OWNERS AND PILOTS INFORMATION MANUAL

(For Approved Document please refer to C01-01-04)

Model GA8

THIS GA8 OWNERS AND PILOTS INFORMATION MANUAL IS FOR ***REFERENCE ONLY*** AND THEREFORE ***MUST NOT*** BE USED AS A SUBSTITUTE FOR THE OFFICIAL CASA AUSTRALIA APPROVED FAA ACCEPTED FLIGHT MANUAL DOCUMENT.

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SECTION 1

GENERAL

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1.1 INTRODUCTION

The Owners and Pilots Information Manual consists of an introductory section and eight additional numbered sections. These sections provide owners and pilots with familiarisation of the GA8 Airvan in all phases of flight, ground handling terminology and servicing.

The operating procedures presented herein are the result of Gippsland Aeronautics knowledge and experience gained over time. For specific information in regard to this Information Manual, please contact:

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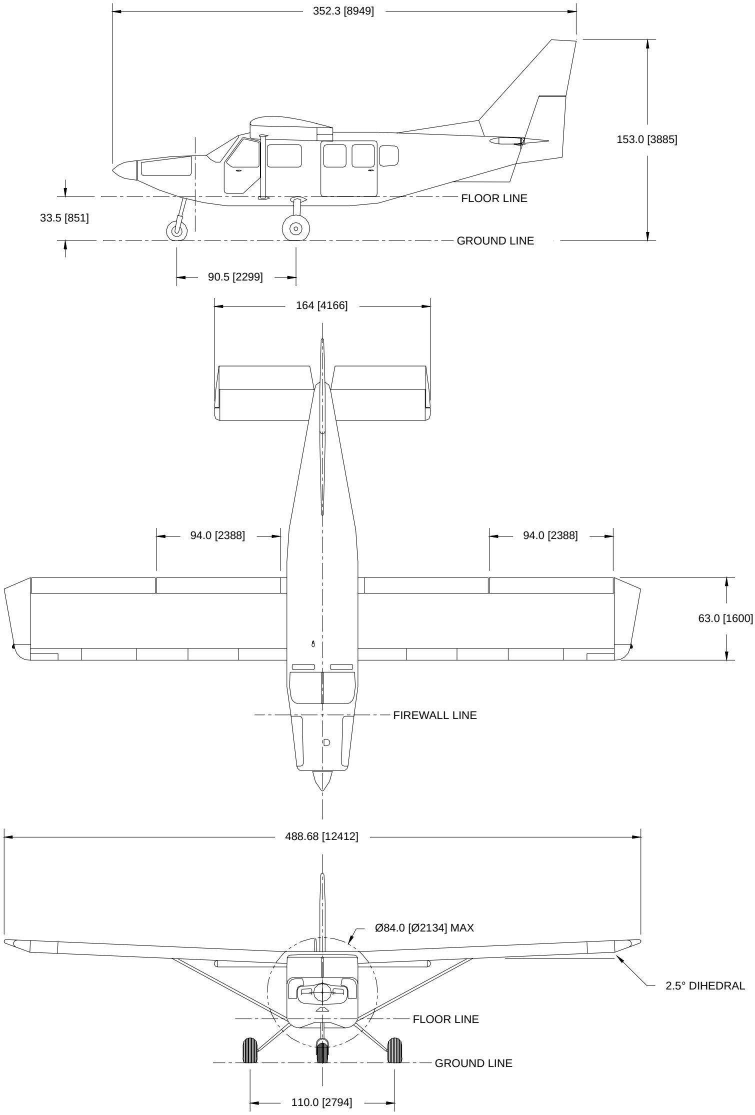

Figure 1-1 Three View of the GA8

Note: *All dimensions in inches and [millimetres] Pilot's Operating Handbook (POH)*

1.1.1 Owners and Pilots Information Manual

The Owners and Pilots Information Manual provides all required details of the standard aircraft and the procedures required to operate it in the normal category. Apart from the listing in Section 6, no other details of any optional equipment fitted at the factory will be found in the basic Owners and Pilots Information Manual.

1.1.2 Definitions

Definitions used in the Owners and Pilots Information Manual such as **WARNING, CAUTION, NOTE** are employed in the following context:

WARNING

Operating procedures, techniques, etc. which if not followed correctly, may result in personal injury or death.

CAUTION

Operating procedures, techniques, etc. which if not strictly observed, may result in damage to the aircraft or to its installed equipment.

NOTE

Operating procedures, techniques, etc. which it is considered essential to highlight.

1.2 GENERAL DESCRIPTION

1.2.1 Aircraft

The GA8 aircraft is a strut braced, high wing, fixed tricycle undercarriage, single engine, eight seat cabin aircraft that has been designed primarily for passenger and utility operations.

The fuselage is an all alloy stressed skin construction and is fully corrosion protected. The floor of the passenger cabin is provided with a quick release system to allow rapid conversion from freight to passenger or combi configurations. The engine cowlings are manufactured from composite materials and feature large, easily removable access panels.

The cockpit is designed to accommodate the pilot in command on the left side and all controls, instruments, selectors and switches are located so as to be within easy reach of the occupant of that seat. A second, optional set of flight controls and instruments may be fitted to the right side front seat position. The centrally located control pedestal, radio stack and overhead switch panel are accessible from either of the two cockpit seats. The cockpit is accessed by forward hinging doors that are located on each side. The main cabin is provided with a large sliding door on the left side at the rear of the fuselage.

The wings are of all metal stressed skin construction with full corrosion protection, and are braced on each side by a single streamlined bracing strut. A single integral fuel tank is located in each wing between the fuselage and the strut. The ailerons and wing flaps are of metal construction and operate in a conventional sense.

The empennage is also an all metal stressed skin construction and is fully corrosion protected. A variable incidence stabiliser is incorporated to provide a wide trim range with maximum aerodynamic efficiency. The vertical surfaces feature a half span rudder that is located on the lower portion of the fin.

1.2.2 Engine

The engine is a, six cylinder, horizontally opposed, air cooled, normally aspirated and fuel injected Lycoming IO-540-K1A5 rated by Lycoming to 300 BHP at full throttle and 2700 RPM. Operations at 2700 RPM are limited to a maximum period of two minutes. Except for take-off, normal full throttle operations are conducted using 2500 RPM.

1.3 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

1.3.1 General Symbols and Abbreviations

A	Ampere
AGL	Above Ground Level
AMSL	Above Mean Sea Level
AVGAS	Aviation Gasoline
BHP	Brake Horse Power
CASA	Civil Aviation Safety Authority (Australia)
CAO	Civil Aviation Order (Australia)
CAR	Civil Aviation Regulation (Australia)
°C	Degrees Celsius
CHT	Cylinder Head Temperature
cm	Centimetre, centimetres
DC	Direct Current
E	East
EMERG	Emergency
FAA	Federal Aviation Administration (USA)
°F	Degrees Fahrenheit
FAR	Federal Aviation Regulation (USA)
ft	Foot, feet
ft/min	Feet per minute
g	Acceleration due to gravity
Gal	Gallon
GAMA	General Aviation Manufacturers Association
hPa	Hectopascal, hectopascals
HF	High Frequency
ICAO	International Civil Aviation Organisation
ICO	Idle Cut Off
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
in	Inch, inches
in Hg	Inches of mercury
in lbs	Inch pounds
incr.	increase
ISA	International Standard Atmosphere
kg	Kilogram
kg/l	Kilogram per litre
kHz	Kilohertz
kts, K	Knots
kPa	Kilopascals
kW	Kilowatt, kilowatts
l	Litre, litres
lb	Pound, pounds
LH	Left Hand
LHS	Left Hand Side

m	Metre
m^2	Square metre
m^3	Cubic metre
mA	Milli ampere
MAC	Mean Aerodynamic Chord
MAN	Manual
MAP	Manifold Air Pressure
max	Maximum
MCP	Maximum Continuous Power
MHz	Megahertz
mm	Millimetre
min	Minimum or minute
m kg	Metre kilogram
N	North
NM	Nautical mile, nautical miles
OAT	Outside Air Temperature
PAX	Passenger
POH	Pilots Operating Handbook
PPH	Pounds per hour
PPM	Parts per million
PROP	Propeller
psi	Pounds per square inch
PWR	Power
QTY	Quantity
qts	Quarts
RH	Right Hand
RHS	Right Hand Side
RPM	Revolutions per minute
S	South
SAE	Society of Automotive Engineers
sec	Seconds
SPKR	Speaker
SQ	Square
SSB	Single Side Band
STBY	Standby
SYST	System
TBO	Time between overhauls
T/O	Take Off
US	United States (of America)
U/S	Unserviceable
USA	United States of America
USG	US Gallon
US Gal	US Gallon
V	Volts
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
W	West

1.3.2 General Airspeed Terminology and Symbols

CAS *Calibrated Airspeed:* the indicated speed of an aircraft corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.

KCAS Calibrated Airspeed expressed in knots.

GS *Ground Speed:* the speed of an aircraft relative to the ground.

IAS *Indicated Airspeed:* the speed of an aircraft as shown on the airspeed indicator. IAS values in this manual assume zero instrument error.

KIAS Indicated Airspeed expressed in knots.

TAS *True Air Speed:* the airspeed of an aircraft relative to the undisturbed air through which it passes.

T.O.S.S *Take-Off Safety Speed:* the airspeed chosen to ensure that adequate control will exist under all conditions, including turbulence and sudden and complete engine failure during the climb after take-off. It is the speed required at 50 feet.

V_A *Manoeuvring Speed:* the maximum speed at which application of full available aerodynamic control will not damage or overstress the aircraft.

V_{FE} *Maximum Flap Extended Speed:* the highest speed permissible with wing flaps in a prescribed extended position.

V_{NE} *Never Exceed Speed:* the limiting airspeed that may not be exceeded at any time.

V_{NO} *Maximum Structural Cruising Speed:* the speed that should not be exceeded except in smooth air and then only with caution.

V_S *Stalling Speed:* or the minimum steady flight speed at which the aircraft is controllable.

V_{SO} *Stalling Speed:* or the minimum steady flight speed at which the aircraft is controllable in the landing configuration.

V_X *Best Angle-of-Climb Speed:* the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.

V_Y *Best Rate-of-Climb Speed:* the airspeed which delivers the greatest gain in altitude in the shortest possible time.

V_{REF} *Reference Landing Approach Speed:* the airspeed equal to $1.3V_{SO}$ and is the airspeed used on approach down to 50 feet above the runway when determining landing distances.

1.3.3 Meteorological Terminology

ISA *International Standard Atmosphere* in which:
The air is a dry perfect gas:
The temperature at sea level is 15°C (59°F):
The pressure at sea level is 1013 hPa (29.92 inches Hg):
The temperature gradient from sea level to the altitude at which the temperature is -56.5°C (-69.7°F) is 0.00198°C (0.003566°F) per foot, and zero above that altitude.

OAT (Outside Air Temperature) The outside free air static temperature.

Airfield Pressure Height The height registered at the surface of an aerodrome by an altimeter with the pressure sub-scale set to 1013 hPa (29.92 inches Hg).

Pressure Altitude Altitude measured from standard sea-level pressure (1013 hPa/29.92 inches Hg) by a pressure or barometric altimeter corrected for position and instrument error.

Indicated Pressure Altitude The altitude actually read from an altimeter when the pressure barometric sub-scale has been set to 1013 hPa (29.92 inches Hg).

Station Pressure Actual atmospheric pressure at field elevation.

QNH The local pressure setting that if set on the subscale of an altimeter will cause the altimeter to indicate local altitude above mean sea level.

Wind The wind velocities to be used as variables on aircraft performance are to be understood as the headwind or tail wind components of the reported winds.

1.3.4 Power Terminology

Take-Off Power Maximum power permissible for take-off.

Maximum Continuous Power Maximum power that is allowed to be used continuously during flight.

1.3.5 Engine Controls and Instruments

Throttle Lever The lever which the pilot uses to control the engine manifold pressure.

Pitch Lever The lever which the pilot uses to control the engine RPM

Mixture Control The control that is used to vary the fuel/air ratio available to the engine.

MAP Gauge The instrument that indicates engine inlet Manifold Air Pressure

Tachometer The instrument that indicates the engine RPM.

1.3.6 Aircraft Performance and Flight Planning Terminology

Climb Gradient The ratio of the change in height during a climb, to the horizontal distance travelled.

Demonstrated Crosswind Component The crosswind component, during take-off and landing, for which adequate control of aircraft was actually demonstrated during certification tests.

1.3.7 Weight and Balance Terminology

Reference Datum An imaginary vertical plane from which all horizontal distances are measured for balance purposes.

Station A location along the aircraft fuselage usually given in terms of distance from the reference datum.

Arm The horizontal distance from the reference datum to the centre of gravity (C of G) of an item.

Moment The product of the weight of an item multiplied by its arm.

Index Unit Moment divided by a constant. Used to simplify balance calculations by reducing the number of digits.

Centre of Gravity (C of G) The point at which an aircraft would balance if suspended. The distance from the C of G to the reference datum can be found by dividing the total moment by the total weight of the aircraft.

C of G Arm The arm obtained by adding the aircraft's individual moments and dividing the sum by the total weight.

C of G Limits The extreme centre of gravity locations within which the aircraft must be operated at a given weight.

Useable Fuel The quantity of fuel available for flight planning purposes.

Unusable Fuel The quantity of fuel (determined under adverse fuel flow conditions) that is not available for flight.

Empty Weight Weight of aircraft with unusable fuel and undrainable oil.

Basic Empty Weight Usually defined as empty weight plus full oil.

Useful Load Difference between take-off weight, and basic empty weight.

Maximum Take-Off Weight Maximum weight approved for take-off.

Maximum Landing Weight Maximum weight approved for the landing.

1.4 USE OF METRIC/IMPERIAL UNITS

This Owners and Pilots Information Manual uses the Imperial/US unit system as the basic system of measurement. Where common usage or available instrumentation refer to the metric system, both units are quoted. The following conversion factors are presented as a ready reference to the conversion factors that have been used in this manual as well as supplying some others that may be found useful.

1 Pound (lb)	=	0.4536 Kilogram (kg)
1 Pound per sq in (psi)	=	6.895 Kilopascal (kPa)
1 Inch (in)	=	25.4 Millimetres (mm)
1 Foot (ft)	=	0.3048 Metre (m)
1 Statute mile	=	1.609 Kilometres (km)
1 Nautical mile (NM)	=	1.852 Kilometres (km)
1 Millibar (mb)	=	1 Hectopascal (hPa)
1 Millibar (mb)	=	0.1 Kilopascal (kPa)
1 Imperial gallon	=	4.546 Litres (l)
1 US gallon	=	3.785 Litres (l)
1 US quart	=	0.946 Litre (l)
1 Cubic foot (ft^3)	=	28.317 Litres (l)
1 Acre	=	0.4047 Hectares
1 Degree Fahrenheit (°F)	=	[1.8 x °C]+32
1 Inch Pound (in lb)	=	0.113 Newton Metres (Nm)
1 Foot Pound (ft lb)	=	1.356 Newton Metres (Nm)

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SECTION 2

LIMITATIONS

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2.1 GENERAL

This section of the Owners and Pilots Operating Manual presents the various operating limitations, instrument markings, colour coding, and basic placards necessary for the safe operation of the aircraft, it's engine, standard systems and standard equipment.

All limitations contained in this section have been approved by the Australian Civil Aviation Safety Authority, and operation in compliance with the limitations presented in this section is required by the Federal Aviation Regulations.

For specific operations, or for operations with equipment fitted that is covered by a supplement, any limitations applicable will be found in the relevant supplement.

2.2 AIRSPEED LIMITATIONS

The indicated airspeeds in the table below are based on airspeed calibration data from Section 5.

SPEED	KCAS	KIAS	REMARKS
Max Manoeuvring Speed (V_A)	124	121	Do not make full or abrupt control movements above this speed.
Never Exceed Speed (V_{NE})	183	185	Do not exceed this speed in any operation.
Max Structural Cruising Speed (V_{NO})	145	143	Do not exceed this speed except in smooth air and then with caution.

2.3 AIRSPEED INDICATOR MARKINGS

The airspeed indicator markings in the table below are based on airspeed calibration data from Section 5.

MARKING	IAS VALUE or RANGE	SIGNIFICANCE
White Arc	57 - 97	Full Flap Operating Range. Lower limit is the maximum weight stalling speed in the landing configuration. Upper limit is the maximum speed with flaps fully extended.
Green Arc	64 - 143	Normal Operating Range. Lower limit is the maximum weight stalling speed with flaps retracted. Upper limit is the maximum structural cruising speed.
Yellow Arc	143 - 185	Operations must be conducted with caution and only in smooth air.
Red Line	185	Maximum speed for all operations (V_{NE}).

2.4 POWER PLANT LIMITATIONS

2.4.1 Engine

Manufacturer: Textron Lycoming Division
Textron Corporation

Model: Lycoming IO-540-K1A5

2.4.2 Engine Limitations

POWER	RPM	MANIFOLD PRESSURE	MAXIMUM TEMPERATURES		PRESSURE LIMITS (See Notes)			
					FUEL		OIL	
			Cyl Head	Oil	Min	Max	Min	Max
Maximum Take-Off (300 BHP)	2700 (max. 2 minutes)	Full Throttle	260°C (500°F)	118°C (245°F)	18 psi (124 kPa)	55 psi (379 kPa)	55 psi (379 kPa)	95 psi (654 kPa)
Maximum Continuous (275 BHP)	2500	Full Throttle	260°C (500°F)	118°C (245°F)	18 psi (124 kPa)	55 psi (379 kPa)	55 psi (379 kPa)	95 psi (654 kPa)

NOTE

2700 RPM may only be used for take-off to a safe height as required to clear obstacles or reach 250ft AGL. Operations at 2700 RPM are limited to a maximum period of two minutes. For all other operations maximum power is to be limited to MCP at 2500 RPM.

NOTE

Other limits are as follows:

1. *Minimum fuel pressure at idle: 12 psi (83 kPa)*
2. *Minimum oil pressure at idle: 25 psi (173 kPa)*
3. *Maximum oil pressure at start: 115 psi (793 kPa)*

2.4.3 Fuel Grade

Avgas 100LL, Avgas 100/130

NOTE

For fuel tank capacities refer to section 2.12 Fuel Limitations

2.4.4 Lubricating Oil

1. *Specification:*

Textron Lycoming Specification No. 301F approves lubricating oils of any brand name conforming to specifications MIL-L-6082 for straight mineral oil and MIL-L-22851 for ashless dispersant oil.

Straight mineral oil must be used during the first 50 hours of operation for new and overhauled engines, or until the oil consumption has stabilised. After the first 50 hours it is recommended that ashless dispersant oil be used.

Refer to Lycoming Service Instruction No.1014 for further details.

2. *Viscosity Grade:*

The following chart is intended to assist in choosing the correct grade of oil and must be considered as a guide only. Multiviscosity grades can also be used as indicated. Refer to Lycoming Service Instruction No. 1014 for further details.

Average Ambient Temperature	Mineral Grades	Ashless Dispersant Grades
All Temperatures	-	SAE 15W50 or 20W50
Above 27°C (80°)	SAE 60	SAE 60
Above 16°C (60°F)	SAE 50	SAE 40 or SAE 50
-1°C (30°F) to 32°C (90°F)	SAE 40	SAE 40
-18°C (0°F) to 21°C (70°F)	SAE 30	SAE 40, 30, 20W40
Below –12°C (10°F)	SAE 20	SAE 30, 20W30

Equivalence of SAE and commonly used
Commercial Grade designations:

SAE:	20	30	40	50	60
Commercial:	55	65	80	100	120

3. *Capacity:*

Total:	12 US quarts (11.4 litres)
Useable:	9.3 US quarts (8.8 litres)
Min safe:	2.8 US quarts (2.7 litres)

WARNING

Dipstick is calibrated in US quarts

2.4.5 Propeller

Manufacturer: Hartzell Propeller Inc.

Model: HC-C2YR-1BF/F8475R

Type: Metal, Constant Speed

Number of blades: 2

Diameter: 84 inches (2134 mm) maximum
78 inches (1981 mm) minimum

Max RPM: 2700

2.5 ENGINE INSTRUMENT MARKINGS

Instrument	Red Line Minimum Limit	Green Arc Normal Operating	Red Arc/Line Maximum Limit	Yellow Arc Precautionary Range
Tachometer	-	575 - 2500 RPM	2700 RPM	2500 - 2700 RPM
Manifold Pressure	-	10 - 30 in Hg	-	-
Oil Pressure	25 psi	55 - 95 psi	115 psi	25 - 55 psi 95 - 115 psi
Oil Temperature	-	60°C - 118°C	118°C	-
Fuel Pressure	12 psi	18 - 55 psi	55 psi	12 - 18 psi
Fuel Quantity	0	0 - F	-	-

2.6 WEIGHT LIMITS

Maximum Take-Off and Landing Weight: .... 4000 lb (1814 kg)

Maximum Weight on Main Cargo Area: .... 1500 lb (680 kg)

Maximum Weight on Cabin Baggage Shelf: .... 250 lb (113 kg)

Maximum Weight in Aft Luggage Bin: .... 50 lb (22 kg)

2.7 CENTRE OF GRAVITY LIMITS

Forward Limit: 48 inches (1219 mm) aft of datum at 2400 lbs (1089 kg) and below;
56 inches (1422 mm) aft of datum at 4000 lbs (1814 kg), linear variation between these points.

Aft Limit: 64 inches (1626 mm) aft of datum at all weights

Datum: Firewall (Fuselage Station 0)
[located 41.63 inches (1057 mm) forward of wing leading edge]

2.8 MANOEUVRE LIMITS

All aerobatic manoeuvres including spins are prohibited.

2.9 FLIGHT LOAD FACTOR LIMITS

Flap Position	Positive	Negative
UP	+ 3.8g	- 1.52g
DOWN	+ 2.0g	0g

2.10 FLIGHT CREW LIMITS

Minimum flight crew is one pilot.

2.11 KINDS OF OPERATION LIMITS

This aircraft is approved for the following types of operations when the required equipment is installed and operational:

- VFR Day and Night
- IFR

Icing

Flight into known icing conditions is prohibited.

Operation Equipment List

Table 2-11 summarises the equipment required under Federal Aviation Regulations (FAR) Part 23 for airworthiness under the listed kind of operation. Refer to relevant local operating rule requirements for additional equipment that may be necessary operationally.

Additional equipment may be fitted to the aircraft but which is not essential for flight.

System Instruments and/or Equipment	Type of Operation			Remarks
	VFR Day	VFR Night	IFR	
Communications				
VHF Comm	A/R	A/R	A/R	As required per local operating regulations
Electrical Power				
Alternator	1	1	1	
Battery	1	1	1	
Volt/Amps Indicator	1	1	1	
Equipment & Furnishings				
Main Vertical Net	A/R	A/R	A/R	As required for carriage of freight
Throwover Net	A/R	A/R	A/R	As required for carriage of freight
Cabin Baggage Shelf Net	A/R	A/R	A/R	As required for carriage of freight
Pilot seat and harness	1	1	1	
Passenger seats and harness	A/R	A/R	A/R	One each required per passenger (max 7)
Fire Protection				
Portable Fire Extinguisher	1	1	1	
Flight Controls				
Pitch Trim Indicator	1	1	1	
Pitch Trim System	1	1	1	
Flap System	1	1	1	
Stall Warning System	1	1	1	
Fuel				
Fuel Quantity Indicator	2	2	2	
Fuel On/Off Valve	1	1	1	

(* A/R - As required)

Table 2-11 Operation Equipment List

System Instruments and/or Equipment	Type of Operation			Remarks
	VFR Day	VFR Night	IFR	
Ice & Rain Protection				
Engine Alternate Air Induction System	1	1	1	
Heated Pitot/Static Probe	—	❖	1	❖ At least one of these items required for VFR Night
Alternate Static Source	—	❖	1	
Lights				
Anti-collision Lights	2	2	2	Located on fin and underbelly
Instrument Lights	—	Yes	Yes	Must be operative on required instruments
Instrument Light Intensity Control	—	Yes	Yes	Must be operative on required instruments
Navigation Lights	—	3	3	
Shock Proof Torch	—	1	1	
Navigation & Pitot Static				
Altimeter	1	1	1	
Backup Altimeter	—	—	1◆	◆ May be a second barometric altimeter or other IFR approved altitude indicator
Airspeed Indicator	1	1	1	
Magnetic Compass	1	1	1	
Vertical Speed Indicator	—	1	1	
Time Piece	1	1	1	May be carried on the pilot
Turn Co-ordinator	A/R	1	1	As required per local operating regulations
OAT Indicator	A/R	1	1	As required per local operating regulations
Vacuum Attitude Indicator	—	1	1	

(* A/R - As required)

Table 2-11 Operation Equipment List (cont.)

