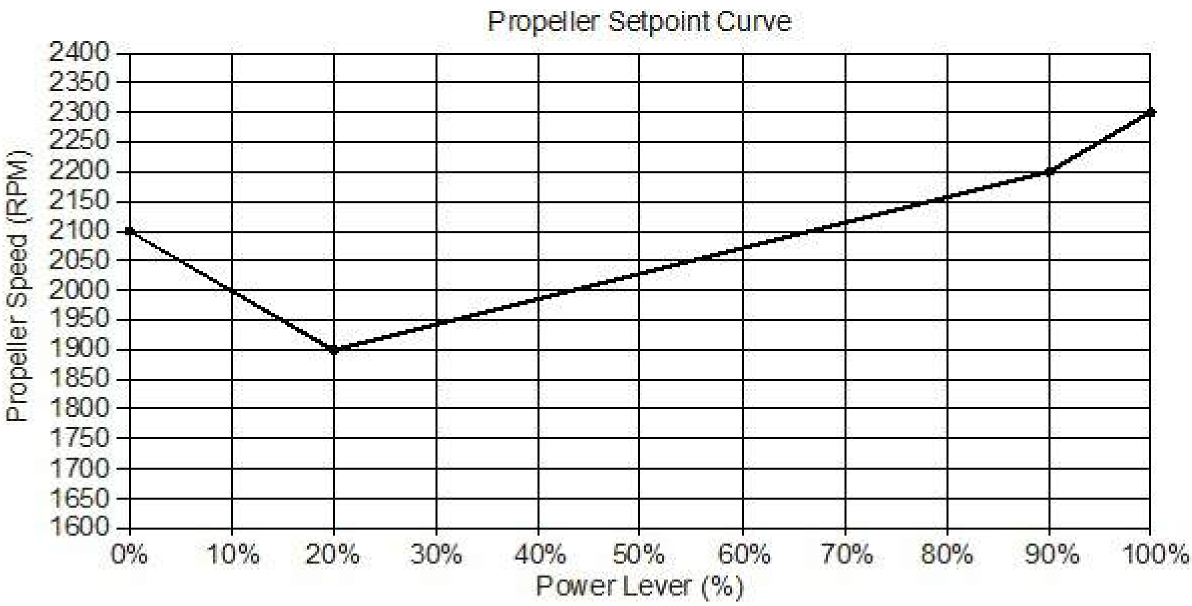
7.9.2 PROPELLER

Two mt-Propeller MTV-6-R-C-F/CF 194-80 hydraulically regulated 3-bladed constant speed feathering propellers are installed. Each propeller has wood composite blades with fiber-reinforced plastic coating and stainless steel edge cladding; in the region of the propeller hub, the leading edge is coated with adhesive PU foil. These blades combine the lowest weight whilst minimizing vibration.

Propeller Control

The propeller pitch control system consists of the P-877-16 mt-Propeller governor valve. The pitch is set by the ECU via an electro-mechanical actuator on the governor. To change the blade pitch angle, gearbox oil is pumped into the propeller hub. Increasing the oil pressure leads to a decrease of pitch and a higher RPM. Decreasing the pressure leads to higher pitch and a lower RPM.

Depending on the power lever setting, the propeller pitch is adjusted such that the required RPM will be obtained as shown in the following diagram.



Pressure Accumulator:

The pressure accumulator is a nitrogen oil type. It is connected to the gearbox oil circuit via an electric valve at the accumulator, which is operated with the ENGINE MASTER switch.

When the ENGINE MASTER switch is set to ON the valve is opened. During engine operation the accumulator makes sure that enough oil pressure is available even if the oil feed by the gearbox oil pump is decreasing due to negative acceleration. The hydraulic pressure keeps the propeller pitch angle below the start lock position, or moves the propeller blades beyond the start lock position.

Feathering:

To feather the propeller the engine must be shut down with the appropriate ENGINE MASTER switch. This will open the electric governor valve. All oil will flow back from the propeller hub, allowing the blades to move into the feathered pitch position. At the same time, the electric valve at the pressure accumulator closes, and the oil pressure is restored in the accumulator.

Feathering is only possible at propeller speeds above 1300 RPM.

CAUTION

If the engine is shut down below 1300 RPM, the propeller pitch remains below the start lock position. In this case, the speed must be increased to increase the propeller RPM.

Unfeathering:

To unfeather the propeller, the associated ENGINE MASTER switch must be set to ON. This will open the electric valve at the pressure accumulator. The pressure stored in the accumulator will move the propeller blades into a low pitch position. As soon as the propeller starts turning and the gearbox oil operates, the accumulator will be refilled.

Ground Operation:

CAUTION

Operation on the ground at high RPM should be avoided as far as possible, as the blades could suffer stone damage. For this reason a suitable site for engine runs should be selected, where there are no loose stones or similar items.

WARNING

Never move the propeller by hand.

7.9.3 OPERATING CONTROLS

Power Lever

Engine performance is controlled by a power lever for each engine. Both power levers are situated on the large center console. ‘Front’ and ‘rear’ are defined in relation to the direction of flight.

Each power lever is used to set the desired engine power LOAD (%)

Lever forward (MAX)	=	Full power
Lever to rear (IDLE)	=	Idle

A separate ECU for each engine controls manifold pressure, injected fuel quantity and propeller speed according to the desired engine power preselected with the power lever. If the power lever is in a low power position - as for a landing approach - while the landing gear is retracted, an aural warning alerts the pilot to the retracted landing gear. Additionally, a CHECK GEAR caution is indicated on the PFD.

A propeller governor, which is controlled by the ECU, is flanged onto the front of each engine. The propeller governor oil circuit is supplied with oil by the gearbox oil pump (also see Section 7.9.2 - PROPELLER). A loss of oil pressure leads to a feathering of the propeller blades, thus allowing continuation of the flight according to 3.13.3 - DEFECTIVE PROPELLER RPM REGULATING SYSTEM.

CAUTION

Following governor failure, the RPM should be adjusted using the power lever. Every effort should be made not to exceed 2300 RPM.

CAUTION

The power lever should be moved slowly, in order to avoid over-speeding, and excessively rapid RPM changes. The light wooden propeller blades produce more rapid RPM changes than metal blades.

WARNING

It is possible that the propeller blades remain in the position of highest pitch in case of a malfunction of the engine control unit. In this case, the reduced engine performance should be taken into consideration.

<u>ELECT. MASTER</u>

The ELECT. MASTER switch has two positions:

OFF disconnecting battery power

ON connecting battery power to the power distribution system

<u>ENGINE MASTER</u>

Each engine can only be cranked with its ENGINE MASTER switched to ON. When activated, the ENGINE MASTER provides the power supply for the preheat system, the unfeathering accumulator valve and the engine itself. To shut down the engine, the appropriate ENGINE MASTER is switched to OFF.

<u>START</u>

Pressing the START LEFT push button starts the LH engine. Pressing the START RIGHT push button starts the RH engine.

Both engines can not be started simultaneously.

ECU VOTER

There are two VOTER switches, one for each engine. For normal operation, both switches are set to AUTO. Each engine is controlled by either ECU A or ECU B. In case of a failure of the active electrical engine control unit (ECU) there should be an automatic switch-over to the other ECU. If the automatic switch over fails, switch over can be done manually by switching to ECU A or ECU B. This procedure should only be applied in an emergency.

ECU TEST

There are two ECU TEST buttons, one for each engine.

Power Lever at IDLE and RPM Below Approximately 900:

By pushing and holding the button until the end of the procedure, the self-test of each engine control unit is started. The procedure is possible on the ground only. Otherwise the test will not start. During the procedure, the ECU performs a switch from ECU A to ECU B or ECU B to ECU A, whichever is active at the moment, with the propeller cycling. The propeller RPM is monitored automatically by the ECU. When switching from one ECU to the other, a slight shake of the engine may occur. Finally, the ECU switches back. After that, both caution lights must extinguish and the engine must run without a change.

Alternate Air

In the event of power loss because of icing or blocking of the air filter, there is the possibility of drawing air from the engine compartment. The ALTERNATE AIR operating lever which serves both engines simultaneously is located under the instrument panel to the right of the center console. To open the alternate air source the lever is pulled to the rear. Normally, the alternate air source is closed with the lever in the forward position.

Placard on the lever, forward position:

ALTERNATE AIR

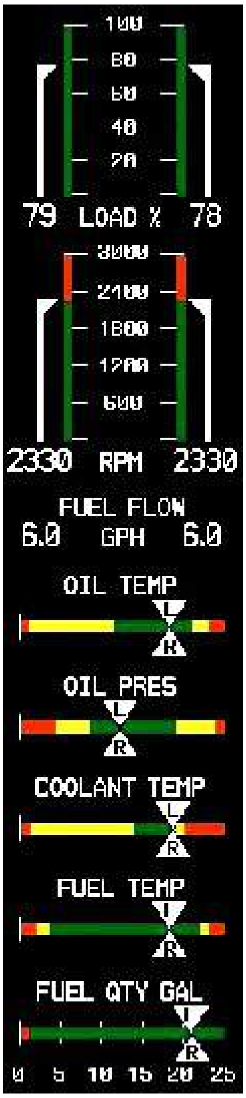
Placard on the lever, visible when lever is in the rearward position:

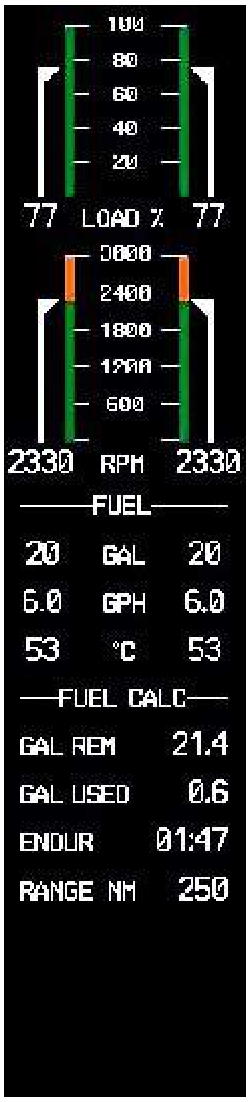
ALTERNATE AIR
ON

7.9.4 ENGINE INSTRUMENTS

The engine instruments are displayed on the Garmin G1000 MFD. Also refer to Section 7.13.3 - MULTI FUNCTION DISPLAY (MFD). Indications for the LH engine are on the left side, indications for the RH engine are on the right side.

Default page Engine	Display when pushing the SYSTEM button If MÄM 62-254 is NOT installed	Display when pushing the FUEL button If MÄM 62-254 is NOT installed





Display when pushing the ENGINE button (if MÄM 62-254 is installed):

NOTE

The figure on the previous page is a general demonstration of a typical G1000 MFD to show the different display modes. The pictured engine instrument markings may not stringently agree with the current engine limitations of the DA 62.

