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Supplement
Pilot´s Operating Handbook
for
Piper

Piper PA-28-151 - Cherokee Warrior
Piper PA-28-161 - Cadet, Warrior II & III
Piper PA-28-181 - Archer III

Equipped with TAE 125-02-114 Installation

Issue: 2
Revision: 7

MODEL No. _____

SERIAL No. _____

REGISTRATION No. _____

This supplement must be attached to the EASA approved Pilot´s Operating Handbook when the TAE 125-02-114 installation has been installed in accordance with EASA STC 10014364.

The information contained in this supplement supersede or add to the EASA approved Pilot´s Operating Handbook and FAA approved AFM only as set forth herein. For limitations, procedures, performance and loading information not contained in this supplement, consult the EASA approved Pilot´s Operating Handbook.

This supplement Pilot's Operating Handbook is approved with EASA STC No. 10014364.

Doc.-No.: 40-0310-40122*

*The last digit of the document number describes the issue of the manual. All manuals with a lower last digit are previous issues of this version.

APPROVAL

The technical content of this document is approved under the authority of the DOA, ref. EASA.21J.010.

LOG OF REVISIONS

Issue/ Revision	Section	Description	Approved	
			Date	Endorsed
2/0	All	New Issue, Change of Ownership, PA28-181 Archer III incorporated	March 2014	EASA STC 10014364 Rev. 10
2/1	0	Fuel quantity PA-28-181 updated	August 2014	EASA STC 10014364 Rev. 12
	2	Fuel quantity PA-28-181 updated		
	4	Fuel quantity PA-28-181 updated		
	5	Fuel quantity PA-28-181 updated		
	6	Fuel quantity PA-28-181 updated		
	7	Fuel quantity PA-28-181 updated		

Issue/ Revision	Section	Description	Approved	
			Date	Endorsed
2/2	0	Update	Jan. 2015	Revision No. 2 to AFM supplement ref. 40-0310-40122 is approved under the authority of DOA ref. EASA.21J.010 Date: January 26, 2015
	4	Procedure added		
2/3	all	Naming change	March 2015	Revision No. 3 to AFM supplement ref. 40-0310-40122 is approved under the authority of DOA ref. EASA.21J.010 Date: 02 March, 2015
	0	Update		
	1	Update		
	5	Splitted into 5, 5a and 5b regarding propeller specs.		
	5a	New section		
	5b	New section		
2/4	0	Update	March 2015	Revision No. 3 to AFM supplement ref. 40-0310-40122 is approved under the authority of DOA ref. EASA.21J.010 Date: 05 March, 2015
	2	Procedure updated		

Issue/ Revision	Section	Description	Approved	
			Date	Endorsed
2/5	All	Change of company name.	May 25, 2020	Revision No. 5 to AFM supplement ref. 40-0310-40122 is approved under the authority of DOA ref. EASA.21J.010 Date: May 25, 2020
	0	Logs update		
	1	Note added, update liquids		
	2	Update liquids. Note added for CAAC.		
	3	Description corrected and procedures updated.		
	4	Description corrected and procedures updated.		
	5b	Description corrected.		
	6	Description corrected.		
	7	Description corrected.		
2/6	0	Update	Jun. 23, 2025	Office of Airworthiness
	1	Update liquids according to OM-02-02 (Rev. 5/3), coolant type added		
	2	Update liquids according to OM-02-02 (Rev. 5/3), update coolant types and placards		
	4	Figure gearbox oil level added, description cabin heat corrected		
2/7	0	Update	Mar. 26, 2026	Office of Airworthiness
	4	Description updated and notes added		
	5	Description updated		

Remark: The parts of the text which changed are marked with a vertical line on the margin of the page.

LIST OF EFFECTIVE SECTIONS

Sections	Issue/ Revision	Date
0	2/7	Mar. 26, 2026
1	2/3	Jun. 23, 2025
2	2/5	Jun. 23, 2025
3	2/2	May 25, 2020
4	2/6	Mar. 26, 2026
5	2/2	March 2015
5a	2/0	March 2015
5b	2/2	Mar. 26, 2026
6	2/3	May 25, 2020
7	2/3	May 25, 2020
8	2/1	March 2015

GENERAL REMARK

The content of this POH supplement is developed on basis of the EASA approved POH.

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CONVERSION TABLES

VOLUME		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Liter [l] US gallon [US gal] US quart [US qt] Imperial gallon [Imp gal] Cubic inch [in³]	[l] / 3.7854 = [US gal] [l] / 0.9464 = [US qt] [l] / 4.5459 = [[Imp gal] [l] x 61.024 = [in³]	 [US gal] x 3.7854 = [l] [[US qt] x 0.9464 = [l] [[Imp gal] x 4.5459 = [l] [in³] / 61.024 = [l]

TORQUE		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Kilopondmeter [kpm] Foot pound [ft.lb] Inch pound [in.lb]	[kpm] x 7.2331 = [ft.lb] [kpm] x 86.7962 = [in.lb]	 [ft.lb] / 7.2331 = [kpm] [in.lb] / 86.7962 = [kpm]

TEMPERATURE		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Degree Celsius [ºC] Degree Fahrenheit [ºF]	[ºC] x 1.8 + 32 = [ºF]	 ([ºF] - 32) / 1.8 = [ºC]

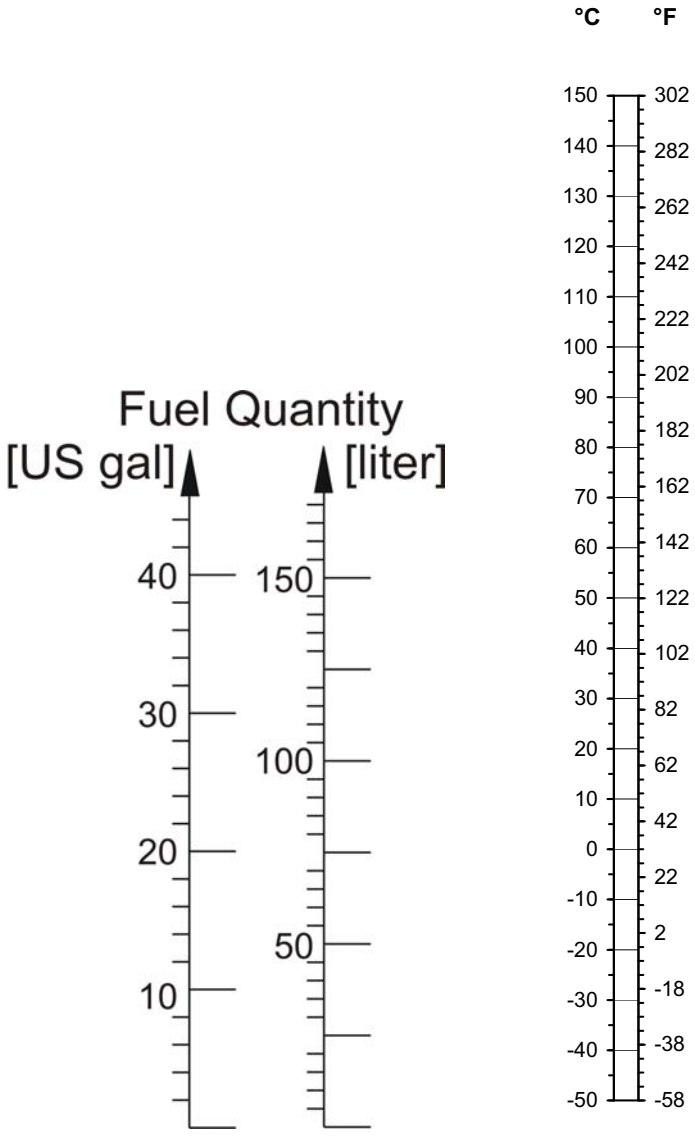
SPEED		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Kilometers per hour [km/h] Meters per second [m/s] Miles per hour [mph] Knots [kts] Feet per minute [fpm]	[km/h] / 1.852 = [kts] [km/h] / 1.609 = [mph] [m/s] / 196.85 = [fpm]	 [mph] x 1.609 = [km/h] [kts] x 1.852 = [km/h] [fpm] / 196.85 = [m/s]

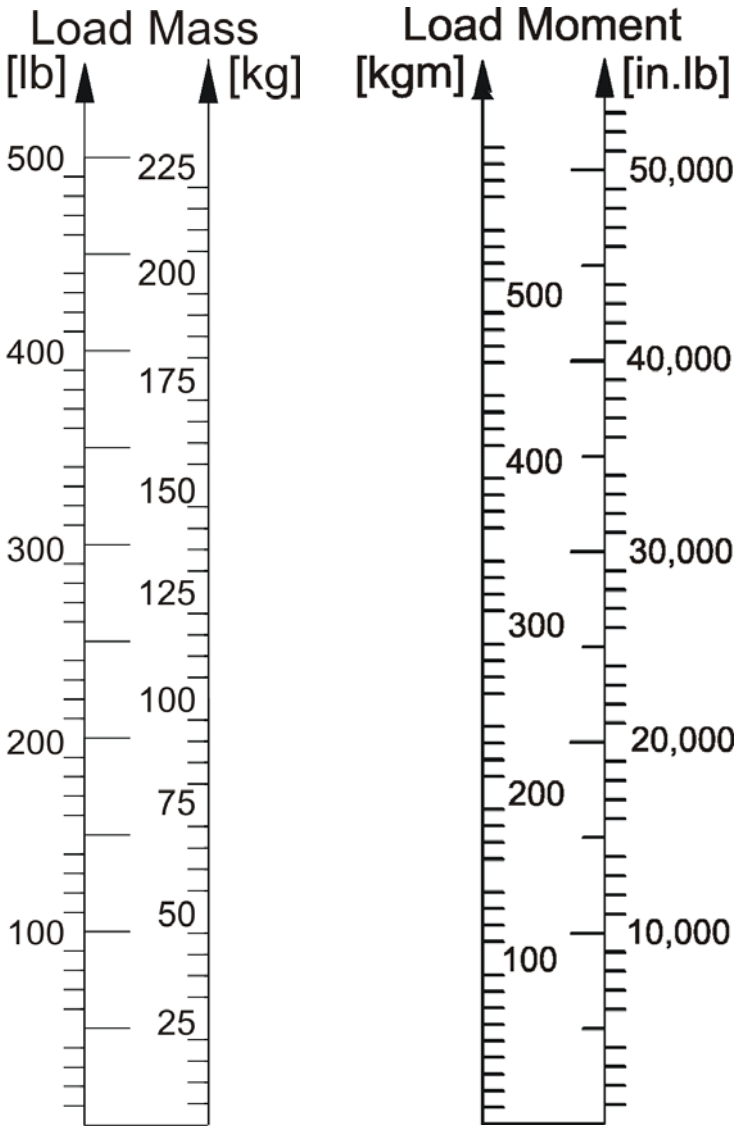
PRESSURE		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Bar [bar] Hectopascal [hpa] =Millibar [mbar] Pounds per square inch [psi] inches of mercury column [inHg]	[bar] x 14.5038 = [psi] [hpa] / 33.864= [inHg] [mbar] / 33.864 = [inHg]	 [psi] / 14.5038 = [bar] [inHg] x 33.864 = [hPa] [inHg] x 33.864 = [mbar]

MASS		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Kilogramm [kg] Pound [lb]	[kg] / 0.45359 = [lb]	 [lb] x 0.45359 = [kg]

LENGTH		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Meter [m] Millimeter [mm] Kilometer [km] Inch [in] Foot [ft] Nautical mile [nm] Statute mile [sm]	[m] / = 0.3048 [ft] [mm] / = 25.4 [in] [km] / = 1.852 [nm] [km] / = 1.609 [sm]	 [in] x 25.4 = [mm] [in] x 2.54 = [cm] [ft] x 0.3048 = [m] [nm] x 1.852 = [km] [sm] x 1.609 = [km]

FORCE		
Unit [Abbr.]	Conversion factor SI to US / Imperial	Conversion factor US / Imperial to Si
Newton [N] Decanewton [daN] Pound [lb]	[N] / 4.448 = [lb] [daN] / 0.4448 = [lb]	 [lb] x 4.448 = [N] [lb] x 0.4448 = [daN]


°C
°F
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
302
282
262
242
222
202
182
162
142
122
102
82
62
42
22
2
-18
-38
-58
Fuel Quantity
[US gal]
[liter]
40
30
20
10
150
100
50


Load Mass
[lb]
[kg]
500
400
300
200
100
225
200
175
150
125
100
75
50
25
Load Moment
[kgm]
[in.lb]
500
400
300
200
100
50,000
40,000
30,000
20,000
10,000

ABBREVIATIONS

FADEC	Full Authority Digital Engine Control
CED 125	Compact Engine Display Multifunctional instrument for indication of engine data
AED 125	Auxiliary Engine Display Multifunctional instrument for indication of engine and airplane data
G1000	Garmin 1000 Multifunctional display

SECTION 1
GENERAL

Safety Recommendations

The following symbols and warnings are used in this manual. They must be heeded strictly to prevent personal injury and material damage, to avoid impairment of the operational safety of the aircraft and to rule out any damage to the aircraft as a consequence of improper handling.