System Instruments and/or Equipment	Type of Operation			Remarks
	VFR Day	VFR Night	IFR	
Navigation & Pitot Static Cont'd				
Electric Attitude Indicator	—	—	1	
Heading Indicator	—	1	1	
Suction Gauge	—	1	1	
Pitot/Static System	1	1	1	
ADF	—	A/R	A/R•	
VOR	—	A/R	A/R•	• Two IFR approved navigational aids fitted to separate electrical buses are required
GPS	—	—	A/R•	
DME	—	—	A/R•	
Transponder	A/R	A/R	A/R	As required per local operating regulations
Engine Indicating				
Manifold Pressure	1	1	1	
Tachometer	1	1	1	
Oil Pressure	1	1	1	
Oil Temperature	1	1	1	
Oil Quantity (Dip Stick)	1	1	1	
Fuel Pressure	1	1	1	
Caution Warning System	1	1	1	Fuel, electrical, pitot heat (if fitted) and vacuum systems
Approved Flight Manual	1	1	1	

(* A/R - As required)

Table 2-11 Operation Equipment List (cont.)

2.12 FUEL LIMITATIONS

	Fuel Quantity	
	Total	Useable
Wing Tanks (each)	44.9 US Gal (170 litres)	43.8 US Gal (166 litres)
Sump Tank	2.4 US Gal (9 litres)	0 US Gal (0 litres)
Cumulative System Capacity	92.2 US Gal (349 litres)	87.7 US Gal (332 litres)

NOTES

1. *The total contents of the sump tank are considered to be unusable fuel.*

2. *Maximum allowable lateral differential fuel loading – 26.4 US Gal (100 litres)*

3. *For Fuel Grade refer to section 2.4.3 Fuel Grade*

2.13 MAXIMUM PASSENGER SEATING LIMITS

The maximum passenger seating capacity is seven - one seated beside the pilot and three rows of two passengers behind.

2.14 OTHER LIMITATIONS

1. If the seat beside the pilot's seat is equipped with a functioning set of flight controls, refer to operational requirements for the occupation of this seat by a passenger.

2. Cockpit and cabin doors may not be opened in flight except for emergency smoke/fume evacuation purposes.

   Maximum allowable airspeed with doors open: 100 KIAS.

3. Maximum operating altitude is 20 000 feet. See section 4.4.12 for use of supplemental oxygen.

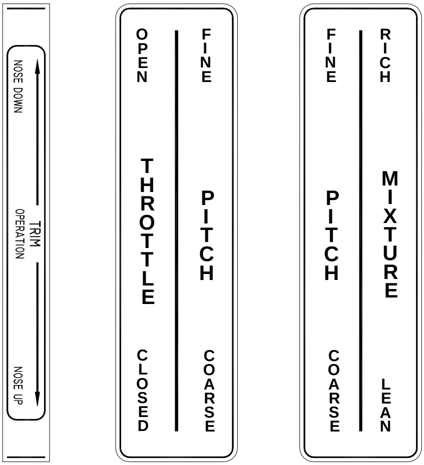
4. The maximum ambient operating temperature is 45°C (113°F).

5. Smoking is not permitted.

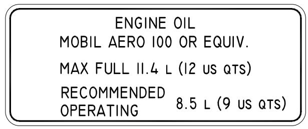
6. The aircraft may be operated onto and from hard sealed, gravel and grass surfaces.

2.15 PLACARDS

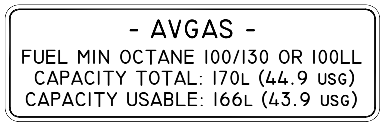
The following placards are required, and are to be located in the proximity indicated. Each placard is to contain wording conforming with the illustrations. The shape and layout of production items may vary between individual aircraft. Consult the manufacturer for individual aircraft placard variations.



Mounted between trim and powerplant controls

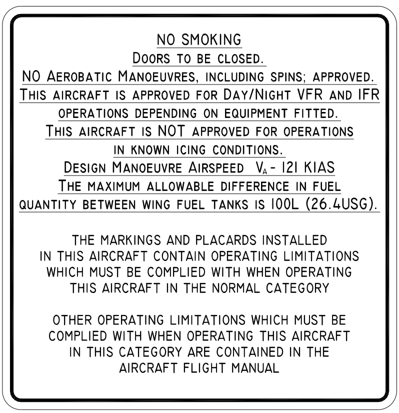


On underside of oil filler flap



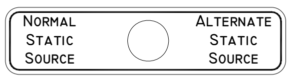
Adjacent to wing fuel filler cap on each wing

Adjacent to earth tag on each wing and cockpit step



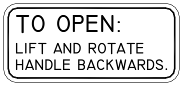
On top and forward of the engine control levers section of the centre console

Directly below the Airspeed Indicator

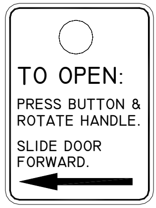


Located behind alternate static switch when alternate static switch fitted

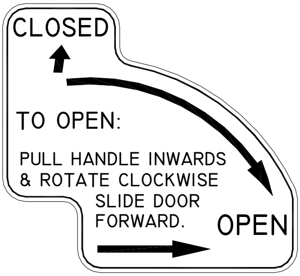
Above each front door



Aft of handle on arm rest of each front door

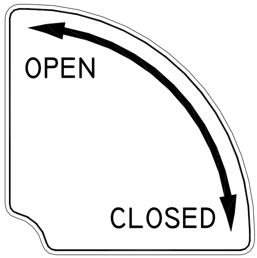


Around release button on the outside of rear door

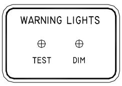


In the inside of the rear lower corner of the rear door window frame

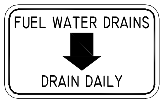
Behind aft most point of handle on the outside/inside of each front door



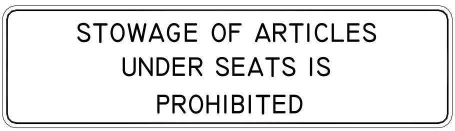
Beside rear door external handle



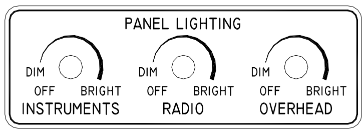
Around warning/caution buttons

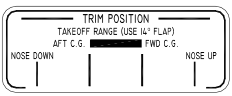


Just below fuselage belly skin crease behind right hand front door

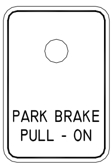


Located on seat backs





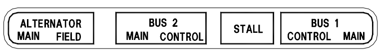
Adjacent to trim position indicator



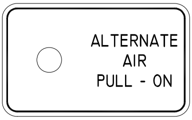
Behind panel lighting dimmer knobs on the instrument panel (either format)

Around park brake knob on the centre console

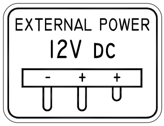
Directly behind each fuel drain cock on the underside of the fuselage near the right hand front door and underside of each wing



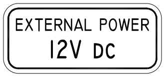
Mount on electric box cover



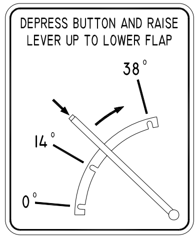
Around alternate air knob on the centre console



On the inside of external power flap

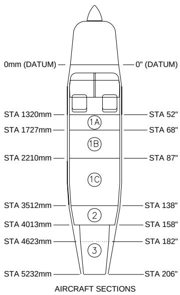


On the outside of external power flap



On centre console beside flap lever - bottom of placard facing the pilot's door

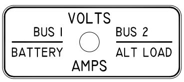
GA8 CARGO AND BAGGAGE LOADING



AREA	MAX. LOAD	MAX. LOAD INTENSITY
IA - MAIN CARGO AREA	680 KG (1500 LBS) COMBINED LOAD FOR AREA IA, IB AND IC	470 KG/M² (96 LBS/FT²)
IB - MAIN CARGO AREA		1010 KG/M² (206 LBS/FT²)
IC - MAIN CARGO AREA		250 KG/M² (51 LBS/FT²)
2 - CABIN BAGGAGE SHELF	113 KG (250 LBS)	225 KG/M² (46 LBS/FT²)
3 - AFT LUGGAGE BIN	22 KG (50 LBS)	80 KG/M² (17 LBS/FT²)

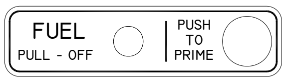
OBSERVE WEIGHT AND BALANCE LIMITATIONS. SEE FLIGHT MANUAL.

On the front face of the cabin baggage shelf near the rear door

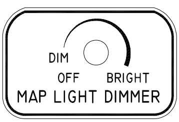


Positioned under the Volt/Amps meter with the switch that changes reading from Bus 1 and Bus 2 located between the respective lettering

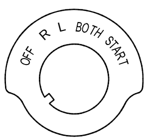
Aft face of throttle quadrant



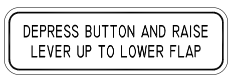
Around fuel primer button



Located adjacent to the dimmer knob on the pilot's side of the overhead circuit breaker panel



Located behind magneto switch



On the upper side of flap lever handle near detent button

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SECTION 3

EMERGENCY PROCEDURES

TABLE OF CONTENTS

Paragraph **Page**

3.1 GENERAL

Section 3 of this handbook describes the procedures to be adopted in the event of an emergency or abnormal situation occurring in the GA8 aircraft.

The procedures are arranged in the sequence considered to be the most desirable in the majority of cases. Steps should be performed in the order listed unless good reasons for deviation exist.

It should be remembered however, that all conceivable eventualities cannot be foreseen by the manufacturer. Particular circumstances such as multiple or unanticipated emergencies, adverse weather etc. may require modification to these procedures. A thorough knowledge of the aircraft and its systems is essential to analyse the situation correctly and determine the best course of action in any particular circumstance.

The following **basic rules** apply to all aircraft emergencies:

1. Maintain Aircraft Control.
2. Analyse the situation and take appropriate action.
3. Land as soon as practicable.

3.2 AIRSPEEDS FOR EMERGENCY OPERATIONS

Manoeuvring Speed (4000 lbs)....................................... 121 KIAS
Maximum Glide
- 4000 lbs .... 78 KIAS
- 3600 lbs .... 74 KIAS
- 3000 lbs .... 68 KIAS

Landing Without Engine Power (Flaps 38°)
- 4000 lbs .... 71 KIAS
- 3600 lbs .... 68 KIAS
- 3000 lbs .... 64 KIAS

3.3 EMERGENCY PROCEDURES CHECK LISTS

3.3.1 Engine Failures

Engine Failure During Take-off Run

1. Throttle.. CLOSED
2. Brakes.. APPLY
3. Wing Flaps.. UP
4. Master Switches Bus 1 & Bus 2......................... OFF
5. Ignition .... OFF
6. Fuel Shutoff Valve .... OFF

Engine Failure Immediately After Take-off

1. Airspeed... 64 – 71 KIAS. Refer section 3.2 for weight specific speed
2. Ignition .... OFF (As time permits)
3. Fuel Shutoff Valve .... OFF (As time permits)
4. Master Switches Bus 1 & Bus 2......................... OFF
5. Wing Flaps.. FULL RECOMMENDED
6. Braking.. HEAVY AFTER TOUCHDOWN

Engine Failure During Flight

1. Airspeed... 69 – 78 KIAS. Refer to section 3.2 for weight specific speed
2. Fuel Pump .... ON-CHECK FUEL PRESSURE
3. Fuel Shutoff Valve .... CONFIRM ON
4. Fuel Quantity .... CHECK
5. Mixture .... RICH
6. Oil .... CHECK TEMP AND PRESSURE
7. Ignition .... CYCLE BOTH-L-R-BOTH
8. Throttle.. CHECK LINKAGE OPERATION
9. Starter .... ACTIVATE IF PROP STOPPED

Notes:

(a) If engine does not restart commence forced landing procedure.

(b) If clear symptoms of a mechanical failure exist, or if the engine has seized due to the loss of oil pressure, do not attempt a restart.

(c) If engine operates with only L or R magneto selected, leave the ignition switch in this position whilst a suitable landing area is selected.

(d) At high elevations or altitudes roughness or loss of power may result from over-richness. In these cases the mixture should only be adjusted sufficiently to obtain smooth running. Observe instruments for temperature rise. Rough engine operation due to over-richness is most usually encountered at altitudes above 5000 feet.

3.3.2 Forced Landings

Emergency Landing Without Engine Power

1. Airspeed .... 64 – 71 KIAS. Refer section 3.2 for weight specific speed
2. Ignition .... OFF
3. Fuel Shutoff Valve .... OFF
4. Master Switches Bus 1 & Bus 2 .... OFF
5. Throttle .... CLOSED
6. Mixture .... Idle Cut Off
7. Propeller .... COARSE (LOW RPM)
8. Wing Flaps.. FULL PRIOR TO TOUCH DOWN
9. Braking .... HEAVY AFTER TOUCH DOWN

Precautionary Landing With Engine Power

1. Airspeed .... 75 KIAS
2. Wing Flaps.. TAKE-OFF
3. Selected field .... OVERFLY & INSPECT
4. Wing Flaps.. FULL ON FINAL APPROACH
5. Braking .... HEAVY AFTER TOUCH DOWN
6. Mixture .... Idle Cut Off
7. Ignition .... OFF
8. Fuel Shutoff Valve .... OFF
9. Master Switches Bus 1 & Bus 2 .... OFF

Ditching

1. Airspeed .... 75 KIAS
2. Wing Flaps.. TAKE-OFF
3. Power (if available) .... ESTABLISH 300 ft/min @ 65 KIAS
4. Approach
   - High Winds, Heavy Seas.. INTO WIND
   - Light Winds, Heavy Swells .... PARALLEL TO SWELLS
5. Wing Flaps.. FULL PRIOR TO TOUCH DOWN
6. Touch Down .... SLOWEST PRACTICAL SPEED
7. Evacuate.. OPEN MAIN CABIN DOOR FIRST if necessary to flood cabin

3.3.3 Fires

During Start On Ground

1. Cranking .... CONTINUE, to get a start which would suck the flames and accumulated fuel through the fuel injector and into the engine.

If engine starts:

2. Power .... 1700 RPM for a few minutes
3. Engine .... SHUTDOWN and inspect for damage

If engine fails to start:

2. Cranking ....CONTINUE
3. Throttle...FULL OPEN
4. Mixture ....Idle Cut Off
5. Fuel Shutoff Valve ....OFF
6. Ignition ....OFF
7. Master Switches Bus 1 & Bus 2......................OFF
8. Aircraft ....EVACUATE and extinguish fire using best available means.

Engine Fire In Flight

1. Fuel Shutoff Valve ....OFF
2. Fuel Pump ....OFF
3. Throttle...CLOSED
4. Propeller ....COARSE
5. Mixture ....Idle Cut Off
6. Master Switches Bus 1 & Bus 2......................OFF
7. Vents...CLOSE HEATER AND AIR VENTS
8. Airspeed..140KIAS to try to blow fire out. INCREASE UP TO V_{NE} if required.
9. Forced Landing...EXECUTE. Refer 3.3.2

Electrical Fire In Flight

1. Master Switches Bus 1 & Bus 2......................OFF
2. Electrical Switches..OFF
3. Extinguisher ....ACTIVATE

If fire goes out:

4. Smoke...USE OXYGEN IF AVAILABLE. VENTILATE CABIN
5. Precautionary Landing....................................AS SOON AS PRACTICAL

If fire does not go out:

4. Land..EXECUTE IMMEDIATELY

WARNING

Do not take the alternator off line (either by turning off the Bus 2 Master or by pulling the alternator field circuit breaker) in flight except in an emergency

Cabin Fire

1. Master Switches Bus 1 & Bus 2......................OFF
2. Vents...CLOSE HEATER AND AIR VENTS
3. Extinguisher ....ACTIVATE
4. Land..AS SOON AS PRACTICAL

3.3.4 Smoke/Fume Evacuation

Once fire is extinguished:

1. Vents .... OPEN HEATER AND AIR VENTS
2. Power .... REDUCE
3. Airspeed .... APPROX 80 KIAS
4. Cockpit Door(s)................................... OPEN ensure seat belts secure
5. Cabin Door .... OPEN APPROX. 6 INCHES (15CM)
6. Power .... ADJUST to maintain approx 80KIAS
7. Doors .... CLOSE WHEN CABIN CLEAR

NOTE

Aircraft may be landed with door(s) open if necessary

3.3.5 Landing With a Flat Main Tyre

1. Landing Area .... SUITABLE
2. Approach .... NORMAL
3. Wing Flaps.. FULL DOWN
4. Touchdown .... GOOD TYRE(S) FIRST, hold aircraft off flat tyre as long as possible with aileron and/or elevator control
5. Mixture.. Idle Cut Off as soon as practical
6. Ignition .... OFF
7. Fuel Shutoff Valve .... OFF
8. Master Switches Bus 1 & Bus 2 .... OFF

3.3.6 Inadvertent Icing Encounter

Flight into known icing conditions is prohibited, however, if icing is inadvertently encountered

1. Pitot Heat (if fitted).. ON
2. Altitude.. Change level or turn back to obtain an outside air temperature less conducive to icing
3. Window Demist.. ON

3.3.7 Electrical Power Supply System Malfunctions

Excessive Rate of Electrical Charge

1. Bus 2 Master Switch ....OFF
2. Non-Essential Electrical Equipment.................OFF
3. Land...AS SOON AS PRACTICAL

Alternator Failure

To check for tripping of over-volt relay:

1. Bus 2 Master Switch ....OFF
2. Bus 2 Master Switch ....ON
3. Alternator Warning Light ....CHECK OFF
4. Ammeter ....CHECK FOR CHARGE

To check for opened circuit breaker:

1. Alternator Field Circuit Breaker.........................CHECK and RESET if required
2. Alternator Warning Light ....CHECK OFF
3. Ammeter ....CHECK FOR CHARGE

If condition not corrected:

1. Bus 2 Master Switch ....OFF
2. Non-Essential Electrical Equipment.................OFF
3. Land...AS SOON AS PRACTICAL

3.3.8 Pitot Static Malfunction

1. Pitot Heat (if fitted) ....ON

If alternate static fitted:

2. Vents...OPEN HEATER AND AIR VENTS
3. Alternate Static ....ALTERNATE SOURCE

3.4 AMPLIFIED EMERGENCY PROCEDURES

This section is provided to supply the pilot with additional information concerning emergency procedures in general. Elaboration of the procedures specified in the EMERGENCY PROCEDURES CHECK LISTS as well as the inclusion of some more generalised emergency procedures that can be better covered by a general descriptive procedure rather than a formal check list are included in this section. This will give the pilot a more complete understanding of these procedures.

3.4.1 Engine Failure

If an engine failure occurs during the take-off run, the most important action is to stop the aircraft on the remaining runway. The extra items in the checklist will provide additional safety after an engine failure on take-off.

If the engine fails shortly after lift off the initial response must be prompt lowering of the nose in order to maintain safe airspeed. In most cases, the landing should be executed straight ahead with only small changes in direction to avoid obstructions. After an engine failure on take-off, altitude and airspeed are seldom sufficient to execute a 180° gliding turn to return to the runway of departure. The checklist procedures assume that adequate time exists to secure the fuel and ignition systems prior to touch down.

After an engine failure in flight, the best glide speed as shown in Figure 3-1 should be established as quickly as possible. While gliding toward a suitable landing area, an effort should be made to identify the cause of the failure. If time permits, an engine restart should be attempted. If the engine cannot be restarted a forced landing must be executed.

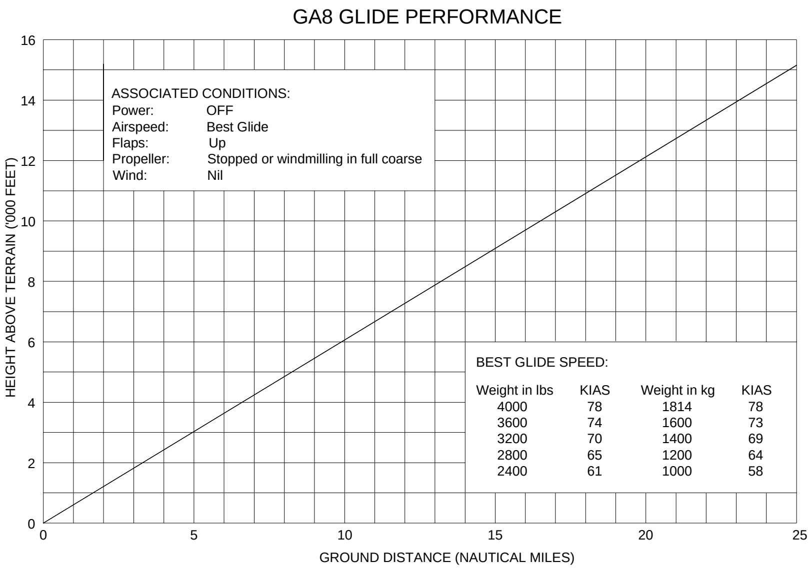

Figure 3-1 Maximum Glide

3.4.2 Forced Landings

If all attempts to restart the engine fail and a forced landing is imminent, a suitable landing area should be selected and the EMERGENCY LANDING WITHOUT ENGINE POWER checklist should be completed if at all possible.

3.4.3 Ditching

The aircraft has not been flight tested in actual ditchings, therefore the recommended procedure is based entirely on the best judgement of the manufacturer.

If available, life jackets should be donned **but not inflated** until after evacuating the aircraft. Inflating the life jackets prematurely increases the risk of damage to them exiting the aircraft. Additionally their bulkiness adds to the difficulty of evacuating the aircraft

Plan the approach into wind if the winds are high and the seas are heavy. With heavy swells and light winds, land parallel to the swell. If possible maintain a constant descent rate of approximately 300 ft/min almost until touchdown but reducing speed to the minimum practical immediately prior to touchdown. An orderly evacuation of the aircraft should then be conducted. It may be necessary to open the main cabin sliding door first to allow the cabin to flood to equalise the pressure prior to opening the cockpit doors.

3.4.4 Fires

Although engine fires are extremely rare in flight, the checklist procedures should be followed if one is encountered. After completion of this procedure, execute a forced landing. <u>Do not</u> attempt to restart the engine after an engine fire.

The initial indication of an electrical fire is usually the smell of burning insulation. Turning off the Master Switch should result in the elimination of the cause of this type of fire.

3.4.5 Rough Engine/Loss of Power

1. SPARK PLUG FOULING Slight engine roughness in flight may be caused by one or more spark plugs becoming fouled by carbon or lead deposits. This may be verified by selecting the ignition switches momentarily from BOTH to LEFT and RIGHT in turn. An obvious power loss in single ignition operation is evidence of spark plug or magneto trouble. Assuming that the spark plugs are the more likely cause, lean the mixture to the point where a just noticeable drop in engine RPM occurs. If the problem does not clear up within several minutes, try a richer mixture. If this does not solve the engine problem, plan to land at the nearest practical airfield to have the situation investigated.

2. MAGNETO MALFUNCTION A sudden engine roughness or misfiring is usually evidence of magneto problems. Switching magneto switches from BOTH to either LEFT or RIGHT should identify which magneto is malfunctioning. Different power and/or mixture settings may alleviate the problem. If not, plan to land at the nearest practical airfield to have the situation investigated.

3. LOW OIL PRESSURE   If low oil pressure is accompanied by normal oil temperature, there is a possibility that the oil pressure gauge or the relief valve is malfunctioning. A leak in the line to the gauge is not necessarily cause for an immediate precautionary landing because the small size of this line will prevent a rapid loss of engine oil. A landing at the closest practical airfield is advisable, however, so that the source of the trouble can be investigated. If a total loss of oil pressure is accompanied by a rise in oil temperature, an engine failure is probably imminent. Reduce engine power immediately and select a suitable forced landing area. Use only the minimum power required to reach the desired touch down point.

3.4.6 Electrical System Malfunctions

WARNING

Do not take the alternator off line (either by turning off the Bus 2 Master or by pulling the alternator field circuit breaker) in flight except in an emergency.

The electrical system is straightforward but to obtain the necessary degree of reliability and redundancy the system must be operated correctly. Normal operation is with both Master Switches in the ON position. Should the need to shed electrical loads arise the Bus 2 Master Switch, which controls the non essential electrical loads and the alternator, is switched off and operation continued on the Bus 1 services utilising battery power alone. More severe electrical system failures, such as those resulting in fire, require both Master Switches to be switched off. In addition to the general guide above specific failures may be dealt with as follows.