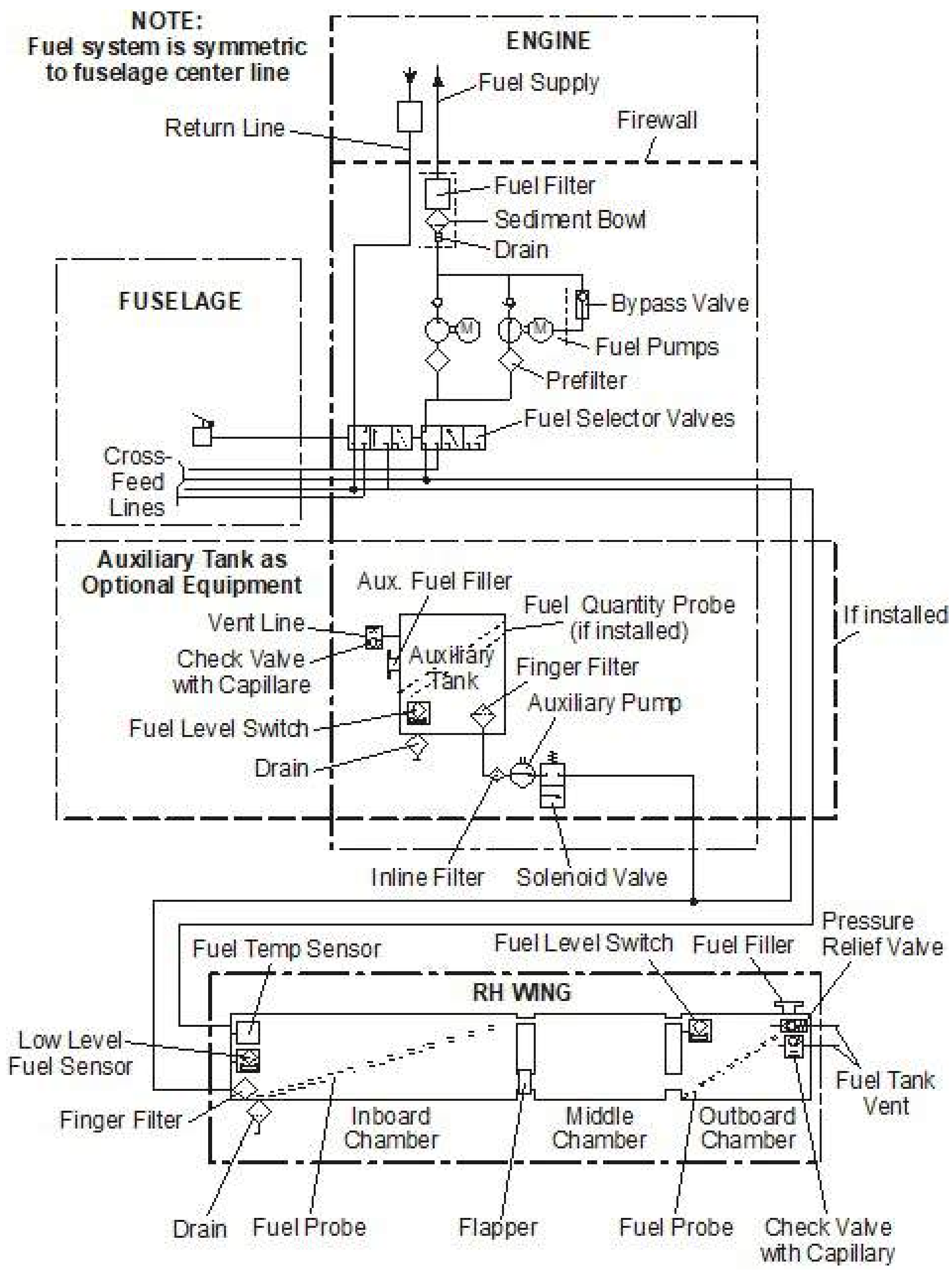
NOTE

The fuel calculations on the FUEL CALC portion do NOT use the airplane's fuel quantity indicators. The values shown are numbers which are calculated from the last fuel quantity update done by the pilot and actual fuel flow data. Therefore, the endurance and range data is for information only, and must not be used for flight planning.

Designation	Indication	Unit
LOAD %	Available power	%
RPM	Propeller RPM	1/min
VOLTS	Volts	V
AMPS	Ampères	A
COOLANT TEMP	Coolant temperature	°C
GEARBOX	Gearbox temperature	°C
OIL TEMP	Engine oil temperature	°C
OIL PRES	Oil pressure	bar
FUEL QTY GAL	Fuel quantity	US gal
FUEL FLOW	Fuel flow	US gal/hr
FUEL TEMP	Fuel temperature	°C

7.9.5 FUEL SYSTEM

General



Fuel is stored in the tanks which are located in the wings.

Normally fuel for the right engine is taken from the right wing main tank, and for the left engine from the left wing main tank.

On each engine, fuel is injected with high pressure directly into the cylinders. The injection nozzles (one per cylinder) are supplied with fuel by the common rail. Pressure inside the rail is generated by a high pressure pump which receives fuel from two independent low pressure fuel pumps. Both pumps are powered electrically. Depending on the power setting, the rail pressure is controlled by the ECU through an electric metering valve. Fuel that is not injected is fed back into the appropriate wing tank.

Both sides of the fuel system are interconnected by crossfeed lines.

In each engine nacelle, an auxiliary fuel tank may be installed.

Fuel Pumps

Each engine is feed by two parallel installed, independent electrically driven low pressure fuel pumps. During normal operation, one of the two fuel pumps is working. In case of a low fuel pressure failure, the ECU switches automatically to the second fuel pump. During landing and take-off, or in case of a fuel pressure failure both fuel pumps can be activated by the FUEL PUMP switch. If both fuel pumps are activated, the fuel pressure increases.

Each fuel pump is electrically connected to the LH/RH ECU BUS and protected by a 7.5 A circuit breaker.

NOTE

By switching between ECU A and B the two independent electrically driven fuel pumps are switched over as well. In case of an emergency, both pumps can be activated simultaneously by using the fuel pump switch.

Fuel Selector Valves

For each engine, one fuel selector valve is provided. The control levers for the fuel selector valves are situated on the center console behind the power levers. The positions are ON, CROSSFEED and OFF. During normal operation, each engine takes the fuel from the tank on the same side as the engine. When CROSSFEED is selected, the engine will draw fuel from the tank on the opposite side in order to extend range and keep fuel weight balanced during single engine operation. With the fuel selector valve both the feeding and the return line are switched.

The desired position is reached by pulling the lever back. To reach the OFF position, a safety guard must be twisted. This is to ensure that this selection is not made unintentionally.

NOTE

If one engine is inoperative, the fuel selector valve for this engine must be in the OFF position.

CAUTION

Do not operate with both fuel selector valves in the crossfeed position. Do not take-off with a fuel selector valve in crossfeed position.

CAUTION

Do not shut down an engine with the fuel selector valve. The high pressure fuel pump can be damaged.

Scheme of the Fuel Selector Valve Positions:

Possible operating modes of the three fuel selector valve positions are outlined systematically in the following scheme. The figures below, show fuel flows for the RH engine (fuel flows LH are alike):

With the LH fuel selector valve in the crossfeed position, the fuel from the RH tank is transferred to the LH engine. Depending on the position of the RH fuel selector valve, the RH tank then feeds both engines (as shown in Figure 4 below) or only the LH engine, when the fuel selector valve of the RH engine is in shut-off position (as shown in Figure 5 below).

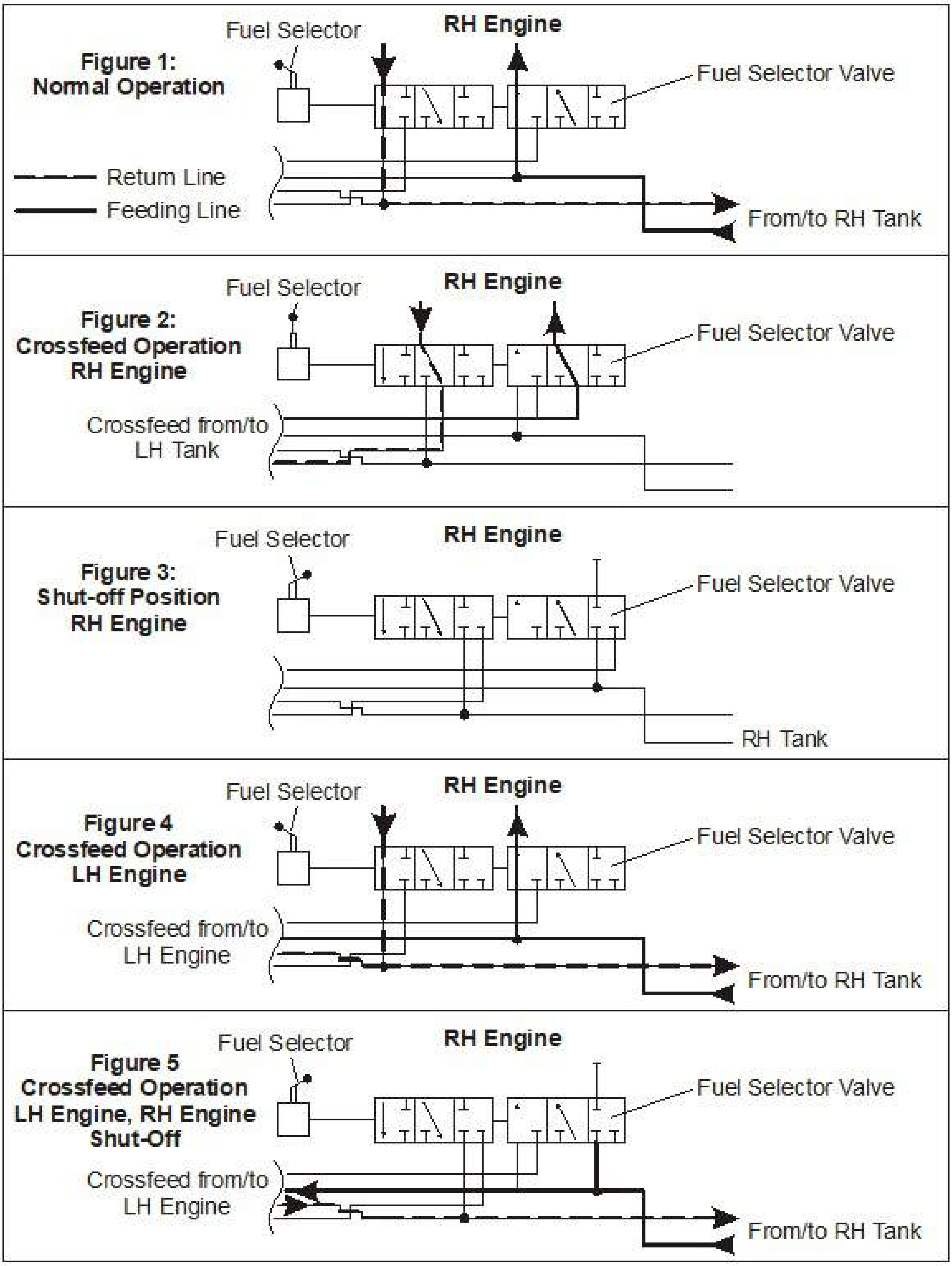
Figure 1: Normal Operation.

Figure 2: Crossfeed Operation.

Figure 3: Shut-off.

Figure 4: Fuel selector valve RH normal operation position, fuel selector valve LH crossfeed position.

Figure 5: Fuel selector RH valve shut-off position, fuel selector valve LH crossfeed position.


Fuel Selector
RH Engine
Figure 1:
Normal Operation
Fuel Selector Valve
Return Line
Feeding Line
From/to RH Tank
Fuel Selector
RH Engine
Figure 2:
Crossfeed Operation
RH Engine
Fuel Selector Valve
Crossfeed from/to
LH Tank
Fuel Selector
RH Engine
Figure 3:
Shut-off Position
RH Engine
Fuel Selector Valve
RH Tank
Fuel Selector
RH Engine
Figure 4
Crossfeed Operation
LH Engine
Fuel Selector Valve
Crossfeed from/to
LH Engine
From/to RH Tank
Fuel Selector
RH Engine
Figure 5
Crossfeed Operation
LH Engine, RH Engine
Shut-Off
Fuel Selector Valve
Crossfeed from/to
LH Engine
From/to RH Tank

Main Fuel Tanks

Each tank consists of three aluminum chambers which are connected by a flexible hose. The tank is filled through a filler in the outboard fuel chamber. Only four liters (1 US gal) of fuel in each wing are unusable, so that a total quantity of 96 liters (25.4 US gal) in each wing is usable.

There are two tank vents. One includes a check valve with a capillary, and one includes a pressure relief valve (bleed type), which operates at 150 mbar (2 PSI) and allows fuel and air to flow to the outside with higher internal pressure. The pressure relief valve protects the tank against high pressure, if the tank was overfilled, in case of an auxiliary fuel transfer failure. The check valve with capillary allows air to enter the tank but prevents flow of fuel to the outside. The capillary equalizes the air pressure during climb. The hose terminals are located on the underside of the wing, approximately 2 meters (7 ft) from the wing tip.

In each tank a coarse filter (finger filter) is fitted before the outlet. To allow draining of the tank, a drain valve is located at the lowest point of the fuel tank.

At the lowest point on each side of the fuel system, a fuel filter with a drain valve is installed. This drain valve can be used to remove water and sediment which has collected in the fuel system. The drain valves are fitted in each nacelle behind the firewall, approximately 15 cm (0.56 ft) backward of the wing leading edge.

Fuel Quantity Indication

Two capacity probes measure the fuel quantity in each main tank. The indication is provided by the G1000 flight display. Information about fuel consumption can be found in Chapter 5 - PERFORMANCE.

<u>Auxiliary Fuel Tanks (if installed)</u>

The auxiliary tanks are optional equipment (OÄM 62-001).