▲ **WARNING:** Non-compliance with these safety rules could lead to injury or even death.

■ CAUTION: Non-compliance with these special notes and safety measures could cause damage to the engine or to the other components.

◆ Note: Information added for a better understanding of an instruction.

UPDATE AND REVISION OF THE MANUAL

▲ **WARNING:** A safe operation is only assured with an up to date POH supplement. Information about actual POH supplement issues and revisions are published in the Service Bulletin TM TAE 000-0004.

◆ Note: The Doc.-No. of this POH supplement is published on the cover sheet of this supplement.

ENGINE

Engine manufacturer: Continental Aerospace Technologies GmbH
Engine model: .....TAE 125-02-114

The TAE 125-02-114 is a liquid cooled in-line four-stroke 4-cylinder turbocharged engine with DOHC (double overhead camshaft), direct fuel injection and common-rail technology. It has a displacement of 1991ccm. The engine is controlled by a FADEC system. The propeller is driven by a built-in gearbox (i = 1.69) with mechanical vibration dampening and overload release. The engine has an electrical self starter and an alternator.
Due to this specific characteristic, all of the information from the flight manual are no longer valid with reference to:

- carburetor and carburetor pre-heating
- ignition magnetos and spark plugs, and
- mixture control and priming system

▲ **WARNING** The engine requires an electrical power source for operation. If the main battery and alternator fail, the engine will only operate on A-FADEC for maximum 30 minutes on FADEC backup battery power. Therefore, it is important to pay attention to indications of alternator failure.

PROPELLER

Manufacturer: ..... MT Propeller Entwicklung GmbH
Model: ..... MTV-6-A/187-129 (except PA-28-181)
..... MTV-6-A/190-69
Number of blades: 3
Diameter: ..... 1.87 m (73.6 in) (MTV-6-A/187-129)
..... 1.90m (74.8 in) (MTV-6-A/190-69)
Type: ..... Variable-pitch propeller (constant speed)

FUELS and LIQUIDS

▲ **WARNING:** The engine must not be started under any circumstances if any fluid level is too low.

■ CAUTION: Use of unapproved fuels may result in damage to the engine and fuel system components, resulting in possible engine failure.

■ CAUTION: Use approved oil with exact declaration only!

■ CAUTION: Normally it is not necessary to fill the cooling liquid or gearbox oil between maintenance intervals. If the level is too low, please notify the service department of Continental Aerospace Technologies GmbH immediately.

Fuel: ..... JET A-1 (ASTM 1655)
..... JET A (ASTM 1655)
..... Jet Fuel No.3 (GB 6537-2006)
..... JP-8 (MIL-DTL-83133E)
..... JP-8+100 (MIL-DTL-83133E)
..... TS-1 (GOST 10227-86)
..... TS-1 (GSTU 320.00149943.011-99)

Alternatives: ..... Diesel (**DIN** EN 590)
..... SASOL GTL Diesel

◆ Note: The additive Biobor JF can be used in jet and diesel fuel systems to prevent microbial contamination and ensure fuel quality. The recommended dosage is 1 oz. per 80 gal fuel. Drain water bottoms prior application. For further information refer to manufacturer specifications especially in the case of an already contaminated fuel system.

Engine oil: ..... AeroShell Oil Diesel Ultra
..... AeroShell Oil Diesel 10W-40
.....Shell Helix Ultra 5W-40
.....Shell Helix Ultra 5W-30
Gearbox oil: .....Centurion Gearbox Oil N1
..... Shell Spirax S6 ATF ZM
..... Shell Spirax S6 GXME 75W-80, API GL-4
..... Shell Spirax S4 G 75W-90, API GL-4

PERMISSIBLE COOLING LIQUID

Coolant:..... Use of Ready Mix ratio 50:50 is recommended

◆ Note: If Ready Mix is not available please use concentrate and distilled water in a ratio of 50:50 to ensure an ice flocculation point at -38°C +/-2°C.

Approved types of coolant:

■ CAUTION: The type of coolant to be used depends on whether the coolant system includes a silicate pouch or not. If installed, the silicate pouch is integrated into the expansion tank. All expansion tanks designated for G40 are labeled accordingly.
Refer to “Placards” chapter 2.

For systems without a silicat pouch: .....BASF Glysantin / G40

For systems with a silicat pouch:: .....BASF Glysantin / G48
..... Valvoline/Zerex Glysantin / G48
.....Mobil Antifreeze Extra / G48
..... Comma Xstream Green - Concentrate / G48
..... BASF Glysantin Protect / G05
..... Valvoline/Zerex Glysantin / G05

■ CAUTION: G05, G40 and G48 must not be mixed with each other.

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SECTION 2
LIMITATIONS

AIRSPEED LIMITATIONS

No change

AIRSPEED INDICATIOR MARKINGS

No change

ENGINE OPERATING LIMITS

Engine manufacturer: Continental Aerospace Technologies GmbH
Engine model: TAE-125-02-114
Take-off and Max. continuous power: ..... 114 kW (155 hp)
Take-off and Max. continuous RPM: .....2300 rpm
Max. recommended cruise: 85%

▲ **WARNING** The engine requires an electrical power source for operation. If the main battery and alternator fail, the engine will only operate on A-FADEC for a maximum of 30 minutes on FADEC backup battery power. Therefore, it is important to pay attention to indications of alternator failure.

▲ **WARNING** Starting the engine with external power is not allowed. If starting the engine is not possible using battery power, the condition of the battery must be verified before flight.

◆ Note: This change of the original aircraft is certified up to an altitude of 16400 ft (5000m).

◆ Note: In the absence of any other explicit statements, all of the information on RPM in this supplement to the Pilot's Operating Handbook are propeller RPM.

Engine operating limits for take-off and continuous operation:

▲ **WARNING:** It is not allowed to start the engine outside of these temperature limits.

◆ Note: The operating limit temperature is a temperature limit below which the engine may be started, but not operated at the take-off RPM. The warm-up RPM to be selected can be found in SECTION 4 of this supplement.

Oil temperature

Minimum engine starting temperature: ..... -32°C
Minimum operating limit temperature: .....50°C
Maximum operating limit temperature: .....140°C

Coolant temperature

Minimum engine starting temperature: ..... -32°C
Minimum operating limit temperature: .....60°C
Maximum operating limit temperature: .....105°C

Gearbox temperature

Minimum operating limit temperature: ..... -30°C
Maximum operating limit temperature: .....120°C

Fuel Temperature

Min. fuel temperature limits in the fuel tank:

Fuel	Minimum fuel temperature in the fuel tank before take-off	Minimum fuel temperature in the fuel tank during flight
JET A-1, JET A, Fuel No.3, JP-8, JP-8+100 TS-1	-30°C	-35°C
Diesel Sasol GTL Diesel	0°C	-5°C

Table 2-1 Minimum fuel temperature limits in the fuel tank

▲ **WARNING:** The fuel temperature of the fuel tank not used should be monitored if its later use is intended.

▲ **WARNING:** The following applies to Diesel and JET fuel mixtures in the tank:
As soon as the proportion of Diesel in the tank is more than 10% Diesel, the fuel temperature limits for Diesel operation must be observed. If there is uncertainty about which fuel is in the tank, the assumption should be made that it is Diesel.

Oil pressure

Minimum oil pressure: ..... 1.2 bar
Minimum oil pressure (at Take-off power): ..... 2.3 bar
Minimum oil pressure (in flight): ..... 2.3 bar
Maximum oil pressure: ..... 6.0 bar
Maximum oil pressure (cold start < 20 sec.):.... ..... 6.5 bar
Maximum oil consumption: ..... 0.1 l/h

ENGINE INSTRUMENT MARKINGS

The engine data of the TAE 125-02-114 installation to be monitored are integrated in the compact engine instrument CED-125 and the auxiliary engine display AED-125 (conventional avionics) or indicated via G1000 display.
The ranges of the individual engine monitoring parameters are shown in the following tables.

◆ Note: "Load" describes the available percentage of maximum engine power

Instrument AED/CED		Red range	Amber range	Green range	Amber range	Red range
Tachometer	[RPM]	--------	--------	0-2300	--------	> 2300
Oil pressure	[bar]	0 - 1.1	1.2 - 2.2	2.3 - 5.1	5.2 - 6.5	> 6.5
	[psi]	0 - 16	17.4 - 32	33.4 - 74	75.4 - 87.0	> 87.0
Coolant temperature	[°C]	< -32	-32...+59	60 - 100	101 - 105	> 105
Oil temperature	[°C]	< -32	-32...+49	50 - 129	130 - 140	> 140
Gearbox temperature	[°C]	--------	--------	< 115	115 - 120	> 120
Load	[%]	--------	--------	0 - 100	--------	--------
Fuel Temperature (left and right)	[°C]	< -30	-30...-1	0 - 69	70 - 75	> 75
Alternator Current	[A]	--------	--------	0 - 52.4	52.5 - 60	>60
Electrical System Voltage	[V]	0 - 21	22 - 24	25 - 29.4	29.5 - 30	>30

Table 2-2a Markings (conventional avionics)

G1000		Red range	Amber range	Green range	Amber range	Red range
Tachometer	[RPM]	--------	--------	0-2300	--------	> 2300
Oil pressure OFF, START, IDLE	[bar]	0 - 1.1	--------	1.2 - 5.1	5.2 - 6.5	> 6.5
	[psi]	0 - 14	--------	17.4 - 74	75.4 - 94.2	> 94.2
Oil pressure above IDLE	[bar]	0 - 1.1	1.2 - 2.2	2.3 - 5.1	5.2 - 6.5	> 6.5
	[psi]	0 - 14	17.4 - 32	33.3 - 74	75.4 - 94.2	> 94.2
Coolant temperature	[°C]	< -32	-32...+59	60 - 100	101 - 105	> 105
Oil temperature	[°C]	< -32	-32...+49	50-129	130-140	> 140
Gearbox temperature	[°C]	--------	--------	< 115	115 - 120	> 120
Load	[%]	--------	--------	0-100	--------	--------
Fuel Temp. on ground	[°C]	< -30	-30...-1	0 - 65	66 - 75	> 75
Fuel Temp. in flight	[°C]	< -35	-35...-6	-5...+65	66 - 75	> 75
Alternator Current	[A]	--------	--------	0-52	53-60	>60
Electrical System Voltage	[V]	0-24.9	--------	25-29.9	--------	≥30

Table 2-2b Markings (G1000)

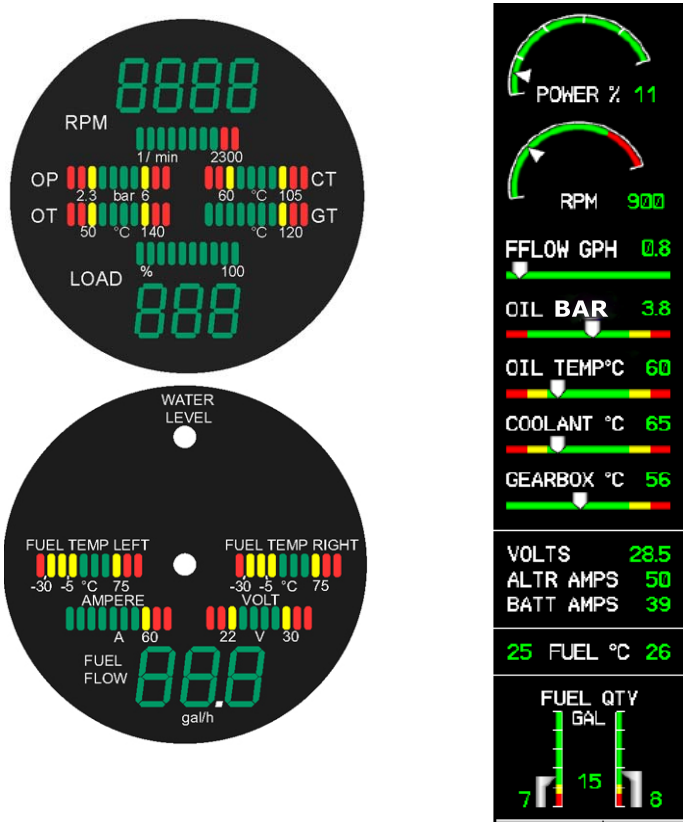

Figure 2-1 CED/AED (conventional avionics) and G1000 Engine Page

Instrument		Red range	Amber range	Green range	Amber range	Red range
Fuel Temperature (left and right)	[°C]	< -30	-30...-1	0-69	70-75	> 75
Alternator Current	[A]	--------	--------	0-84	85-90	>90
Electrical System Voltage	[V]	0-10	11-12.5	12.6-14.0	15.0	> 15.0

Table 2-2c AED Markings (14V)

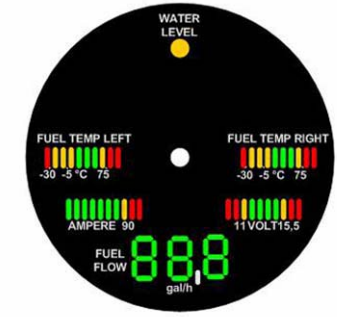

Figure 2.2 AED (14V)

◆ Note: If an engine reading is in the amber or red range, a caution is indicated. It only extinguishes when the "Confirm" button is pressed.
If this button is pressed longer than a second, a self test of the instrument is initiated.