1. INSUFFICIENT RATE OF CHARGE   If the ammeter indicates a declining or zero charge in flight with electrical services switched on, minimal or no electrical power is being supplied by the alternator. If the charge drops sufficiently the alternator warning light will illuminate.

A possible cause of a zero charge indication is the over-volt relay tripping the alternator off line if the alternator output voltage had exceeded approximately 16 volts due to a failure of the voltage regulating system. The over-volt relay can be reset to check for this failure by turning the Bus 2 Master Switch OFF then ON again. If the over-volt relay trips the alternator off line a second time it can be assumed that an over-volt problem definitely exists and the Bus 2 Master should be switched off again. If the alternator comes back on line, be aware for further problems, as the cause may be an internal alternator fault.

The opening of the alternator field circuit field breaker will also cause the alternator to go off line. If the breaker is open, it may be reset, but only once. If the breaker opens again there is a definite problem with the alternator circuit, and consideration should be given to landing at the nearest practical airfield.

Another possible cause of a zero charge indication is the failure of the alternator or the alternator drive belt. Provided the eventual total loss of electrical services will not affect the safety of flight, the flight may continue.

A declining charge indication may be due to slipping of the alternator drive belt under increasing electrical load, in which case the alternator will not be delivering it's full output as additional services are turned on.

With the alternator off line the battery will be supplying the required electrical power. To conserve battery power the Bus 2 Master should be switched off. If flight with no electrical services is safe the Bus 1 Master Switch may also be switched off to further conserve battery power. Refer to Figure 7-3 in Section 7 for details of what items of equipment are powered from each bus.

2. ILLUMINATION OF ALTERNATOR ("ALT") WARNING LIGHT Illumination of this amber caution light indicates that the alternator is not providing electrical power, or the system voltage has dropped below a nominal 12.5 volts. Refer to "Insufficient Rate of Charge" above for symptoms, possible causes, and actions to be taken.

3. EXCESSIVE CHARGE RATE It is quite normal to have a relatively high charge rate when the battery is being recharged after an engine start, particularly if the battery was not fully charged to begin with. However, should the ammeter indicate a significantly higher charge rate than normal after, say, 30 minutes since engine start, it is possible that there has been a failure in the voltage regulating system. Continued operation with an excessively high alternator output voltage will eventually overheat and damage the battery as well as causing damage to any electronic/avionics systems that require a nominal 14 volts for their operation. In this event the Bus 2 Master Switch should be turned off and operation continued on Bus 1 and battery power alone. Consideration should then be given to landing at the nearest practical airfield to have the problem investigated.

4. CIRCUIT BREAKERS Failure of an individual circuit will, in most circumstances, result in opening of the relevant circuit/switch breaker. To ensure a permanent fault exists in the circuit the breaker should be reset once. If the breaker again pops the circuit is faulty and the flight should be continued without that service.

5. ALTERNATOR INDEPENDENCE Usually battery power is required to initially excite the alternator. However, the GA8 features a circuit incorporating a capacitor to provide an independent source of initial electrical energy to the alternator should the battery fail. The capacitor circuit operates whenever the Bus 2 Master Switch is selected from OFF to ON. The alternator then provides the energy for the field current and recharges the capacitor.

3.4.7 Fuel System Malfunctions

The fuel system has been designed to be as simple to operate as possible. The sump tank should remain FULL at all times. Should this not be the case then transfer of fuel from the main fuel tanks has ceased. This situation will be indicated initially by the red "FUEL" warning light located between the fuel gauges illuminating, indicating that the fuel level in the sump tank has fallen below its usual operating level. Confirmation of this results in the illumination of the red LED "SUMP TANK LOW FUEL" warning light showing that the fuel level is continuing to fall.

The fuel warning system is provided with two red warning lights each operating from separate power supplies to provide a measure of redundancy in the event of a fuel warning system failure.

The only two likely causes of this problem are:

1. **The fuel supply from the main tanks has been exhausted** - This condition will also be indicated by the fuel contents indicator gauges and the illumination of the amber "CHECK FUEL" caution lights adjacent to each of those, providing a progressive series of warnings prior to the illumination of the red lights.

   ACTION: *Prepare immediately for a precautionary/forced landing as all useable fuel has been consumed and limited fuel remains in the aircraft from when the first red warning light illuminates.*

2. **Both the fuel filters have become partially or completely blocked** - This event would be signified by illumination of the "FUEL" and "SUMP TANK LOW FUEL" warning light(s) whilst the fuel gauges and unlit amber "CHECK FUEL" caution lights indicate that useable fuel remains in the main tanks and supply lines. In the event that the fuel filters were to become blocked or restricted, usually as a result of contaminated fuel, this may cause the engine to operate incorrectly particularly at high power settings. The indications accompanying fuel filter restriction are that the fuel pressure reading will decrease progressively in direct proportion to the rate and level of restriction, causing the engine to run lean which may cause cylinder head temperatures to increase or in more severe cases starve the engine of sufficient fuel to maintain the selected power setting.

   ACTION: Reduce power and prepare immediately for a forced landing. Sufficient fuel flow may be available to allow the engine to operate at reduced power settings, observe power instruments to ensure correct operating parameters. Under these circumstances it would be imprudent to continue beyond the first landing area that may be available.

3.4.8 Spins

Intentional spins are prohibited in this aircraft. Should an inadvertent spin occur, the following recovery procedure should be used:

1. **Retard the throttle to idle**
2. **Centralise ailerons**
3. **Apply and hold full rudder opposite to the direction of rotation**
4. **Move stick progressively forward far enough to break stall**
5. **Hold these control inputs until rotation stops**
6. **As rotation stops, centralise rudder and make a positive, smooth recovery from the resulting dive**

3.4.9 Pitot Static Malfunction

If erroneous readings of the pitot-static instruments (airspeed indicator, altimeter or vertical speed indicator) are suspected, the most likely cause is icing of the wing mounted pitot-static probe. The alternate static source (if fitted) should be selected to the Alternate Static Source position to supply static pressure from the cabin to these instruments.

For aircraft fitted with a heated pitot-static probe, the initial action is to select the pitot heat to ON. If the problem persists one minute after switching on the pitot heat, the alternate static source should be selected.

The corrections presented in Table 3-1 for speed and Table 3-2 for attitude should be used when operating with flaps up and the alternate static source selected. With 14° and 38° flap the change in airspeed does not exceed 5 knots and the change in altitude does not exceed 50 feet with the alternate static source selected. If the system continues to operate incorrectly, use known pitch and power settings to maintain sufficient airspeed.

For aircraft that are not fitted with either pitot heat or alternate static systems, follow the steps in Section 3.3.6 Inadvertent Icing Encounter.

KIAS - Alternate Source	Correction to be added - knots
70	0
80	-1
90	-2
100	-3
110	-4
120	-4
130	-5

Table 3-1 Alternate Static - Airspeed Calibration (Flaps Up)

NOTE

Indicated airspeed assumes zero instrument error

Altitude - Alternate Source (feet)	Correction to be added - feet						
	KIAS						
	70	80	90	100	110	120	127
1000	0	0	-20	-20	-40	-40	-60
5000	0	0	-20	-20	-40	-60	-60
10000	0	0	-20	-20	-40	-60	-60

Table 3-2 Alternate Static - Altimeter Calibration (Flaps Up)

SECTION 4

NORMAL PROCEDURES

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4.1 GENERAL

Section 4 of this handbook describes the procedures to be adopted for normal operations of the GA8 aircraft.

The procedures are arranged in the sequence considered to be the most desirable and therefore steps should be performed in the order listed unless good reasons for a deviation exist.

4.2 SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 4000 lbs (1814 kg) and may be used for any lesser weight. However, to achieve the take-off and landing performance specified in section 5, the weight specific take-off safety speeds (T.O.S.S.) and landing approach speeds (V_{REF}) stated on the take-off and landing charts must be used.

Take-Off:

T.O.S.S. (Speed @ 50 ft)............................. 71 KIAS
Normal Climb Out .... 76-80 KIAS

Climb, Flaps Up:

Initial (scheduled climb) .... 78 KIAS
Enroute .... 80-90 KIAS

Landing Approach:

V_{REF} (Speed @ 50 ft).................................... 71 KIAS
Baulked Landing .... 71 KIAS Initially

Maximum Recommended in Turbulence:

All Weights.. 121 KIAS

Maximum Demonstrated Crosswind Velocity:...... 15 knots

4.3 NORMAL PROCEDURES CHECK LISTS

4.3.1 Preflight Inspection

Before flight, a careful visual inspection is to be carried out to ensure that the aircraft and its systems are serviceable.

The following guide is to be used in conjunction with the preflight inspection checklist:

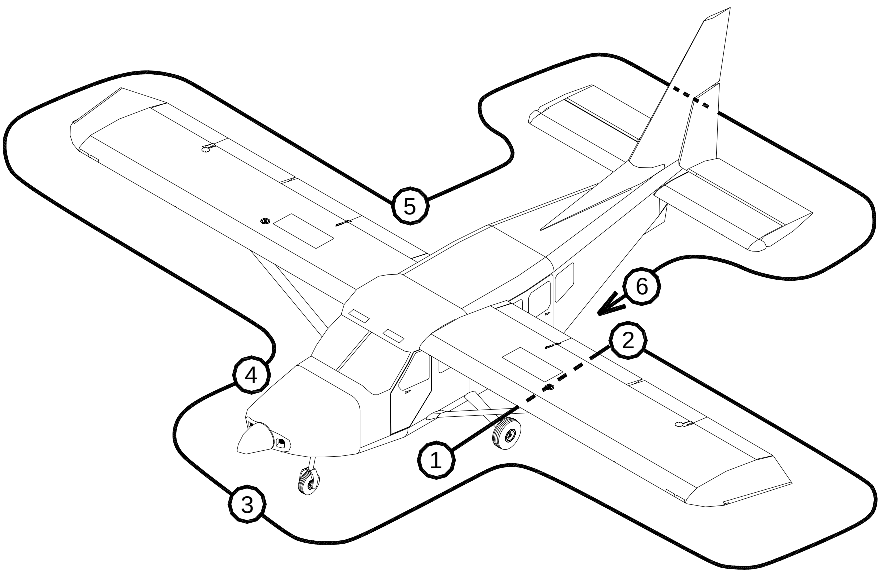

Figure 4-1 Preflight Inspection

1. Cockpit

Magnetos..OFF
Master Switches Bus 1 and Bus 2.............ON
Volts, Bus 1 and Bus 2................................CHECK system voltage/Battery condition
Fuel ....ON check gauges contents
Alternator Warning Light.............................CONFIRM ON
Caution Warning Panel ....CHECK ALL LIGHTS use press to test button
Nav/Landing Lights.....................................ON/OFF as required to check
Stall Warning..CHECK
Master Switches Bus 1 and Bus 2.............OFF
Mixture...Idle Cut Off
Trim ....CYCLE smooth operation throughout range
Alternate Static (if fitted).............................NORMAL SOURCE
Harnesses and Seats.................................CHECK CONDITION
Windshield..CLEANLINESS
Cockpit Area...GENERAL CONDITION
Loose Objects ....SECURE
Cockpit Doors/Latches...............................CONDITION & OPERATION

2. Left Wing / Left Centre Fuselage

Wing Fuel Tank Drain.................................DRAIN water, sediment & fuel grade
Flap..DOWN, CONDITION, HINGES & SECURITY
Aileron ....CONDITION, HORNS, HINGES & SECURITY
Wingtip ....CONDITION & NAV/LANDING LIGHTS
Pitot Head..UNCOVERED & UNOBSTRUCTED
Leading Edge ....DAMAGE & CONDITION
Wing Strut and Fairings.............................CONDITION & SECURITY
Fuel Contents ....NOTED or AS REQUIRED
Fuel Cap...SECURE
Undercarriage...SECURITY & OBVIOUS DEFECTS
Tyres..INFLATION & CONDITION
Brake Assembly ....CONDITION, PADS, CALIPER & HOSE

3. Engine / Propeller / Nose Gear

Engine Air Outlets/Inlets.............................CHECK FOR OBSTRUCTIONS
Exhaust System ....CONDITION & SECURITY
Oil ....QUANTITY/DIPSTICK SECURE
Accessible Engine Components.................CONDITION & SECURITY
Propeller ....OIL LEAKS, NICKS & DAMAGE
Spinner ....CONDITION & SECURITY
Cowling..CONDITION & SECURITY
Nose Wheel/Tyre..CONDITION & INFLATION
Nose Strut ....CONDITION & OIL LEAKS

4. Right Wing / Right Centre Fuselage

Wing Fuel Tank Drain................................ DRAIN water, sediment & fuel grade
Sump Tank Fuel Drain.............................. DRAIN water, sediment & fuel grade
2 x Fuel Strainer Drains............................ DRAIN water, sediment & fuel grade
Undercarriage... SECURITY & OBVIOUS DEFECTS
Tyres.. INFLATION & CONDITION
Brake Assembly.. CONDITION, PADS, CALIPER & HOSE
Fuel Contents .... NOTED or AS REQUIRED
Fuel Cap.. SECURE
Wing Strut and Fairings............................ CONDITION & SECURITY
Leading Edge .... DAMAGE & CONDITION
Wingtip... CONDITION & NAV/LANDING LIGHTS
Flap.. CONDITION, HINGES & SECURITY
Aileron .... CONDITION, HORNS, HINGES & SECURITY
Fuel Vent .... CHECKED & CLEAR
Fuel Vent Plenum Drain .... CHECKED & CLEAR

5. Rear Fuselage / Empennage

Rear Fuselage Skins .... CONDITION
Inspection Panels .... SECURE
Fairings.. CONDITION & SECURITY
Stabiliser.. CONDITION & SECURITY
Elevators.. CONDITION & SECURITY
Rudder.. CONDITION & SECURITY
Ventral Fin .... CONDITION & SECURITY

6. Rear Cabin

Sliding Door .... CONDITION check smooth operation
Door Lock .... CONDITION & SECURITY
Door Tracks .... CONDITION & SECURITY
Cabin .... CLEAN, NO LOOSE ARTICLES
Seat Belts/Cargo Restraints .... CONDITION & SECURITY
Cabin Locker .... CORRECT LOADING & SECURITY
Sliding Door .... CLOSED & LOCKED

4.3.2 Before Starting Engine

Pre flight Inspection ....COMPLETED
Passenger Briefing ....COMPLETED
Pilot Seat ....ADJUSTED & LOCKED
Harnesses...SECURE
Brakes...ON/PARK
Radios, Electrical Equipment.......................OFF
Circuit Breakers ....IN

4.3.3 Starting Engine

Park Brake ....ON
Master Switches, Bus 1 and Bus 2 ....ON
Volts, Bus 1 and Bus 2 ....CHECK system voltage 12V if battery condition good
Fuel Shutoff Valve ....ON
Alternate Air...OFF
Mixture ....Idle Cut Off
Propeller ....FULL FINE-INCREASING RPM
Throttle..½" OPEN
Fuel Pump ....ON
Prime ....MIXTURE TO FULL RICH until fuel flow indicates then Idle Cut Off
Fuel Pump ....OFF or on as required if engine hot
Starter ....ENGAGE when engine fires RELEASE otherwise REPRIME
Mixture ....FULL RICH
Throttle..IDLE APPROX 1000 RPM
Oil Pressure ....CHECK (pressure to be indicated within 30 secs)
Volts/Amps...CHECK CHARGING SYSTEM
Avionics ....ON

NOTE

If engine fails to achieve a normal start, assume it to be flooded. Crank engine over with throttle wide and mixture in Idle Cut Off , if engine fires retard throttle and advance mixture to full rich, otherwise repeat above start procedure.

4.3.4 Before Take-Off

Park Brake .... ON
Ground Check and Run Up
1. Warm Up .... 1000-1200 RPM avoid prolonged idle at low RPM
2. Oil .... CHECK TEMPERATURE & PRESSURE
3. Ignition Check .... 2100 RPM Both-L-Both-R-Both. Max drop 175RPM less than 50RPM difference
4. Propeller Check .... 1500 RPM cycle prop control, 3 times if cold, less than 500RPM drop
5. Idle Check .... 500-800RPM throttle fully closed
Throttle .... 1000-1200 RPM
Trim .... SET for loading configuration
Mixture .... FULL RICH or as required for altitude
Propeller .... FULL FINE
Master Switches Bus 1 and Bus 2 .... ON
Magnetos .... BOTH
Fuel Shutoff Valve .... CONFIRM PUSHED IN
Fuel Quantity .... CHECK sufficient for task
Fuel Pump .... ON light on
Flaps .... SET to TAKE OFF (14°)
Instruments .... SET AND CHECK ALL alternate static normal source (if fitted)
Switches .... SELECTED as required
Caution Light Panel .... PRESS TO TEST
Circuit Breakers .... CHECK
Controls .... FULL & FREE MOVEMENT, CORRECT SENSE
Hatches .... CLOSED & LOCKED
Harnesses .... SECURE all seat belts correctly fastened and adjusted

4.3.5 Take-Off

Mixture .... FULL RICH see amplified procedures
Propeller .... FULL FINE (FULL INCREASING RPM)
Throttle .... FULL OPEN
Elevator Control .... NEUTRAL
Directional Control .... NOSEWHEEL STEERING & RUDDER
Rotate .... 60KIAS raise nosewheel clear of ground
Take Off Safety Speed .... REFER TO TAKEOFF CHART in Section 5
Accelerate to Climb Speed .... 76 KIAS TO SAFE HEIGHT- 200FT or as required
Flaps .... UP
Fuel Pump .... OFF
Power .... SET as required

4.3.6 Initial Climb

Throttle .... FULL OPEN
RPM .... 2500 RPM
Airspeed .... 76-86 KIAS

4.3.7 Cruise

75% Power ....25 in.Hg - 2500 RPM (100 lb/hr [63 L/hr])
65% Power ....23 in.Hg - 2350 RPM (83 lb/hr [52 L/hr])
Mixture ....LEAN (refer to Amplified Procedures)

4.3.8 Descent

Power...REDUCE MANIFOLD AIR PRESSURE
Mixture ....ENRICH during descent

4.3.9 Before Landing (and flight below 1000ft AGL)

Brakes..OFF
Harnesses..SECURE
Mixture ....RICH
Fuel Pump ....ON

4.3.10 Landing

Airspeed @ 50ft..REFER TO LANDING CHART in Section 5
Wing Flaps...AS REQUIRED normally 38°
Directional Control ....RUDDER & NOSEWHEEL STEERING
Braking...AS REQUIRED

4.3.11 Baulked Landing

Power...FULL THROTTLE - 2700 RPM
Wing Flaps...RETRACT **SLOWLY** Approximately 3 sec per setting
Airspeed...ESTABLISH NORMAL CLIMB SPEED initially 71 KIAS

4.3.12 After Landing/Securing

Wing Flaps...UP
Fuel Pump ....OFF
Parking Brake ....ON/AS REQUIRED
Radios and Electrical Equipment.................OFF
Mixture ....Idle Cut Off when CHT has decreased and stabilised
Ignition ....OFF
Master Switches Bus 1 and Bus 2...............OFF
Controls ....SECURE

4.4 AMPLIFIED PROCEDURES

This section is provided to supply the pilot with additional information concerning normal procedures in general. Elaboration of the procedures specified in the NORMAL PROCEDURES CHECK LISTS as well as the inclusion of some more generalised procedures that can be better covered by a general descriptive procedure rather than a formal check list are included in this section. This will give the pilot a more complete understanding of these procedures.

4.4.1 Preflight Inspection

The Preflight inspection as covered by the PREFLIGHT INSPECTION CHECKLIST is recommended prior to the first flight of the day. Inspection procedures for subsequent flights can be abbreviated provided essential items such as fuel and oil quantities, security of fuel and oil filler caps are satisfactory. After refuelling fuel samples must be taken from all drain points, five in total, one in each of the two wing fuel tanks and three under the fuselage below the right side cockpit door.

Aircraft operated from rough strips, especially at high altitudes, are subject to abnormal undercarriage abuse. Frequent checks of all undercarriage components, tyres and brakes is warranted in these situations.

4.4.2 Starting Engine

The IO-540-K series engine is fitted with magnetos that are not equipped with impulse couplings. The engine is started with the ignition switch which when placed in the START position disables the right magneto, activates a starting vibrator and selects a retard breaker in the left magneto. When the ignition switch is released to the BOTH position both magnetos are enabled into their normal operating mode. This starting obviously precludes to option of hand swinging or "propping" an engine when there is insufficient charge available in the aircraft battery for a normal start. A Ground Power Unit should be used in such circumstances utilising the receptacle located adjacent to and to the rear of the pilot's cockpit door.

After starting, oil pressure should start to rise within 30 seconds in normal temperatures and about twice as long in very cold weather. If it does not rise within this time stop the engine and investigate the cause.

4.4.3 Taxiing

Positive control is available to the pilot when taxiing the GA8 due to the direct linkage type nosewheel steering. Care should be exercised in strong winds, particularly in quartering tail wind conditions. As with any high wing configuration aircraft, appropriate elevator and aileron control positions are essential during taxiing operations particularly during strong tail wind conditions.

Taxiing over loose gravel or stones should be done at low engine RPM to minimise propeller damage.

4.4.4 Before Take-Off

Warm Up

Most of the warm up will have occurred during taxiing and whilst conducting the Before Take-Off checks. The engine is warm enough for take-off when the throttle can be opened without the engine faltering.

Magneto Check

The magneto check should be made at 2100 RPM as indicated by the tachometer with the mixture set to full rich. Select the LEFT magneto OFF and note the RPM drop, then return to BOTH until the engine regains speed. Select RIGHT magneto OFF and note the RPM drop, then return to BOTH. Drop in RPM should not exceed 175 RPM and the difference between magnetos should not exceed 50 RPM. Do not operate on a single magneto for an extended period, a few seconds is usually sufficient to check RPM drop and will minimise spark plug fouling.

Propeller Check

Move the propeller control lever through its complete range of operation to ensure that it is operating correctly and return it to the full fine (full increase RPM) position. Do not allow the engine RPM to drop by more than 500 RPM. In cold operating conditions the propeller should be exercised at least three times to allow warmed engine oil to circulate throughout the system.

4.4.5 Take-Off

Power Check

Full throttle runups over loose gravel are especially harmful to the propeller and should be avoided. When take-offs must be made from a gravel surface, it is very important that the throttle is advanced slowly and a rolling start take-off technique be used to minimise propeller damage.

It is important to check full throttle engine performance early in the take-off run. Any sign of rough engine operation or sluggish acceleration is good cause for discontinuing the take-off and conducting a full power runup to confirm normal engine operation prior to the next take-off attempt.

Prior to take-off from high elevation airfields, the mixture should be leaned just enough to give smooth engine operation during a full throttle static runup. During climb at high elevations or altitudes roughness or loss of power may result from over-richness. In these cases the mixture should only be adjusted sufficiently to obtain smooth running - not for economy. Observe instruments for temperature rise. Rough engine operation due to over-richness is most usually encountered at altitudes above 5000 feet.

Wing Flap and Power Settings

Normal take-offs are accomplished at full throttle, 2700 RPM and 14° (first notch) flap selected. The flaps should not be retracted until a safe height is achieved and all obstacles have been cleared (250ft AGL). After retracting flap power must be reduced to full throttle at 2500 RPM. Take-offs may be made with flaps up but this will increase the take-off distance by approximately 10% and will result in a more pronounced nose up attitude at lift off.

4.4.6 Climb

Initial Climb

Initial climb is performed with flaps up, full throttle, 2500 RPM at 78KIAS.

Enroute Climb

Enroute climbs are performed with flaps up, full throttle, 2500 RPM and at speeds 5 to 10 knots higher than the initial scheduled climb speed. This provides better engine cooling with very little loss of climb performance. At altitudes above approximately 3000 feet the mixture may be leaned for smoother engine operation.

4.4.7 Cruise

The power setting and cruising altitude are the two major factors that will affect the cruising speed and range of the GA8. Other influencing factors include the weight and loading, temperature and equipment installed in a given aircraft. The maximum power setting normally used for cruise is 75% of the engines rated power. Power settings below this will result in increased range and endurance corresponding with the reduced fuel consumption. At a miserly power setting of 45% the GA8 is capable of attaining an endurance of close to eight and a half hours, using correct leaning procedures, for a range of just over 850 nautical miles (with no reserves). The most appropriate power setting for altitude and other considerations may be derived from the tables included in Section 5 of this manual. For efficient and economical operation as well as to achieve maximum engine service life the engine must always be operated in accordance with the procedures and specifications set out in the engine manufacturers operator's manual.