Description

The auxiliary fuel tanks are installed in the rear section of the engine nacelles, above the wing main spars. Each auxiliary fuel tank has a filler cap located on the top surface of the nacelle. The additional fuel capacity is 18.5 US gallons (70 liters) per side. The total fuel capacity (main fuel tanks and auxiliary fuel tanks) is 44.5 US gallons (168.4 liters) per side.

The fuel supply connection attaches to a finger filter mounted at the rear of the auxiliary fuel tank. Each auxiliary fuel tank has a auxiliary pump which transfers fuel into the related main fuel tank.

The vent line for the auxiliary fuel tank has a check valve with capillary. It allows air to enter the tank, but prevents flow of fuel to the outside. The capillary equalizes the air pressure during climb. A fuel drain valve is located at the rear of each auxiliary tank.

Operation

Two AUX PUMP switches in the cockpit are used to activate the auxiliary pumps. The switches are located behind the elevator trim wheel on the center console. Both switches are intended to be used simultaneously to prevent the airplane from additional lateral imbalance. The auxiliary pump transfers the fuel from the auxiliary fuel tank into the related main fuel tank. The fuel level switch shuts off this pump automatically when the auxiliary fuel tank is empty or when the main fuel tank is full. During operation of the pumps an advisory alert on the Garmin G1000 indicates that the fuel transfer is in progress.

If the auxiliary fuel tank is empty, a caution alert appears on the Garmin G1000. In this case, the auxiliary pumps must be switched OFF.

If MÄM 62-254 is installed:

One fuel probe measures the fuel quantity in each auxiliary tank. The indication is provided by the G1000 flight display. Information about fuel consumption can be found in Chapter 5 -PERFORMANCE.

When one auxiliary pump is defective, the fuel stored in the related auxiliary fuel tank is not available. For use of the remaining fuel pump refer to to Section 4B.12 - L/R FUEL TRANSFER FAIL. The flight plan must be amended accordingly.

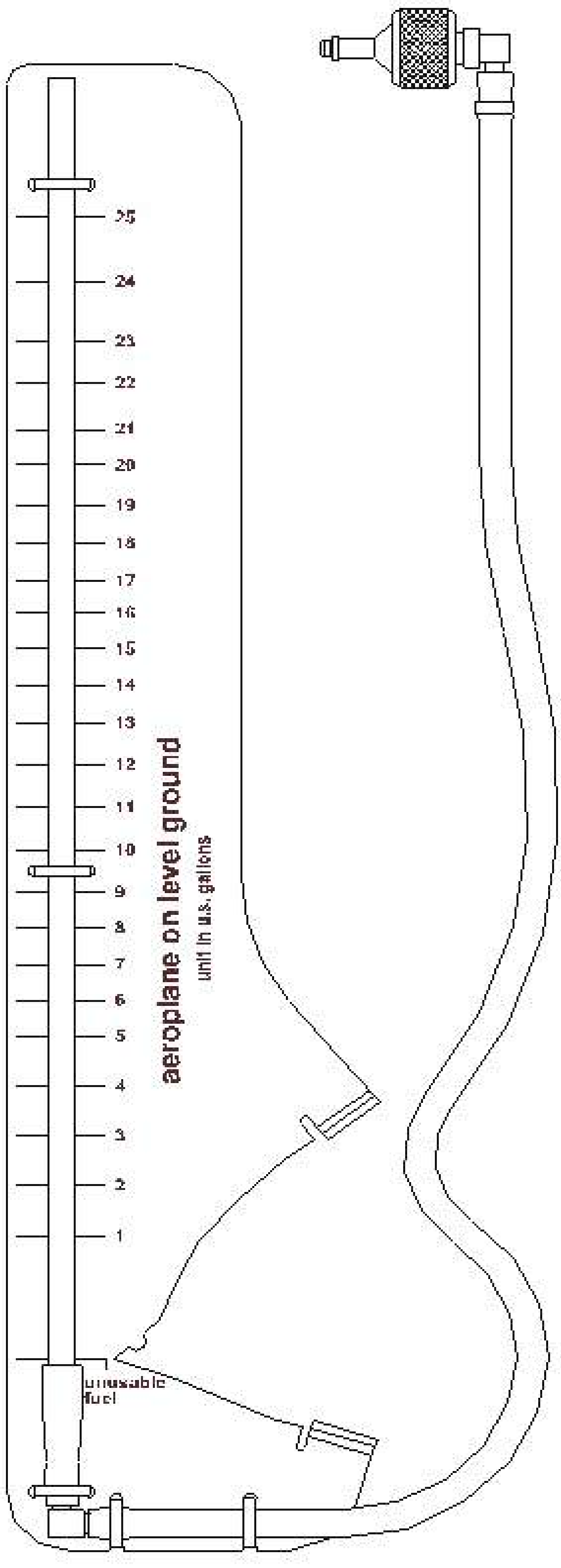
The auxiliary pumps are electrically connected to the LH MAIN BUS and protected by a 7.5 A circuit breaker.

Alternate Means for Fuel Quantity Indication for the Fuel Tank:

The alternate means for fuel quantity indication allows the fuel quantity in the tank to be determined during the preflight inspection. It functions according to the principle of communicating containers. The fuel quantity measuring device has a recess which fits the airfoil of the wing in front of the fuel tank drain, which lies approximately 10 cm (4 in) outboard of the engine nacelle. The metal connector is pressed against the drain of the tank. The amount of fuel in the tank can now be read off from the vertical ascending pipe.

For an exact indication, the airplane must stand on level ground and the measuring device must be held vertically.

The designated location for the fuel quantity measuring device is the aft baggage tray.



Alternate Means II for Fuel Quantity Indication for the Fuel Tank:

For an exact indication, the airplane must stand on horizontal ground with the wings level.

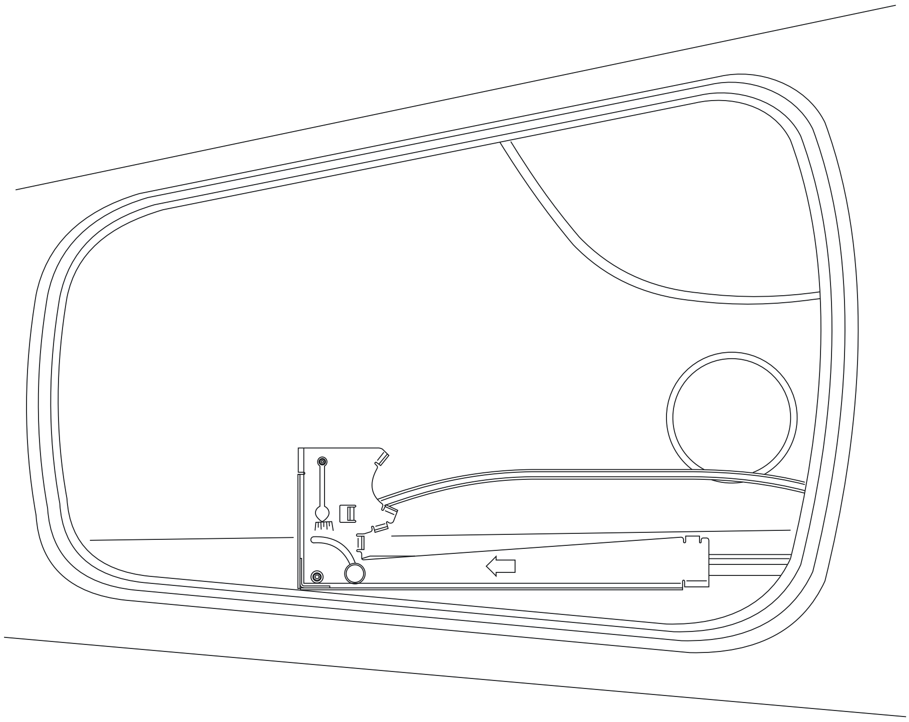
The fuel indicator II includes a protractor for an additional pitch angle measurement. The fuel indicator II is placed on the LH nose baggage compartment floor. The lower edge of the fuel indicator II must be supported by the nose baggage compartment for the entire length. Read and record the pitch angle.

Standard Tanks:

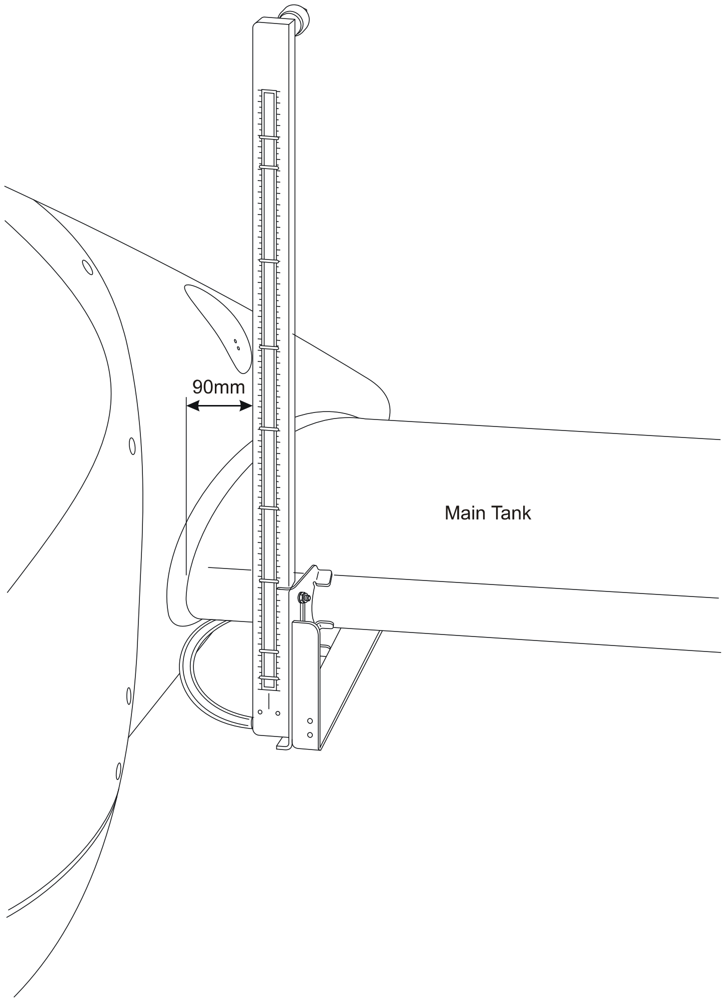
Unfold the fuel indicator II and center it at the nose of wing. Read the fuel level on the scale and refer to the tables provided in order to determine the exact fuel quantity.

Auxiliary Tanks (if installed):

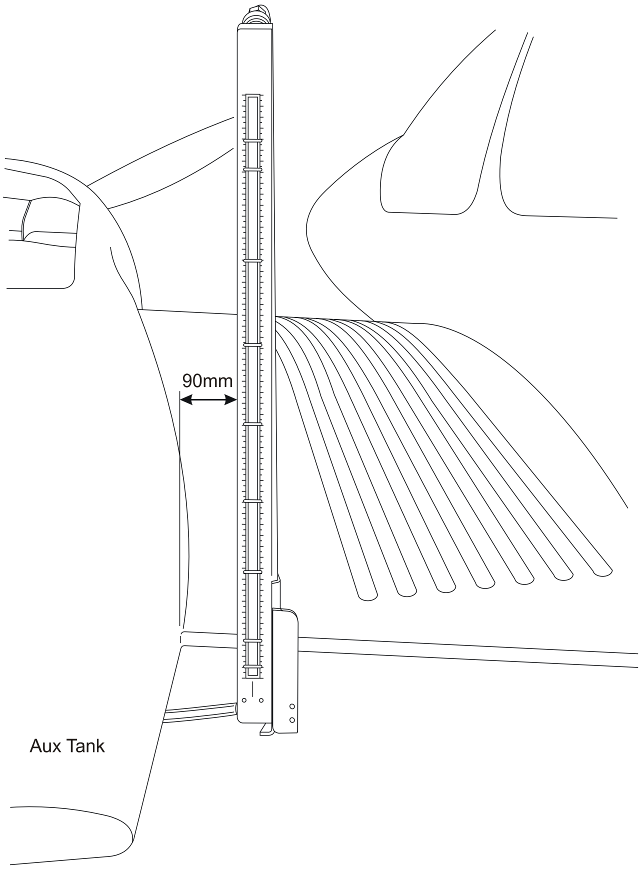
Unfold the fuel indicator II and place it on the trailing edge of the center wing. Read the fuel level on the scale and refer to the tables provided in order to determine the exact fuel quantity.