WARNING/CAUTION OVERVIEW

Aircraft Event	**Conventional Avionics via lightpanel/AED/CED**	
FADEC Warning	FADEC A	Red Light
	FADEC B	Red Light
Alternator Failure	Alt	Red Light
AED/CED Failure	AED	Amber Light
	CED	Amber Light
Glow Failure	Glow	Amber Light
Fuel Quantity	Fuel L	Amber Light
	Fuel R	Amber Light
Fuel Temp.	AED	Green, Amber or Red Range
Coolant Temp.	CED	
Gearbox Temp.		
Oil Temp.		
Oil Pressure		
% Power	CED	Green Range, Load [%]
Propeller Speed	CED	Green or Red Range, Value [RPM]
FORCE B active	Indicated by switch position	
Engine coolant level is low	„Water Level“ light illuminates	

Table 2-3 Warnings/Cautions (conventional avionics)

Aircraft Event	G1000 CAS Massage	
	Priority	Text
FADEC Warning	Warning	ECU A FAIL
	Warning	ECU B FAIL
Engine coolant level is low	Caution	COOL LVL
Engine glow plug is active	Advisory	GLOW ON
FORCE B switch active	Advisory	ECU B ACTIVE
Alternator Failure, as determined by the ALTREG	Warning	ALTR FAIL
Engine starter motor energized when engine is running	Warning	START ENGD

Aircraft Event	G1000 Engine Page Indication
% Power	Green Range, Load [%]
Propeller Speed	Green or Red Range, Value [RPM]
Oil Pressure	Green, Amber or Red Range, Value [bar]
Oil Temp.	Green, Amber or Red Range, Value [°C]
Coolant Temp.	
Gearbox Temp.	
Fuel Temp.	Value [°C]
Fuel Quantity (Fuel L, Fuel R)	Green, Amber or Red Range, Value [GAL]

Table 2-4 Warnings/Cautions/Indications (G1000)

A CAS message shall be considered "active" from the time it is triggered until the condition is no longer valid (i.e. has been resolved).

◆ Note: STARTER ENGAGED is a warning CAS message without inhibits. The CAS message is active, when starter switch is engaged for more than 20s or the engine is running and the starter would engage

CAS Message Priority indication G1000:

Advisory: Info only
- white text and black background

Caution: Not accepted
- black text and yellow background

Accepted via Master Caution switch
- yellow text and black background

Warning: Not accepted
- Flash between white text, red background and red text, white background

Accepted via Master Warning switch
- Red text and black background

WEIGHT LIMITS

PA 28-151 Cherokee Warrior (normal category):

Maximum Ramp Weight: ..... 1056 kg
Maximum Takeoff Weight: ..... 1055 kg
Maximum Landing Weight ..... 1055 kg

PA 28-151 (utility category):

Maximum Ramp Weight: ..... 886 kg
Maximum Takeoff Weight: ..... 885 kg
Maximum Landing Weight ..... 885 kg

PA 28-161 Cherokee Warrior II & Cadet (S/N 28-7716001 through 28-8216300 & S/N 2841001 through 2841365):

Maximum Ramp Weight: ..... 1056 kg
Maximum Takeoff Weight: ..... 1055 kg
Maximum Landing Weight ..... 1055 kg

PA 28-161 Warrior II (S/N 28-8316001 through 28-8616057 & 2816001 through 2816109)
PA 28-161 Warrior III (S/N 2816110 through 2816119 & 2842001 and up):

Maximum Ramp Weight: ..... 1110 kg
Maximum Takeoff Weight: ..... 1107 kg
Maximum Landing Weight ..... 1107 kg

PA 28-161 (utility category):

Maximum Ramp Weight: ..... 917 kg
Maximum Takeoff Weight: ..... 916 kg
Maximum Landing Weight ..... 916 kg

PA 28-181 Archer III (normal category):

Maximum Ramp Weight: ..... 1160 kg
Maximum Takeoff Weight: ..... 1157 kg
Maximum Landing Weight ..... 1157 kg

PA 28-181 Archer III (utility category):

Maximum Ramp Weight: ..... 970 kg
Maximum Takeoff Weight: ..... 966 kg
Maximum Landing Weight ..... 966 kg

MANEUVER LIMITS

■ CAUTION: Intentionally initiating negative G maneuvers is prohibited!

Normal Category: No change

Utility Category: Intentionally initiating spins is prohibited.

Max. usable fuel quantity:

Warrior III: 113.5 l

Archer III (G1000): 75.7 l

FLIGHT LOAD FACTORS

No change

◆ Note: The load factor limits for the engine must also be observed. Refer to the Operation & Maintenance Manual for the engine.

■ CAUTION: Avoid extended negative g-loads duration. Extended negative g-loads can cause propeller control and engine problems.

KINDS OF OPERATION EQUIPMENT LIST

No change

PERMISSIBLE FUEL GRADES

■ CAUTION: Using non-approved fuels and additives can lead to dangerous engine malfunctions.

Fuel: .....JET A-1 (ASTM 1655)
.....JET A (ASTM 1655)
..... Jet Fuel No.3 (GB 6537-2006)
.....JP-8 (MIL-DTL-83133E)
.....JP-8+100 (MIL-DTL-83133E)
..... TS-1 (GOST 10227-86)
.....TS-1 (GSTU 320.00149943.011-99)

Alternatives: ..... Diesel (**DIN** EN 590)
.....SASOL GTL Diesel

◆ Note: The additive Biobor JF can be used in jet and diesel fuel systems to prevent microbial contamination and ensure fuel quality. The recommended dosage is 1 oz. per 80 gal fuel. Drain water bottoms prior application. For further information refer to manufacturer specifications especially in the case of an already contaminated fuel system.

MAXIMUM FUEL QUANTITIES

Due to the higher specific density of Kerosene and Diesel in comparison to Aviation Gasoline (AVGAS) with the TAE 125-02-114 installation the permissible tank capacity has been reduced (PA-28-151 / 161 only).

PA-28-151 & PA-28-161:
2 standard tanks: ..... each 85.2 l
Total capacity: .....170.4 l
Total usable fuel: .....162.8 l
Total unusable fuel: .....7.6 l

PA-28-181:

2 standard tanks: ..... each 94.6 l
Total capacity: ..... 189.3 l
Total usable fuel: ..... 181.7 l
Total unusable fuel: ..... 7.6 l

■ CAUTION: To prevent air from penetrating into the fuel system avoid running the tanks dry. As soon as the "Low Level" Warning illuminates, switch to a tank with sufficient fuel or land.

◆ Note The tanks are equipped with a Low Fuel Warning.
For conventional avionics: If the fuel level is below 10 l, the "Fuel L" or "Fuel R" Warning Light illuminates respectively.
For G1000: Refer to original POH.

PERMISSIBLE OIL TYPES

Engine oil: ..... AeroShell Oil Diesel Ultra
..... AeroShell Oil Diesel 10W-40
..... Shell Helix Ultra 5W-40
..... Shell Helix Ultra 5W-30
Gearbox oil:..... Centurion Gearbox Oil N1
..... Shell Spirax S6 ATF ZM
..... Shell Spirax S6 GXME 75W-80, API GL-4
..... Shell Spirax S4 G 75W-90, API GL-4

■ CAUTION: Use the approved oil with exact designation only.

PERMISSIBLE COOLING LIQUID

Coolant:..... Use of Ready Mix ratio 50:50 is recommended

◆ Note: If Ready Mix is not available please use concentrate and distilled water in a ratio of 50:50 to ensure an ice flocculation point at -38°C +/-2°C.

Approved types of coolant:

■ CAUTION: The type of coolant to be used depends on whether the coolant system includes a silicate pouch or not. If installed, the silicate pouch is integrated into the expansion tank. All expansion tanks designated for G40 are labeled accordingly.
Refer to “Placards” in this chapter.

For systems without a silicat pouch: ..... BASF Glysantin / G40

For systems with a silicat pouch:: ..... BASF Glysantin / G48
..... Valvoline/Zerex Glysantin / G48
..... Mobil Antifreeze Extra / G48
..... Comma Xstream Green - Concentrate / G48
..... BASF Glysantin Protect / G05
..... Valvoline/Zerex Glysantin / G05

■ CAUTION: G05, G40 and G48 must not be mixed with each other.

PLACARDS

Near the fuel tank caps:

Normal Category
(PA-28-151 / 161)

JET A-1 / Diesel Fuel
CAP. 81.0 LITER (21.5 U.S. GAL.) USABLE
TO BOTTOM OF FILLER INDICATOR TAB

Normal Category
(PA-28-181)

JET A-1 / Diesel Fuel
CAP. 91.0 LITER (24 U.S. GAL.) USABLE

◆ Note: The placard for CAAC region additionally lists Jet Fuel No. 3 in Chinese (中国 3 号航煤).

Utility Category

JET A-1 / Diesel Fuel
CAP. 57.0 LITER (15 U.S. GAL.) USABLE

On the oil funnel or at the flap of the engine cowling:

Figure 2.3

Drain Valve Fuel filter
The decal is attached to the drain valve of the fuel filter.

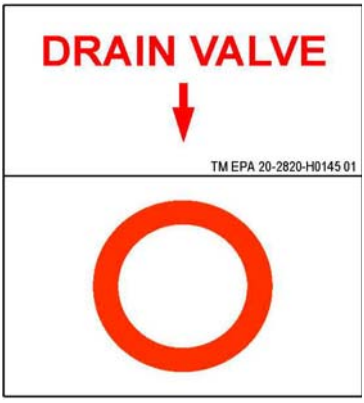

Figure 2.4

Expansion Tank: Coolant

The decal is attached to the expansion tank.

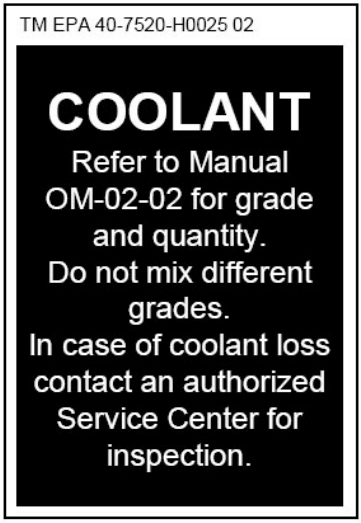

Figure 2.5

Figure 2.6 Expansion tank for G40 coolant type ("new" resp. "modified")

Figure 2.7 Expansion tank for G48 coolant type

If installed, at the flap of the engine cowling to the External Power Receptacle**:**

„ATTENTION 12 V DC OBSERVE CORRECT POLARITY“

OR

„ATTENTION 24 V DC OBSERVE CORRECT POLARITY“

SECTION 3
EMERGENCY PROCEDURES

INDEX OF CHECKLISTS

GENERAL

In addition to the original AFM/POH, the following applies:

▲ **WARNING:** Due to an engine shut-down or failures indicated by the FADEC warning lights there might be a loss of propeller valve currency which leads to a low pitch setting of the propeller. This might result in propeller overspeed.
Airspeeds below 100 KIAS are suitable to avoid propeller overspeed in
failure case. If the propeller speed control fails, climbs can be performed at 65 KIAS and a powersetting of 100%.

◆ Note: **G1000**: In case of a warning the following generally applies:
Master Caution indication (amber, aural alert) --> confirm (aural alert stops)
Master Warning indication (red, aural alert) --> confirm (aural alert stops)

Proceed as described below.

◆ Note: Refer to the original POH for emergency procedures for the Archer III aircraft with G1000 if not otherwise stated herein.

EMERGENCY PROCEDURES CHECK LIST

ENGINE MALFUNCTION

DURING TAKE-OFF (ON GROUND)
- Take-off abort -

(1) Thrust Lever - IDLE
(2) Brakes - APPLY
(3) Wing flaps (if extended) - RETRACT
(4) Engine Master - OFF
(5) Alternator, Main Bus (except G1000) and Battery switch - OFF

IMMEDIATELY AFTER TAKE-OFF
- Take-off abort -

If there is an engine malfunction after take-off, at first lower the nose to keep the airspeed and attain gliding attitude. In most cases, landing should be executed straight ahead with only small heading corrections to avoid obstacles.

▲ **WARNING:** Altitude and airspeed are seldom sufficient for a return to the airfield with a 180° turn while gliding.