The exhaust gas temperature (EGT) may be used as an aid for leaning the mixture in flight at 75% power or less. To set the mixture using the EGT gauge, lean the mixture slowly until the temperature peaks on the EGT gauge, and then adjust the mixture based on the following:

Best Power: enrich mixture until the EGT indicator is 100°F rich of peak EGT

Best Economy: enrich mixture until the EGT indicator is 25° - 50°F rich of peak EGT

Operation of the mixture control should be slow enough to allow for the slight lag in the EGT gauge. Engine roughness may occur when operating at best economy. If this occurs, enrich the mixture sufficiently to obtain smooth engine operation. Any change in altitude or throttle setting requires the EGT to be rechecked and the mixture re-set.

4.4.8 Stalls

In any attitude or under any loading condition the stall is preceded by a slight aerodynamic buffet. In addition an artificial stall warning horn is set to activate 5 to 7 KIAS above the stall speed in any configuration. All controls are effective up to and completely through the stall and there is no noticeable tendency to enter a spin after the stall.

4.4.9 Approach and Landing

Landings are normally conducted with full flaps (38°) and the propeller set to the full fine position. The landing approach is conventional. Care must be taken to ensure airspeed is accurately maintained during the final landing approach. Timely and appropriate use of power should be exercised to maintain the desired flight path and airspeed. Excessively high approach speeds will result in prolonged floating and increased landing distance. Normally the throttle should be fully closed during the 'flare' to reduce the tendency to float and prolong the touchdown. Touchdown should occur on the main wheels initially, followed by the nose gear which should be held clear of the ground during the initial ground roll. Positive braking may then be applied depending on requirements and circumstances. For maximum braking effectiveness the wing flaps should be retracted and back pressure applied to the control column.

4.4.10 Cross Wind Landing

When landing in a strong cross wind use a wing low, crab, or a combination method of drift correction. Avoid a prolonged hold off by allowing the aircraft to settle onto the runway in a slightly nose high and wing low attitude, touching down on the into wind mainwheel first followed by the other mainwheel and then the nose gear in quick succession. In strong and/or gusty wind conditions it may be desirable to make the final approach at a slightly higher than normal airspeed with partial or no flap selected.

4.4.11 Baulked Landing

In a baulked landing (go-around), the wing flaps should be retracted to 14° immediately after full power has been applied. Upon reaching a safe airspeed, the flaps should be smoothly retracted to the full up position and a normal climb established.

4.4.12 Flight at High Altitude

For flight at high altitudes check regulation requirements for use of supplemental oxygen.

4.4.13 Flight Over Water

When life preservers and rafts are required, crew life preservers can be stowed in the side door pockets. Passenger life preservers and rafts should be stowed or donned in accordance with the operator’s Operations Manual.

4.5 NOISE CHARACTERISTICS

The certificated noise level for the GA8 at 4000 lbs (1814 kg) maximum weight and 2500 RPM as established in accordance with Federal Aviation Regulation Part 36 Appendix G is 87.1 dB(A). No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

SECTION 5

PERFORMANCE

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5.1 GENERAL

The performance data on the following pages is presented so that you may know what to expect from the aircraft under various conditions, and also to facilitate the planning of flights in detail and with reasonable accuracy. The data has been computed from actual flight tests with the aircraft and engine in good condition and using average piloting techniques.

Performance data is presented in tabular or graphical form to illustrate the effect of different variables. Sufficiently detailed information is provided in the tables so that conservative values can be selected and used to determine the particular performance figure with reasonable accuracy.

Cruise performance data assumes that the recommended lean mixture setting is used. Some indeterminate variables such as mixture leaning technique, fuel metering characteristics, engine and propeller condition, and air turbulence may account for variations of 10% or more in range and endurance. It is therefore important to utilise all available information to estimate the fuel required for a particular flight.

5.2 TAKE-OFF

The take-off distance chart presented on the following pages contains data enabling the take-off distance to be determined for a variety of operating conditions. The chart allows for the take-off distance to be determined in feet or metres depending on the pilot's preference.

The chart is based on take-off distances from rest to a height of 50 feet with the engine operating at take-off power. The surface corrections on the charts are based on standard factors related to strips with a firm surface. Soft ground and unusually long and/or wet grass will increase the take-off distance over that scheduled and the pilot should therefore ensure that adequate strip length is available to cover these conditions.

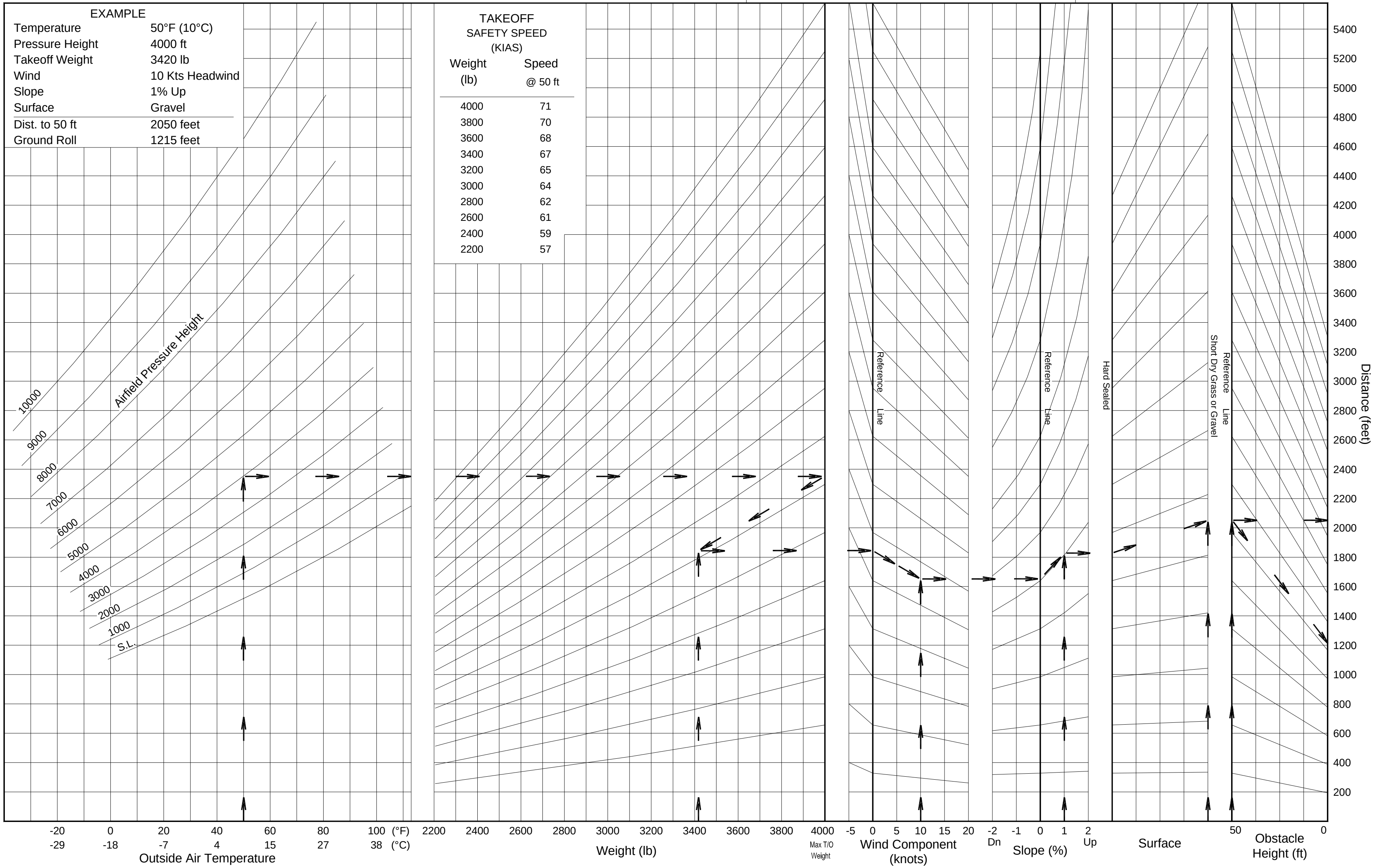
The technique used in establishing the chart take-off distance involves accelerating the aircraft along the ground with the elevators held neutral, then rotating and commencing a climb so that the appropriate T.O.S.S. is achieved and maintained at or before the 50 foot height point.

Extrapolation outside the boundaries of the Take-Off Distance Chart is not permitted. When the outside air temperature and/or pressure height is below the lowest range scheduled on the charts, the aircraft performance shall be assumed to be no better than that appropriate to this lowest range. The performance information is not valid when the outside air temperature and/or pressure height exceeds the maximum values for which this information is scheduled.

GA8 TAKEOFF DISTANCE CHART - 14° FLAP (Imperial Units)

Associated Conditions
Power : 2700RPM/full throttle set before brake release
Flaps : 14°

Note
Takeoff distances are unfactored.



EXAMPLE

Temperature	50°F (10°C)
Pressure Height	4000 ft
Takeoff Weight	3420 lb
Wind	10 Kts Headwind
Slope	1% Up
Surface	Gravel
Dist. to 50 ft	2050 feet
Ground Roll	1215 feet

TAKEOFF SAFETY SPEED (KIAS)

Weight (lb)	Speed @ 50 ft
4000	71
3800	70
3600	68
3400	67
3200	65
3000	64
2800	62
2600	61
2400	59
2200	57

GA8 TAKEOFF DISTANCE CHART - 14° FLAP (Metric Units)

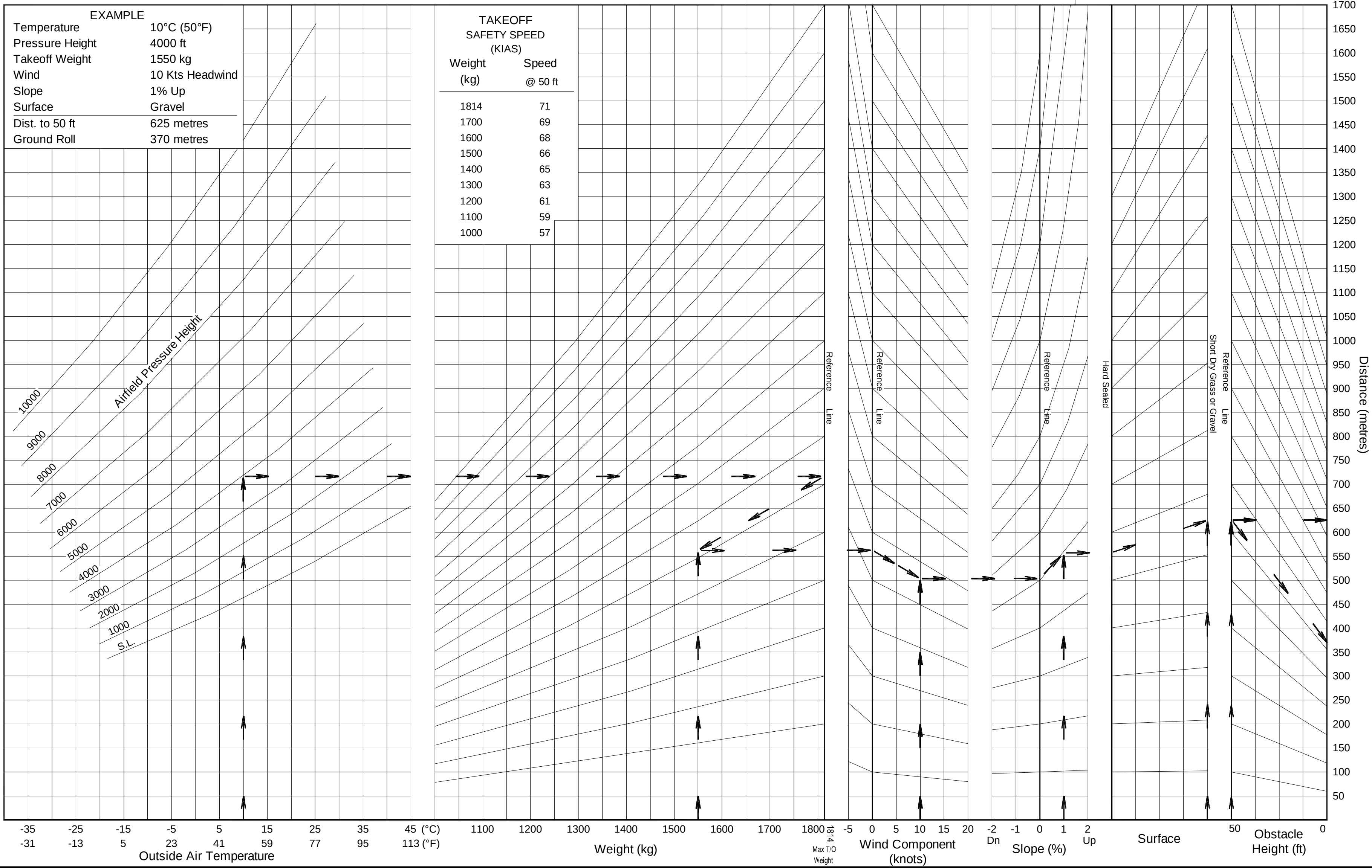
Associated Conditions
Power : 2700RPM/full throttle set before brake release
Flaps : 14°

Note
Takeoff distances are unfactored.

EXAMPLE	
Temperature	10°C (50°F)
Pressure Height	4000 ft
Takeoff Weight	1550 kg
Wind	10 Kts Headwind
Slope	1% Up
Surface	Gravel
Dist. to 50 ft	625 metres
Ground Roll	370 metres

TAKEOFF SAFETY SPEED (KIAS)

Weight (kg)	Speed @ 50 ft
1814	71
1700	69
1600	68
1500	66
1400	65
1300	63
1200	61
1100	59
1000	57



5.3 CLIMB

5.3.1 Scheduled Climb

Associated conditions:

Power: Full Throttle

Engine Speed: 2500 RPM

Airspeed: 78 KIAS

Flaps: UP

Weight (lbs)	Press Alt (ft)	**Rate of Climb** (ft/min)					
		Outside Air Temperature					
		-20°C (-29°F)	0°C (32°F)	15°C (59°F)	30°C (86°F)	45°C (113°F)	ISA
4000	0	1025	885	787	695	608	787
	2000	895	756	659	568	481	684
	4000	769	631	535	443	357	584
	6000	646	509	412	321	234	487
	8000	526	388	292	201	114	393
	10000	408	270	173	82	-	301
3600	0	1202	1054	951	855	764	951
	2000	1065	919	818	723	633	844
	4000	933	789	689	595	507	741
	6000	806	663	565	472	384	642
	8000	683	542	444	352	265	546
	10000	564	424	327	235	149	455
3200	0	1415	1256	1147	1045	949	1147
	2000	1269	1113	1006	906	812	1034
	4000	1129	976	871	773	681	925
	6000	995	845	742	646	557	823
	8000	867	720	619	525	437	725
	10000	745	601	502	410	325	633
2800	0	1681	1508	1389	1278	1174	1389
	2000	1522	1352	1237	1129	1029	1266
	4000	1370	1205	1093	988	891	1150
	6000	1226	1066	957	855	762	1042
	8000	1091	935	829	731	641	940
	10000	964	813	710	616	529	846
2400	0	2026	1831	1698	1575	1461	1698
	2000	1847	1659	1530	1412	1302	1563
	4000	1679	1496	1372	1258	1153	1436
	6000	1521	1345	1225	1116	1015	1318
	8000	1373	1204	1090	985	890	1209
	10000	1237	1075	966	867	776	1110

Associated conditions:

Power: Full Throttle
Engine Speed: 2500 RPM
Airspeed: 78 KIAS
Flaps: UP

Weight (kg)	Press Alt (ft)	**Rate of Climb** (ft/min)					
		Outside Air Temperature					
		-20°C (-29°F)	0°C (32°F)	15°C (59°F)	30°C (86°F)	45°C (113°F)	ISA
1814	0	1025	885	787	695	608	787
	2000	895	756	659	568	481	684
	4000	769	631	535	443	357	584
	6000	646	509	412	321	234	487
	8000	526	388	292	201	114	393
	10000	408	270	173	82	-	301
1700	0	1133	988	887	793	703	887
	2000	999	856	757	663	574	782
	4000	870	728	629	537	449	680
	6000	744	604	506	414	326	582
	8000	622	483	385	294	207	487
	10000	504	365	268	177	90	396
1500	0	1354	1198	1091	990	896	1091
	2000	1210	1058	952	854	761	979
	4000	1073	923	819	723	632	873
	6000	941	794	692	597	508	771
	8000	815	670	570	476	389	674
	10000	694	551	453	361	275	582
1300	0	1633	1462	1345	1236	1134	1345
	2000	1476	1309	1195	1089	990	1224
	4000	1326	1164	1053	949	853	1110
	6000	1184	1026	918	818	725	1002
	8000	1050	897	792	694	604	901
	10000	924	775	673	579	492	808
1100	0	2002	1808	1676	1554	1441	1676
	2000	1824	1637	1509	1392	1282	1542
	4000	1657	1476	1353	1239	1134	1416
	6000	1500	1325	1207	1098	998	1299
	8000	1353	1185	1071	967	872	1190
	10000	1218	1056	948	849	759	1092

5.3.2 Take-Off Configuration Climb

Associated conditions:

Power:	Full Throttle
Engine Speed:	2500 RPM
Airspeed:	71 KIAS
Flap:	14°

Sea Level Gradient of Climb: 9.4% (1:10.6)

5.3.3 Landing Configuration Climb

Associated conditions:

Power:	Full Throttle
Engine Speed:	2500 RPM
Airspeed:	65 KIAS
Flap:	38°

Sea Level Gradient of Climb: 8.3% (1:12.1)

5.4 LANDING

The landing distance charts presented on the following pages provide information to achieve the minimum landing distance for a variety of operating conditions. Charts are provided to enable landing distance to be determined using either a 3° power assisted approach or a power off glide approach. The charts also allow landing distance to be determined in feet or metres depending on the pilot's preference.

Each chart is based on landing distances from a height of 50 feet to stop. The surface corrections on the chart are based on standard factors related to strips with a firm dry surface. Wet and/or slippery surfaces will increase the landing distance over that scheduled and the pilot should therefore ensure that adequate strip length is available to cover these conditions.

The technique used in establishing the 3° Approach Landing Chart distance is such that the aircraft approaches with sufficient power to maintain a 3° approach gradient down to the 50 foot height point at the given airspeed appropriate to weight. At the 50 foot height point the power is reduced to idle. After touch down maximum wheel braking is used to bring the aircraft to a stop. Use this chart to determine maximum landing performance when using an instrument assisted landing approach.

The technique used in establishing the Power Off Approach Landing Chart distance is such that the aircraft approaches with idle power down to the 50 foot height point at the given airspeed appropriate to weight. After touch down maximum wheel braking is used to bring the aircraft to a stop. Use this chart to determine maximum landing performance when using a visual landing approach.

Extrapolation outside the boundaries of each landing distance chart is not permitted. When the outside air temperature and/or pressure height is below the lowest range scheduled on the charts, the aircraft performance shall be assumed to be no better than that appropriate to this lowest range. The performance information is not valid when the outside air temperature and/or pressure height exceeds the maximum values for which this information is scheduled.

GA8 3° APPROACH LANDING CHART - 38° FLAP (Imperial Units)

Associated Conditions

Power : 3° Power Approach to 50 ft obstacle, then Idle
Flaps : 38°

Note

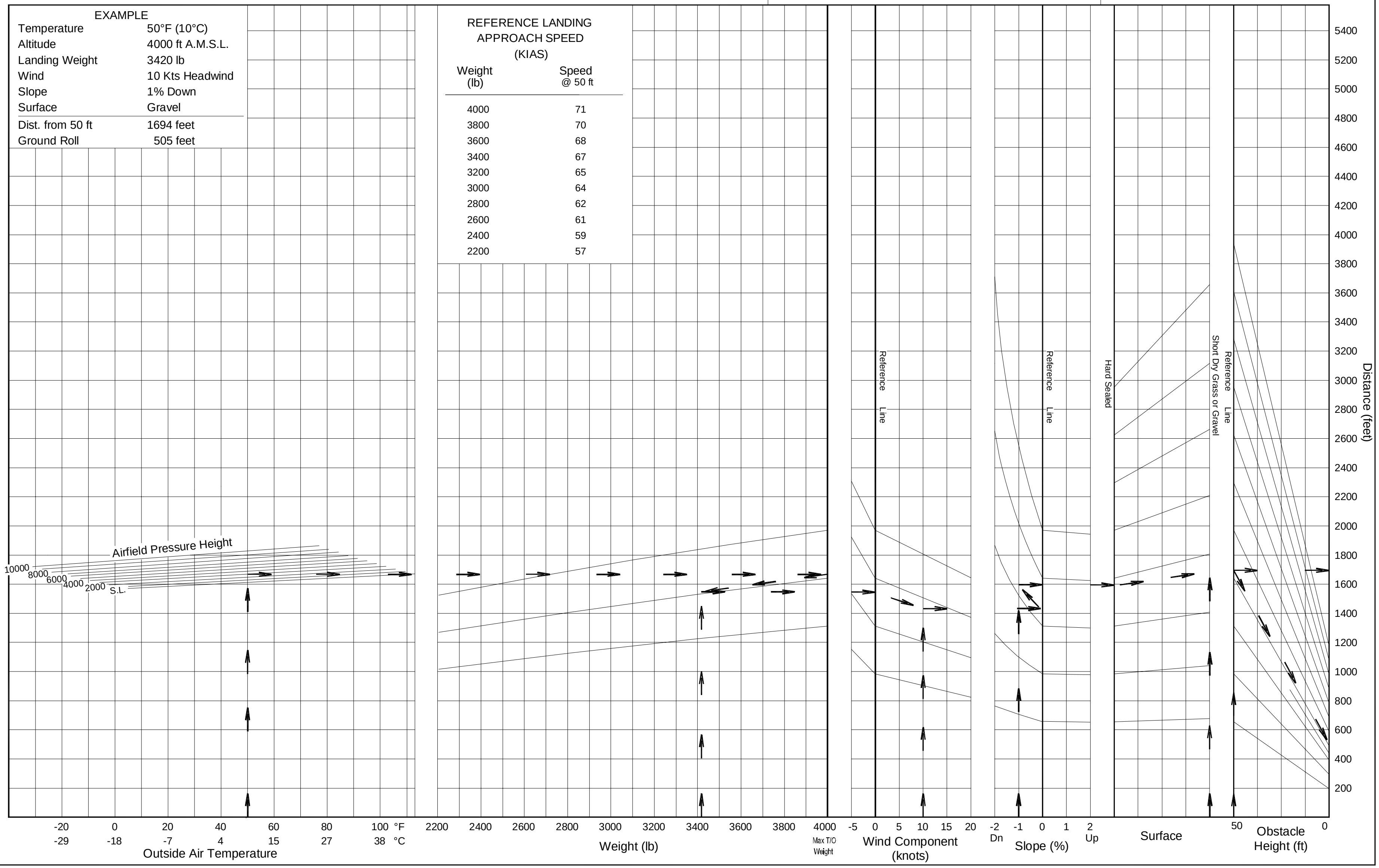
Landing distances are unfactored

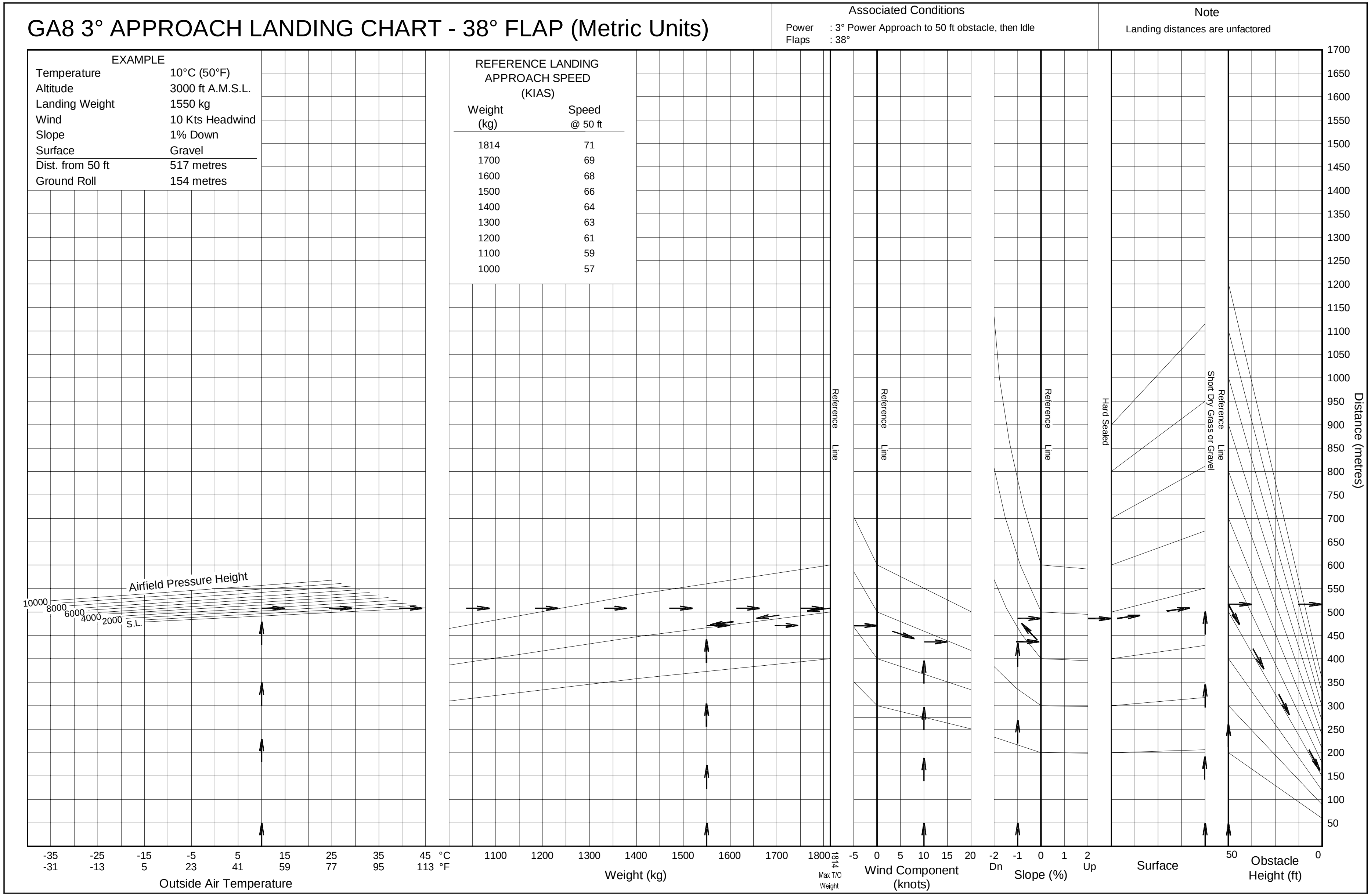
EXAMPLE

Temperature	50°F (10°C)
Altitude	4000 ft A.M.S.L.
Landing Weight	3420 lb
Wind	10 Kts Headwind
Slope	1% Down
Surface	Gravel
Dist. from 50 ft	1694 feet
Ground Roll	505 feet