Fuel Quantity Indicator II, Pitch Angle Measurement in Baggage Compartment



Fuel Quantity Indicator II, Main Tank



Fuel Quantity Indicator II, Aux Tank

Standard Tank Configuration

Fuel Quantity Indicator II: Pitch Angle Reading					Usable Fuel Quantity	
2°	**3°**	**4°**	**5°**	**5°**	**US gal**	**Liter**
105	90	85	75	65	1	3.8
120	110	105	100	95	2	7.6
130	125	116	108	102	3	11.4
145	140	132	125	115	4	15.1
160	150	143	135	128	5	18.9
170	165	155	148	137	6	22.7
180	168	160	152	145	7	26.5
186	178	170	161	152	8	30.3
198	190	180	174	165	9	34.1
212	205	198	185	175	10	37.9
220	215	210	200	195	11	41.6
240	230	221	212	205	12	45.4
250	245	239	232	225	13	49.2
270	261	252	245	235	14	53.0
280	275	265	260	252	15	56.8
300	292	285	275	265	16	60.6
315	305	298	290	282	17	64.4
330	320	312	305	290	18	68.1
340	335	325	320	312	19	71.9
357	348	340	330	320	20	75.7
370	362	352	345	338	21	79.5
390	378	367	358	350	22	83.3
402	395	385	377	366	23	87.1
425	415	407	400	380	24	90.8

Auxiliary Tank (if installed) Configuration

Fuel Quantity Indicator II: Pitch Angle Reading					**Usable Fuel Quantity**	
2°	**3°**	**4°**	**5°**	**5°**	**US gal**	**Liter**
87	92/85	92/86	92/86	92/85	1	3.8
110	110	112/105	110/100	110/100	2	7.6
120	123	125	127	130	3	11.4
135	135	140	142	145	4	15.1
150	150	155	158	163	5	18.9
160	167	170	175	185	6	22.7
170	175	180	185	190	7	26.5
185	190	195	205	210	8	30.3
200	210	215	220	230	9	34.1
217	220	225	235	245	10	37.9
230	235	245	250	260	11	41.6
235	245	255	265	275	12	45.4
250	260	270	280	290	13	49.2
260	270	285	300	310	14	53.0
270	285	300	315	325	15	56.8

Fuel Temperature

Max. fuel temperature: 60 °C (140 °F)

Fuel Grade

Approved fuel grades are listed in Section 2.14 - FUEL.

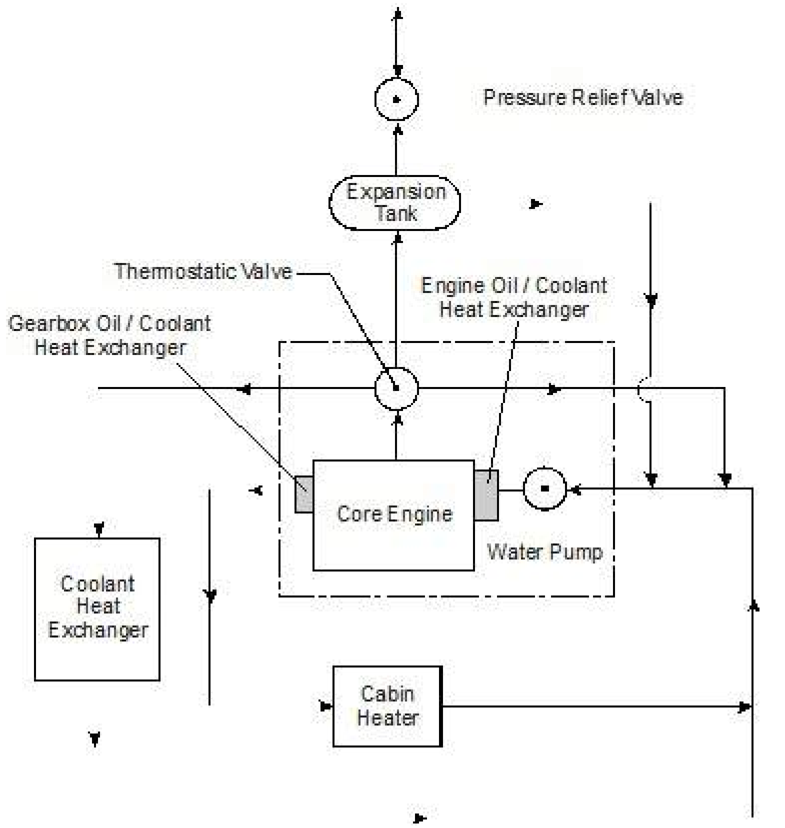
NOTE

In order to provide information about the fuel grade, it is recommended to enter the fuel grade in the airplane log each time fuel is refilled.

7.9.6 COOLING SYSTEM

The engine is liquid cooled. The liquid cooling system consists of two circuits. The first (small) cooling circuit is always active and includes an integral gearbox oil/coolant heat exchanger and a cabin air heat exchanger.

The second cooling circuit (large) includes an integral engine oil heat exchanger and a large main coolant cooler. The second cooling circuit activates through a thermostat, when the coolant reaches approximately 75°C (167°F). The flow through the heat exchanger is independent of the coolant temperature. An expansion tank helps to adjust the pressure in the system. The system is protected against overpressure by means of a pressure relief valve.



7.9.7 OIL SYSTEMS

Each engine has two separate oil systems.

Lubrication System (Engine and Turbo-Charger)

The engine lubrication is a wet sump lubrication system. The oil is cooled by a water/oil-cooler on the upperside of the engine.

A dip-stick is provided to check the oil quantity through an inspection door in the left cowling. If required, oil can be replenished through this door (for approved oil grades refer to Section 2.4 - POWER-PLANT LIMITATIONS).

Gearbox and Propeller Governor System

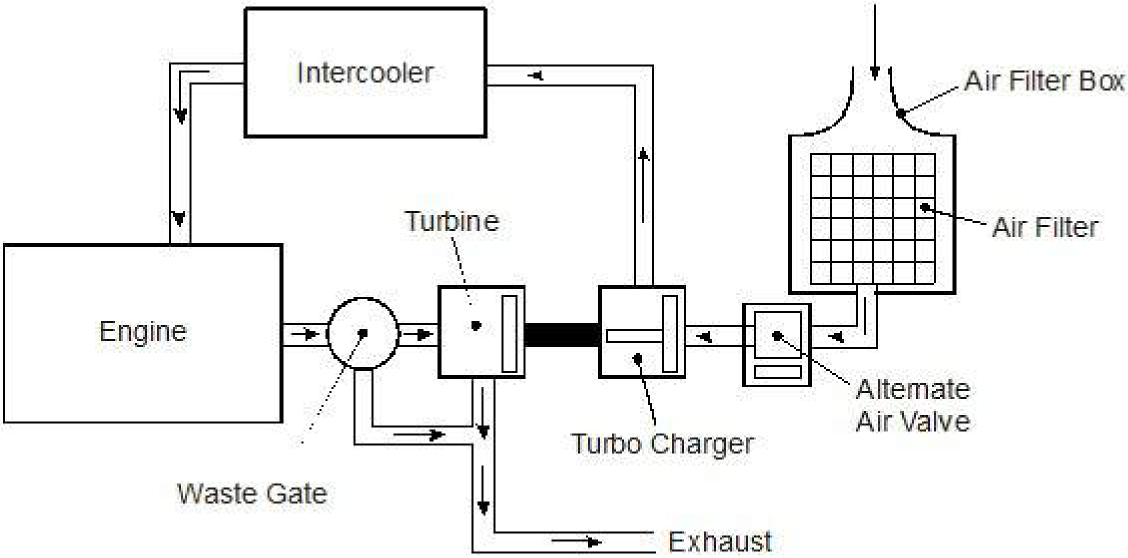
The second oil circuit lubricates the gearbox and serves the governor system and the regulation of the propeller. The gearbox oil is also cooled via an integral oil/coolant heat exchanger.

The gearbox oil quantity can be checked with the help of an inspection glass which can be reached through an inspection door on the left side of the cowling.

CAUTION

If the gearbox oil quantity is too low, unscheduled maintenance is necessary (for approved oil grades refer to Section 2.4 - POWER-PLANT LIMITATIONS).

7.9.8 TURBO-CHARGER SYSTEM



The exhaust system contains a manifold which collects exhaust gases from the outlets of the cylinders and feeds them to the turbine of the turbo charger. Behind the turbine, the exhaust gases are guided through the lower cowling to the exterior of the airplane. Excess exhaust gases bypass the turbine. The bypass is controlled by the ECU through the waste gate valve. A manifold pressure sensor behind the compressor allows the ECU to calculate the correct position of the waste gate valve. This prevents excessive manifold pressures at low density altitudes. The intake air is compressed in the compressor which is driven by the turbine, and is subsequently cooled down in the intercooler to increase power. Cooling the air increases efficiency through the higher density of the cooler air.

7.9.9 FIRE DETECTION SYSTEM

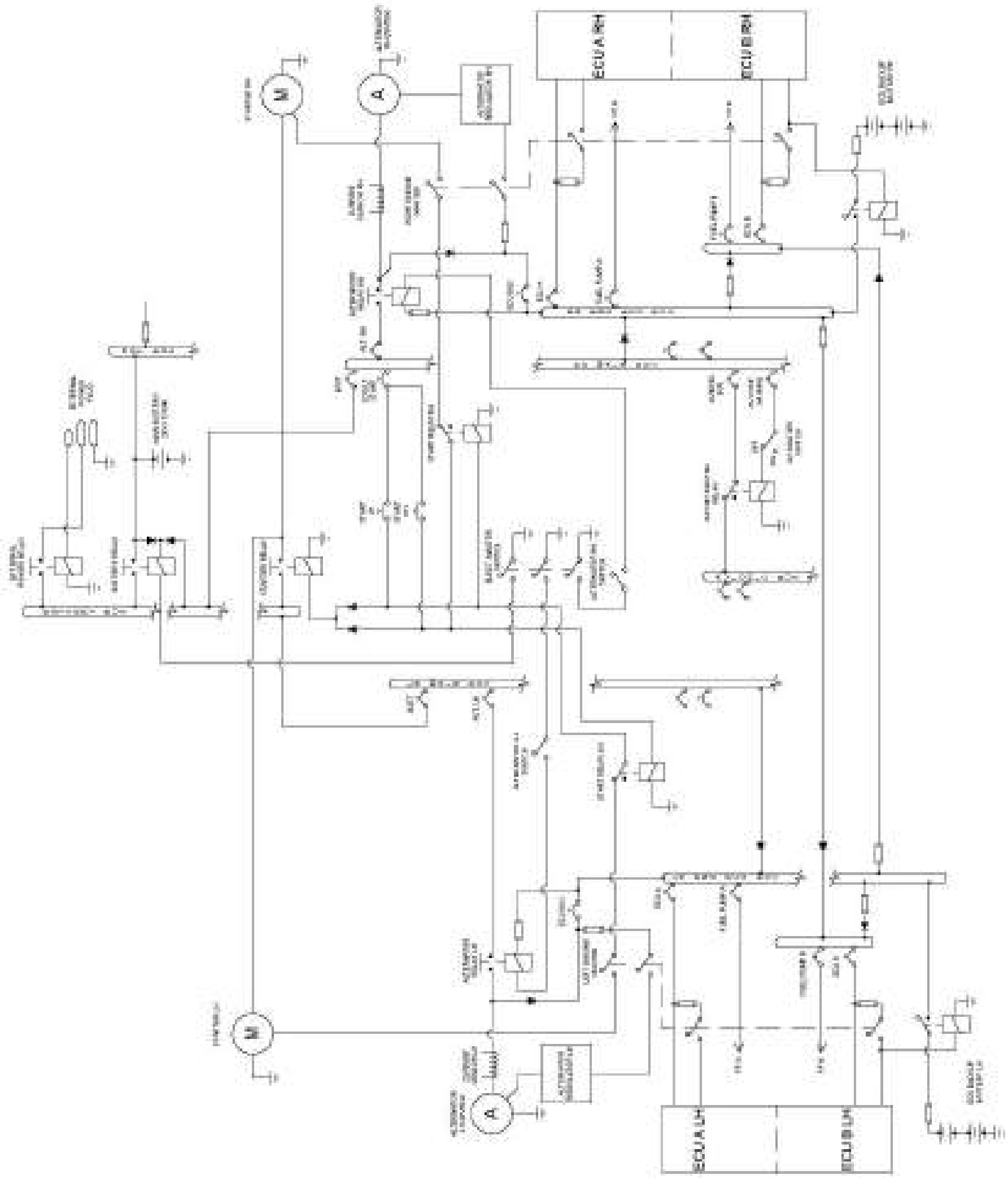
The fire detection system in the DA 62 consists of an overheat detector in the hot area of each engine. In case of an increase of the engine compartment temperature above 250 °C (480 °F) the overheat detector closes the electric circuit and a warning message appears in the annunciation window of the G1000 PFD.