(1) Airspeed..... 73 KIAS (wing flaps retracted)
.....65 KIAS (wing flaps extended)
(2) Fuel Selector - CLOSED
(3) Engine Master - OFF
(4) Wing flaps - as required (40° is recommended)
(5) Alternator, Main Bus (except G1000) and Battery Switch - OFF

LOSS OF ENGINE POWER DURING FLIGHT

(1) Push Thrust Lever full forward (take-off position).
(2) Fuel Selector to tank with sufficient fuel quantity and temperature
(3) Electric Fuel Pump - ON
(4) Establish Best Glide Speed

(5) Check engine parameters (FADEC indicators, oil pressure and temperature, fuel quantity)

If normal engine performance is not achieved, the pilot should:

i) Land as soon as possible.
ii) Be prepared for an emergency landing
iii) Expect an engine failure

▲ **WARNING:** The high-pressure pump must be checked before the next flight.

EMERGENCY LANDING WITH ENGINE OUT

If all attempts to restart the engine fail and an emergency landing is imminent, select suitable site and proceed as follows:

(1) When field can easily be reached slow down to 63 KIAS for shortest landing.
(2) Fuel Selector - CLOSED
(3) Engine Master - OFF
(4) Flaps - as required (40° is recommended)
(5) Alternator, Main Bus (except G1000) and Battery Switch - OFF
(6) Seat belts and harnesses - TIGHT
(7) Touch-down-slightly nose up attitude
(8) Brake firmly

◆ Note: Gliding Distance. Refer to Figure 5a-5 in SECTION 5a of this Supplement to the Pilot's Operating Handbook.

Fires

ENGINE FIRE WHEN STARTING ENGINE ON GROUND

(1) Engine Master - OFF
(2) Fuel Selector - CLOSED
(3) Electric Fuel Pump - OFF
(4) Battery Switch - OFF
(5) Extinguish the flames with a fire extinguisher, wool blankets or sand.
(6) Examine the fire damages thoroughly and repair or replace the damaged parts before the next flight.

ENGINE FIRE DURING TAKE-OFF (ON GROUND)

(1) Engine Master - OFF
(2) Fuel Selector - CLOSED
(3) Electric Fuel Pump - OFF
(4) Battery switch - OFF
(5) Extinguish the flames with a fire extinguisher, wool blankets or sand.
(6) Examine the fire damages throughly and repair or replace the damaged parts before the next flight.

ENGINE FIRE IN FLIGHT

(1) Engine Master - OFF
(2) Fuel Selector - CLOSED
(3) Select an appropriate airspeed to avoid engine overspeed
(4) Electric Fuel Pump - OFF (if in use)
(5) Main Bus switch (except G1000) - OFF
(6) Cabin heat and defroster - OFF
(7) Perform emergency landing (as described in the procedure “Emergency Landing With Engine Out“)

ELECTRICAL FIRE IN FLIGHT (except PA-28-181 w. G1000)

The first signs of an electrical fire is usually the odour of burning or smouldering insulation. Proceed as follows:

(1) Main Bus switch - OFF
(2) Avionics switch - OFF
(3) Vents - OPEN
(4) Cabin Heat - OFF
(5) Fire Extinguisher – Activate (if available)

▲ **WARNING:** After the fire extinguisher has been used, make sure that the fire is extinguished before exterior air is used to remove smoke from the cabin.

If there is evidence of continued electrical fire, consider turning off battery and alternator.

▲ **WARNING:** If the FADEC Backup battery is not installed this will shut down the engine and require an emergency landing. The engine has been demonstrated to continue operating for a maximum of 30 minutes when powered by the FADEC Backup battery only.

(6) Circuit Breakers Check - DO NOT reset
(7) Main Bus switch - ON
(8) Avionics switch - ON

▲ **WARNING:** Turn on only electrical equipment required to continue flight depending on the situation and land as soon as practical.
Switch Circuit breakers ON one at a time, with delay after each.

ELECTRICAL FIRE IN FLIGHT (PA-28-181 w. G1000 only)

The first signs of an electrical fire is usually the odor of burning or smoldering insulation. Proceed as follows:

(1) EMERG BATT switch - Verify ARM
(2) BATT MASTR switch - OFF
(3) ALTR switch - OFF

▲ **WARNING:** When BATT MASTR and ALTR switches are OFF, the engine will be operating on the FADEC BACKUP BATTERY. Duration of engine operation n the FADEC BACKUP BATTERY is limited to a maximum of 30 minutes.

(4) Vents - OPEN
(5) HEAT/DEF (Defroster) - OFF
(6) Fire Extinguisher – Activate (if available)

▲ **WARNING:** After the fire extinguisher has been used, make sure that the fire is extinguished before exterior air is used to remove smoke from the cabin.

LOSS OF OIL PRESSURE

(<2.3 bar IN CRUISE [amber range] OR <1.2 bar AT IDLE [red range])

(1) Reduce power as quickly as possible
(2) Check oil temperature: If the oil temperature is high or near operating limits,
    i) Land as soon as possible.
    ii) Be prepared for an emergency landing.
    iii) Expect an engine failure.

◆ Note: During warm-weather operation or long climbs at low airspeed engine temperatures could rise into the amber range and trigger the caution light. This warning allows the pilot to avoid overheating of the engine as follows:
    (1) Increase airspeed by decreasing the pitch angle
    (2) Reduce power, if the engine temperature approaches the red area

LOSS OF FUEL PRESSURE

Not applicable for TAE 125-02-114 installation

HIGH OIL TEMPERATURE (OT - CED/OIL TEMP °C - G1000 display)

(1) Increase airspeed and reduce power as quickly as possible
(2) Check the oil pressure: if the oil pressure is lower than normal (<2.3 bar [33.4 psi] at cruise or <1.2 bar [17.4 psi] at idle),
    i) Land as soon as possible.
    ii) Be prepared for an emergency landing.
    iii) Expect an engine failure.
(3) If the oil pressure is in normal range:
    i) Land as soon as practical.

HIGH COOLANT TEMPERATURE (CT - CED/COOLANT °C - G1000 display)

(1) Increase airspeed and reduce power as quickly as possible
(2) Cabin Heat and Shut Off Cabin Heat - COLD, resp. CLOSED
(3) If coolant temperature reduces rapidly to normal range, continue to fly normally and monitor coolant temperature, Cabin Heat.
(4) If coolant temperature does not decrease
    i) Land as soon as practical.
    ii) Be prepared for an emergency landing.
    iii) Expect an engine failure.

“Water Level“ LIGHT ILLUMINATES/Caution COOL LVL

(1) Increase airspeed and reduce power as quickly as possible
(2) Coolant temperature “CT“ - CHECK and MONITOR
(3) Oil temperature “OT“ - CHECK and MONITOR
(4) If coolant temperature and/or oil temperature are rising into amber or red range,
    i) Land as soon as practical.
    ii) Be prepared for an emergency landing.
    iii) Expect an engine failure.

HIGH GEARBOX TEMPERATURE (GT - CED/GEARBOX°C - G1000 display)

(1) Reduce power to 55% - 75% as quickly as possible
(2) Land as soon as practical

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

■ CAUTION: The TAE 125-02-114 requires an electrical power source for its operation. If the alternator fails, continued engine operation time is dependent upon the remaining capacity of the main battery, the FADEC backup battery and equipment powered. The engine has been demonstrated to continue operating for approximately 120 minutes based upon the following assumptions:

Equipment		Time switched on	
		in [min]	in [%]
NAV/COM 1 receiving	ON	120	100
NAV/COM 1 transmitting	ON	12	10
NAV/COM 2 receiving	OFF	0	0
NAV/COM 2 transmitting	OFF	0	0
GPS	ON	60	50
Transponder	ON	120	100
Fuel Pump	OFF	0	0
AED-125	ON	120	100
Battery Ignition Relay	ON	120	100
CED-125	ON	120	100
Landing Light	ON	12	10
Flood Light	ON	1.2	1.0
Pitot Heat	ON	24	20
Interior Lightning	OFF	0	0
Navigation Lights	OFF	0	0
Beacon Lights	OFF	0	0
Strobe Lights	OFF	0	0
ADF	OFF	0	0
Intercom	OFF	0	0
Turn Indicator	OFF	0	0
Engine control system	ON	120	100

Table 3-1 Check List (conventional avionics)

■ CAUTION: This table only gives a reference point. The pilot should turn off all nonessential items and supply power only to equipment which is absolutely necessary for continued flight depending upon the situation.
Deviating from this recommendation, the remaining engine operating time may change.

▲ **WARNING:** If the power supply from both alternator and main battery is interrupted, continued engine operation is dependent on the remaining capacity of the FADEC backup battery. The engine has been demonstrated to continue operating for 30 minutes when powered by the FADEC backup battery only. In this case, all electrical equipment will not operate:
- land immediately
- DO NOT switch the FORCE-B switch, this will shut down the engine

Emergency Procedures Check List (G1000)

Alternator Failure
Indication: Master Warning, Triple Chime ALTR FAIL

■ CAUTION: The ALTR circuit breaker should not be opened manually when the alternator is functioning properly.

Verify Failure ..... CHECK ALTR AMPS Indication
ALTR Switch..... OFF
ALTR Circuit Breaker .....RESET if Tripped
ALTR Switch..... ON

If alternator still failed:

ALTR Switch ..... OFF
Electrical Power Remaining ..... 30 minutes or less
Electrical Load ..... SHED in less than 3 minutes
NON ESS BUS Circuit Breaker ..... PULL
Lighting BUS Circuit Breaker ..... PULL
AVION MASTER Switch ..... OFF

To ensure 30-minutes of battery life:

Battery Discharge ..... -13Amps Maximum
Pitot Heat ..... 6 Minutes Usage Maximum
Com Radio ..... 3 Minutes Usage Maximum

▲ **WARNING:** DO NOT activate the Force B switch!

After 30 minutes, pull the circuit breaker "CB BATT".
Land as soon as possible.
Once "CB BATT" is pulled EMERG BATT ON is indicated and the PFD is powered for approximately 30 minutes.
Continue with section „Complete Electrical Failure".
A continued engine operation time of 90 minutes has been demonstrated.

COMPLETE ELECTRICAL FAILURE
Indication: Single Chime, EMERG BATT ON

◆ Note: The VOLTS indication on the EIS window automatically changes to the emergency bus voltage (E VOLTS) when operating exclusively on the emergency bus.

EMERG BATT Switch ..... Verify ARM
Standby Flight Instrument ..... Verify OPERATIONAL
Aircraft Control ..... Use PFD and Standby Instrument
BATT MASTR Switch ..... OFF
ALTR Switch ..... OFF

◆ Note: Cooling air for PFD, GIA1 and the transponder will be lost when operating exclusively on the emergency bus as indicated by the PFD FAN FAIL and AV FAN FAIL advisory CAS message.

Prior to landing:

Landing Light ..... INOPERATIVE

Approximately 30 minutes of electrical power for avionics is available.
Land as soon as possible.

List of operative equipment while on the emergency bus:

- PFD (reversionary mode)
- Engine Instruments
- Com 1
- Nav 1
- Standby Instrument
- Audio Panel
- Avionics Lighting/Dimming

■ CAUTION: In the event of a complete electrical failure of the alternator, primary and emergency batteries, the EFD1000 will revert to its internal battery allowing approximately 30 additional minutes of operation. In this occurrence the EFD1000 will illuminate “ON BAT“ annunciation and display an estimated battery charge state.

Emergency Procedures Check List (conventional avionics)

ALTERNATOR WARNING DURING NORMAL ENGINE OPERATION

(1) Ammeter - CHECK

(2) Alternator CHECK - ON

■ CAUTION: If the FADEC was supplied by battery only until this point, the RPM can momentarily drop, when the alternator is switched on. In any case: leave the alternator switched ON!

(3) Battery Switch CHECK - ON

(4) Electrical load - REDUCE IMMEDIATELY as follows:

i) NAV/ COM 2 – OFF
ii) Fuel Pump – OFF
iii) Landing Light – OFF (use as required for landing)
iv) Taxi Light – OFF
v) Strobe Light – OFF
vi) Nav Lights – OFF
vii) Beacon – OFF
viii) Interior Lights – OFF
ix) Intercom – OFF
x) Pitot Heat – OFF (use as required)
xi) Autopilot – OFF
xii) Non-essential equipment – OFF

(5) The pilot should

i) Land as soon as practical.
ii) Be prepared for an emergency landing.
iii) Expect an engine failure.

AMMETER SHOWS BATTERY DISCHARGE DURING NORMAL ENGINE OPERATION FOR MORE THAN 5 MINUTES

◆ Note: If ampere and voltage indications decrease simultaneously, the battery is being discharged.

(1) Alternator Switch CHECK - ON

■ CAUTION: If the FADEC was supplied by battery only until this point, the RPM can momentarily drop, when the alternator is switched on. In any case: leave the alternator switched ON!