REFERENCE LANDING APPROACH SPEED (KIAS)

Weight (lb)	Speed @ 50 ft
4000	71
3800	70
3600	68
3400	67
3200	65
3000	64
2800	62
2600	61
2400	59
2200	57

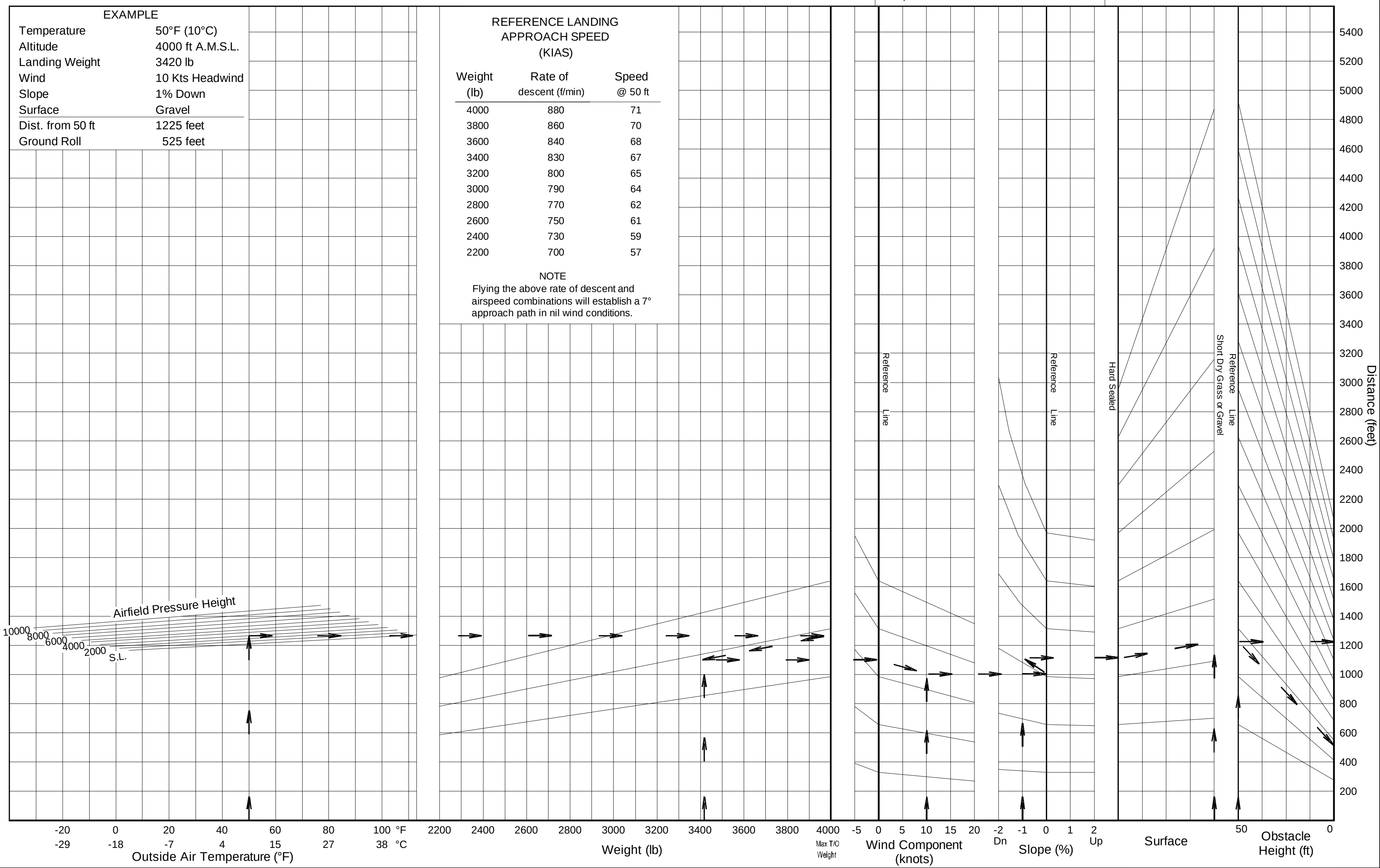



GA8 3° APPROACH LANDING CHART - 38° FLAP (Metric Units)
Associated Conditions
Power : 3° Power Approach to 50 ft obstacle, then Idle
Flaps : 38°
Note
Landing distances are unfactored
EXAMPLE
Temperature 10°C (50°F)
Altitude 3000 ft A.M.S.L.
Landing Weight 1550 kg
Wind 10 Kts Headwind
Slope 1% Down
Surface Gravel
Dist. from 50 ft 517 metres
Ground Roll 154 metres
REFERENCE LANDING APPROACH SPEED (KIAS)
Weight (kg) | Speed @ 50 ft
1814 71
1700 69
1600 68
1500 66
1400 64
1300 63
1200 61
1100 59
1000 57
Airfield Pressure Height
10000
8000
6000
4000
2000
S.L.
Reference Line
Reference Line
Reference Line
Hard Sealed
Short Dry Grass or Gravel
Reference Line
Distance (metres)
-35 -25 -15 -5 5 15 25 35 45 °C
-31 -13 5 23 41 59 77 95 113 °F
Outside Air Temperature
1100 1200 1300 1400 1500 1600 1700 1800
Weight (kg)
1814 Max T/O Weight
-5 0 5 10 15 20
Wind Component (knots)
-2 Dn -1 0 1 2 Up
Slope (%)
Surface
50 Obstacle Height (ft) 0

GA8 POWER OFF APPROACH LANDING CHART - 38° FLAP (Imperial Units)

Associated Conditions
Power : Idle power
Flaps : 38°

Note
Landing distances are unfactored



EXAMPLE	
Temperature	50°F (10°C)
Altitude	4000 ft A.M.S.L.
Landing Weight	3420 lb
Wind	10 Kts Headwind
Slope	1% Down
Surface	Gravel
Dist. from 50 ft	1225 feet
Ground Roll	525 feet

REFERENCE LANDING APPROACH SPEED (KIAS)

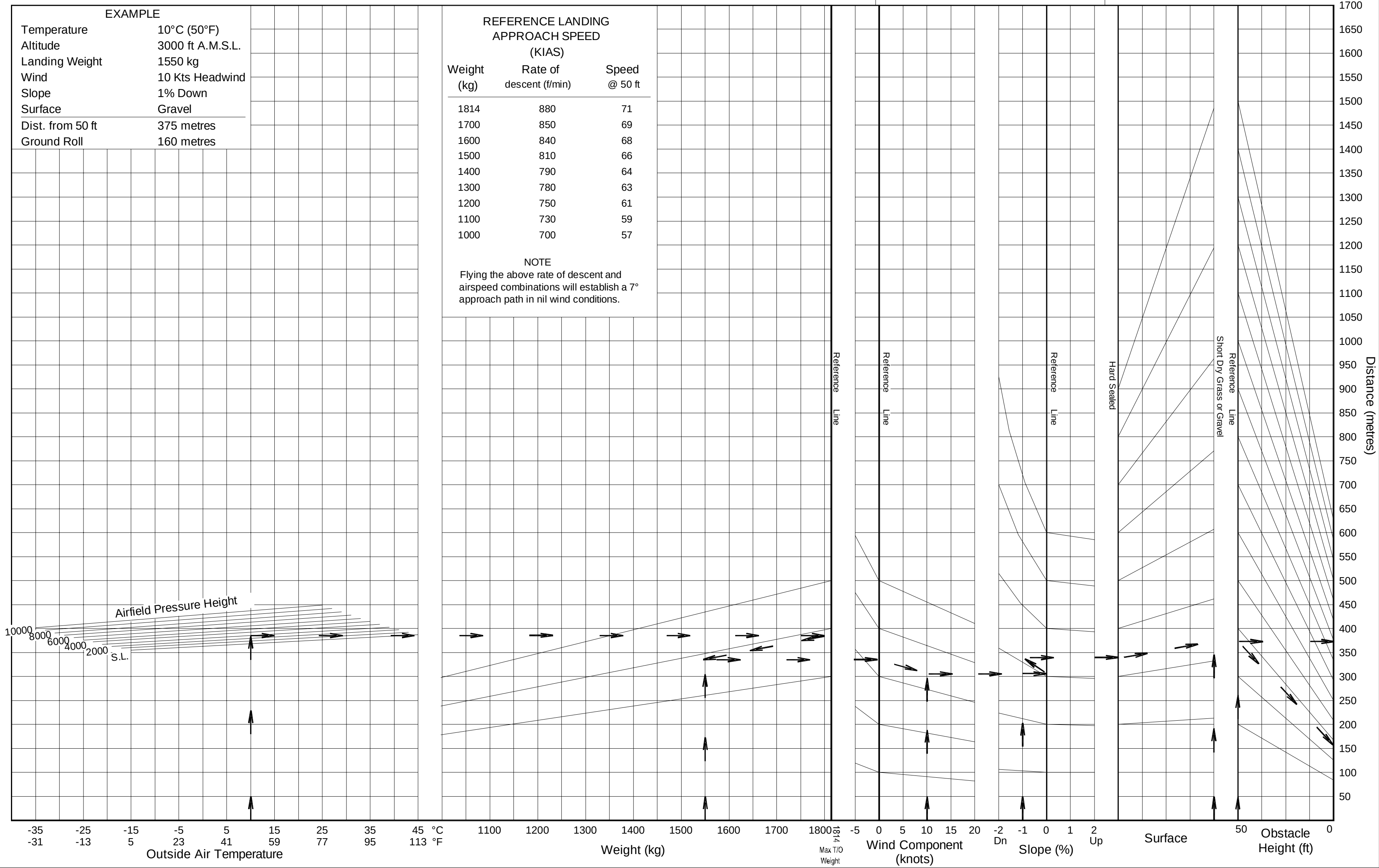
Weight (lb)	Rate of descent (f/min)	Speed @ 50 ft
4000	880	71
3800	860	70
3600	840	68
3400	830	67
3200	800	65
3000	790	64
2800	770	62
2600	750	61
2400	730	59
2200	700	57

NOTE
Flying the above rate of descent and airspeed combinations will establish a 7° approach path in nil wind conditions.

GA8 POWER OFF APPROACH LANDING CHART - 38° FLAP (Metric Units)

Associated Conditions
Power : Idle power
Flaps : 38°

Note
Landing distances are unfactored



Weight (kg)	Rate of descent (f/min)	Speed @ 50 ft
1814	880	71
1700	850	69
1600	840	68
1500	810	66
1400	790	64
1300	780	63
1200	750	61
1100	730	59
1000	700	57

5.5 AIRSPEED CALIBRATION

Conditions:

Power: As required for level flight or maximum rated RPM as appropriate.

KIAS	KCAS		
	Flaps UP	Flaps 14°	Flaps 38°
57	-	-	56
60	-	59	59
64	62	63	63
70	72	72	74
80	82	82	84
90	93	92	93
97	100	99	99
100	103	-	-
110	113	-	-
120	123	-	-
130	133	-	-
140	142	-	-
150	152	-	-
160	161	-	-
170	170	-	-
180	179	-	-
185	183	-	-

NOTE

Indicated airspeed assumes zero instrument error

5.6 STALL SPEEDS

Associated conditions:

Power: Idle
Centre of Gravity: Forward Limit
Weight: 4000 lbs (1814 kg)

	Angle of Bank							
	0°		30°		45°		60°	
Flaps	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
Up	64	62	69	67	76	74	90	88
14°	60	59	65	64	71	70	85	84
38°	57	56	61	60	67	66	80	79

NOTE

KIAS values are approximate and are based on level flight airspeed calibration data

NOTE

Stalling speeds will reduce as weight is reduced and as the centre of gravity is moved aft.

NOTE

Height loss during a straight and level stall may be up to 300 feet in some aircraft configurations.

5.7 GLIDE

The maximum horizontal distance travelled in still air has been determined to be 1.65 nautical miles per 1000 feet of altitude lost.

Associated conditions:

Power:	OFF
Airspeed:	Refer Figure 3-1 in Section 3.4.1
Flaps:	Up
Wind:	Nil
Propeller:	Stopped or windmilling in full coarse

CAUTION

Propeller windmilling in full fine will reduce glide distance considerably.

5.8 CRUISE

	Best Economy Cruise Performance				
Altitude (ft)	MAP (in.Hg)	RPM	Fuel Flow (lbs/hr)	Fuel Flow (litre/hr)	TAS (knots)
4000	23	2300	89	56	118
	24	2400	98	62	121
	25	2500	113	71	125
6000	23	2300	87	55	118
	23	2400	93	59	124
	23	2500	106	67	125
	19	2000	60	38	106
8000	22	2300	86	54	120
	22	2400	89	56	121
	22	2500	95	60	122
	20	2000	59	37	104
	17	2000	48	30	90

NOTE

The Best Economy cruise performance applies to the most forward C of G case.

The cruise performance for Best Power results in a 30~45% increase in fuel flow for a 3~5% increase in TAS.

SECTION 6

WEIGHT AND BALANCE / EQUIPMENT LIST

TABLE OF CONTENTS

Paragraph **Page**

6.1 GENERAL

This section provides the current empty/basic weight and describes the procedure for establishing the basic empty weight and moment of the aircraft. Procedures for calculating the weight and moment for various operations are also provided. A list of all equipment available from the manufacturer is included in the equipment list.

Each item of equipment fitted to the aircraft when originally delivered from the factory is indicated in the equipment list. These items are all included in the empty/basic weight of the aircraft as delivered. Any subsequent changes to the equipment fit must be recorded and the empty/basic weight and moment data amended as required by the appropriate regulations applicable in the particular country of registration.

It is the responsibility of the pilot to ensure that the aircraft is loaded correctly.

6.2 AIRCRAFT WEIGHT

6.2.1 Aircraft Weighing Procedures

1. Preparation

(a) Drain all fuel from the aircraft using the fuel drain points as required to ensure that **all the fuel** is removed, including that in the sump tank.
(b) Service engine oil as required to obtain a normal full indication.
(c) Move both front seats to central position.
(d) Raise flaps to the fully retracted position.
(e) Place all control surfaces in a neutral position.
(f) Ensure that any equipment, loose items etc. that are not considered to be part of the aircraft are removed. This includes the seats in rows 2, 3, and 4, and any tiedown netting.

2. Jacking and Levelling

NOTE

The following procedure assumes that a conventional aircraft weighing kit utilising three individual electronic load cells fitted to aircraft jacks is used to weigh the aircraft. If such a system is not available appropriate variations to the procedures will be required.

(a) Place the main jacks under the jacking points located on the front wing spar just outboard of each strut;
(b) Place a suitable fixture through the tail's tie-down point;
(c) Raise all three jacks at a similar rate until the wheels are clear of the ground. Individual jacks can then be adjusted to finally level the aircraft.

NOTE

The aircraft is longitudinally level when the two marked level points are at the same elevation. This can be determined by using a water level.

3. Weighing

With the aircraft level, record the weight shown for each load cell making any adjustments required for zero error or cell calibration.

4. Measuring

With the aircraft still level, drop a plumb bob from the firewall on the centreline of the aircraft to the ground. Drop a second and third plumb bob from each wing spar adjacent to the wing jacking points. Mark a point midway between the two wing jacking points on the aircraft centreline. Drop a fourth plumb bob from the tail jacking point. Measure and record the distance between the firewall and the midpoint of wing jacking points, and the firewall and the tail jacking point along the ground on the aircraft centre line.

5. Calculation

Use the weights and the measurement obtained to calculate the Empty Weight and C.G. as well as the Basic Empty Weight and C.G. The sample form given in Figure 6-1 may be used to assist in correctly recording and calculating these weights.

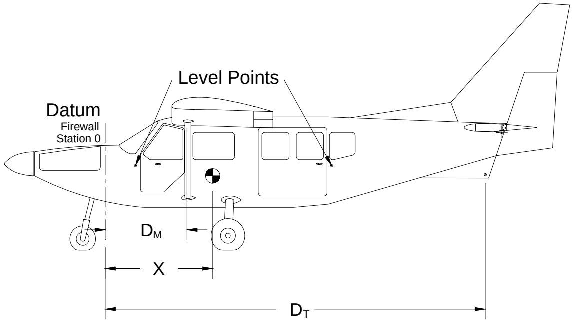
NOTE

Empty weight includes unusable fuel and full oil

6.2.2 Weight and Balance Record

Subsequent to each weighing and the establishment of new Empty and Basic Weight data, the revised data is to be recorded in the "Summary of Empty Weight Changes" section of the airframe log book. Additionally this section of the airframe log book is to be used to calculate and record any subsequent changes to the weight and balance data that may occur as a result of the installation or removal of equipment, or of changes to the aircraft structure.

The "Weight and Balance Record" (Figure 6-2) is to be amended after every change in weight and balance so that a continuous history of the current weight and balance data is available to the pilot. The latest entry will therefore be the current data.



Aircraft Registration:____________________ **Date:______________**

MEASURED DATA

Load Cell Position	Distance (in)	Reading (lb)	Adjustment (±lb)	Nett Load (lb)
Left Wing	D_M = 50.63			L =
Right Wing				R =
Tail	D_T = 242.76			T =
			Sum of Nett Loads	S=

X = CG position = [(L + R)xD_M + TxD_T] + S

i.e. X = [(____+____) x ___ + ___x____] + ____

X = _________mm

Item	Weight (lb)	Arm (in)	Moment (lb.in)
Aircraft as weighed	S =	X =	
Add unusable fuel	(sump) 13.89 (wings) 12.35	27.76 72.00	385.59 889.20
Basic Empty Weight			
Remove drainable oil	-17.42	-21.26	370.35
Empty Weight			

Figure 6-1 Aircraft Weighing Form

WEIGHT AND BALANCE RECORD

(Continuous history of changes in structure or equipment affecting weight and balance)

Aircraft Type: GA8 | Serial Number: | Aircraft Registration:

Date	Description of Modification	Weight Change Added (+) Wt (lb)	Weight Change Added (+) Arm (in)	Weight Change Removed (-) Wt (lb)	Weight Change Removed (-) Arm (in)	Running Empty Weight Wt (lb)	Running Empty Weight Arm (in)	Running Empty Weight Index (lb.in)	Authorised
	Empty Weight								

Figure 6-2 Weight and Balance Record

6.3 LOADING SYSTEM

The Loading Trim Sheets on the following pages will assist the pilot in ensuring that the GA8 is operated within the prescribed weight and centre of gravity limitations. Two types of trim sheet are provided; combined passenger/freight and freighter configurations. It is at the pilot's discretion as to which is the more appropriate trim sheet to use for any particular flight.

The cabin is divided into 6 sections for weight and balance purposes. The aft luggage bin net (P/N GA8-255011-9) must be in place whenever any articles are carried in the aft luggage bin or on the cabin baggage shelf. The aft luggage bin is intended for small/light articles only and is limited to a maximum of 50 lbs (22 kg).

Rows of the Loading Trim Sheet for the carriage of crew and passengers are divided into two scales. The first scale is 170 lb per division (77 kg per division for metric trim sheet) corresponding to the standard person weight. The second scale is 100 lb per division (50 kg per division for metric trim sheet), which can also be used when a passenger and freight occupy the same row. See example loading on the Pax/Freighter Loading Trim Sheet. A scale of 20 US gallons or 100 lb per division (50 litres per division for metric trim sheet) is provided for fuel calculations.

6.3.1 Procedure

1. Write weights of aircraft, pilot, passengers, cargo and fuel in each of the appropriate boxes down the right hand side of the sheet.
2. Add the aircraft basic weight, pilot, passengers and cargo to obtain a Zero Fuel Weight subtotal. *(The current aircraft basic weight and basic index units can be found on the Aircraft Weight and Balance Record on the previous page)*
3. Add the fuel weight to this subtotal to obtain the Aircraft Takeoff Weight.
4. On the Centre of Gravity Moment Chart draw two horizontal lines equating to the Takeoff Weight and Zero Fuel Weight.
5. Mark the Aircraft Basic Index Unit at the top of the sheet and drop a line down to the Row 1 scales.
6. Count across, to the right, the number of divisions equivalent to the weight listed for Row 1. From this point, drop a line down to the next row scale and count across, to the right, the number of divisions equivalent to the weight listed for that row.
7. Repeat **Step 6** for all appropriate rows remembering that either or both divisions can be used for any one row.
8. From the final item drop a line down on to the Centre of Gravity Moment Chart to meet the Zero Fuel Weight.
9. In the fuel section, count across to the right the number of divisions equivalent to the quantity or weight of fuel and drop a line down on to the Centre of Gravity Moment Chart to meet the Takeoff Weight.
10. If both of these two intersections are within the unhatched area of the graph, the aircraft will remain inside the Weight and Centre of Gravity envelope for all fuel states.