To test the fire detectors (refer to Section 4A.6.1 - PREFLIGHT INSPECTION) push the test button located next to the gear selector switch. An aural alert and the fire warning message for the LH and RH engine should appear in the annunciation window of the G1000 PFD.

CAUTION

If the warning does not appear, unscheduled maintenance is necessary.

7.10 ELECTRICAL SYSTEM



7.10.1 GENERAL

The DA 62 has 28 Volt DC system, which can be sub-divided into:

- Power generation
- Storage
- Distribution
- Consumers

Power Generation

Power generation is provided by two 70 Ampère alternators (generators) which are mounted on the bottom left side of each engine. The alternators are driven by a flat belt.

The power output line of the left hand alternator is connected to the LH MAIN BUS via the LH alternator relay and a 60 Ampère circuit breaker. The power output line of the RH alternator is connected to the RH MAIN BUS via the RH alternator relay and a 60 Ampère circuit breaker. Both main busses are connected to the BATTERY BUS via a 90 Ampère circuit breaker.

Both generator power output lines also run through a current sensor for each alternator, which provides an indication of the power being supplied to the electrical system by an alternator including the current for battery charging on the G1000. In the event of a main battery failure, the field of each alternator is energized by two 12 V, 7.2 Ah sealed lead acid batteries (ECU backup battery) connected in series, which are installed under the passengers' seats. The ECU backup batteries provide also electrical power for the ECU for a time of 30 minutes (condition).

The ENGINE MASTER LH (RH) switches connect the ECU backup battery to the alternator field via a 10 Ampère fuse.

Alternator Control:

Each alternator has an alternator control unit. It measures the alternator output voltage and controls the current through the alternator field coils via a pulse-width modulated signal. To keep the output voltage stable in all load and speed situations, the alternator field signal is modulated accordingly.

The left alternator regulator also measures the power output of both (LH and RH) alternators via separate current sensors. Based on the current measurements, the LH alternator regulator controls the output of its associated alternator, providing paralleling between the alternators.

The alternator control unit includes a comprehensive set of diagnostic functions that will warn the operator using a caution message (L/R ALTN FAIL) on the G1000 PFD in case of over- or undervoltage as well as a couple of other internal warning levels.

Storage

Main battery power is stored in a 24 V, 13.6 Ah lead-acid battery mounted on the right-aft side of the front electric/avionic compartment. The main battery is connected to the HOT BATTERY BUS; and to the BATTERY BUS via the 'battery'-relay which is installed in the relay junction box on the forward side of the front electric/avionic compartment.

The battery relay is controlled with the ELECT. MASTER switch which is located on the left-hand side of the instrument panel.

Distribution

Electrical power is distributed via the HOT BATTERY BUS, the BATTERY BUS, the LH (RH) ECU BUS, the LH (RH) MAIN BUS, and the AVIONIC BUS.

HOT BATTERY BUS:

The HOT BATTERY BUS is directly connected to the main battery and cannot be disconnected from the main battery. The HOT BATTERY BUS provides power to the pilot map/reading light which is protected by its own fuse.

BATTERY BUS:

The BATTERY BUS is connected to the main battery via the battery relay which can be controlled by the ELECT. MASTER switch. The BATTERY BUS provides power to the LH (RH) MAIN BUS and heavy duty power to both starters.

ECU BUS:

The LH (RH) ECU BUS is connected to the LH (RH) MAIN BUS via a diode and connected to the power output line of the alternator via diode and a 30 Ampère circuit breaker and provides power directly to ECU A and its fuel pump. ECU B and its fuel pump derive their electrical power from their associated ECU BUS via an additional diode and fuse.

Additionally, each ECU B and its fuel pump is supplied with electrical power from the opposite engine side ECU BUS via a diode and fuse.

The LH (RH) ENGINE MASTER switch must be set to ON to activate the engine ECU.

To support the alternator electrical power supply to the ECUs in case of a malfunction of the main battery, additional sealed-lead-acid batteries (ECU backup battery) are connected to the RH and LH ECU bus.

These batteries are able to provide 30 minutes of engine operation in case of a complete airplane electrical failure. Both engines may stop if the 30 minutes have elapsed.

MAIN BUS:

The LH (RH) MAIN BUS is connected to the BATTERY BUS via a 90 Ampère circuit breaker. The LH MAIN BUS provides power to the consumers directly connected to the LH MAIN BUS. The RH MAIN BUS provides power to the consumers directly connected to the RH MAIN BUS and the AVIONIC BUS via the avionics master relay.

The AVIONIC MASTER switch must be set to ON to connect the RH MAIN BUS to the AVIONIC BUS.

Consumers

The individual consumers (e.g. radio, position lights, etc.) are connected to the appropriate bus via automatic circuit breakers.

Designations and abbreviations used to identify the circuit breakers are explained in Section 1.5 - DEFINITIONS AND ABBREVIATIONS.

Voltmeter

The voltmeter displays the voltage of the electrical system. Under normal operating conditions the alternator voltage is shown, otherwise it displays the main battery voltage.

Ammeter

The ammeter displays the intensity of current which is supplied to the electrical system by the LH (RH) alternator.

Landing and Taxi Lights

Landing and taxi lights are built into the wing center section, and are each operated by means of a switch (LANDING, TAXI) located on the row of switches on the instrument panel.

Position and Strobe Lights

Combined position and strobe lights (anti collision lights) are installed on both wing tips. Each system is operated by a switch (POSITION, STROBE) located on the row of switches on the instrument panel.

Flood Light

A two-dimensional light emitter is mounted above the instrument panel on the left and right side. They illuminate the instrument panel as well as all levers, switches, etc. The flood lights are switched on and their brightness is adjusted by means of a rotary button (FLOOD) in the center section of the instrument panel.

Instrument Lighting

With a rotary button (INSTRUMENT) in the center section of the instrument panel, the internal lighting of the instruments and placards is switched on and its brightness is adjusted.

Pitot Heating

The Pitot probe, which provides measurement for the Pitot-static system, is electrically heated. The heating is activated with a switch (PITOT HEAT) located on the row of switches on the instrument panel. The temperature is automatically kept constant by means of a thermal switch on the Pitot probe, and as an additional safety measure a thermal fuse is built in. If this thermal fuse is activated, the Pitot heating can no longer be switched on, and the PITOT FAIL will be displayed. In this case, the system should be serviced. The PITOT HT OFF is displayed if the Pitot heating is switched off.

Static Port Heating (if OÄM 62-037 is installed)

The static pressure ports, which provide measurement for the Pitot-static system, are electrically heated and located on the RH and LH fuselage side walls. The heating is activated in combination with the Pitot heating system (PITOT HEAT switch). The switch is located on the instrument panel. On ground, the maximum temperature is limited by means of an on-ground switch, to prevent overheating. The function of the system must be checked on ground before take-off during walk-around.

External Power Socket

The DA 62 has an external 28 Volt DC power socket located on the lower surface of the fuselage nose section. When external power is connected, the control relay is energized and the external power comes online.

The socket itself has three pins:

- a large negative pin
- a large positive pin
- a small positive pin

A diode protects the system from reverse polarity.

28V Power Outlet Option (if OÄM 62-1002 is installed)

The DA 62 has a 28V power outlet at the lower right of the instrument panel. Only equipment, that has been certified specifically for this outlet may be used. In case of any malfunction of the equipment or any of the alternators, the equipment must be disconnected or switched off.

For more information refer to the Airplane Maintenance Manual.

7.10.2 ELECTRONIC ENGINE CONTROL UNIT/ECU

Engine Control and Regulation

The electronic ECU is used to control the engine actuators (e.g. fuel injectors) according to the engine sensor information. The ECU monitors, controls and regulates all important parameters for engine operation.

The installed sensors are:

- Oil temperature (lubrication system engine)/OIL TEMP
- Oil pressure (lubrication system engine)/OIL PRES
- Coolant temperature/COOLANT TEMP
- Gearbox temperature/GEARBOX
- Camshaft RPM (twice)
- Crankshaft RPM (twice)
- Fuel pressure in the common rail
- Manifold pressure
- Manifold air temperature
- Ambient air pressure
- Propeller governor/oil pressure
- Power lever position (twice)
- Voltage
- Starter switch signal
- Fuel pressure
- VOTER switch signal
- ECU TEST switch signal

In accordance with the received signals and a comparison with the programmed characteristic diagrams, the necessary inputs are calculated and transmitted by the following signal lines to the engine:

- Signal for propeller governor pressure valve
- Signal for the rail-pressure regulation valve
- Signal for each of the 4 injection nozzles
- Activation of the glow plugs
- Signal for the waste gate valve

The following alerts are displayed on PFD of the G1000:

- Glow sparks active
- Status ECU A
- Status ECU B
- Low fuel pressure

The electronic ECU consists of two ECUs per engine. A VOTER switch is integrated in the electronic ECU and proposes (if set to AUTO) an ECU to control the engine regarding the ECU operating hours or - in case of a failure - the ECU with better engine control capability. If the VOTER switch is set to A or B, the related EECU is forced to control the corresponding engine with ECU A respectively ECU B.

A fault detected by the ECUs is indicated by a caution message on the PFD (L/R ECU A/B FAIL). Two types of faults are known:

- Faults which lead to a latched caution indication

- Faults which lead to a non-latched indication

In case of a latched caution, unscheduled maintenance is necessary and Austro Engine GmbH has to be informed.

7.10.3 WARNING, CAUTION AND ADVISORY MESSAGES

Crew Alerting System (CAS)

The G1000 crew alerting system (CAS) is designed to provide visual and aural alerts to the flight crew. Alerts are divided into three levels as follows:

WARNING

CAUTION

ADVISORY

Crew alerts will appear in the alerts window on the PFD. In this window, warnings will appear at the top, followed by cautions and advisories, respectively. Within the criticality levels, messages will appear from newest (top) to oldest (bottom).

At the low right corner of the display, there is a MSG (message) soft key. The MSG key provides two functions in the CAS:

1. Pressing the MSG key acknowledges a new master warning/caution/advisory indication.
2. An additional MSG key press with no master alert indication active will open a pop-up auxiliary flight display (AFD) page that contains information for all active alerts.

This structure allows the crew to scroll through all system alerts if the alerts window overflows. This approach displays the most critical alerts close to the pilot's primary field of view at all times, with the option of allowing lower criticality alerts to overflow and be accessible from the pop-up AFD page/window.

Alert Levels

Level	Text Color	Importance	Audible Tone
Warning	Red	May require immediate corrective action	Warning chime tone which repeats without delay until acknowledged by the crew
Caution	Amber	May require future corrective action	Single warning chime tone
Annunciation Advisory	White		None
Message Advisory	White		None
Safe Operation Annunciation	Green	Lowest	None

Warning Alerts on the G1000

Warning Alerts	Meaning/Cause
L/R ENG TEMP	The annunciation is active when the engine coolant temperature is greater than 100 °C (212 °F).
L/R OIL TEMP	The annunciation is active when the engine oil temperature is greater than 139 °C (282 °F).
L/R OIL PRES	The annunciation is active when the engine oil pressure is less than 0.9 bar (13.05 psi).
L/R FUEL TEMP	The annunciation is active when the fuel temperature is greater than 60 °C (140 °F).
L/R GBOX TEMP	The annunciation is active when the gearbox oil temperature is greater than 120 °C (248 °F).
L/R FUEL PRES	The annunciation is active when the engine fuel pressure is low.
L/R ALTN AMPS	The annunciation is active when the alternator load is greater than 70 Amps.
L/R ENG FIRE	The annunciation is active when an engine fire is detected.
L/R STARTER	This annunciation is used to indicate to the pilot that the starter is engaged when it should not be.
L/R DOOR OPEN	Left/Right pilot door is not closed and locked.
REAR DOOR OPEN	Passenger door is not closed and locked.
FWD DOOR OPEN	Left or right baggage door is/are not closed and locked.
POSN ERROR	The annunciation is active when the G1000 will no longer provide GPS based navigational guidance.
ATTITUDE FAIL	The annunciation is active when the display system is not receiving attitude reference information from the AHRS.