(2) Battery Switch CHECK - ON
(3) Electrical load - REDUCE IMMEDIATELY as follows:
   i) NAV/ COM 2 – OFF
   ii) Fuel Pump – OFF
   iii) Landing Light – OFF (use as required for landing)
   iv) Taxi Light – OFF
   v) Strobe Light – OFF
   vi) Nav Lights – OFF
   vii) Beacon – OFF
   viii) Interior Lights – OFF
   ix) Intercom – OFF
   x) Pitot Heat – OFF (use as required)
   xi) Autopilot – OFF
   xii) Non-essential equipment – OFF
(4) The pilot should,
   i) Land as soon as practical.
   ii) Be prepared for an emergency landing.
   iii) Expect an engine failure.

TOTAL ELECTRICAL FAILURE

(all equipment inoperative, except engine)

▲ **WARNING:** If both alternator and main battery fail, continued engine operation is dependent on the remaining capacity of the FADEC backup battery. The engine has been demonstrated to continue operating for 30 minutes when powered by the FADEC backup battery only. In this case, all other electrical equipment will not operate.

▲ **WARNING:** If the aircraft was operated on battery power only until this point (alternator warning illuminated), the remaining engine operating time may be less than 30 minutes.

(1) Alternator Switch CHECK – ON
(2) Battery Switch CHECK – ON
(3) Land as soon as possible
    i) Be prepared for an emergency landing
    ii) Expect an engine failure

▲ **WARNING:** Do not activate the FORCE-B switch, this will shut down the engine.

FADEC WARNING

◆ Note: The FADEC consists of two components that are independent of each other: FADEC A and FADEC B. In case of malfunctions in the active FADEC, it automatically switches to the other.

<u>One FADEC light/FADEC warning is flashing</u>

(1) Press FADEC test knob/switch at least 2 seconds
(2) FADEC warning extinguished (LOW category warning):
    a) Continue normal flight
    b) Inform service center after landing
(3) Steady FADEC Light/warning illuminated (HIGH category warning):
    a) Observe the other FADEC light (conventional avionics)
    b) Land as soon as practical
    c) Select an airspeed to avoid engine overspeed
    d) Inform service center after landing

<u>Both FADEC Lights/warnings are flashing</u>

◆ Note: The load display may not correspond to the actual value.

(1) Press FADEC test knob at least 2 seconds
(2) FADEC Light/warning extinguished (LOW category warning):
    a) Continue normal flight
    b) Inform service center after landing
(3) Steady FADEC Light/warning illuminated (HIGH category warning):
    a) Check the available engine power
    b) Expect engine failure
    c) Flight can be continued, however the pilot should:
        i) Select an appropriate airspeed to avoid engine overspeed.
        ii) Land as soon as possible.
        iii) Be prepared for an emergency landing.
    d) Inform service center after landing.
(4) In case a fuel tank was flown empty, proceed at the first signs of insufficient fuel feed as follows:
    a) Immediately switch the Fuel Selector to tank with sufficient fuel quantity.
    b) Electric Fuel Pump - ON
    c) Select an appropriate airspeed to avoid engine overspeed.
    d) Check the engine (engine parameters, airspeed / altitude change, whether the engine responds to changes in the Thrust Lever position).
    e) If the engine acts normal, continue the flight and land as soon as practical.

▲ **WARNING:** The high-pressure pump must be checked before the next flight

ABNORMAL ENGINE BEHAVIOR

If the engine acts abnormal during flight and the system does not automatically switch to the B-FADEC, it is possible to switch to the B-FADEC manually.

▲ **WARNING:** It is only possible to switch from the automatic position to B-FADEC (A-FADEC is active in normal operation, B-FADEC is active in case of malfunction). This only becomes necessary when no automatic switching occurred in case of abnormal engine behaviour.

(1) Select an appropriate airspeed to avoid engine overspeed

▲ **WARNING:** When operating on FADEC backup battery only, the Force B switch MUST NOT BE activated. This will shutdown the engine.

(2) Force B switch - SELECT to B-FADEC
(3) Flight may be continued, but the pilot should:
    i) Select an appropriate airspeed to avoid engine overspeed.
    ii) Land as soon as practical
    iii) Be prepared for an emergency landing

SPIN RECOVERY

No change for the TAE 125-02-114 installation

OPEN DOOR

No change for the TAE 125-02-114 installation

ROUGH ENGINE OPERATION

ENGINE MALFUNCTION DURING FLIGHT

◆ Note: Running a tank dry activates both FADEC lights flashing.

In case that one tank was flown dry, at the first signs of insufficient fuel feed proceed as follows:

(1) Immediately switch the Fuel Selector to tank with sufficient fuel quantity
(2) Electric Fuel Pump - ON
(3) Check the engine (engine parameters, airspeed/altitude change, whether the engine responds to changes in the Thrust Lever position)
(4) If the engine acts normal, continue the flight and land as soon as practical.

▲ **WARNING:** The high-pressure pump must be checked before the next flight.

PROPELLER RPM TOO HIGH

Propeller RPM between 2300 and 2400 for more than 20 seconds or over 2,400:

(1) Reduce power
(2) Reduce airspeed below 100 KIAS or as appropriate to prevent propeller overspeed
(3) Set power as required to maintain altitude and land as soon as practical.

◆ Note: If the propeller speed control fails, climbs can be performed at 65 KIAS and a power setting of 100%. In case of overspeed the FADEC will reduce the engine power at higher airspeeds to avoid propeller speeds above 2500 rpm

FLUCTUATIONS IN PROPELLER RPM

If the propeller RPM fluctuates by more than +/- 100 RPM with a constant Thrust Lever position:

(1) Change the power setting and attempt to find a setting where the propeller RPM no longer fluctuates
(2) If this does not work, set the maximum power at an airspeed <100 KIAS until the propeller speed stabilizes
(3) If the problem is resolved, continue the flight
(4) If the problem continues, reduce power to 55% - 75% or select a power level where the propeller RPM fluctuations are minimum. Fly at an airspeed below 110 KIAS and land as soon as practical

ENGINE SHUT DOWN IN FLIGHT

If it is necessary to shut down the engine in flight (for instance, abnormal engine behavior does not allow continued flight or there is a fuel leak, etc.), proceed as follows:

(1) Select an appropriate airspeed to avoid engine overspeed
(2) Engine Master - OFF
(3) Fuel Selector - CLOSED
(4) Electric Fuel Pump - OFF
(5) If the propeller also has to be stopped (for instance, due to excessive vibrations)
    i) Reduce airspeed to below 55 KIAS.
    ii) when the propeller is stopped, continue to glide at 73 KIAS.

RESTART AFTER ENGINE FAILURE

While gliding to a suitable landing strip, try to determine the reason for the engine malfunction. If time permits and a restart of the engine is possible, proceed as follows:

(1) Airspeed between 65 and 85 KIAS (100 KIAS maximum)
(2) Glide below 13000 ft
(3) Fuel Selector to tank with sufficient fuel quantity and temperature
(4) Electric Fuel Pump - ON
(5) Thrust Lever - IDLE
(6) Engine Master OFF, then ON (if the propeller does not turn, then “Starter“ ON)
(7) Check the engine power: Thrust Lever 100%, engine parameters, check altitude and airspeed

◆ Note: The propeller will normally continue to turn as long as the airspeed is above 65 KIAS. Should the propeller stop at an airspeed of 65 KIAS or more, the reason for this should be found out before attempting a restart. If it is obvious that the engine or propeller is jammed, do not use the starter

◆ Note: If the Engine Master is in OFF position, the load display shows 0% even if the propeller is turning.

CARBURETOR ICING

Not applicable for TAE 125-02-114 installation.

FLIGHT IN ICING CONDITIONS

▲ **WARNING:** Flight into known icing conditions is prohibited.

In case of inadvertent icing encounter proceed as follows:

(1) Pitot Heat switch - ON (if installed)

(2) Turn back or change the altitude to obtain an outside air temperature that is less conducive to icing.

(3) Cabin heat control full and open defroster outlets to obtain maximum windshield defroster airflow. Adjust cabin air control to get maximum defroster heat and airflow.

(4) Advance the Thrust Lever to increase the propeller speed and keep ice accumulation on the propeller blades as low as possible.

(5) Watch for signs of air filter icing and pull the "Alternate Air Door" control if necessary. An unexplained loss in engine power could be caused by ice blocking the air intake filter. Opening the "Alternate Air Door" allows preheated air from the engine compartment to be used.

(6) Plan a landing at the nearest airfield. With an extremely rapid ice build up, select a suitable "off airfield" landing site.

(7) With an ice accumulation of 0.5 cm or more on the wing leading edges, a significantly higher stall speed should be expected.

(8) Leave wing flaps retracted. With a severe ice build up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.

(9) Perform a landing approach using a forward slip, if necessary, for improved visibility.

(10) Approach at increased airspeed depending upon the amount of the accumulation.

(11) Perform a landing in level attitude.

SECTION 4
NORMAL PROCEDURES

PREFLIGHT INSPECTION

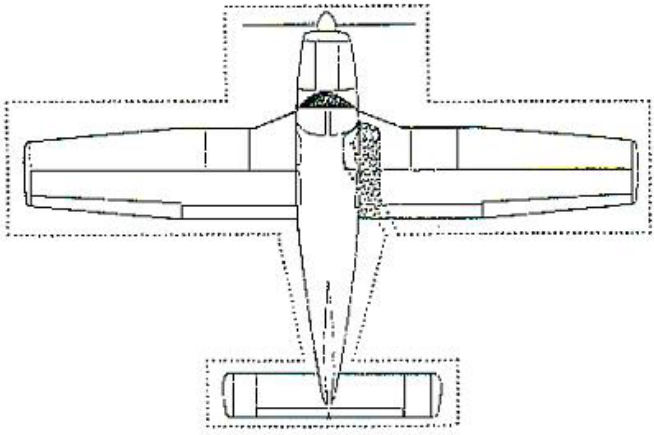

Figure 4-1

PREPARATION

Airplane status ..... airworthy, papers on board
Logbook ..... CHECK refuelling with allowed fuel (SECTION 2)
Weather .....suitable
Baggage ..... weighed, stowed, tied
Weight and CG .....within limits
Navigation ..... planned
Charts and navigation equipment .....on board
Performance and range ..... computed and safe

COCKPIT

(1) Control wheel ..... release restraints
(2) Avionics ..... OFF
(3) Parking brake ..... SET
(4) Electrical switches ..... OFF
(5) Engine Master switch ..... OFF
(6) Cabin Heat ..... OFF

▲ **WARNING:** When turning on the battery switch, using an external power source, or pulling the propeller through by hand, treat the propeller as if the Engine Master was ON.

(7) Battery and Main Bus (except G1000) Switch ..... ON
(8) Fuel quantity indicators ..... CHECK
(9) Fuel Temperature ..... CHECK
(10) Water level light (AED)/warning (G1000)... CHECK, if OFF
(11) Annunciator panel/G1000 Warnings ..... CHECK
(12) Battery and Main Bus (except G1000) Switch ..... OFF
(13) Flight Controls ..... CHECK
(14) Flaps ..... CHECK
(15) Trim ..... CHECK, set NEUTRAL
(16) Pitot drain ..... DRAIN, CLOSE
(17) Static drain ..... DRAIN, CLOSE
(18) Windows ..... CHECK, CLEAN
(19) Tow bar ..... STOW
(20) Baggage ..... SECURE
(21) Baggage door ..... CLOSE, SECURE

RIGHT WING

(1) Wing ..... free of ice, snow, frost
(2) Control surfaces ..... CHECK if free of ice, snow, frost
(3) Hinges ..... CHECK
(4) Static wicks ..... CHECK
(5) Wing tip and lights ..... CHECK
(6) Fuel tank ..... CHECK supply visually, fuel level not above bottom of filler indicator tab, secure cap
(7) Fuel tank sump ..... DRAIN, CHECK for water sediment and proper fuel (see section 2)
(8) Fuel vent ..... CLEAR
(9) Tie down and chock ..... REMOVE
(10) Main gear strut ..... Proper Inflation (114 ± 6 mm / 4.50 in.)
(11) Tire ..... CHECK
(12) Brake block and discs ..... CHECK
(13) Fresh air inlet ..... CLEAR

NOSE

(1) Oil ..... CHECK level
(2) Oil dipstick ..... SECURE
(3) Fuel and oil ..... CHECK for leaks
(4) Cowling ..... SECURE
(5) Windshield ..... CHECK
(6) Propeller and spinner ..... CHECK
(7) Air inlets ..... UNDAMAGED and CLEAR
(8) Landing light ..... CHECK

(9) Gearbox Oil Level ..... CHECK
.....the oil has to cover at least half of the inspection glass