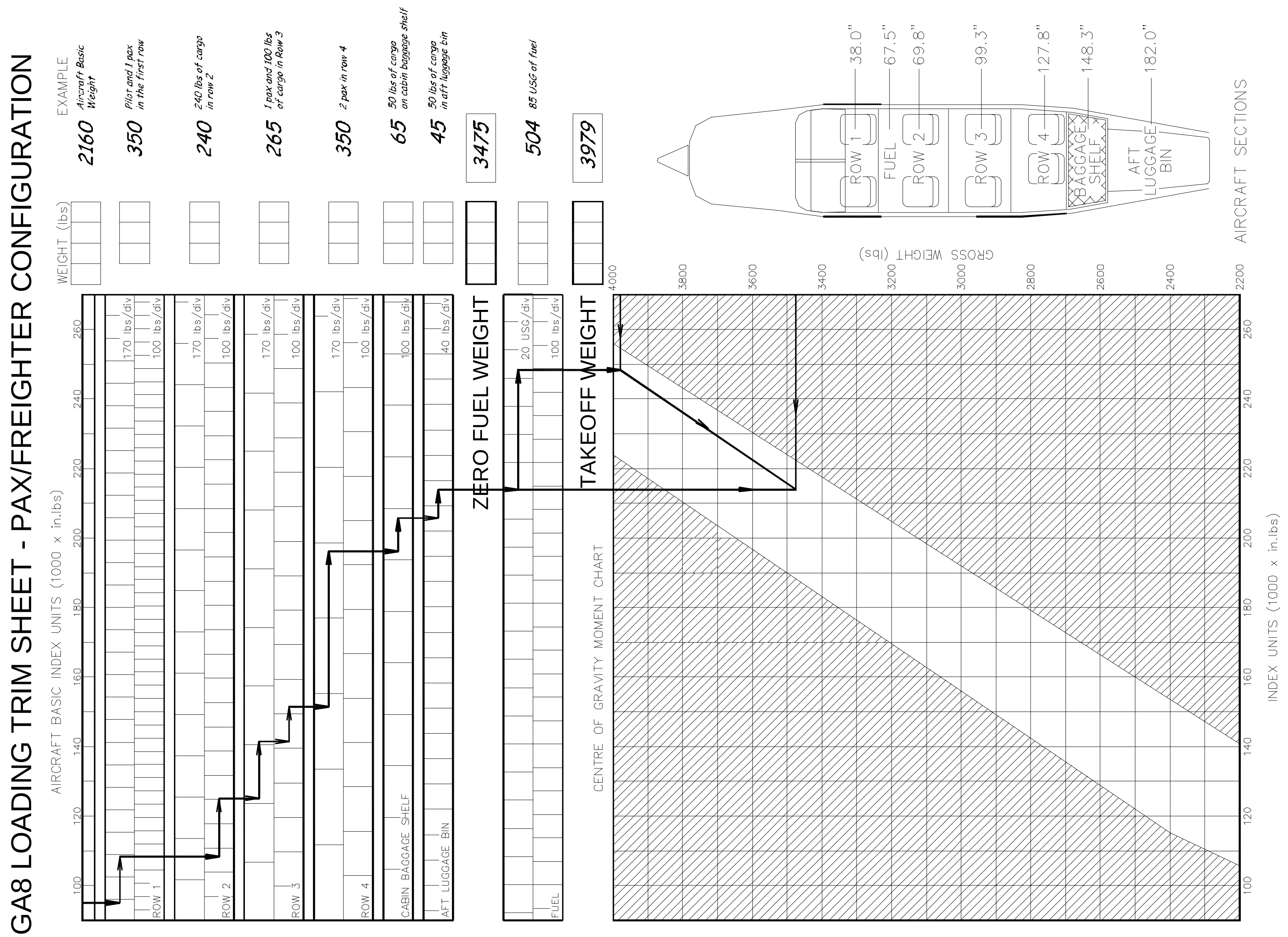


Figure 6-3a Pax/Freighter Loading Trim Sheet (Imperial/US Units)

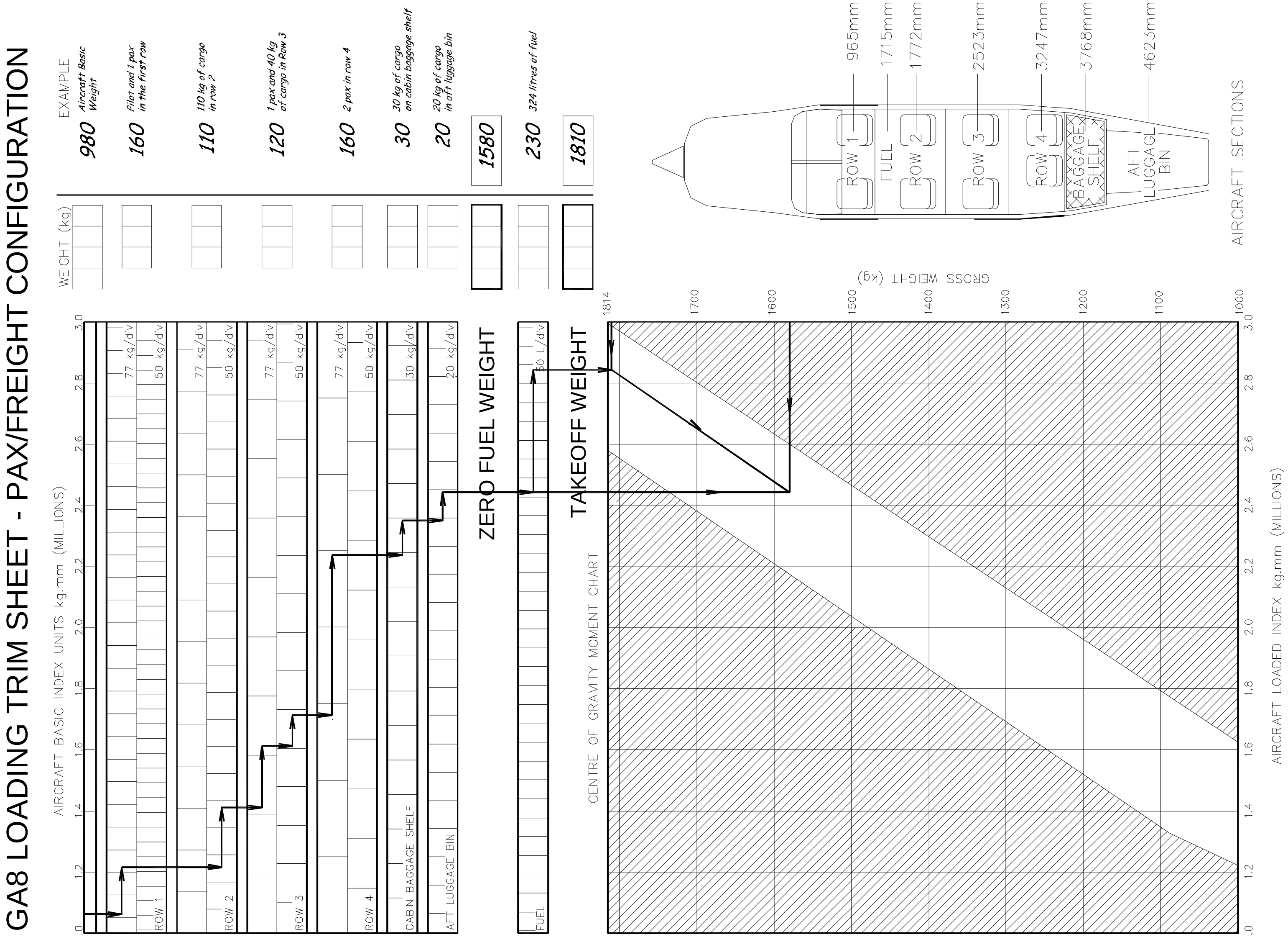


Figure 6-3b Pax/Freighter Loading Trim Sheet (Metric Units)

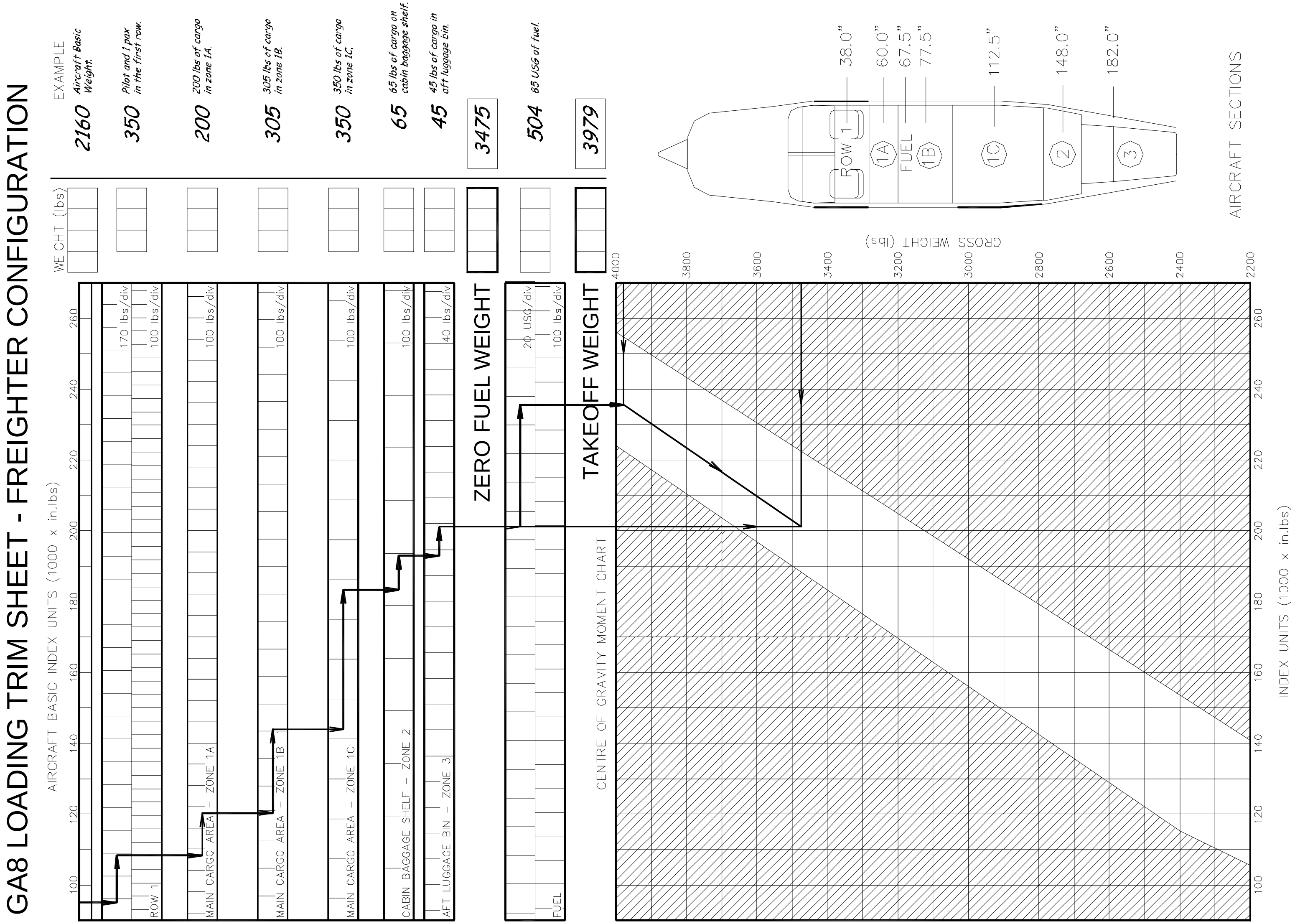


Figure 6-3c Freighter Loading Trim Sheet (Imperial/US Units)

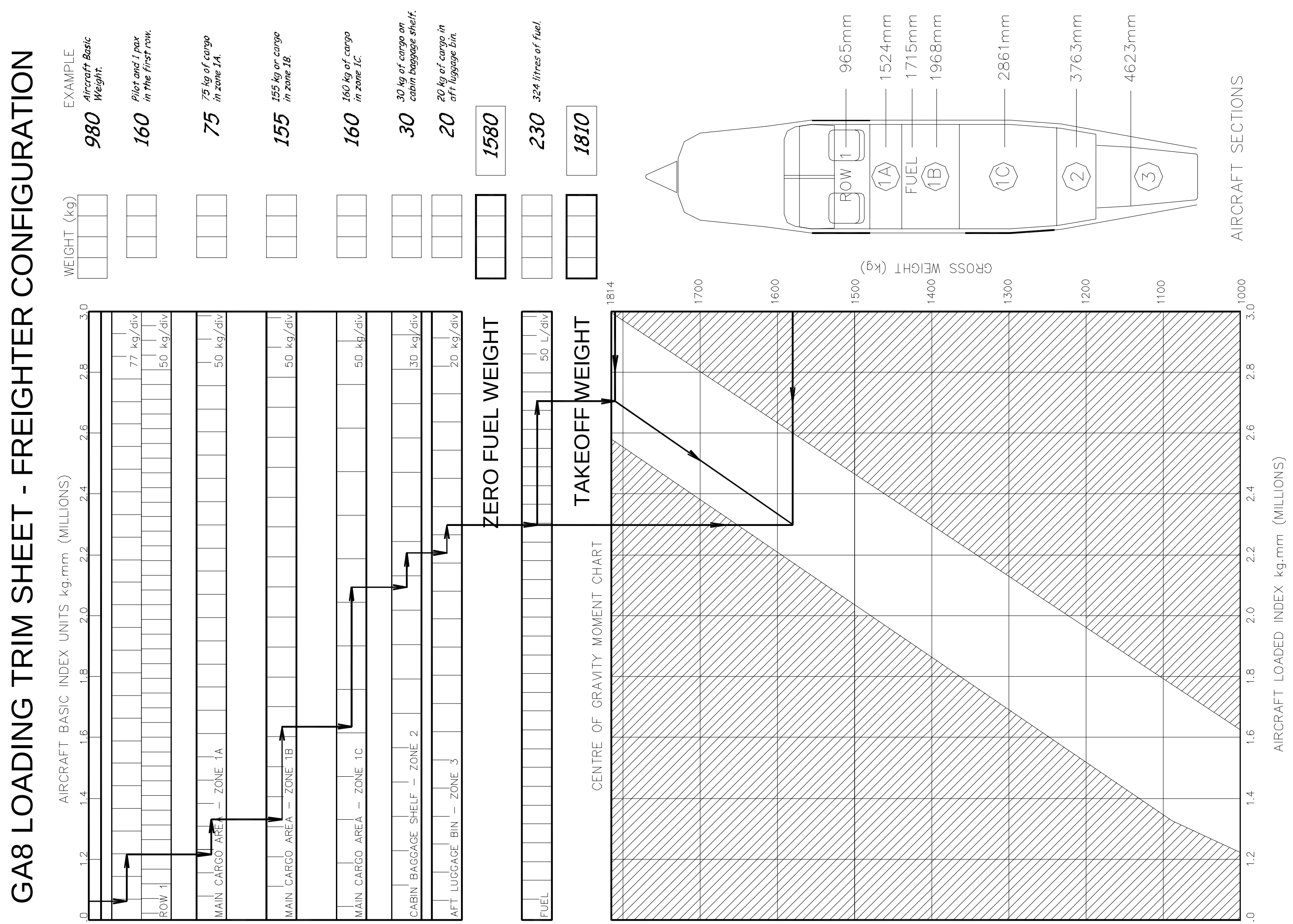


Figure 6-3d Freighter Loading Trim Sheet (Metric Units)

6.4 CARRIAGE OF FREIGHT

The aircraft is easily kept within centre of gravity limits by loading about the middle of the cabin. Forward centre of gravity is generally compromised with only two heavy crew in the front seats or with heavy freight loaded towards the front of the cabin. Aft centre of gravity is generally compromised with just the pilot and heavy freight loaded directly in through the rear cabin door.

There are three distinct areas in which freight can be carried in the GA8 as illustrated in Figure 6-4 – the main cargo area (zones 1A, 1B and 1C), the cabin baggage shelf (zone 2), and the aft luggage bin (zone 3).

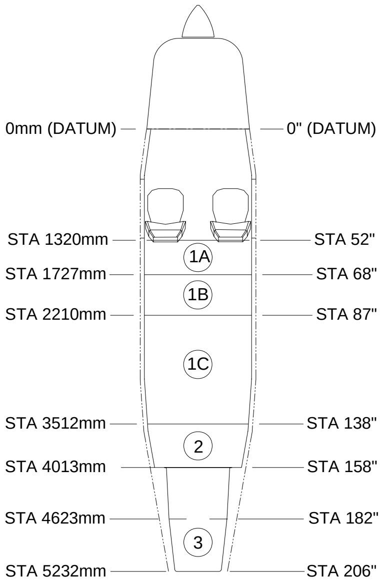


Figure 6-4

Area	Maximum Load	Maximum Load Intensity
1A – Main Cargo Area	1500 lbs (680 kg) – combined load for Area 1A, 1B and 1C	96 lbs/ft² (470 kg/m²)
1B – Main Cargo Area		206 lbs/ft² (1010 kg/m²)
1C – Main Cargo Area		51 lbs/ft² (250 kg/m²)
2 – Cabin Baggage Shelf	250 lbs (113 kg)	46 lbs/ft² (225 kg/m²)
3 – Aft Luggage Bin	50 lbs (22 kg)	17 lbs/ft² (80 kg/m²)

NOTE

If heavy objects are to be carried they should be loaded in zone 1B as this area has the highest allowable floor load intensity, and is also the best position for centre of gravity considerations

NOTE

Maximum floor load intensity must not be exceeded. Items of freight that exceed the maximum floor intensity loading must be secured to shoring or pallets capable of spreading the load to below maximum load intensity limits.

6.4.1 Cargo Net Ratings

The cargo net rating refers to the maximum weight of freight that can be restrained using the appropriate net in accordance with the manufacturer's recommended freight restraining procedures.

Main Vertical Net and Throwover Net: 1500 lbs (680 kg)

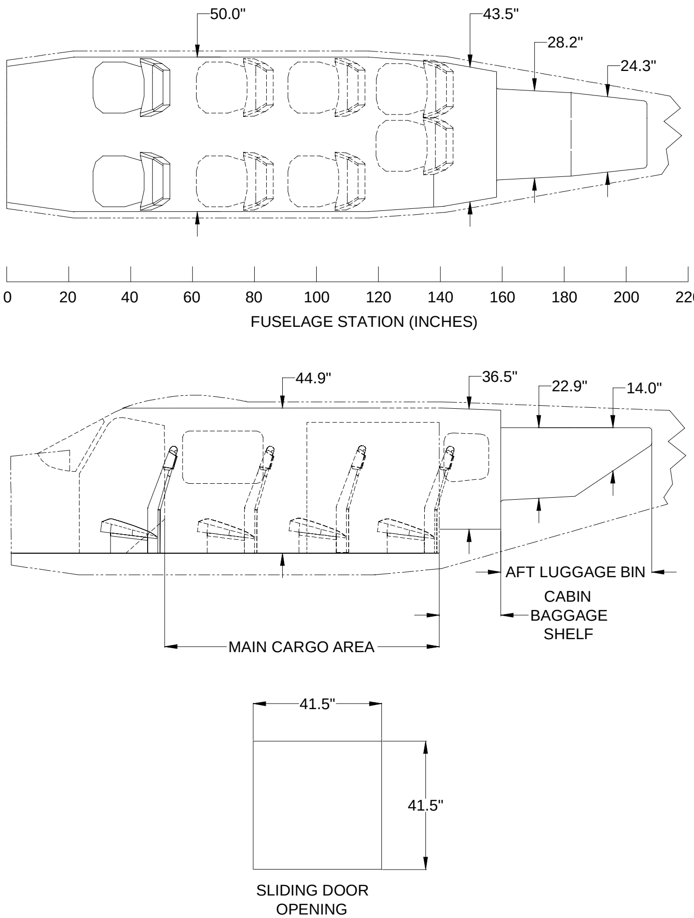
NOTE

The throwover net is designed to be used in conjunction with the main vertical net and NOT as a standalone net. It is recommended that the throwover net be used in all cargo restraining configurations as it minimises the possibility of freight moving in the cabin which may result in shifting the aircraft's centre of gravity.

Cabin Baggage Shelf Net: 250 lbs (113 kg)

Aft Luggage Bin Net: 50 lbs (22 kg)

6.4.2 Interior Dimensions



	Length (in)	Width (in)	Height (in)	Volume (ft^3)
Main Cargo Area	86.0	50.0	44.9	111.7
Cabin Baggage Shelf	20.0	42.0	36.5	17.7
Aft Luggage Bin	-	-	-	13.0

Figure 6-5 Aircraft Interior Dimensions

6.4.3 Restraining Procedure

Main Cargo Area

The restraint of freight in the main cargo area is achieved through the use of a main vertical net (GA8-255011-13) and a throwover net with adjustable strap assemblies (GA8-255011-15). The main vertical net clips into the roof anchor plates and into either of the two rows of floor anchor plates for the front row passenger seats. Refer to Figure 6-6.

The throwover net's hook and keepers clip onto "dee rings" found on the main vertical net and depending on the size of the freight being restrained the end of the net with the cargo feet can be clipped into any row of floor anchor plates and then using the adjustable strap assemblies the net shall be pulled taught.

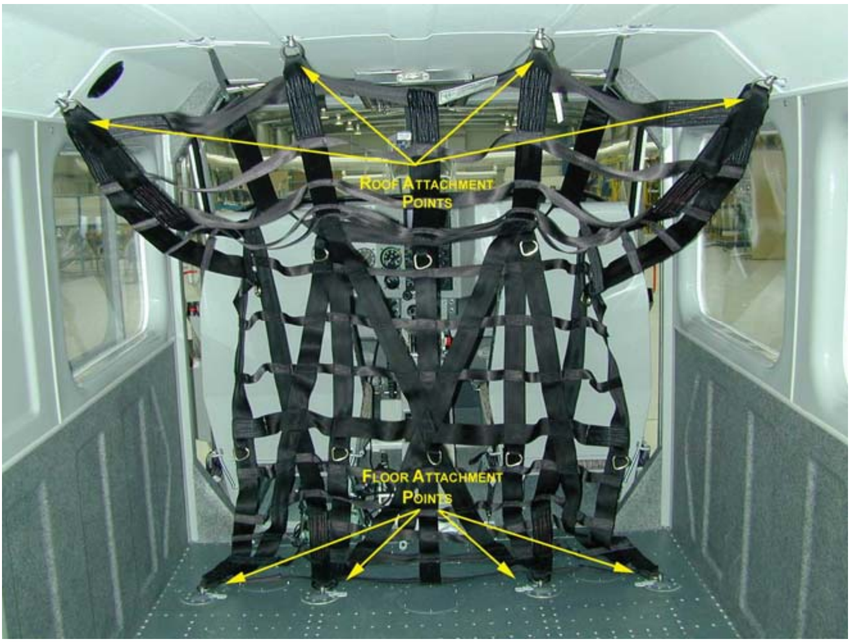


Figure 6-6 Main Vertical Cargo Net Attachment

WARNING

The main net must have all its cargo feet clipped into the correct anchor plates, ie. the cargo feet at the top of the net clip into the roof anchor plates and the cargo feet at the bottom of the net clip into the floor anchor plates.

Cabin Baggage Shelf Area

The restraint of freight in the cabin baggage shelf area is achieved through the use of a cabin baggage shelf net (P/N GA8-255011-11) with adjustable strap assemblies. All eight fittings on the net must be used for proper functioning of the net. There are four fittings on the bottom of the net that must always be clipped into the four anchor plates located at the front of the cabin baggage shelf floor. There are fittings on each side of the net that must be clipped in to the respective wall anchor plates. Lastly, there are two fittings at the top of the net that must be clipped into the corner roof anchor point (see Figure 6-7 for details) or the rear shelf floor mounted anchor points. The net shall be pulled taught through the use of the adjustable strap assemblies sewn on the net to insure adequate clearance from any passengers sitting in the rear row of seats.

Figure 6-7 Cabin Baggage Shelf Net Attachment

WARNING

The cabin baggage shelf net must have all its cargo fittings clipped into the correct anchor plates, ie. the two cargo feet at the top of the net clipped into the roof anchor plates or the rear floor anchor plates, and the cargo fittings at the bottom and side of the net clipped into the forward floor and wall anchor plates respectively.

Aft Luggage Bin Area

The restraint of freight in the aft luggage bin is achieved through the use of the aft luggage bin net (P/N GA8-255011-9). The net is attached to the top of the aft cabin bulkhead by an extruded aluminium section, and is secured by a steel tube integral with the bottom edge of the net that fits into a hole on each side of the bulkhead opening.

When securing the net, insert the left hand end (when viewed looking aft) of the steel tube into the left bulkhead hole. Keep sliding the tube until the right hand end of the tube fits between the bulkhead opening. Then insert the right hand end of the tube into the right hand hole and slide the tube back to the right.

To gain access to the bin, reverse the above procedure.

Figure 6-8 Aft Luggage Bin Net Attachment

6.5 EQUIPMENT LIST

The following equipment list provides details of equipment that is fitted as standard in the GA8 aircraft, or is available from the manufacturer as an option. A separate list of all equipment fitted in each particular GA8 is provided in the aircraft log book.

The columns in the equipment list contain the following information:

1. Opt.Code An **O** indicates that the item of equipment is available as an optional fitment from the manufacturer.

2. Description Description of the item of equipment and the relevant manufacturer's or Gippsland Aeronautics part number.