Warning Alerts	Meaning/Cause
AIRSPEED FAIL	The annunciation is active when the display system is not receiving airspeed input from the air data computer.
ALTITUDE FAIL	The annunciation is active when the display system is not receiving altitude input from the air data computer.
VERT SPEED FAIL	The annunciation is active when the display system is not receiving vertical speed input from the air data computer.
HDG	The annunciation is active when the display system is not receiving valid heading input from the AHRS.
WARN	This annunciation constitutes a RAIM position warning. The nav deviation bar is removed.

Audible Warning Alerts

Warning Alerts	Meaning/Cause
Landing gear retracted	A warning chime tone which repeats without delay is active when the landing gear is retracted while the flaps move into the LDG position or when the POWER lever is placed in a position below approximately 25%.

Caution Alerts on the G1000

Caution Alerts	Meaning/Cause
L/R ECU A FAIL or L/R ECU B FAIL	The annunciation is active when a fault was detected by ECU A or ECU B.
L/R FUEL LOW	The annunciation is active when the fuel quantity is below 4 ± 1 US gal usable fuel.
L/R VOLTS LOW	The annunciation is active when bus voltage is less than 25 Volts.
L/R ALTN FAIL	The annunciation is active when the alternator has failed.
L/R COOL LVL	The annunciation is active when engine coolant level is low.
PITOT FAIL	The annunciation is active when the Pitot heater is failed.
PITOT HT OFF	The annunciation is active when the Pitot heat is off.
STAL HT FAIL	The annunciation is active when the stall heater is failed.
STAL HT OFF	The annunciation is active when the stall heater is off.
L/R AUX FUEL E	This annunciation can only occur when the auxiliary fuel tank system (optional equipment) is installed. The annunciation is active when the L/R auxiliary fuel tank is empty and AUX PUMP is ON.
INTEG RAIM not available	The annunciation is active when RAIM (Receiver Autonomous Integrity Monitor) is not available.
AHRS ALIGN: Keep Wings Level	The annunciation is active when the AHRS (Attitude and Heading Reference System) is aligning.
CHECK GEAR	Landing gear is not down and locked.

Annunciation Advisory Alerts on the G1000

Advisory Alerts	Meaning/Cause
L/R GLOW ON	The annunciation is active when the glow plugs are powered.
L/R AUXPUMP ON	The annunciation is active when fuel transfer from auxiliary to main tank is in progress (if installed).

Message Advisory Alerts on the G1000

Advisory Alerts	Meaning/Cause
PFD FAN FAIL	The annunciation is active when the PFD fan is inoperative.
MFD FAN FAIL	The annunciation is active when the MFD fan is inoperative.
GIA FAN FAIL	The annunciation is active when the GIA fan is inoperative.

7.11 PITOT-STATIC SYSTEM

Total pressure is measured at the leading edge of the left wing using a Pitot probe. The static pressure is measured through the static ports in the rear fuselage. To protect against dirt and condensation there are filters in the system. The Pitot probe and the static port (if OÄM 62-037 is installed) are electrically heated. Static port heat (if OÄM 62-037 is installed) is engaged together with the Pitot heating.

With the alternate static valve, the static pressure in the cabin can be used as static pressure source in the event of a failure of the Pitot-static system.

7.12 STALL WARNING SYSTEM

The lift detector of the DA 62 is located on the front edge of the left wing below the wing chord line. It is supplied electrically and provides a stall warning, before the angle of attack becomes critical. The stall status is announced to the pilot by a continuous sound in the cockpit.

The lift detector vane, the mounting plate and the complete housing are heated to prevent icing. Heating is engaged together with the Pitot heating.

7.13 GARMIN G1000 INTEGRATED AVIONICS SYSTEM

7.13.1 GENERAL

The Gamin G1000 is a fully integrated flight, engine, communication, navigation and surveillance instrumentation system. This integrated avionics system consists of a primary flight display (PFD), a multi-function display (MFD), an audio panel, an attitude and heading reference system (AHRS), an air data computer (ADC) and the sensors and computers to process flight and engine information for display to the pilot. The system contains dual GPS receivers, dual VOR/ILS receivers, dual VHF communications transceivers, a transponder, and an integrated annunciation system to alert the pilot of certain abnormal conditions.

A remote avionic box is located in the front electric/avionic compartment. A push-to-talk (PTT) button for the COM portion of the G1000 is mounted on the end of each control stick. There are connection facilities for up to 5 (or optionally 7) headsets. The connections for the pilot, copilot and 1st passenger row are located between the pilot´s and copilot´s seat. The connections for the 2nd passenger row are located on the left and right outboard side of each seat. As the audio panel is limited to a maximum of 6 microphones, a switch is optionally installed, swapping the 6th microphone input between the 1st row middle seat and the 2nd row right seat. The headset phones are not affected by the switch.

Refer to the Garmin G1000 Cockpit Reference Guide, P/N 190-01896-( ), and Garmin G1000 Pilot's Guide for the Diamond DA 62, P/N 190-01895-( ), for complete descriptions of the G1000 system and operating procedures.

If MÄM 62-254 is installed, refer to the Garmin G1000 NXi Cockpit Reference Guide, P/N 190-01905-( ) and Garmin G1000 NXi Pilot's Guide for the Diamond DA 62, P/N 190-01904-( ) for complete descriptions of the G1000 NXi system and operating procedures.

NOTE

Near the DME ground station, it can happen under certain adverse conditions that the Bendix/King KN 63 DME loses the direct signal from the ground station and locks onto an "echo". This will result in an inaccurate indication of the distance.

NOTE

During retraction and extension of the landing gear, the ADF-indication may be inaccurate.

NOTE

The airplane electrical system slightly interferes with the WX500 stormscope, causing strikes to be displayed beyond the 100 NM range ring. Thus, it is recommended to use range settings below 100 NM or carefully verify if the indicated strikes are real. It is also recommended not to display Strike data on the Map page if a higher range than 50 NM is used.

7.13.2 PRIMARY FLIGHT DISPLAY (PFD)

The primary flight display (PFD; see figure below) typically displays airspeed, attitude, altitude, and heading information in a traditional format. Slip information is shown as a trapezoid under the bank pointer. One width of the trapezoid is equal to a one ball width slip. Rate of turn information is shown on the scale above the compass rose; full scale deflection is equal to a standard rate turn. The following controls are available on the PFD (clockwise from top right):

* Communications frequency volume and squelch knob
* Communications frequency set knobs
* Communications frequency transfer button
* Altimeter setting knob (baro set)
* Course knob
* Map range knob and cursor control
* FMS control buttons and knob
* PFD softkey buttons, including master warning/caution acknowledgment
* Altitude reference set knob
* Heading bug control
* Navigation frequency transfer button
* Navigation frequency set knobs
* Navigation frequency volume and identifier knob

The PFD displays the crew alerting (annunciator) system. When a warning or caution message is received, a warning or caution annunciator will flash on the PFD, accompanied by an aural tone. A warning is accompanied by a repeating tone, and a caution is accompanied by a single tone. Acknowledging the alert will cancel the flashing and provide a text description of the message. Refer to Chapter 3 - EMERGENCY PROCEDURES, Chapter 4B - ABNORMAL OPERATING PROCEDURES, and Section 7.10.3 - WARNING, CAUTION AND ADVISORY MESSAGES.

Advisory messages related to G1000 system status are shown in white and are accompanied by a white flashing ADVISORY alert. Refer to the G1000 Pilot's Guide and Cockpit Reference Guide for descriptions of the messages and recommended actions (if applicable).

Trend vectors are shown on the airspeed and altimeter displays as a magenta line predicting 6 seconds at the current rate. The turn rate indicator also functions as a trend indicator on the compass scale.

The PFD can be displayed in a composite format for emergency use by pressing the DISPLAY BACKUP button on the audio panel. In the composite mode, the full crew alerting function remains, but no map functions are available.

7.13.3 MULTI-FUNCTION DISPLAY (MFD)

The multi-function display (MFD) typically displays engine data, maps, terrain, traffic and topography displays, and flight planning and progress information. The display unit is, nearly identical to the PFD and contains the same controls as previously listed. Additionally the MFD incorporates the controls for the autopilot system.

Engine instruments are displayed on the MFD. Discrete engine sensor information is processed by the Garmin engine airframe (GEA) sub-system. When an engine sensor indicates a value outside the normal operating range, the legend will turn yellow for caution range, and turn red and flash for warning range.

Also refer to Section 7.9.4 - ENGINE INSTRUMENTS.

7.13.4 AUDIO PANEL

The audio panel contains traditional transmitter and receiver selectors, as well as an integral intercom and marker beacon system. The marker beacon lights appear on the PFD. In addition, a clearance recorder records the last 2 ½ minutes of received audio. Lights above the selections indicate what selections are active. Pressing the red DISPLAY BACKUP button on the audio panel causes both the PFD and MFD to display a composite mode.

7.13.5 ATTITUDE AND HEADING REFERENCE SYSTEM (AHRS)

The attitude and heading reference system (AHRS) uses GPS, rate sensors, air data, and magnetic variation to determine pitch and roll attitude, sideslip and heading. Operation is possible in a degraded mode if the system loses any of these inputs. Status messages alert the crew of the loss of any of these inputs. The AHRS will align while the airplane is in motion, but will align quicker if the wings are kept level during the alignment process.

7.13.6 AIR DATA COMPUTER (ADC)

The air data computer (ADC) provides airspeed, altitude, vertical speed, and air temperature to the display system. In addition to the primary displays, this information is used by the FMS and TIS systems.

7.13.7 GWX 70 WEATHER RADAR

The Garmin GWX 70 Weather Radar System provides information about precipitation conditions ahead of the airplane. The system consists of a combined microwave transmitter and receiver system in the nose cone, mounted to the front baggage compartment bulkhead. The system is connected to the electrical system of the airplane via a circuit breaker on the instrument panel. The processed data of the GWX 70 system is displayed on the Garmin G1000 MFD. Refer to the Garmin G1000 Pilot's Guide, P/N

190-01895-( ) or Garmin G1000 NXi Pilot's Guide, P/N 190-01904-( ) in the latest effective issue for more information.

7.13.8 PFD/MFD CONTROL UNIT (KEYPAD)

The optional PFD/MFD control unit is a user interface allowing for ease of data entry, PFD/MFD operation and NAV/COM tuning. The PFD/MFD control unit is installed in the center armrest. Access to the control unit is accomplished by a folding mechanism. The control unit must be stowed during take-off and landing, all emergencies and abnormal operating procedures.

For more information, refer to the Garmin G1000 Pilot's Guide, P/N 190-01895-( ) or the latest effective issue.

7.14 AVIONICS

7.14.1 AUTOPILOT SYSTEM

General

The GFC 700 automatic flight control system (AFCS) is a 3 axis autopilot and flight director system which provides the pilot with the following features: altitude preselect and altitude hold (ALT); yaw damper; flight level change with airspeed hold (FLC); vertical speed hold (VS); navigation tracking for VOR (NAV) and GPS (GPS); heading hold (HDG); approach mode and go around (GA) pitch/roll guidance. The system consists of autopilot controls on the multi-function display (MFD), servos with autopilot processing logic, flight director processing logic in the GIAs, a control stick-mounted elevator trim switch, a control stick mounted trim interrupt and autopilot disconnect switch, a control stick mounted CWS (control wheel steering) switch, a power lever mounted GA (go-around) switch, and PFD/MFD-mounted altitude preselect, heading, and course knobs.

The GFC 700 autopilot contains an electric pitch trim system which is used by the autopilot for automatic pitch trim during autopilot operation and by the pilot for manual electric pitch trim when the autopilot is not engaged. The manual electric pitch trim is operated by a split switch on the pilot's control stick.

The GFC 700 autopilot and manual electric trim (MET) will not operate until the system has satisfactorily completed a preflight test. The preflight test begins automatically with initial power application to the autopilot (AVIONIC MASTER switch is set to the ON position).