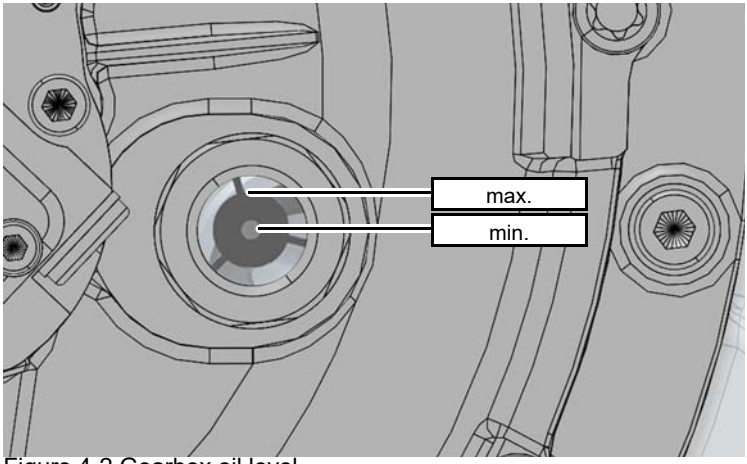

Figure 4-2 Gearbox oil level

(10) Nose chock ..... REMOVE
(11) Nose gear strut ..... Proper Inflation (83 ± 6 mm / 3.25 in.)
(12) Nose wheel tire ..... CHECK
(13) Fuel strainer .....DRAIN
CHECK for watersediment and proper fuel (SECTION 2)

LEFT WING

(1) Wing.....free of ice, snow, frost
(2) Fresh air inlet .....CLEAR
(3) Main gear strut..... Proper Inflation (114 ± 6 mm / 4.50 in.)
(4) Tire..... CHECK
(5) Brake block and discs..... CHECK
(6) Fuel tank ..... CHECK supply visually,
fuel level not above bottom of filler indicator tab
secure cap
(7) Fuel tank sump ..... DRAIN, CHECK for water,
sediment and proper fuel (SECTION 2)
(8) Fuel vent .....CLEAR
(9) Tie down and chock..... REMOVE

(10) Pitot heat.....REMOVE cover - holes CLEAR
(11) Wing tip and lights ..... CHECK
(12) Control surfaces..... CHECK if free of ice, snow, frost
(13) Hinges..... CHECK
(14) Static wicks ..... CHECK

FUSELAGE

(1) Antennas..... CHECK
(2) Empennage .....free of ice, snow, frost
(3) Fresh air inlet .....CLEAR
(4) Stabilator and trim tab..... CHECK
(5) Tie down ..... REMOVE
(6) Battery switch .....ON
(7) Check lighting ..... CHECK
(8) Nav and strobe lights ..... CHECK
(9) Stall warning ..... CHECK
(10) Pitot heat..... CHECK
(11) All switches .....OFF
(12) Passengers.....board
(13) Cabin door .....CLOSE and SECURE
(14) Seat belts and harnesses ... FASTEN - CHECK inertia reel

BEFORE STARTING ENGINE

(1) Brakes ..... SET
(2) Fuel Selector ..... desired tank
(3) Radios ..... OFF
(4) Alternate Air Door ..... CLOSED

STARTING ENGINE

▲ **WARNING:** Starting the engine using external power is not allowed. If starting the engine is not possible using battery power, the condition of the battery must be verified before flight.

(1) Thrust Lever ..... IDLE
(2) Alternator Switch ..... ON
(3) Force B Switch ..... Select Automatic
(4) Battery and Main Bus (except G1000) Switch ..... ON
CHECK fuel quantity and temperature

■ CAUTION: The electronic engine control needs an electrical power source for its operation. For normal operation battery, alternator and main bus (except G1000) have to be switched on. Separate switching is only allowed for tests and in the event of emergencies.

(5) Strobe lights ..... ON
(6) Electric fuel pump ..... ON
(7) Engine Master ..... ON
(8) Glow Control Indication ..... CHECK ON, then OFF
(9) Starter ..... ENGAGE until engine starts

■ CAUTION: Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds. After operating the starter motor, let it cool off for 20 seconds. After 6 attempts to start the engine, let the starter cool off for half an hour.

(10) Oil pressure ..... CHECK

■ CAUTION: Shut down the engine immediately if the minimum oil pressure of 1 bar is not indicated after 3 seconds!

(11) CED/AED Test Button .... PRESS (to delete Caution Light) (conventional avionics)

(12) Ammeter/BATT AMPS ...CHECK for positive charging current

(13) Voltmeter/VOLTS..... CHECK for GREEN range

FADEC Backup Battery Test

a) Alternator ..... OFF, engine must operate normally
b) Battery ..... OFF, for min. 10 seconds; engine must operate normally, the red FADEC lamps should not be illuminated
c) Battery .....ON
d) Alternator .....ON

FADEC Backup Battery Test (G1000)

a) Emergency Battery .....OFF
b) Alternator .....OFF
c) Battery Master Switch..... OFF (PFD OFF), for min. 10 sec., engine must operate normally
d) Battery Master Switch.....ON
e) Alternator .....ON
f) Emergency Battery ..... ON; FADEC warning must not occur

▲ **WARNING** It must be ensured that both battery and alternator are ON!
If the guarded alternator switch is installed, the switch guard must be closed.

(14) Avionics .....ON
(15) Ammeter/BATT AMPS Check for positive charging current
(16) Voltmeter/VOLTS..... Check for green range
STARTING ENGINE WHEN COLD ..... N/A
STARTING ENGINE WHEN HOT ..... N/A
STARTING ENGINE WHEN FLOODED..... N/A
GROUND CHECK ..... N/A

WARM UP

Let the engine warm up for about 2 minutes at IDLE (890 RPM).

Increase RPM to max. 1400 RPM until Oil temperature 50°C (122 °F), Coolant temperature 60°C (140 °F).

FADEC AND PROPELLER ADJUSTMENT FUNCTION CHECK

a) Thrust Lever - IDLE, FADEC indicators should be OFF
b) FADEC Test Button - PRESS and HOLD for entire test
c) FADEC indicators - ON, RPM increases

▲ **WARNING:** If the FADEC indicators do not come on at this point, it means that the test procedure has failed and take-off should **not** be attempted.

d) The FADEC automatically switches to B-component (only FADEC B/ECU B is indicated)
e) Propeller control activated; RPM decreases
f) The FADEC automatically switches to A-component (only FADEC A/ECU A is indicated), RPM increases
g) Propeller control activated; RPM decreases

h) FADEC A/ECU A indicator OFF, idle RPM is reached, the test is completed

i) FADEC Test Button - RELEASE

(1) Force B Switch - switch to FADEC B

(2) Engine - check running without a change

(3) Force B Switch - switch back to Automatic

▲ **WARNING:** If there are prolonged engine misfires or the engine shuts down during the test, take off may not be attempted.

▲ **WARNING:** The whole test procedure has to be performed without any failure. In case the engine shuts down or the FADEC lights/ warnings are flashing, take-off is prohibited. This applies even if the engine seems to run without failure after the test.

◆ Note: If the Test Button is released before the self-test is over, the FADEC immediately switches over to normal operation.

◆ Note: While switching from one FADEC to another, it is normal to hear and feel a momentary surge in the engine.

Thrust Lever .....FULL FORWARD,
.....load display min. 94%, RPM 2240 - 2300
Thrust Lever.....IDLE

BEFORE TAKE-OFF

Alternator, Battery and Main Bus (except G1000) Switch .. CHECK ON
Flight instruments, CAS Messages, PFD ..... CHECK
Alternator Warning Light (conventional avionics) ..... OFF
Fuel Selector ..... proper tank
Fuel Temperature ..... CHECK
Electric Fuel Pump ..... ON
Engine Instruments ..... CHECK
Alternate Air Door ..... CLOSED
Seat backs ..... ERECT
Belts / harness ..... FASTENED / CHECK
Empty seats. ..... seat belts snugly FASTENED
Flaps ..... SET
Trim tab ..... SET
Controls ..... FREE AND CORRECT
Door ..... LATCH

TAKE-OFF

Normal take-off

(1) Flaps ..... 25° (second notch)
(2) Trim ..... SET
(3) Accelerate to 45 - 57 KIAS (depending on flight mass)
(4) Control wheel ..... back pressure to rotate to climb attitude
(5) Accelerate to and maintain 55 - 65 KIAS (depending on flight mass) until obstacle clearance is achieved
(6) Best rate climb speed (flaps 10°) ..... 65 KIAS
(7) Flaps ..... RETRACT slowly

◆ Note: For aircraft which have the optional GFC 700 autopilot, the Takeoff/Go-Around (TOGA) button will not be installed. This removes the following autopilot and flight director modes/capability:

- Takeoff mode (flight director)

CLIMB

(1) Best rate climb speed (flaps up).....70 KIAS (PA-28-151/-161)
..... 76 KIAS (PA-28-181)

◆ Note: The best rate of climb at gross weight will be obtained at 70 KIAS / 76 KIAS. At lighter than gross weight this speed is reduced somewhat.

◆ Note: For better engine cooling a climb speed of:
79 KIAS (PA-28-151/161)
87 KIAS (PA-28-181 Archer III)
is recommended.

(2) En route climb.....recommended 85% to 90%

◆ Note: For extended duration climbs on high density altitude days set power to 85%-90% after Take-Off.

(3) Electric Fuel Pump..... OFF at desired altitude

CRUISING

(1) Cruise Power .....SET
(max. 100%, 75% or less is recommended)

(2) CED 125, AED 125 and Caution Light.....MONITOR
(oil pressure, water level as well as temperature of oil, water, gearbox and fuel within operating limits)

(3) Fuel quantity .....MONITOR
Gauges and LOW LEVEL caution lights (conventional avionics)
FUEL QTY bars (G1000 display)

(4) Select the other fuel tank approximately every 30 minutes to empty and heat both tanks equally (refer to SECTION 2, ENGINE OPERATING LIMITS)

■ CAUTION: Do not use any fuel tank below the minimum permissible fuel temperature!

(5) FADEC Warning Lights.....MONITOR

DESCENT

Normal

(1) Thrust Lever ..... AS REQUIRED
(2) Airspeed ..... DO NOT EXCEED V_{NO}

Power off

(1) Thrust Lever ..... IDLE
(2) Airspeed ..... AS REQUIRED
(3) Power .....verify with Thrust Lever every 30 seconds

APPROACH AND LANDING

(1) Fuel Selector .....proper tank
(2) Seat backs .....ERECT
(3) Belts / harness ..... FASTEN / CHECK
(4) Electric Fuel Pump .....ON
(5) Flaps ..... SET - DO NOT EXCEED V_{FE}
(6) Trim .....to 70 KIAS
(7) Final approach speed (flaps 40°) .....63 KIAS

◆ Note: For aircraft which have the optional GFC 700 autopilot, the Takeoff/Go-Around (TOGA) button will not be installed. This removes the following autopilot and flight director modes/capability:

- Go-Around mode (flight director)
- Go-Around mode (autopilot coupled if UPS installed)

STOPPING ENGINE

(1) Flaps ..... RETRACT
(2) Electric Fuel Pump .....OFF
(3) Radios .....OFF
(4) Thrust Lever .....IDLE
(5) Engine Master .....OFF
(6) Battery and Main Bus (except G1000) Switch .....OFF

SECTION 5
PERFORMANCE

FLIGHT PLANNING EXAMPLE

◆ Note: The information contained in this Section is to be used for example purposes only. The maximum weights according to SECTION 2 are to be observed for flight planning. This example is based on a PA 28-161 - Normal category and installed propeller MTV-6-A/187-129;
Max. Ramp Weight 1110 kg,
Max. Take-Off Weight 1107 kg

a) Airplane Loading

The first step in planning a flight is to calculate the airplane weight and center of gravity by utilizing the information provided in SECTION 6 (Weight and Balance) of this supplement to the Pilot's Operating Handbook.

The Basic Empty Weight of the airplane, determined by the company who made the modification, has been entered in Figure 6-5a to Figure 6-5d of this supplement. If any alterations to the airplane have been made affecting weight and balance, reference to the aircraft logbook and Weight and Balance Record (Figure 6-7 in the original POH) should be made to determine the current Basic Empty Weight of the airplane.

Make use of the Weight and Balance Loading Form (Figure 6-6) of this supplement and the C.G. Range and Weight graph of the EASA approved Pilot's Operating Handbook approved to determine the total weight of the airplane and the center of gravity position.

After proper utilization of the information provided, the following weights apply to the flight planning example:

The landing weight cannot be determined until the weight of fuel to be used has been established (refer to item (g)(1)).

(1) Basic Empty Weight..... 730 kg
(2) Occupants (3 x 77 kg..... 231 kg
(3) Baggage and cargo ..... 30 kg
(4) Fuel (0.80 kg/l x 160 l, JET A-1) ..... 128 kg
(5) Take-off Weight ..... 1081 kg
(6) Landing Weight
    (a) (5) minus (g) (1)
    (1050 kg minus 50.9 kg)..... 1000.9 kg

The take-off weight is below the maximum of 1107 kg, and the weight and balance calculations have determined that the C.G. position is within the approved limits.

(b) Take-off and landing

Now that the aircraft loading has been determined, all aspects of the take-off and landing must be considered.

All of the existing conditions at the departure and destination airport must be acquired, evaluated and maintained throughout the flight.

Apply the departure airport conditions and take-off weight to the appropriate take-off performance figures (Section 5a/5b) to determine the length of runway necessary for the take-off and/or the barrier distance.