3. Weight Weight of the item of equipment in pounds (and kilograms).

4. Arm Arm of the item of equipment in inches (and millimetres).

Unless otherwise indicated, the installation certification basis for the equipment included in this list is the aircraft's approved type design. Equipment fitted in the field after delivery must be fitted in accordance with approved data. This can be approved data obtained from the manufacturer, or data approved locally in accordance with appropriate regulations.

Opt. Code	Description	Weight lb (kg)	Arm in (mm)
	Engine: Lycoming IO-540-K1A5. Includes starter, injector, spark plugs and oil filter assembly	443.1 (201)	-25.6 (-650)
	Exhaust Manifold and Muffler: GA8-781011-1 (LH) GA8-781011-2 (RH)	23.1 (10.5)	-19.7 (-500)
	Alternator: GA8-243012-11	10.1 (4.6)	-38.4 (-975)
	Oil cooler: Niagra NDM 20006A (each)	3.1 (1.4)	-14.8 (-375)
	Propeller: Hartzell HC-C2YR1BF/F8475R	52.0 (23.6)	-48.0 (-1220)
	Spinner Assembly: Hartzell A2298-2P	5.3 (2.4)	-50.0 (-1270)
	Governor: McCauley D-20893	3.1 (1.4)	-39.4 (-1000)
	Artificial Horizon: Sigmatek 23-501-06-16	2.0 (0.9)	13.8 (350)
	Directional Gyro: Sigmatek 19262-001-9	2.6 (1.2)	13.8 (350)
	Turn Co-ordinator: Mid Continent 1394T100-7Z	2.5 (1.1)	13.8 (350)
	Airspeed Indicator: GA8-341012-11	0.9 (0.4)	13.8 (350)
	Altimeter: United 5943PM-3	0.9 (0.4)	13.8 (350)
	Vertical Speed Indicator: United 7000	0.7 (0.3)	13.8 (350)
	Fuel Quantity Indicator: GA8-284011-11	0.2 (0.1)	13.8 (350)
	Fuel Pressure Indicator: GA200-733311-15	0.4 (0.2)	15.7 (400)
	Oil Pressure Gauge: GA8-793011-11	0.4 (0.2)	15.7 (400)
	Oil Temperature Gauge: GA200-793311-13	0.2 (0.1)	15.7 (400)
	Tachometer: GA8-771013-11	0.9 (0.4)	14.2 (360)
	Manifold Pressure Indicator: GA8-774011-11	0.9 (0.4)	14.2 (360)

Opt. Code	Description	Weight lb (kg)	Arm in (mm)
	Vacuum Gauge: UMA 3-200-12	0.2 (0.1)	15.7 (400)
	Cylinder Head Temperature: GA200-772011-11	0.2 (0.1)	15.7 (400)
	Exhaust Gas Temperature: Alcor 211-110	0.2 (0.1)	15.7 (400)
	Outside Air Temperature: Scott 2716-00	0.2 (0.1)	38.0 (965)
	Fuel Flow Meter: JPI FS450	0.2 (0.1)	15.7 (400)
	Volts/Amps Indicator: EI VA-1A-50	0.2 (0.1)	15.7 (400)
	Battery: Concorde RG-35A	29.5 (13.4)	42.5 (1080)
O	GPS: Bendix King KMD 150	3.3 (1.5)	12.0 (305)
O	GPS: Bendix King KLN 94	3.6 (1.6)	12.0 (305)
O	Intercom: Bendix King KMA-24H	1.8 (0.8)	12.0 (305)
O	VHF COMM: Bendix King KY-97A	2.9 (1.3)	12.0 (305)
O	Transponder: Bendix King KT-76A	3.1 (1.4)	12.0 (305)
O	ADF: Bendix King KR-87	6.6 (3.0)	12.0 (305)
O	NAV/COMM: Bendix King KX-165	5.7 (2.6)	12.0 (305)
O	ELT: ACK E-01	3.4 (1.6)	214.0 (5435)
	Fire Extinguisher: Chubb B0150S	5.5 (2.5)	37.4 (950)
O	Carpet	12.1 (5.5)	80.0 (2032)

Opt. Code	Description		Weight lb (kg)	Arm in (mm)
	Pilot Seat: GA8-251011-11		21.2 (9.6)	42.3 (1075)
O	RH Front Seat (Row 1): GA8-251011-11		21.2 (9.6)	42.3 (1075)
O	Passenger Seat (Row 2):	GA8-252011-11 (LH) GA8-252011-12 (RH)	13.9 (6.3)	75.8 (1925)
O	Passenger Seat (Row 3):	GA8-252011-11 (LH) GA8-252011-12 (RH)	13.9 (6.3)	105.4 (2677)
O	Passenger Seat (Row 4):	GA8-252011-11 (LH) GA8-252011-12 (RH)	13.9 (6.3)	133.9 (3401)
O	Main Vertical Cargo Net: GA8-255011-13		4.9 (2.2)	-
O	Main Throwover Cargo Net: GA8-255011-15		14.3 (6.5)	-
O	Cabin Baggage Shelf Net: GA8-255011-11		6.6 (3.0)	-
	Aft Luggage Bin Net: GA8-255011-9		2.2 (1.0)	157.3 (3995)
	Additions/Deletions			

SECTION 7

AIRCRAFT & SYSTEMS DESCRIPTION

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7.1 INTRODUCTION

This section provides descriptions of the aircraft and it's systems as well as methods of operation where appropriate. Optional equipment may be installed.

7.2 AIRFRAME

The GA8 is an eight place, single engine, high wing monoplane utilising stressed metal skin construction. The aircraft is designed for passenger and/or freight type operations. Seating is provided in the passenger configuration for the pilot and seven passengers in four rows of two seats. The passenger seats are easily removed to convert the aircraft for freight operations.

WINGS: The wings are of all metal stressed skin construction, but are externally braced with a streamline section strut that bolts to the lower fuselage members and wing spar fittings. The main fuel tanks are incorporated in the inner wing panels between the main and rear wing spars and between the wing strut attachment fittings and the fuselage. The wing tips are removable for easier access to the internal wing structure and for easy replacement. The ailerons are fully balanced and are cable controlled out to the aileron, then actuated via a bellcrank and pushrod. The wing flaps are mechanically operated.

FUSELAGE: The fuselage is of all metal stressed skin aluminium construction. It is corrosion protected by being treated with P14 or equivalent primer and two part enamel or equivalent externally. Numerous inspection panels are supplied both internal and externally allowing ease of maintenance, inspection of the control cables, and cleaning the interior of the rear fuselage.

EMPENNAGE: The empennage consists of the fin, rudder, adjustable stabiliser, and elevators. All are constructed of 2024 Aluminium alloy sheet and are of stressed skin design.

7.3 FLIGHT CONTROLS

The aircraft's flight control system consists of conventional aileron, rudder and elevator control surfaces. These are manually operated by conventional cable linkages. The control column is of a wheel and yoke variety. The control column actuates the ailerons and elevators in the conventional manner while the rudder pedals operate the rudder.

The aileron and elevator controls may be locked by securing the control column with the pilot's seat belt when the aircraft is parked on the ground. This will prevent damage to these systems by wind buffeting.

Trim System The elevator trim control is located on the left side of the cockpit centre console and consists of a cable operated trim drum arrangement to adjust the stabiliser angle of incidence. Selection of nose up trim pivots the leading edge of the stabiliser downwards.

7.4 INSTRUMENT PANEL

Although the instrument panel spans the width of the cockpit, all instruments are on the left hand side in front of the pilot. Radio and navigation aids are stacked in line with the centre console but are canted towards the pilot for ease of observation. The right hand side may contain any additional radios or a group of 6 flight instruments for use by a flight instructor when the aircraft is fitted with dual controls for training purposes.

Figure 7-1 Typical Instrument Panel Layout

7.5 GROUND CONTROL

The GA8 aircraft is fitted with mechanical linkage from the rudder pedals to the nose wheel. This gives the ground handling a direct feel. The minimum turning radius is approximately about the wingtip. Ground handling is via a towbar attached to two pegs located just above the nose wheel fork. The aircraft is easily manoeuvred by one person provided the aircraft is empty.

7.6 WING FLAP SYSTEM

The wing flaps are of the single slotted type with three selectable positions; Up, 14° and 38°. The position of the flaps is determined by notches engaged by the operating lever on the right hand side of the pilot's seat. The flap handle acts as the flap position indicator. The selected position can be easily confirmed by visual observation.

The flap system is cable and push rod actuated. The flaps are extended by cable tension provided by the flap operating lever acting on a torque tube and push rod mechanism. They are retracted by a return cable in opposition to the extension mechanism. The flap structure has been designed to withstand all air loads but has not been designed as a grab handle for passengers getting in and out of the rear cabin door. The flap skin is thin sheet aluminium and is easily creased.

7.7 UNDERCARRIAGE SYSTEM

The main undercarriage is of 5160 chrome steel tapering tube. Cleveland wheel and brake assemblies are fitted and are equipped with 6 ply rating 8-50 x 6 tyres. The nose wheel undercarriage is an oil damped coil spring strut with steering via scissor link and pushrods direct from the rudder pedals. The nose wheel is a Cleveland assembly with 6-00 x 6 tyre. Refer to Section 8 for the recommended tyre pressures.

7.8 SEATS

All seats in the GA8 comply with FAA crashworthiness requirements. The seat base is designed to crush in the event of an accident that induces large vertical decelerations. If the seat is dented, creased or damaged in anyway (maybe due to mishandling, being knocked with cargo or kicked by passengers) it should be taken out of service. **UNDER NO CIRCUMSTANCES SHOULD IT BE REPAIRED**. No repair patches or replacement material should be added to the seat as this will compromise its crashworthiness. The seat should be returned to the manufacturer for assessment and repair or replacement.

The pilot seat is mounted on rails attached to the cockpit floor structure. Two locking pins are provided to enable fore and aft adjustment as desired. They are found on each side of the seat toward the rear and should both be locked downward before each flight.

7.9 OCCUPANT RESTRAINT HARNESSES

Both front seats are fitted with four point restraint harness assemblies. An inertia reel is fitted to the shoulder straps. The clasp arrangement requires a turn either way of the central knob for release.

Rear cabin seats are fitted with three point automotive style restraint harness assemblies. An inertia reel is fitted to the shoulder strap. The clasp arrangement requires the depressing of the red slider for release.

7.10 ENTRANCE DOORS

A forward opening cockpit door is fitted to each side of the aircraft. The door latch is a simple rotary latch operated by a handle on both the inside and out. These doors also act as emergency exits.

A forward sliding rear cabin door is provided on the left hand side of the aircraft. The door latch is located at the rear end of the door, and is a two part operation to unlock. From the inside, the handle is pulled inwards, then rotated forward where upon the door slides freely. From the outside, depress the button above the handle with one hand and then rotate the handle with the other hand, where upon the door begins to slide. For closing, the door is slid closed and the handle rotated from either inside or outside until it locates into the lock detent.

Opening of the doors in flight is approved in an emergency such as for smoke or fume evacuation and for special operations in accordance with approved supplements. Although flight handling is not affected with the door open, airspeed should be restricted to a maximum of approximately 100 KIAS to minimise air loads on the open door.

7.11 ENGINE

The aircraft is fitted with a Lycoming IO-540-K1A5 horizontally opposed, six cylinder, overhead valve, air cooled, fuel injected engine with an air cooled wet sump oil system. The engine is rated at 300 BHP maximum take-off power with full throttle and 2700 RPM, and 275 BHP maximum continuous power with full throttle and 2500 RPM.

CAUTION

These engines are equipped with a dynamic counter-weight system and must be operated accordingly; avoid high engine speed, low manifold pressure operation. Use a smooth, steady movement of the throttle (avoid rapid opening and closing). If this warning is not heeded, there could be severe damage to the counter-weights, rollers and bushings.

Engine Controls Engine power is controlled by a throttle located in a throttle quadrant on the centre console to the right of the pilot. It is readily identified by a smooth black cylindrical knob. The throttle operates in the conventional sense in that when fully forward the throttle is full open, and in the fully aft position, the throttle is closed.

The propeller control is located on the throttle quadrant to the right of and on a shorter arm than the throttle control. It is fitted with a blue knob with lateral grooves for identification. The full fine, takeoff position is fully forward and the coarse position is fully aft.

The mixture control is located on the throttle quadrant to the right of the propeller control. It is fitted with a red knob with raised points around the circumference for identification. The full rich position is fully forward, and fully aft is idle cut off.

The alternate air control is a push-pull control located beneath the throttle quadrant. With the control pushed fully forward (in), cold filtered air is selected. Fully aft (out) selects warm unfiltered air from within the engine compartment. If the induction air filter becomes blocked, the alternate air valve will automatically open. An amber caution light will illuminate on the instrument panel if the valve opens, whether manually or automatically, to warn the pilot of its operation.

Engine Instruments Engine operation is monitored by a tachometer, manifold pressure gauge, fuel pressure and fuel flow gauges, oil pressure and oil temperature gauges and a cylinder head temperature gauge. These instruments are located in the instrument panel in front of the pilot and are marked with green arcs to indicate the normal operating range, yellow arcs to indicate precautionary ranges and red lines at the maximum/minimum allowable limits. These limits and gauge markings are also given in Section 2 of this manual.

Engine Oil System Oil for engine lubrication is supplied from a sump at the bottom of the engine. The oil capacity of the engine is 12 US quarts (11.4 litres). Oil is drawn from the sump through an oil suction strainer screen into the engine driven oil pump. Oil passes from the pump to a thermostatically controlled bypass valve. If the oil is cold, the bypass valve allows the oil to bypass the oil cooler and flow directly to the filter. If the oil is hot, the bypass valve routes the oil from the accessory case through flexible hoses to the oil cooler. On returning to the accessory case, the oil passes through the full flow replaceable element oil filter. The filtered oil then enters a pressure relief valve that regulates the engine oil pressure by allowing excessive oil to return to the sump, while the remaining oil under pressure is circulated to the various engine components for lubrication. Residual oil returns to the sump by gravity flow.

An oil filler cap/dipstick is located on the top of the engine and is accessible through an access door in the engine cowling. The dipstick is calibrated in US quarts**.** To minimise possible loss of oil through the breather, normally 10-11 US quarts as measured on the dipstick is sufficient for routine operations rather than the full 12 US quarts. For engine oil grade and specifications, refer to Section 2 of this manual.

An oil pressure indicator and red oil pressure warning light is provided on the instrument panel.

WARNING

The absolute minimum safe oil quantity in the sump is 2.8 US quarts (2.7 litres). If the engine is to be operated below the recommended operating oil quantity of 9 US quarts (8.5 litres) the oil consumption should be closely monitored.

New Engine Break-in and Operation The engine has undergone a run-in at the factory and is ready for normal operation. It is suggested, however, that a minimum of 65% and preferably 75% power be used for cruising until a total of 50 hours has accumulated or until the oil consumption has stabilised. This will assist with proper seating of the rings and minimise the possibility of cylinder wall glazing. This procedure also applies following cylinder replacement or top overhaul of one or more cylinders.

CAUTION

Straight mineral oil should be used during the break-in period. Refer to Section 2 of this manual for specifications.

Ignition System Engine ignition is provided by two engine driven magnetos, as well as two spark plugs in each cylinder. The right magneto fires the upper right and the lower left spark plugs, and the left magneto fires the upper left and the lower right spark plugs. Normal operation is conducted with both magnetos on due to the more complete burning of the fuel-air mixture with dual ignition sources. The individual magnetos are selected using the conventional OFF-R-L-BOTH-START key switch located on the left hand side of the instrument panel.

Starting System The electrically driven starter motor is mounted at the front of the engine. When energised, the starter motor pinion engages a ring gear that is fitted to the flywheel/alternator pulley. When the master switch is on, turning the magneto key to the spring loaded start position energises the starter solenoid located near the battery and this in turn energises the starter motor.

If the engine is underprimed (most likely in cold weather with a cold engine) it will not fire at all. Additional priming will be necessary. When hot it may require none and may start with the throttle just cracked open. Experience with the individual engine will enable the pilot to make the correct judgment on this. Weak intermittent firing followed by puffs of black smoke from the exhausts usually indicates overpriming or flooding. Excess fuel can be cleared from the combustion chambers sufficiently to allow the engine to start by applying the following procedure: set the mixture control in ICO, fuel pump off, throttle full open, and engage the starter. When the engine fires retard the throttle and advance the mixture lever. When operating with a hot engine or in hot conditions the fuel pump may be used to ensure smooth engine idling and operations.

Air Induction System The engine induction air normally enters through an intake chamber on the underside of the engine cowl behind the propeller spinner. This intake has a replaceable element air filter incorporated which removes dust and other foreign matter from the induction air. After passing through the air filter, the air enters the inlet to the intake air plenum that is mounted off the injector unit on the rear left side of the engine. The plenum is fitted with spring loaded valve that will supply air to the engine in the event that the air filter becomes severely or completely blocked. This valve may be manually operated by the alternate air control beneath the throttle quadrant. After passing through the plenum, the air enters the inlet to the Bendix RSA fuel injection servo regulator. The inlet air is then ducted to the engine cylinders through intake manifold tubes. The servo regulator monitors air flow passing through it and meters fuel in direct proportion giving the proper fuel/air mixture at all engine speeds.

Exhaust System Two separate slip jointed exhaust manifold assemblies are fitted, one for the left bank of cylinders and one for the right. Mufflers are fitted which include heat exchangers for cabin heating and the exhaust pipes exit out through the lower side of the engine cowl.

Fuel Injection System The engine is equipped with a Bendix RSA fuel injection system that is composed of two primary components, a servo regulator and a flow divider. The servo regulator regulates fuel pressure by means of a servo valve using airflow signals. When this regulated pressure is applied across the fuel control jetting this provides a fuel flow that is proportional to the airflow. The air/fuel ratio is controlled, within limits, by the mixture control. The flow divider is the device that ensures the correct distribution of metered fuel to each cylinder fuel nozzle.

Cooling System Ram air for engine cooling enters through two intakes at the front of the engine cowl. The cooling air is directed around the cylinders and other areas of the engine by appropriate baffles and is then exhausted through an opening in the rear of the lower cowl. Air for oil system cooling enters the lower intake chamber and flows through two oil coolers at the back of the chamber. The air then exhausts out the lower cowl opening with the engine cooling air.

7.12 PROPELLER

The aircraft is equipped with a two blade constant speed Hartzell model HC-C2YR-1BF/F8475R propeller. The propeller blades are of forged aluminium construction and anodised to reduce corrosion. The blades are fitted to a lightweight forged alloy hub that houses the pitch changing mechanism. The propeller is operated by engine oil, the flow of which is regulated by an engine mounted governor. The propeller is 84 inches (2134 mm) in diameter.

7.13 FUEL SYSTEM

The GA8 fuel system consists of an integral fuel tank in each wing, a sump fuel tank in the fuselage floor and associated plumbing. Fuel gravity feeds from the front and rear inboard corner of each tank. The two delivery pipes from each side join together in the fuselage wall below the wing. The resulting single delivery lines from each side continue down to an area below the forward right hand seat. There, each fuel line goes through individual service taps and into drainable fuel strainer bowls with serviceable mesh screens. These taps are for servicing the strainer bowls only and cannot be actuated by the pilot. From the strainer bowls the fuel feeds to the sump tank through individual float valves. The float valves are arranged so that the (laterally) low wing tank predominantly feeds the sump tank. The dual float valves avoid the operational problems involved with fuel tank selection whilst eliminating fuel tank crossfeed, and ensures that the fuel system does not continue to be fed from the wing high tank to the detriment of lateral trim. From the sump tank fuel flows through an electric boost pump then forward through the fuel shutoff valve to the engine driven mechanical fuel pump and injection system. All wing and sump tank outlets have finger filters. The three fuel tanks and two strainer bowls are fitted with fuel drains.

The wing tanks are vented at the outboard bulkhead, with lines that run inboard into a plenum located centrally in the top of the fuselage. The vent line from the sump tank also joins into the plenum. This plenum is in turn vented to atmosphere via a standpipe to the underside of the right hand wing. The plenum is also drained to the same point. In addition, the fuel delivery lines are vented at the right angle bends at the top of the fuselage walls (the lines to this point run virtually horizontally from the wing tank delivery outlets). Any vapour bubble which finds its way into the system of vertical and horizontal pipes between the wing tanks and the sump tank would remain trapped without this feature and considerably reduce the fuel flow. The lines from the top of the four supply lines are joined together and arranged to remain clear of fluid with low fuel levels. The intent is to clear any air bubbles formed in the fuel lines due to the outlets in the tanks uncovering from the sloshing fuel when the contents are low.

Two fuel gauges are provided to show fluid levels in each wing tank. The sump tank does not have a fuel gauge as its contents are deemed to be unusable and should not to be considered for flight planning.

Optical fuel sensors are placed in the wing tank to sump tank supply lines. These are half way down each fuselage wall at the junction of the fore and aft wing tank supply lines. These indicate to the pilot via amber caution lights that the wing tank is no longer supplying fuel to the sump tank. The caution light will flash intermittently (especially in rough conditions) to indicate that air bubbles are passing down the line, and will increase in intensity until the light comes on solid, at which point that wing tank is empty. The sump tank itself has an optical fuel sensor as well as a float switch to indicate to the pilot via red warning lights that the sump tank fuel level is dropping. Figure 7-2 is a schematic drawing of the fuel system.

NOTE

See section 3 of this manual for procedures associated with these caution and warning lights.

NOTE

As ground and flight attitudes are essentially the same the fuel gauge indications are valid in either case.

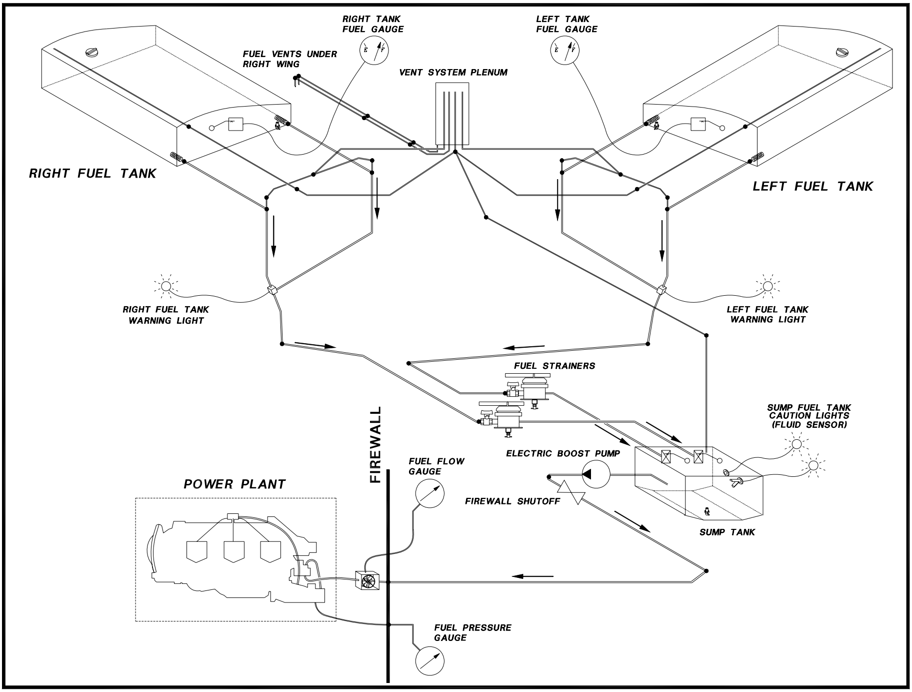

Figure 7-2 Fuel System Schematic

7.14 BRAKE SYSTEM

The aircraft has a single disc, hydraulically actuated brake on each main undercarriage wheel. Each brake is connected by a hydraulic line to a master cylinder attached to the respective rudder pedal. Each brake is thus independently operated by pushing the top part of the corresponding rudder pedal. When the aircraft is parked, both main wheel brakes may be set by lifting up the park brake knob located on the centre console up then pushing both brakes ON. To release the park brakes, push the park brake knob down.

CAUTION

Check park brake is OFF prior to landing

7.15 ELECTRICAL SYSTEM

The GA8 has a 12/14 volt electrical system consisting of a 12 volt battery, starter motor, self regulating alternator with a nominal 14 volt output, starter solenoid, electric fuel boost pump, volts/amps meter, circuit breakers, stall and fuel warning systems, oil temperature gauge, navigation, taxi, landing and instrument lights, switches and related wiring. The electrical system is constructed as a dual bus system. Bus 1 provides power for electrical services such as the landing lights, COMM 1, GPS and instrument lights. All other services are powered from Bus 2. The bus that powers each service may be identified by examining the overhead panel. Bus 1 items are enclosed within a white line.