The following conditions will cause the autopilot to automatically disconnect:

- Electrical power failure
- Internal autopilot system failure
- AHRS malfunction
- Loss of air data computer information

The GFC 700 may be manually disconnected by any of the following means:

- Depressing the red AP DISC button on the pilot's or co-pilot's control stick
- Moving the left (outboard) side of the manual electric trim switch on the pilot's control stick
- Pushing the AP button on the autopilot mode controller when the autopilot is engaged
- Depressing the GA button on the left side of the power lever (if ESP is not installed)
- Pulling the AFCS/ESP/USP circuit breaker
- Turning off the AVIONICS MASTER switch
- Turning off the ELECT. MASTER switch

In addition, the CWS (control wheel steering) switch on the pilot's control stick will disconnect the autopilot servos from the airplane flight controls as long as the CWS switch is depressed.

Power to the GFC 700 autopilot and electric trim system is supplied through the AVIONIC MASTER switch and the AFCS/ESP/USP circuit breaker. The AVIONIC MASTER switch can be used as an additional means to disable the autopilot and electric trim system. The red AP DISC switch on the pilot's control stick will interrupt power to the manual electric trim for as long as the switch is depressed.

Loss of instruments or components of the G1000 system will affect the GFC 700 AFCS as follows:

- Loss of the AHRS will cause the autopilot to disconnect. The autopilot and flight director will be inoperative. Manual electric trim will be available.
- Loss of the heading function of the AHRS will result in loss of the HDG mode. If in HDG mode at the time heading is lost, the autopilot will revert to basic roll mode (ROL).

- Loss of the MFD will not cause the autopilot to disconnect, and will remain engaged with limited functionality, but the autopilot cannot be re-engaged after disconnect by the pilot.
- Loss of the PFD will cause the autopilot to disconnect. The autopilot and flight director will be inoperative. Manual electric trim will be available.
- Loss of air data computer information will cause the autopilot to disconnect. The autopilot will be inoperative. The flight director will be available except for air data modes (ALT, VS, FLC). Manual electric trim is available.
- Loss of GIA #1 will cause the autopilot to disconnect. The autopilot, flight director and manual electric trim will be inoperative. Loss of GIA #2 will also prevent autopilot and manual electric trim operation, but flight director will be available.
- Loss of the standby attitude module or compass will have no effect on the autopilot.
- Loss of both GPS systems will cause the autopilot and flight director to operate in NAV modes (LOC, BC, VOR, VAPP) with reduced accuracy. Course intercept and station crossing performance may be improved by executing intercepts and station crossings in HDG mode, then reselecting NAV mode.

The GFC 700 automatic flight control system (AFCS) installed in the Diamond DA 62 consists of the following components:

- One GDU which contains the following mode control buttons:
- AP (Autopilot engage/disengage)
- FD (Flight director on/off)
- HDG (Heading mode on/off)
- NAV (Nav mode on/off)
- APR (Approach mode on/off)
- ALT (Altitude hold mode on/off)
- VS (Vertical speed mode on/off)

- FLC (Flight level change mode on/off)
- NOSE UP and NOSE DN (Vertical mode reference change)
- YD (Yaw damper on/off)
- This GDU is installed as the MFD.
- Servos with autopilot processing logic in the pitch, roll, yaw and pitch trim control systems
- Servo mounts and brackets
- Flight director processing logic in the GIAs
- Control stick-mounted manual electric trim (MET) switch (split switch) for pitch trim
- Control stick-mounted trim interrupt and autopilot disconnect switch
- Control stick-mounted CWS (control wheel steering) switch
- Remote-mounted go-around switch (on the left side of the power lever knob)
- PFD/MFD mounted altitude preselect knob (ALT)
- PFD/MFD mounted heading select knob (HDG)

Flight director commands and autopilot modes are displayed on the PFD. Full AFCS functionality is only available with both displays operating, and will disconnect under certain reversionary conditions.

Upon initial system power-up, the system undergoes a preflight test. At the end of the test, the autopilot disconnect tone sounds and the PFT and AFCS annunciations are removed. Successful completion of the preflight test is required for the autopilot and manual electric trim to engage.

Annunciation of the flight director and autopilot modes is shown in the lower status field of the PFD. In general, green indicates active modes and white indicates armed modes. When a mode is directly selected by the pilot, no flashing of the mode will occur. When automatic mode changes occur, they will be annunciated with a flashing annunciation of the new mode for ten seconds in green. If a mode becomes unavailable for whatever reason, the mode will flash for ten seconds in yellow and be replaced by the new mode in green.

Normal autopilot disconnects are annunciated with a yellow flashing AP on the PFD accompanied by a two second autopilot disconnect tone. Normal disconnects are those initiated by the pilot with the AP DISC switch, the MET switch, the AP button on the MFD mode controller, or the GA button (if ESP/USP is NOT installed). Abnormal disconnects will be accompanied by a red flashing AP on the PFD accompanied by a continuous autopilot disconnect tone. The disconnect tone and flashing alert may be cancelled by pressing the AP DISC switch or the left side of the MET switch.

Refer to the Garmin G1000 Cockpit Reference Guide, P/N 190-01896-( ), and Garmin G1000 Pilot's Guide for the Diamond DA 62, P/N 190-01895-( ), for complete descriptions of the G1000 system and operating procedures.

If MÄM 62-254 is installed, refer to the Garmin G1000 NXi Cockpit Reference Guide, P/N 190-01905-( ) and Garmin G1000 NXi Pilot's Guide for the Diamond DA 62, P/N 190-01904-( ) for complete descriptions of the G1000 NXi system and operating procedures.

Power Supply

The AVIONIC MASTER switch supplies power to the avionics bus bar of the radio circuit breakers and the AFCS/ESP/USP circuit breaker.

The following circuit breaker is used to protect the following element of the GFC 700 autopilot:

Circuit Breaker	Function
AFCS/ESP/USP	Supplies power to the autopilot pitch, roll, yaw and pitch trim servos.

7.14.2 AUTOMATIC FLIGHT CONTROL SYSTEM ANNUNCIATIONS AND ALERTS

Automatic Flight Control System (AFCS) Status Alerts

The following annunciations can appear on the PFD above the airspeed and attitude indicators. Only one annunciation occurs at a time, and messages are priorized by criticality.

Warning Alerts on the Automatic Flight Control System (AFCS)

Warning Alerts	Meaning/Cause
PFT	PREFLIGHT TEST - Preflight system test failed; aural alert sounds at failure.
AFCS	SYSTEM FAILURE - AP and MET are unavailable; FD may still be available.
PTCH	PITCH FAILURE - Pitch axis control failure; AP inoperative.
ROL	ROLL FAILURE - Roll axis control failure; AP inoperative.
YAW	YAW DAMPER FAILURE - Yaw damper control failure; AP inoperative.
PTRM	PITCH TRIM FAILURE (or stuck AP TRIM switch) - if AP engaged, take control of the airplane and disengage AP. If AP disengaged, move AP TRIM switches separately to release.

Caution Alerts on the Automatic Flight Control System (AFCS)

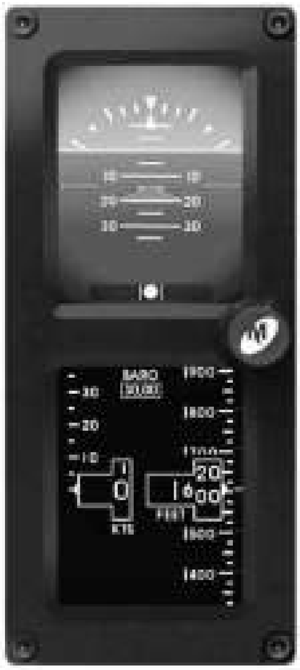
Caution Alerts	Meaning/Cause
↑ELE	ELEVATOR MISTRIM UP - Pitch servo providing sustained force in the indicated direction.
↓ELE	ELEVATOR MISTRIM DOWN - Pitch servo providing sustained force in the indicated direction.
←AIL	AILERON MISTRIM LEFT - Roll servo providing sustained force in indicated direction.
AIL→	AILERON MISTRIM RIGHT - Roll servo providing sustained force in indicated direction.
←RUD	RUDDER MISTRIM LEFT - Yaw servo providing sustained force in the indicated direction.
RUD→	RUDDER MISTRIM RIGHT - Yaw servo providing sustained force in the indicated direction.

Advisory Alerts on the Automatic Flight Control System (AFCS)

Advisory	Meaning/Cause
PFT	PREFLIGHT TEST - Performing preflight system test; aural alert sounds at completion. Do not press the AP DISC switch during servo power-up and preflight system tests as this may cause the preflight system test to fail or never to start (if servos fail their power-up tests). Power must be cycled to the servos to remedy the situation.

7.15 MID CONTINENT MD302 STANDBY ATTITUDE MODULE

The Mid Continent MD302 Standby Attitude Module is a self-contained situational awareness instrument that provides airplane attitude, altitude, airspeed and slip indication.



The Standby Attitude Module consists of two separate LCD displays. The upper display serves as artificial horizon and the lower display as airspeed indicator and altimeter. The user interface of the Standby Attitude Module allows for simple, intuitive operation using a single push-and-turn control knob.

Refer to the Mid Continent MD302 Standby Attitude Module Pilot's Guide, P/N 9017846 in the latest effective issue for more information.

The MD302 Standby Attitude Module is not connected to an external ARINC 429 source (Garmin G1000), thus heading information and automatic BARO synchronization is not available in the DA 62.

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CHAPTER 8
AIRPLANE HANDLING, CARE AND MAINTENANCE

Page

8.1 INTRODUCTION

Chapter 8 contains the manufacturer's recommended procedures for proper ground handling and servicing of the airplane. The Airplane Maintenance Manual (Doc. No. 7.02.25) lists certain inspection and maintenance requirements which must be followed if the airplane is to retain a new plane performance and reliability.

8.2 AIRPLANE INSPECTION INTERVALS

Inspections are scheduled every 50, 100, 200, 1000 and 2000 hours. Independent of the flight hours, an annual inspection must be performed every year. A non-recurring engine inspection must be performed on new engines after 3 to 6 hours. The respective inspection checklists are prescribed in the Airplane Maintenance Manual, Chapter 05.

For maintenance work on engine and propeller, the currently effective Operator's Manuals, Service Instructions, Service Letters, and Service Bulletins of Austro Engine and mt-Propeller must be followed. For airframe inspections, the currently effective checklists/manuals, Service Bulletins, and Service Instructions of the manufacturer must be followed.

CAUTION

Unscheduled maintenance checks are required after:

- hard landings
- propeller strike
- engine fire
- lightning strike
- occurrence of other malfunctions and damage

Unscheduled maintenance checks are described in the Airplane Maintenance Manual (Doc. No. 7.02.25; Section 05-50).

8.3 AIRPLANE ALTERATIONS OR REPAIRS

Alterations or repairs to the airplane may be carried out only according to the Airplane Maintenance Manual, Doc. No. 7.02.25, and only by authorized personnel.

8.4 SERVICING

8.4.1 REFUELING

WARNING

Do not allow fire, sparks or heat near fuel. Fuel burns violently and can cause injury to persons and damage to the airplane.

WARNING

Do not get fuel on your skin. Fuel can cause skin disease.

WARNING

Connect the airplane and the fuel supply vehicle to electrical ground before refueling. If you do not ground the airplane, static electricity can cause fire during refueling.

WARNING

Make sure that a suitable fire extinguisher is available at all times during refueling.

WARNING

Turn off all ground equipment in the refueling area.

WARNING

Do not operate electrical switches in the airplane during refueling.

CAUTION

Use only approved fuel types given in Chapter 2.

1. Ground the airplane and the fuel supply vehicle electrically.
2. Remove the fuel filler cap (located on top of the outer wing). Check cap retaining cable for damage.
3. Refuel the airplane.
4. Install the fuel filler cap.
5. Repeat steps 2 to 4 for the other wing.
6. Remove the ground cable from the airplane and the fuel supply vehicle.

8.4.2 ENGINE OIL LEVEL CHECK

1. Open the inspection door on the bottom of the upper left cowling.
2. Remove the filler cap.
3. Clean the oil dip-stick.
4. Install the filler cap.
5. Remove the filler cap again.
6. Read the oil level from the dip-stick.
7. If necessary, add engine oil and repeat steps 3 to 6.
8. Install the filler cap.
9. Close the inspection door.
10. Repeat steps 1 to 9 for the other engine.

8.4.3 GEARBOX OIL LEVEL CHECK

1. Open the inspection door on the bottom of the upper left cowling.
2. Check gearbox oil level in inspection window by using a flashlight.
3. Close the inspection door.
4. Repeat steps 1 to 3 for the other engine.