The landing distance calculations are performed in the same manner using the existing conditions at the destination airport and, when established, the landing weight.

The conditions and calculations for the example flight are listed below. The take-off and landing distances required for the example flight have fallen well below the available runway lengths.

	Departure Airport	Destination Airport
(1) Pressure Altitude	1500ft	2500 ft
(2) Temperature	27°C (ISA + 15°C)	24°C (ISA + 14°C)
(3) Wind Component	0 knots	0 knots
(4) Runway Length Available	1463 m	2316 m

The takeoff distance charts, Section 5a/5b, should be consulted, keeping in mind that distances shown are based on the short field technique. Conservative distances can be established by reading the chart at the next higher value of weight, temperature and altitude. For example, in this particular sample problem, the takeoff distance information presented for a weight of 1,107 kg, pressure altitude of 2000 ft and a temperature of ISA+20°C should be used and results in the following:

Ground Roll	331 m
Total Distance to clear a 15 m obstacle	660 m

For calculation of landing distance refer to original POH.

◆ Note: The remainder or the performance charts used in this flight planning example assume no wind condition. The effect of winds aloft must be considered by the pilot when computing climb, cruise and descent performance.

(c) Climb

The next step in the flight plan is to determine the necessary climb segment components.
The desired cruise pressure altitude and corresponding cruise outside air temperature values are the first variables to be considered in determining the climb components from the table "Time, Fuel and Distance to Climb". After time, distance and quantity of fuel for the cruise pressure altitude and outside air temperature values have been established, apply the existing conditions at the departure field to the respective table. Now, subtract the values obtained from the table for the field of departure conditions from those for the cruise pressure altitude.The remaining values are the true fuel, time and distance components for the climb segment of the flight plan corrected for field pressure altitude and temperature.

The following values were determined from the above instructions in the flight planning example:

(1) Cruise Pressure Altitude ..... 5000 ft
(2) Cruise OAT ..... 16°C (ISA + 11°C)

Due to the difference in temperature to the standard atmosphere, the following correction applies:

$$\frac{11°C(20°F)}{10°C(18°F)} x 10\% = 11\% \text{ Increase}$$

(3) Time to Climb
((7.3 min minus 1.4 min = 5.9) + 11%) ..... 6.6 min
(4) Distance to Climb
((9.4 NM minus 1.7 NM = 7.7) + 11%)..... 8.6 NM
(5) Fuel to Climb
((4.2 l minus 0.8 l Jet A-1 = 3.4 l) + 11%) ..... 3.8 l
(6) Fuel to start-up, taxi and take-off 1l
(7) Fuel for start-up, taxi and take-off and climb
(1 l plus 3.8 l) ..... 4.8 l

(d) Descent

To determine the descent data for fuel, time and distance the appropriate tables in Section 5a/5b can be used with sufficient accuracy.

(e) Cruise

Using the total distance to be traveled during the flight, subtract the previously calculated distance to climb to establish the total cruise distance.

Calculate the cruise fuel consumption for the cruise power setting with the appropriate table.

The cruise time is found by dividing the cruise distance by the cruise speed and the cruise fuel is found by multiplying the cruise fuel consumption by the cruise time.

The cruise calculations established for the cruise segment of the flight planning example are as follows:

(1) Total Distance ..... 300 NM

(2) Cruise Distance
(e)(1) minus (c)(4)
(300 NM - 8.6 NM) ..... 291.4 NM

(3) Cruise Power 70%

(4) Cruise Speed ..... 109.5 KTAS

(5) Cruise Fuel Consumption ..... 22.1 l/h

(6) Cruise Time
(e)(2) divided by (e)(4)
(291.4 NM divided by 109.5 KTAS) ..... =2.66 h

(7) Cruise Fuel
(e)(5) multiplied by (e)(6)
(22.1 l/h x 2.91 h) ..... =58.8 l

(f) Total Flight Time

The total flight time is determined by adding the time to climb and the cruise time.

◆ Note: The time values taken from the climb table are in minutes and must be converted to hours before adding them to the cruise time.

The following flight time is required for the flight planning example:

Total Flight Time
(c)(3) plus (e)(6)
(0.11 h + 2.66 h) ..... =2.77 h

(g) Total Fuel Required

Determine the total fuel required by adding the fuel to climb and the cruise fuel. When the total fuel (in liters) is determined, multiply this value by 0.84 kg/l for JET A-1 or for Diesel to determine the total fuel weight used for flight.

The total fuel calculations for the example flight plan are shown below:

(1) Total Fuel Required
(c)(7) plus (e)(7)
(4.8 l plus 58.8 l of Jet A-1)..... 63.6 l
(63.6 l x 0.80 kg/l) ..... 50.9 kg

SECTION 5a
PERFORMANCE

◆ Note: This chapter applies to aircrafts with propellers **MTV-6-A/187-129**.
Determine the correct propeller designation located on the blades.

◆ Note: The chapter not relevant to the respective propeller can be omitted.

GROUND ROLL AND TAKE-OFF DISTANCE
at 916 kg

(PA-28-151/-161)

Conditions:

Weight 916 kg
Flaps 25°
Full Power Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift-off speed: 47 KIAS
Speed at 15 m: 51 KIAS

Notes:

(1) Decrease distances 10% for each 9 Knots headwind; Increase distances 10% for each 2 knots of tailwind up to 10 Knots.

(2) For operation on dry, grass runway, increase distances by 15% of the ground roll figure.

(3) Consider additional distances (min. 20%) for wet grass runway, softened ground or snow.

Press. Alt.	Ground Roll and Take-Off Distance [m] Outside Air Temperature [°C]					
[ft]	[m]	ISA	ISA+10	ISA+20	ISA+30	ISA+35
0	Gnd Roll	156	167	183	193	218
	50ft (15m) obstacle	310	332	365	388	438
1000	Gnd Roll	165	177	194	204	231
	50ft (15m) obstacle	328	351	386	410	464
2000	Gnd Roll	174	187	205	216	244
	50ft (15m) obstacle	347	372	409	434	491
3000	Gnd Roll	185	198	217	229	259
	50ft (15m) obstacle	367	393	433	460	520
4000	Gnd Roll	195	210	230	243	274
	50ft (15m) obstacle	389	417	459	487	552
5000	Gnd Roll	207	222	244	258	291
	50ft (15m) obstacle	411	441	486	516	585
6000	Gnd Roll	219	235	258	273	309
	50ft (15m) obstacle	436	468	515	548	621
7000	Gnd Roll	237	255	280	296	334
	50ft (15m) obstacle	472	506	558	593	673
8000	Gnd Roll	257	276	303	320	363
	50ft (15m) obstacle	510	548	605	642	729
9000	Gnd Roll	281	302	332	351	397
	50ft (15m) obstacle	559	601	663	704	800
10000	Gnd Roll	308	331	364	385	436
	50ft (15m) obstacle	613	660	728	773	879

Table 5a-1a Takeoff Distance at take-off weight 916 kg

GROUND ROLL AND TAKE-OFF DISTANCE
at 1055 kg

(PA-28-151/-161)

Conditions:

Weight 1055 kg
Flaps 25°
Full Power Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift-off speed: 50 KIAS
Speed at 15 m (50 ft): 55 KIAS

Notes:

(1) Decrease distances 10% for each 9 Knots headwind; Increase distances 10% for each 2 knots of tailwind up to 10 Knots.

(2) For operation on dry, grass runway, increase distances by 15% of the ground roll figure.

(3) Consider additional distances (min. 20%) for wet grass runway, softened ground or snow.

Press. Alt.	Ground Roll and Take-Off Distance [m] Outside Air Temperature [°C]					
[ft]	[m]	ISA	ISA+10	ISA+20	ISA+30	ISA+35
0	Gnd Roll	225	241	264	278	314
	50ft (15m) obstacle	447	478	526	558	631
1000	Gnd Roll	238	254	279	295	332
	50ft (15m) obstacle	473	506	556	591	668
2000	Gnd Roll	251	269	295	312	352
	50ft (15m) obstacle	500	536	589	626	708
3000	Gnd Roll	266	285	313	330	373
	50ft (15m) obstacle	529	567	624	663	750
4000	Gnd Roll	282	302	331	350	395
	50ft (15m) obstacle	560	601	661	702	795
5000	Gnd Roll	298	320	351	371	419
	50ft (15m) obstacle	593	636	701	744	844
6000	Gnd Roll	316	339	372	394	445
	50ft (15m) obstacle	628	674	743	789	895
7000	Gnd Roll	335	360	395	418	472
	50ft (15m) obstacle	666	715	788	837	950
8000	Gnd Roll	355	382	419	443	502
	50ft (15m) obstacle	706	759	837	889	1009
9000	Gnd Roll	381	409	450	475	538
	50ft (15m) obstacle	758	814	898	954	1084
10000	Gnd Roll	408	439	483	510	578
	50ft (15m) obstacle	813	875	965	1025	1166

Table 5a-1b Takeoff Distance at take-off weight 1055 kg

GROUND ROLL AND TAKE-OFF DISTANCE
at 1107 kg

(only **PA 28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA 28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:
Weight 1107 kg
Flaps 25°
Full Power Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift-off speed: 52 KIAS
Speed at 15 m (50 ft): 57 KIAS

Notes:

(1) Decrease distances 10% for each 9 Knots headwind; Increase distances 10% for each 2 knots of tailwind up to 10 Knots.

(2) For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

(3) Consider additional distances (min. 20%) for wet grass runway, softened ground or snow.

Press. Alt.	Ground Roll and Take-Off Distance [m] Outside Air Temperature [°C]					
[ft]	[m]	ISA	ISA+10C	ISA+20	ISA+30	ISA+35
0	Gnd Roll	255	273	299	336	356
	50ft (15m) obstacle	507	542	596	673	716
1000	Gnd Roll	269	289	316	355	377
	50ft (15m) obstacle	536	574	631	712	758
2000	Gnd Roll	285	305	335	376	399
	50ft (15m) obstacle	567	607	668	754	803
3000	Gnd Roll	302	323	355	399	423
	50ft (15m) obstacle	600	643	707	799	851
4000	Gnd Roll	319	342	376	423	448
	50ft (15m) obstacle	635	681	749	847	902
5000	Gnd Roll	338	363	398	448	476
	50ft (15m) obstacle	672	721	794	899	956
6000	Gnd Roll	358	385	422	475	505
	50ft (15m) obstacle	712	765	842	953	1015
7000	Gnd Roll	380	408	448	504	536
	50ft (15m) obstacle	755	811	894	1012	1077
8000	Gnd Roll	403	433	476	536	569
	50ft (15m) obstacle	801	860	948	1074	1144
9000	Gnd Roll	432	464	510	575	611
	50ft (15m) obstacle	859	923	1018	1154	1229
10000	Gnd Roll	463	498	547	617	656
	50ft (15m) obstacle	922	992	1094	1240	1322

Table 5a-1c Takeoff Distance at take-off weight 1107 kg

MAXIMUM RATE-OF-CLIMB at 916 kg

(PA-28-151/-161)

Conditions:

Take-off weight 916 kg
Climb speed V_y = 70 KIAS
Flaps Up
Full Power

Notes:

1. For operation in air colder than this table provides, use coldest data shown.
2. For operation in air warmer than this table provides, use extreme caution.

Press. Alt.	Rate of Climb [ft/min] Temperature [°C]					
[ft]	ISA - 10	ISA	ISA + 10	ISA + 20	ISA + 30	ISA + 35
0	997	989	973	888	741	671
1000	990	983	967	881	734	664
2000	984	976	960	874	727	657
3000	978	970	953	867	720	649
4000	971	963	946	860	713	642
5000	964	956	939	853	706	634
6000	957	949	932	845	698	627
7000	950	941	924	838	690	619
8000	943	934	917	830	682	611
9000	907	898	881	795	650	580
10000	871	862	844	760	618	549
11000	835	825	808	725	585	518
12000	799	789	771	690	553	486
13000	762	752	735	654	520	454
14000	726	715	698	619	487	423
15000	689	678	660	583	453	390
16000	652	641	623	547	420	358
17000	614	603	585	510	386	326
18000	577	565	547	474	352	293

Table 5a-2a Maximum Rate of Climb at 916 kg

TIME, FUEL AND DISTANCE TO CLIMB at 916 kg

(PA-28-151/-161)

Conditions:

Takeoff weight 916 kg
Climb speed v_y = 70 KIAS
Flaps Up; Full Power; Zero wind, Standard Temperature

Notes:

(1) Add 4 l of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 10°C above standard temperature.
(3) Distances shown are based on zero wind.
(4) Time, distance and fuel required are only valid from the point where the airplane climbs at v_y = 70 KIAS.