The master switches (mounted on the front left hand side of the overhead electrical panel) individually connect the two main busses by solenoids. The Bus 1 Master Switch connects to the battery, while the Bus 2 Master Switch simultaneously connects to both the alternator field and the battery. The feeds from the battery to the overhead electrical panel mounted main busses are protected by 50 amp (Bus 1) and 70 amp (Bus 2) circuit breakers mounted at the battery box. The master switch solenoids are protected by their own circuit breakers, as are the alternator feed (100 amps) and alternator field (10 amps). These circuit breakers along with the stall warning circuit breaker (1 amp) can be found in the floor in front of the pilot's seat under a kick proof cover.

A combined volts/amps meter on the instrument panel provides information regarding the electrical system. The voltmeter indicates the system voltage for Bus 1 and Bus 2 (each bus is individually selected using a toggle switch), whilst the ammeter indicates the amount of electrical energy produced by the alternator. An amber alternator failure caution light will illuminate if the alternator is not delivering electrical power.

The self-regulating engine driven alternator delivers a regulated nominal 14 volts to the aircraft electrical system. An over-volt relay is fitted that will trip the alternator off line if the output voltage exceeds approximately 16 volts. This system is designed to protect any avionics or electrical equipment from damage due to excessive voltage as well as protecting the battery from over-charge. The over-volt relay can be reset by momentarily turning the Bus 2 Master Switch OFF, then ON again. If the over-volt relay trips the alternator off line a second time it can be assumed that a fault definitely exists. The alternator can be taken off line at any time by turning off the Bus 2 Master Switch, or if battery power is still required on both master circuits, by pulling the 10-amp alternator field circuit breaker. In the event that the aircraft battery goes open circuit, the alternator will continue to function. A circuit incorporating a 47000μF 40V capacitor will re-energise the alternator automatically whenever the Bus 2 Master Switch is turned OFF then back ON.

The overhead panel contains circuit breakers (or switch breakers) for all circuits connected to either bus, except for the stall warning breaker located in the floor. The overhead panel is marked to show which circuits are on Bus 1 and which are on Bus 2, and is backlit for night operations.

A ground power receptacle is fitted externally on the fuselage floor behind the pilots. This receptacle is wired with reverse and over voltage protection.

Refer to Figure 7-3 for a simplified schematic of the electrical system.

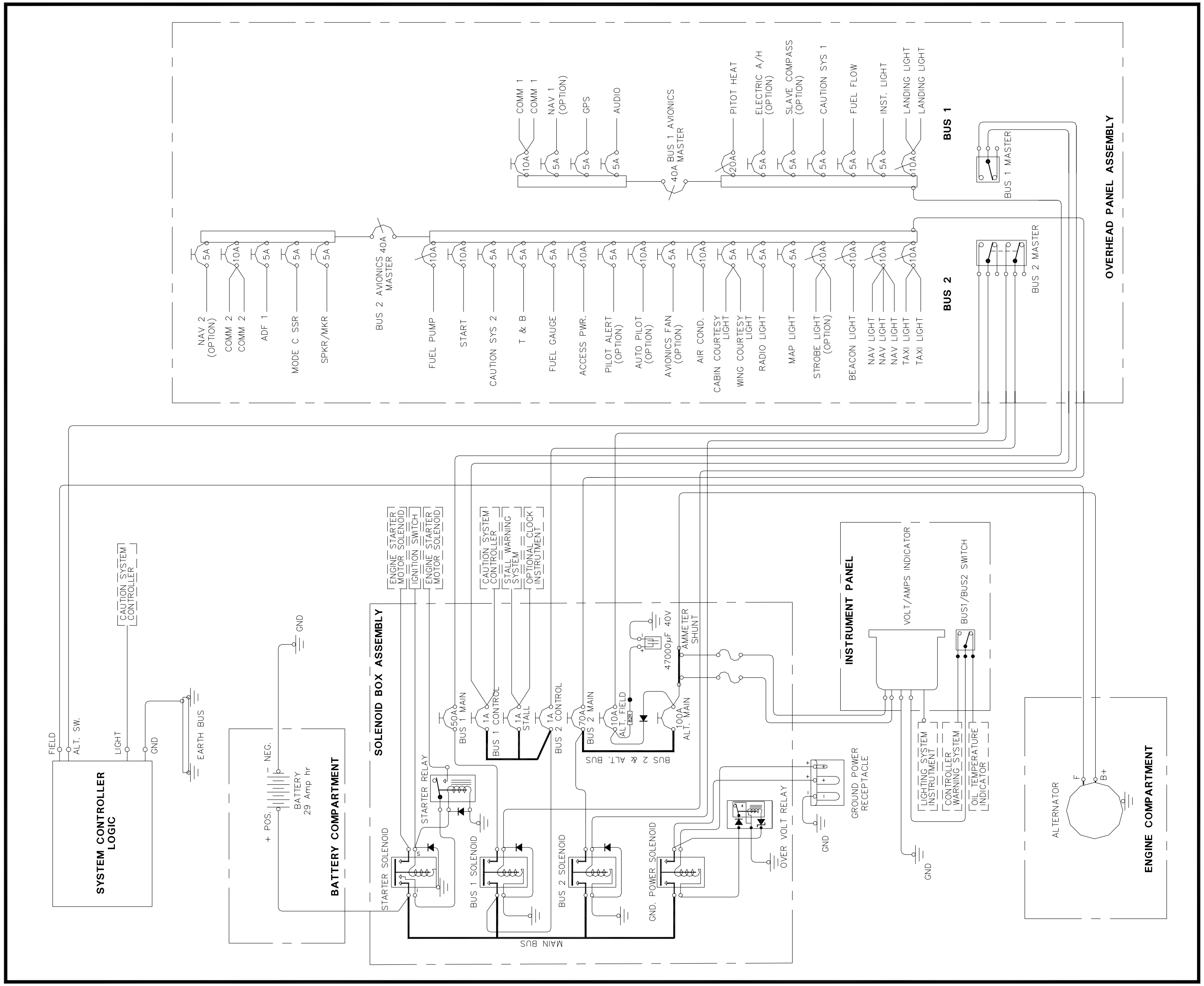

Figure 7-3 Electrical System Schematic

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NOTE

The master switches are not switch breakers and their circuits are protected by circuit breakers found in the floor in front of the pilot's seat.

7.16 LIGHTING SYSTEM

Exterior Lighting Conventional navigation lights are located on the wing tips and the trailing edge of the vertical fin. Four 55 watt landing and taxi lights are fitted, two in the leading edge of each outer wing section. Red anti-collision beacons are fitted to the top of the vertical fin and underneath the fuselage. An optional under wing courtesy light may be provided on the left hand side of the aircraft. All exterior lights are controlled by toggle switches located on the overhead panel.

Interior Lighting Interior lighting is provided by various 3 watt lights placed around the cabin interior. A map light is provided above the pilot's head next to the overhead electrical panel and is mounted on a flexible arm to allow the pilot to aim the light beam. Thus, in case of an instrument lighting failure, the map light can act as emergency lighting for the instrument panel.

7.17 COCKPIT VENTILATION

Ventilation air is provided by ventilators in the instrument panel and in the overhead cabin lining. The volume of the air supply can be regulated by rotating the ventilator shutters as desired.

7.18 PITOT-STATIC SYSTEM AND INSTRUMENTS

The pitot-static system supplies ram air pressure to the airspeed indicator and static pressure to the airspeed indicator, altimeter and the vertical speed indicator. The system is composed of a heated pitot/static probe mounted on the left wing tip.

Airspeed Indicator The airspeed indicator is calibrated in knots. Limitations and range markings (in KIAS) are incorporated on the instrument as specified in Section 2 sub-section 2.3.

Altimeter Aircraft altitude is depicted by a barometric type altimeter. A knob near the lower left portion of the altimeter allows the ambient barometric pressure sub-scale to be adjusted to the current value. This sub-scale has a dual calibration of millibars (mb) and inches of Mercury (in Hg).

Vertical Speed Indicator The vertical speed indicator indicates the aircrafts rate of climb or descent in feet per minute. The pointer is actuated by changes in ambient barometric pressure as sensed by the static source.

Pitot Heat The pitot heat system, when fitted, consists of a heating element in the pitot tube, a switch on the overhead panel labelled PITOT HEAT, an amber caution lamp and associated wiring. Illumination of the amber caution lamp indicates that the pitot heat is turned off, or turned on but the heating element is not receiving electrical current.

Alternate Static An alternate static may be fitted, and is required for aircraft capable of IFR operations. The alternate static source disconnects the normal static source (located at the pitot static probe on the left wing) from the instruments and opens a port in the cabin. The corrections presented in Section 3.4.9 for speed and altitude should be used when operating with the alternate static source selected.

7.19 VACUUM SYSTEM AND INSTRUMENTS

An engine driven vacuum pump provides suction for the artificial horizon indicator. A vacuum system pressure indicator and an amber caution light is provided on the instrument panel.

7.20 STALL WARNING SYSTEM

The aircraft is equipped with an electrically operated artificial stall warning system. A vane type lift transducer is located on the leading edge of the right wing. As the aircraft approaches the stall the angle of the airflow lifts the transducer vane activating a warning horn in the cockpit. The system is set to warn of an impending stall when the airspeed falls to within 5 to 7 knots of the stalling speed. The system will operate reliably in any loading condition or flap setting. The warning horn requires electrical power and operates independently of the master switch. The circuit breaker for the stall warning is found in front of the pilot’s seat.

7.21 AVIONICS

The aircraft may be fitted with a variety of avionics equipment.

All avionic services are powered from the dual bus system that is energised by turning ON the Bus 1 and Bus 2 Master Switches on the overhead panel. The Bus 1 and Bus 2 Avionics Master Switches must also be selected ON to activate the services on the respective bus. Figure 7-3 provides information of which services are on each bus.

SECTION 8

HANDLING, SERVICE & MAINTENANCE

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Paragraph **Page**

8.1 INTRODUCTION

This section contains factory recommended procedures for proper ground handling and routine care and servicing of your GA8 aircraft. It also identifies certain inspection and maintenance requirements that fall into two basic categories:

1. Mandatory Inspection and Maintenance Requirements
2. Recommended Preventative Maintenance and Minor Field Repairs

All inspections, maintenance, and repairs must be conducted in accordance with the applicable regulations in the country of registration of the aircraft. Regulations usually require that all **Mandatory Inspection and Maintenance Requirements** be carried out and certified for only by appropriately trained and licensed personnel, whereas, to the extent limited by the regulations, **Factory Recommended Preventative Maintenance and Minor Field Repairs** may be carried out by a suitably licensed pilot on an aircraft they own or operate.

8.2 IDENTIFICATION PLATE

All correspondence with the factory regarding your aircraft should include the **Serial Number**. This is the only identification recognised by the factory, as it is possible that the aircraft registration and/or owner has changed since the aircraft was originally delivered. The Serial Number and Model Number can be found on a fireproof identification plate located on the left hand side of the tailcone near the sliding tailplane fairing.

8.3 AIRCRAFT DOCUMENTS

The following documents are supplied with the aircraft when delivered from the factory:

< **PILOT'S OPERATING HANDBOOK & APPROVED FLIGHT MANUAL**
< **TEXTRON LYCOMING OPERATOR'S MANUAL for IO-540 SERIES ENGINE**
< **AIRFRAME LOG BOOK**
< **ENGINE LOG BOOK**
< **PROPELLER LOG BOOK**

In addition to the above, on delivery from the factory other data, certificates and documents will be supplied as required by any applicable regulations.

The following additional documents are available from your GA8 dealer or direct from the factory:

< **GA8 SERVICE MANUAL**
< **GA8 MAINTENANCE SCHEDULES**
< **GA8 ILLUSTRATED PARTS CATALOGUE**

8.4 AIRCRAFT INSPECTION, MAINTENANCE & REPAIR

8.4.1 Mandatory Inspection and Maintenance Requirements

Although the applicable regulations in the country of registration of the aircraft may vary the requirements somewhat, the aircraft will normally be required to undergo a mandatory annual/100 hourly inspection and maintenance in accordance with approved maintenance schedules. In addition some components, in particular the engine and it's accessories, will be subject to complete overhaul based on time in service.

Gippsland Aeronautics recommends that all Mandatory Inspection and Maintenance Requirements be conducted in accordance with the Gippsland Aeronautics GA8 MAINTENANCE SCHEDULES using the procedures and techniques specified in the GA8 SERVICE MANUAL.

From time to time other mandatory inspections may be required in the light of in service experience. In this event airworthiness directives relating to the airframe, engine, propeller or other components/equipment as appropriate will be issued. It is the responsibility of the owner/operator to ensure compliance with all applicable airworthiness directives and, when the inspections are repetitive, to take appropriate action to prevent inadvertent non-compliance.

All maintenance carried out must be correctly recorded and certified for in the relevant log books.

8.4.2 Recommended Preventative Maint. & Minor Field Repairs

Depending on the applicable regulations in the country of registration of the aircraft, limited maintenance and minor repairs may be carried out by a suitably licensed pilot on an aircraft they own or operate. Reference should be made to the relevant regulations to determine the specific maintenance operations that are authorised. Although the remainder of this section provides the majority of the information that should be required by the pilot to enable them to conduct limited maintenance and minor repairs, it is nevertheless desirable that a copy of the GA8 SERVICE MANUAL be available to the pilot to ensure that proper procedures are followed at all times or to provide additional details where required.

Where permitted by appropriate regulations, Gippsland Aeronautics recommends the following preventative maintenance:

DAILY:

1. Check flaps for sluggish retraction on the ground and lubricate hinges with clean engine oil using an oil can if necessary.
2. Ensure correct tyre pressures to prevent premature wear.

In addition to the preventative maintenance recommendations listed above, the pilot must always be diligent when carrying out their inspections and be prepared to rectify any defects found to the extent permitted by the appropriate regulations.

8.5 ALTERATIONS OR REPAIRS

It is essential that the relevant airworthiness authorities are contacted **prior to** any alterations or modifications to the aircraft to ensure that continued airworthiness of the aircraft is not violated. The certification standard of the GA8 is the Federal Aviation Regulations (FAR) Part 23 at Amendment 54.

Alterations and repairs to the aircraft structure shall be carried out in accordance with the GA8 SERVICE MANUAL or in accordance with the FAA publication AC 43.13-1A & 2A or subsequent issues.

8.6 GROUND HANDLING

The aircraft can be easily manoeuvred on level ground by one person using a tow bar to push or pull as required. Additional persons can assist by pushing or pulling on the main wing struts. **The aircraft should not be manoeuvred in any way by the empennage.** In congested areas, wing and/or tail walkers should be positioned to ensure adequate clearance from stationary objects.

8.7 PARKING

When possible park the aircraft into the anticipated wind and set the parking brakes. Do not set the parking brakes during cold weather when accumulated moisture may freeze the brakes, or when the brakes are very hot. Lock the controls using the lower portion of the pilot's restraint harness around the control column to secure it. Install wheel chocks when available. When severe weather conditions or high winds are anticipated, the best precaution is to hangar the aircraft. In less severe conditions, or when hangarage is not available the aircraft should be tied down as outlined in the following paragraph.

8.8 TIE DOWN

The following procedure should be used to tie-down the aircraft:

a. Lock the ailerons and elevator as described above or by using suitable locally manufactured external control surface locks.

b. Chock the wheels.

c. Attach a suitably strong (recommended 1200 lb (550 kg) tensile strength) tie down rope to the wing tiedown rings at approximately 45 degrees to the ground. Leave sufficient slack to avoid damage due to rope shrinkage that may occur when a moist rope dries out.

d. Attach a suitably strong (recommended 1200 lb (550 kg) tensile strength) tie down rope to the tail tiedown at approximately 45 degrees to the ground. Leave sufficient slack to avoid damage due to rope shrinkage that may occur when a moist rope dries out.

8.9 JACKING

The aircraft may be jacked in order to service the landing gear, change wheels/tyres and to perform other service functions. The procedure for jacking the aircraft is as follows:

a. Place the main jacks under the jacking points located on the wings just outboard of the wing strut attachment. Jacking adaptors are required to suit the actual types of jacks used and to locate the jacks positively during the exercise.

b. Place a suitable fixture through the tail's tie-down point and jack up from this point.

c. Raise the jacks until the wheels are clear of the ground as required.

CAUTION

Empty Weight longitudinal Centre of Gravity for this aircraft type is in the vicinity of the main jacking points. Therefore, the tail jacking point may be required to be held down rather than lifted up. If this is the case, two courses of action are available. The tail maybe held down by the ventral fin tie down using rope attached to the ground or heavy weight. Alternatively if using a lifting jack, weights can be placed on top of the tailplane near the root section.

8.10 LEVELLING

The aircraft is longitudinally level when an accurate level placed between the two level points so placarded on the left hand side of the fuselage gives a level indication. Two easy methods are a string line and spirit level or a water level.

The aircraft is laterally level when an accurate level placed across the cabin floor or across the belly of the aircraft gives a level indication.

8.11 FLUID SERVICING

8.11.1 Fuel System

Filling Fuel Tanks Observe all the required precautions for handling fuel and filling tanks. Ensure that the aircraft is bonded to Earth using the earthing point provided just behind the front door step on either side of the aircraft. Additionally prior to opening the fuel cap the earth strap on the refuelling nozzle should be attached to the earthing point adjacent to the tank filler neck. Fill the tank to within 1 inch (25 mm) of the top of the tank. Once refuelling has been completed, turn on the master switch and note the fuel gauge readings as a check.

Fuel Draining/Sampling Five quick drain fuel drain fittings are provided in the GA8 fuel system. There is one for each main fuel tank located on the lower rear inboard corner of the tank and three on the lower right hand side of the fuselage below the front door to drain the sump tank and strainer bowls. Fuel should be drained/sampled from all of these points before the first flight of the day and after each subsequent refuelling.

Draining Fuel System The complete fuel system may be drained by the using the five fuel drain points.

8.11.2 Engine Lubrication System

Filling the Engine Sump The engine sump should be filled to the operating level with the lubricating oil specified in Section 2.4.3. This may be accomplished by using a suitable funnel inserted in the oil filler tube located on the top of the engine. An access cover is provided in the engine cowl for this purpose.

Draining the Sump The engine sump is drained by removing the lower engine cowl and removing the sump drain plug (or using the quick drain valve if fitted). Ensure that the sump plug is correctly replaced **and lock wired** prior to refilling the engine with oil.

8.12 WHEEL BRAKE SYSTEM

Brake System The brake system utilises two foot operated brake cylinders with integral fluid reservoirs. The brakes do not require adjustment of pad clearances. If the brake pads show signs of excessive wear, they should be replaced.

Park Brake The park brake is a one way valve incorporated in the brake system. The park brake is actuated by raising park brake knob on the centre console and **then applying both foot brakes.** To release the brakes, press the park brake knob downwards.

Filling Brake Cylinders This is accomplished from inside the cockpit by removing the plug from the top of the cylinders and filling with mineral based hydraulic fluid to specification MIL-H-5606. Ensure that no contaminants are allowed to enter the reservoir, particularly when removing or replacing the plug.

8.13 UNDERCARRIAGE

Because of its simplicity, the undercarriage does not require complicated maintenance. The main undercarriage leg requires no maintenance except for an occasional clean around the fairing to remove dirt, grime and grass and inspection of the brake hoses. The nose gear requires the leg to be clean for smooth operation. Bolts and bushes should be inspected regularly and if worn excessively, replaced.

8.14 TYRES

The tyres should be carefully checked for correct inflation, cuts, abrasions, wear, slippage and other obvious defects and replaced if necessary. The tyres may be demounted from the wheels by deflating the tubes, then removing the wheel through-bolts, allowing the wheel halves to be separated.

WARNING

Removal of the wheel through-bolts without first deflating the tube may result in death or injury.

The recommended tyre inflation pressures are:

MAINS WHEELS	27 –29 psi (186 - 200 kPa)
NOSE WHEEL	31 – 33 psi (214 - 228 kPa)

When carrying heavy loads, or when operating from hard or sealed surfaces, increased pressures in the mains may be found desirable. Operator experience and the tyre wear pattern may be used as a guide to determine variations to the specified tyre pressures.

8.15 INDUCTION AIR FILTER

Dust and dirt must be prevented from entering the engine induction system. Dust and dirt ingested into the engine is probably the greatest single cause of premature engine wear. *The value of maintaining the air filter in good clean condition cannot be overstressed.*

Visual Inspection A visual inspection of the foam cartridge should be made at intervals of approximately eight flying hours, or more frequently under very dusty conditions. This inspection should be made to determine if the foam cartridge has been dislodged or damaged or suffering an excessive build up of debris.

Cleaning The cartridge is treated with a sticky material during manufacture to increase its dust trapping ability and should be replaced rather than cleaned.

8.16 BATTERY SERVICE

The GA8 must be fitted with a "no maintenance" 12 volt, 29 Ampere Hour Concorde Sealed Lead Acid Battery (P/N RG-35A).

The battery is located in a compartment under the pilot’s seat in the cockpit To gain access to the battery, remove the seat, floor carpet and screws securing the battery box cover.

WARNING

Do not perform any maintenance on the electrical system in conjunction with maintenance on the fuel system. The escape of fuel fumes under the floor and/or in the aircraft may cause an explosion.

As the name implies, the "no maintenance" battery requires no routine maintenance other than to check its security occasionally and to clean the terminals if required.

8.17 FLYABLE STORAGE

Aircraft in non-operational storage, for a maximum of 30 days, are considered to be in flyable storage status. Every seventh day during these periods, the propeller should be rotated by hand through five revolutions. This action "limbers" the oil and prevents any accumulation of corrosion on engine cylinder walls.

WARNING

For maximum safety, check that both magnetos are OFF, the throttle closed, the mixture control is in the ICO position, and the aircraft is secured before rotating the propeller by hand. Do not stand within the arc of the propeller blades while turning the propeller.

After 30 days, the aircraft should preferably be flown for 30 minutes. As well as helping to avoid engine problems, this also helps to reduce accumulations of water in the fuel system, tops up the battery charge, and exercises the other aircraft systems. If it is not possible to fly the aircraft, a ground run up should be made just long enough to produce an oil temperature within the lower green arc range. Excessive ground run up should be avoided.

If the aircraft is to be out of service for long periods, refer to the GA8 SERVICE MANUAL for proper storage procedures.

8.18 CLEANING AND SIMILAR CARE

8.18.1 Windshield and Windows

The windshield and windows are made from an acrylic plastic material and consequently a certain amount of care is required to keep them clean. The following procedure is recommended:

1. Flush with clean water to remove excess dirt, bugs and other loose particles.
2. Wash with a mild soap and warm water. Use a soft cloth or sponge. Do not rub excessively.
3. Rinse thoroughly, then dry with a clean moist chamois. Do not rub with a dry cloth as this builds up an electrostatic charge that attracts dust. Oil and grease may be removed by rubbing lightly with a soft cloth moistened with kerosene. **Do not use volatile solvents** such as gasoline, alcohol, benzine, carbon tetrachloride, lacquer thinner or most commercial window cleaning sprays, as they will soften and craze the plastic.
4. After washing, the windshield and windows should be cleaned using an aircraft windshield cleaner following carefully the manufacturers instructions.

8.18.2 Painted Surfaces

The painted exterior surfaces of the aircraft can be washed using a mild detergent and water. Special aircraft cleaning detergents may be used or alternatively an automotive liquid detergent provided it is non-corrosive and contains no abrasive materials. Stubborn oil and grease may be removed using a small amount of solvent such as kerosene.

8.18.3 Propeller Care

Preflight inspection of propeller blades for nicks, and wiping them occasionally with an oily cloth to clean off grass and bug stains will ensure long and trouble free service. Small nicks on the propeller, particularly near the tips, and on the leading edge and on the rear face near the leading edge, should be dressed out as soon as possible as these nicks produce stress concentrations, and if ignored, may result in cracks and subsequent blade failure. Never use an alkaline cleaner on the blades; remove grease and oil with a suitable solvent such as kerosene.

8.18.4 Engine Compartment

The engine compartment should be kept clean to minimise any danger of fire, and to allow proper inspection of engine components. The engine and engine compartment may be washed down with a suitable solvent, then dried thoroughly.

CAUTION

Particular care should be given to electrical equipment before cleaning. Solvent should not be allowed to enter magnetos, starter, alternator, and the like. These components should be protected before saturating the engine with solvent. Any oil, fuel, and air openings on the engine and accessories should be covered before washing the engine with solvent. Caustic cleaning solutions should be used cautiously and should always be properly neutralised after their use.

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