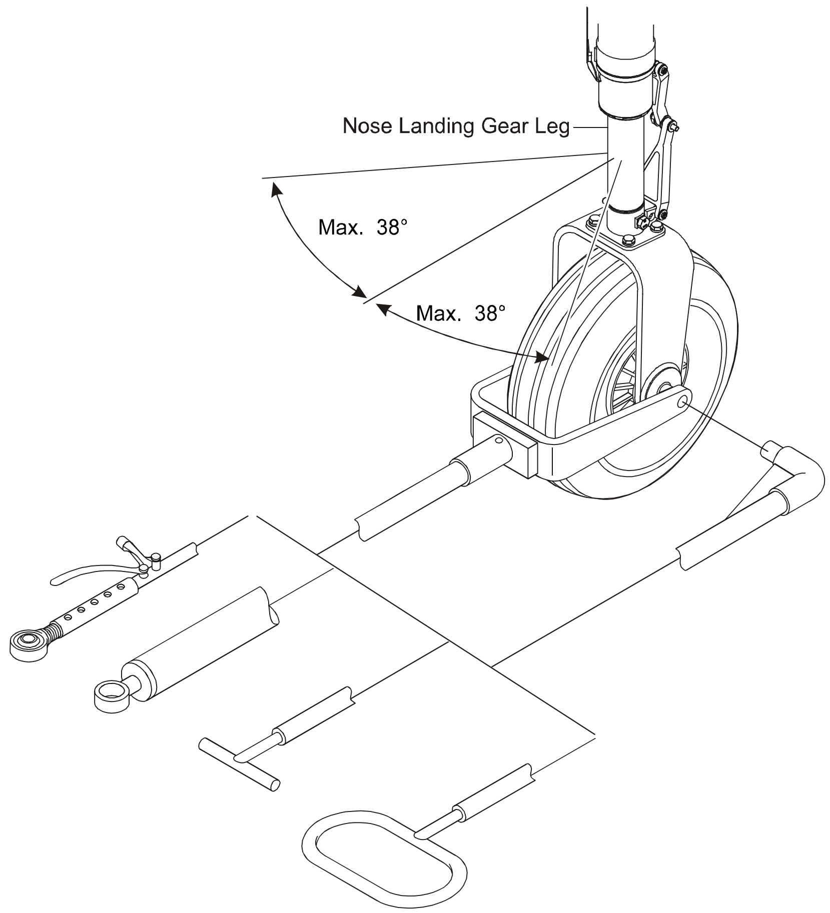
8.4.4 TIRE INFLATION PRESSURE CHECK

1. Remove dust cap from valve stem by turning counterclockwise.
2. Connect tire gauge to valve stem, read pressure.
3. Correct pressure if necessary (nose wheel 3.2 bar/46 psi, main wheels 3.8 bar/55 psi).
4. Install dust cap on valve stem by turning clockwise.

8.5 GROUND HANDLING/ROAD TRANSPORT

8.5.1 GROUND HANDLING

For pushing or pulling the airplane on the ground, it is recommended to use the tow bar which is available from the manufacturer. The tow bar is engaged in the appropriate hole in the nose wheel as shown on the picture.



Tow Bar Variants

WARNING

WARNING

If the airplane is towed by a towing vehicle, do not turn the nose wheel more than 40 degrees either side of the center position or damage to the gear will result.

When towing the airplane with a towing vehicle, a qualified person must sit in the cockpit ready for immediate braking action, in the event the towing becomes uncoupled. The movement of the towing vehicle should always be started and stopped slowly to avoid unnecessary shock loads on the nose landing gear. The maximum steering angle of 40 degrees to either side must not be exceeded.

WARNING

The tow bar must be removed before starting the engine.

In the event that the airplane must be pulled out of soft ground or deep snow, towing lines must be used. The towing lines should be attached to the main landing gear struts as high as possible without interfering with the brake lines. The ropes should be long enough to sufficiently clear the nose or tail. A qualified person must sit in the cockpit to maintain control of the airplane using the nose wheel steering and brakes.

WARNING

All towing lines must be removed before starting the engine.

8.5.2 PARKING

For short term parking, the airplane must be positioned into the wind, the parking brake must be engaged, and the wing flaps must be in the retracted position. For extended and unattended parking, as well as in unpredictable wind conditions, the airplane must be anchored to the ground or placed in a hangar. Parking in a hangar is recommended.

NOTE

If the engine is not used for more than 4 weeks an engine ground run must be performed. Refer to AE Operation Manual, Doc. No. E4.01.01, latest revision.

The manufacturer offers a control surfaces gust lock which can be used to block the primary controls. It is recommended that the control surfaces gust lock is used when parking outdoors, because otherwise the control surfaces can hit the stops in strong tail wind. This can lead to excessive wear or damage.

WARNING

The control surfaces gust lock must be removed before flight.

The control surfaces gust lock is installed as follows:

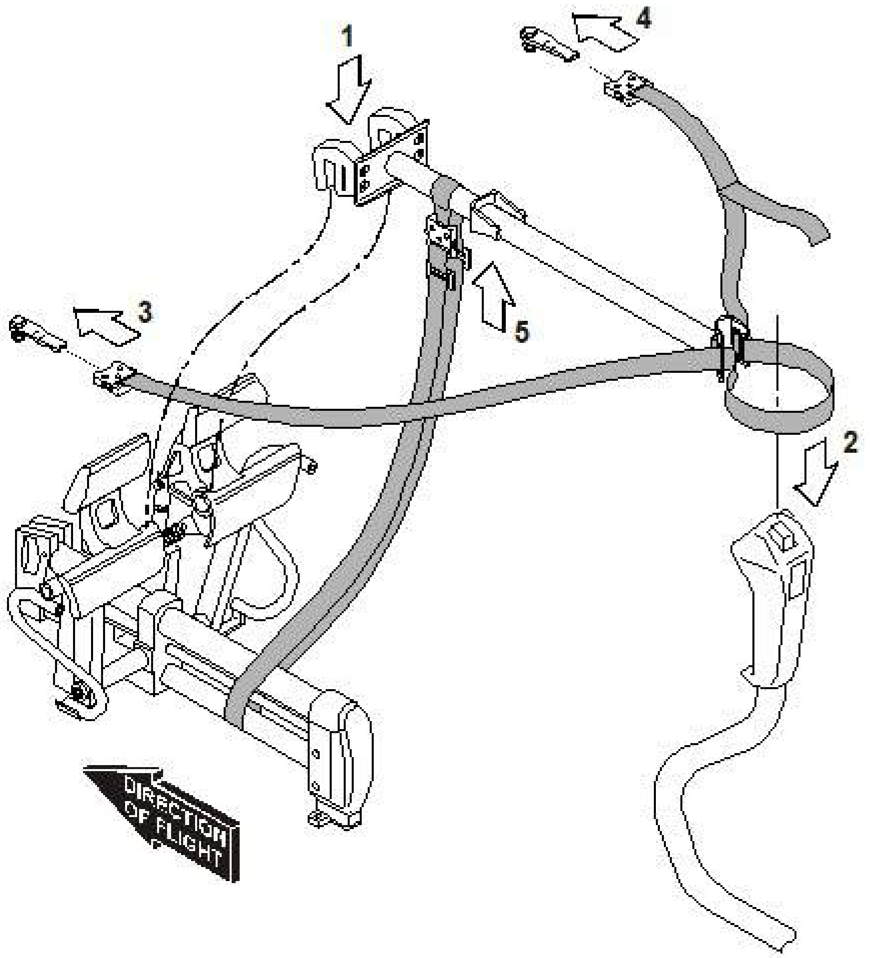
1. Move the rudder pedals to the middle position.
2. Engage the control surfaces gustlock with the pedals.
3. Engage the stick, wrap straps around stick once.
4. Attach the locks.
5. Wrap the strap under the lower rail of the rudder pedal assy and attach the lock on the gust lock.

CAUTION

Do not wrap the strap around the spindle.

6. Tighten all straps.

For removal reverse the sequence.


1
2
3
4
5
DIRECTION OF FLIGHT

8.5.3 MOORING

Near the lower end of the tail fin of the airplane there is a hole which can be used to tie down the airplane to the ground. Also on each wing near the wing tip, an eyelet with a metric M8 thread can be installed and used as tie-down points.

8.5.4 JACKING

The airplane can be jacked at the two jackpoints located on the lower side of the center wing's LH and RH root ribs as well as at the tail fin.

8.6 CLEANING AND CARE

CAUTION

The airplane must be kept clean. The bright surface prevents the structure from overheating.

CAUTION

Excessive dirt deteriorates the flight performance.

8.6.1 PAINTED SURFACES

The entire surface of the airplane is painted with a white weatherproof two component paint. Nevertheless, it is recommended to protect the airplane against moisture and dampness. It is also recommended not to store the airplane outside for long periods of time.

Dirt, insects, etc. can be removed with water alone, and if necessary, with a mild detergent. An automotive paint cleaner can be used for stubborn spots. For best results, clean the airplane after the day's flying is ended, so that the dirt will not become ingrained.

Oil stains, exhaust stains, etc. on the lower fuselage skin can be removed with a cold detergent. Before starting, ensure that the detergent does not affect the surface finish. Use commercial automotive preservatives without silicone additives to conserve the paint finish.

8.6.2 FRONT AND REAR DOOR

The windscreen and all windows should be cleaned with 'Plexiklar' or any other acrylic glass detergent if available; otherwise, use lukewarm water. Final cleaning should be carried out with a clean piece of chamois leather or soft cloth. Never rub or polish dry acrylic glass.

8.6.3 PROPELLER

Damage and malfunctions during operation must be inspected by authorized personnel.

Surface

The manufacturer uses PU paint or acrylic paint which is resistant to almost any solvent. The blades may be treated with commercial automotive cleaning agents or preservatives. The penetration of moisture into the wooden core must be avoided by all means. Should doubts arise, an appropriately rated inspector must be consulted.

8.6.4 ENGINE

Engine cleaning is part of the scheduled inspections.

8.6.5 INTERIOR SURFACES

The interior should be cleaned using a vacuum cleaner. All loose items (pens, bags etc.) should be removed or properly stored and secured.

All instruments can be cleaned using a soft dry cloth. Plastic surfaces should be wiped clean using a damp cloth without any cleaning agents.

The leather interior should be treated with leather sealer within 3 months since new, and then at intervals of 3 to 6 months. Clean the leather interior with an appropriate mild leather cleaning agent and a soft cleaning brush for leather.

Note that the acrylic glass windows transmit the ultraviolet radiation from the sun.

8.7 GROUND DE-ICING

Approved deicing fluids are:

Manufacturer	Name
Kilfrost	TKS 80
Aeroshell	Compound 07
	AL-5 (DTD 406B)

1. Remove any snow from the airplane using a soft brush.
2. Spray deicing fluid onto ice-covered surfaces using a suitable spray bottle.
3. Use a soft piece of cloth to wipe the airplane dry.

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CHAPTER 9
SUPPLEMENTS

Page

9.1 INTRODUCTION

Chapter 9 contains information concerning additional (optional) equipment of the DA 62.

Unless otherwise stated, the procedures given in the supplements must be applied in addition to the procedures given in the main part of the Airplane Flight Manual.

All approved supplements are listed in the List of Supplements in this Chapter.

The Airplane Flight Manual contains exactly those supplements which correspond to the installed equipment according to the Equipment Inventory of Section 6.5.

9.2 LIST OF SUPPLEMENTS

Airplane S/N: Registration: Date:

Sup. No.	Title	Rev. No.	Date	applicable	
				YES	NO
A33	Integrated Avionics System Garmin G1000 and G1000 NXi, SBAS and P-RNAV Operation	1	31-Jan-2017	□	□
A34	Electronic Stability and Protection System (ESP)	0	01-Apr-2015	□	□
M15	On Top Exhaust System	0	18-Aug-2017	□	□
O04	Operation without Unfeathering Accumulator	0	14-Nov-2015	□	□
O08	Pilot’s Removable Stick	0	30-Jan-2016	□	□
S02	Ice Protection System	1	15-Nov-2015	□	□
S03	Ice Protection System for Flight into Known Icing	2	05-May-2017	□	□
S04	Continuous Flow Oxygen System	1	14-Nov-2015	□	□
S06	G1000 Synthetic Vision Technology	1	20-Sep-2016	□	□
S07	Recirculating Cabin - Air Cooling	1	08-Sep-2016	□	□

Airplane S/N: Registration: Date:

Sup. No.	Title	Rev. No.	Date	applicable	
				YES	NO
				☐	☐
				☐	☐
				☐	☐
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