Press. Alt. [ft]	OAT [°C]	ROC [FPM]	Time [MIN]	Distance [NM]	Fuel used [l]	[US Gal]
0	15	989	0.0	0.0	0.0	0.0
1000	13	983	1.0	1.2	0.6	0.1
2000	11	976	2.0	2.4	1.1	0.3
3000	9	970	3.1	3,6	1.7	0.5
4000	7	963	4.1	5.0	2.3	0.6
5000	5	956	5.1	6.3	2.9	0.8
6000	3	949	6.2	7.7	3.5	0.9
7000	1	941	7.2	9.2	4.0	1.1
8000	-1	934	8.3	10.7	4.6	1.2
9000	-3	898	9.4	12.3	5.1	1.4
10000	-5	862	10.5	14.0	5.6	1.5
11000	-7	825	11.7	15.8	6.1	1.6
12000	-9	789	13.0	17.8	6.5	1.7
13000	-11	752	14.3	19.9	7.0	1.9
14000	-13	715	15.6	22.2	7.5	2.0
15000	-15	678	17.1	24.6	7.9	2.1
16000	-17	641	18.6	27.3	8.4	2.2
17000	-19	603	20.2	30.1	8.8	2.3
18000	-21	565	21.9	33.2	9.3	2.5

Table 5a-2bTime, Fuel and Distance to Climb at 916 kg

MAXIMUM RATE-OF-CLIMB at 1055 kg

(PA-28-151/-161)

Conditions:

Take-off weight 1055 kg
Climb speed V_y = 70 KIAS
Flaps Up
Full Power

Notes:

1. For operation in air colder than this table provides, use coldest data shown.
2. For operation in air warmer than this table provides, use extreme caution.

Press. Alt.	Rate of Climb [ft/min] Temperature [°C]					
[ft]	ISA - 10	ISA	ISA + 10	ISA + 20	ISA + 30	ISA + 35
0	780	772	756	680	552	490
1000	773	765	749	673	545	482
2000	766	758	742	666	537	475
3000	759	751	735	658	529	467
4000	752	743	727	651	522	459
5000	745	736	720	643	513	451
6000	738	728	712	635	505	443
7000	730	720	704	627	497	434
8000	722	713	696	618	488	425
9000	690	680	663	587	459	397
10000	657	647	630	555	429	368
11000	624	613	596	522	399	339
12000	591	580	563	490	369	310
13000	557	546	529	457	338	281
14000	524	513	495	425	308	251
15000	490	479	461	392	277	221
16000	456	444	427	358	246	191
17000	422	410	392	325	214	161
18000	387	375	357	291	183	130

Table 5a-3a Maximum Rate of Climb at 1055 kg

TIME, FUEL AND DISTANCE TO CLIMB
at 1055 kg

(PA-28-151/-161)

Conditions:

Takeoff weight 1055 kg
Climb speed v_y = 70 KIAS
Flaps Up; Full Power; Zero wind, Standard Temperature

Notes:

(1) Add 4 l of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 10°C above standard temperature.
(3) Distances shown are based on zero wind.
(4) Time, distance and fuel required are only valid from the point where the airplane climbs at v_y = 70 KIAS.

Press. Alt. [ft]	OAT [°C]	ROC [FPM]	Time [MIN]	Distance [NM]	Fuel used [l]	[US Gal]
0	15	772	0.0	0.0	0.0	0.0
1000	13	765	1.3	1.5	0.7	0.2
2000	11	758	2.6	3.1	1.5	0.4
3000	9	751	3.9	4.8	2.2	0.6
4000	7	743	5.3	6.5	2.9	0.8
5000	5	736	6.6	8.3	3.7	1.0
6000	3	728	8.0	10.2	4.5	1.2
7000	1	720	9.4	12.1	5.2	1.4
8000	-1	713	10.8	14.1	6.0	1.6
9000	-3	680	12.2	16.3	6.7	1.8
10000	-5	647	13.7	18.6	7.3	1.9
11000	-7	613	15.3	21.0	7.9	2.1
12000	-9	580	17.0	23.7	8.6	2.3
13000	-11	546	18.8	26.6	9.2	2.4
14000	-13	513	20.6	29.8	9.9	2.6
15000	-15	479	22.7	33.2	10.5	2.8
16000	-17	444	24.8	37.0	11.2	3.0
17000	-19	410	27.2	41.2	11.9	3.1
18000	-21	375	29.7	45.8	12.6	3.3

Table 5a-3b Time, Fuel and Distance to Climb at 1055 kg

MAXIMUM RATE-OF-CLIMB at 1107 kg

(**PA-28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA-28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:

Take-off weight 1107 kg
Climb speed V_y = 70 KIAS
Flaps Up, Full Power

Notes:

1. For operation in air colder than this table provides, use coldest data shown.
2. For operation in air warmer than this table provides, use extreme caution.

Press. Alt.	Rate of Climb [ft/min] Temperature [°C]					
[ft]	ISA - 10	ISA	ISA + 10	ISA + 20	ISA + 30	ISA + 35
0	711	702	687	614	491	432
1000	704	695	680	607	484	424
2000	697	688	673	599	476	416
3000	690	681	665	592	468	408
4000	682	673	657	584	460	400
5000	675	666	650	576	452	392
6000	667	658	642	568	443	383
7000	660	650	633	559	435	375
8000	652	642	625	551	426	366
9000	620	610	593	520	397	338
10000	588	578	561	489	368	310
11000	556	546	529	457	339	282
12000	524	513	496	426	310	253
13000	492	480	463	394	280	225
14000	459	448	430	362	250	196
15000	426	414	397	330	220	167
16000	393	381	363	297	189	137
17000	360	347	330	265	159	107
18000	326	314	296	232	128	77

Table 5a-4a Maximum Rate of Climb at 1107 kg

TIME, FUEL AND DISTANCE TO CLIMB at 1107 kg

(only **PA-28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA-28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:

Takeoff weight 1107 kg
Climb speed v_y = 70 KIAS
Flaps Up; Full Power; Zero wind, Standard Temperature

Notes:

(1) Add 4 l of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 10°C above standard temperature.
(3) Distances shown are based on zero wind.
(4) Time, distance and fuel required are only valid from the point where the airplane climbs at v_y = 70 KIAS.

Press. Alt. [ft]	OAT [°C]	ROC [FPM]	Time [MIN]	Distance [NM]	Fuel used [l]	[US Gal]
0	15	702	0.0	0.0	0.0	0.0
1000	13	695	1.4	1.7	0.8	0.2
2000	11	688	2.9	3.4	1.6	0.4
3000	9	681	4.3	5.3	2.4	0.6
4000	7	673	5.8	7.2	3.2	0.9
5000	5	666	7.3	9.1	4.1	1.1
6000	3	658	8.8	11.2	4.9	1.3
7000	1	650	10.3	13.4	5.8	1.5
8000	-1	642	11.9	15.6	6.6	1.8
9000	-3	610	13.5	18.0	7.4	1.9
10000	-5	578	15.2	20.5	8.1	2.1
11000	-7	546	17.0	23.3	8.8	2.3
12000	-9	513	18.8	26.3	9.5	2.5
13000	-11	480	20.9	29.6	10.3	2.7
14000	-13	448	23.0	33.2	11.0	2.9
15000	-15	414	25.3	37.2	11.8	3.1
16000	-17	381	27.9	41.6	12.6	3.3
17000	-19	347	30.6	46.4	13.4	3.5
18000	-21	314	33.6	51.9	14.3	3.8

Table 5a-4b Time, Fuel and Distance to Climb at 1107 kg

CRUISE PERFORMANCE, RANGE AND ENDURANCE at 1055 kg

(PA-28-151/-161)

Conditions:

Take-off weight 1055 kg
Flaps Up
Zero wind

Notes:

1. Endurance information are based on fuel tanks with a capacity of 162.8 l usable fuel and include 4 l for startup and taxi; time, fuel and distance to climb 45 min. reserve.
2. Increase true airspeed and range by 1% per 10°C above ISA temperature. Decrease true airspeed and range by 1% per 10°C below ISA temperature.
3. Cruise Power above 75% not recommended. For economic cruise set load 70% or less.

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
2000	100	130	33.6	8.9	516	3.9
2000	90	125	29.6	7.8	571	4.6
2000	80	118	25.8	6.8	635	5.3
2000	70	111	22.1	5.8	709	6.4
2000	60	102	18.6	4.9	793	7.7
2000	50	92	15.3	4.0	883	9.5
4000	100	133	33.6	8.9	522	3.9
4000	90	127	29.6	7.8	578	4.5
4000	80	120	25.8	6.8	642	5.3
4000	70	112	22.1	5.8	716	6.3
4000	60	104	18.6	4.9	799	7.6
4000	50	93	15.3	4.0	888	9.4
6000	100	135	33.6	8.9	529	3.9
6000	90	129	29.6	7.8	585	4.5
6000	80	122	25.8	6.8	649	5.2
6000	70	114	22.1	5.8	723	6.3
6000	60	105	18.6	4.9	806	7.6
6000	50	95	15.3	4.0	894	9.4
8000	100	137	33.6	8.9	535	3.8
8000	90	131	29.6	7.8	591	4.4
8000	80	124	25.8	6.8	656	5.2
8000	70	116	22.1	5.8	729	6.2
8000	60	107	18.6	4.9	811	7.5
8000	50	96	15.3	4.0	898	9.2

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
10000	90	133	29.6	7.8	598	4.4
10000	80	126	25.8	6.8	663	5.1
10000	70	118	22.1	5.8	736	6.1
10000	60	108	18.6	4.9	817	7.4
10000	50	97	15.3	4.0	902	9.1
12000	90	135	29.6	7.8	606	4.3
12000	80	128	25.8	6.8	669	5.0
12000	70	119	22.1	5.8	742	6.0
12000	60	110	18.6	4.9	822	7.3
12000	50	98	15.3	4.0	905	9.0
14000	80	130	25.8	6.8	676	4.9
14000	70	121	22.1	5.8	748	5.9
14000	60	111	18.6	4.9	827	7.2
14000	50	99	15.3	4.0	909	8.8
16000	80	132	25.8	6.8	684	4.9
16000	70	123	22.1	5.8	755	5.8
16000	60	112	18.6	4.9	833	7.0
16000	50	100	15.3	4.0	912	8.7

Table 5a-5a Cruise Performance, Range and Endurance at 1055 kg

Cruise Performance, Range and Endurance at 1107 kg

(only **PA-28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA-28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:

Take-off weight 1107 kg
Flaps Up
Zero wind

Notes:

1. Endurance information are based on fuel tanks with a capacity of 162.8 l usable fuel and include 4 l for startup and taxi; time, fuel and distance to climb 45 min. reserve.
2. Increase true airspeed and range by 1% per 10°C above ISA temperature. Decrease true airspeed and range by 1% per 10°C below ISA temperature.
3. Cruise Power above 75% not recommended. For economic cruise set load 70% or less.

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
2000	100	127	33.6	8.9	501	3.9
2000	90	121	29.6	7.8	554	4.5
2000	80	114	25.8	6.8	615	5.3
2000	70	107	22.1	5.8	685	6.4
2000	60	99	18.6	4.9	763	7.7
2000	50	89	15.3	4.0	847	9.5
4000	100	129	33.6	8.9	507	3.9
4000	90	123	29.6	7.8	560	4.5
4000	80	116	25.8	6.8	621	5.3
4000	70	109	22.1	5.8	691	6.3
4000	60	100	18.6	4.9	769	7.6
4000	50	90	15.3	4.0	851	9.4
6000	100	131	33.6	8.9	513	3.8
6000	90	125	29.6	7.8	566	4.5
6000	80	118	25.8	6.8	627	5.2
6000	70	110	22.1	5.8	697	6.2
6000	60	101	18.6	4.9	774	7.5
6000	50	91	15.3	4.0	855	9.3
8000	100	133	33.6	8.9	519	3.8
8000	90	127	29.6	7.8	572	4.4
8000	80	120	25.8	6.8	633	5.2
8000	70	112	22.1	5.8	702	6.1
8000	60	103	18.6	4.9	779	7.4
8000	50	92	15.3	4.0	858	9.2

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
10000	90	129	29.6	7.8	578	4.3
10000	80	122	25.8	6.8	639	5.1
10000	70	113	22.1	5.8	707	6.1
10000	60	104	18.6	4.9	783	7.3
10000	50	93	15.3	4.0	860	9.1
12000	90	131	29.6	7.8	585	4.2
12000	80	124	25.8	6.8	645	5.0
12000	70	115	22.1	5.8	713	5.9
12000	60	105	18.6	4.9	787	7.2
12000	50	94	15.3	4.0	862	8.9
14000	80	125	25.8	6.8	651	4.9
14000	70	117	22.1	5.8	718	5.8
14000	60	107	18.6	4.9	791	7.1
14000	50	94	15.3	4.0	864	8.7
16000	80	127	25.8	6.8	658	4.8
16000	70	118	22.1	5.8	724	5.7
16000	60	108	18.6	4.9	795	6.9
16000	50	95	15.3	4.0	866	8.6

Table 5a-5b Cruise Performance, Range and Endurance at 1107 kg

GLIDE RANGE

Conditions:
Propeller windmilling
Flaps 0°, Zero wind, 78 KIAS

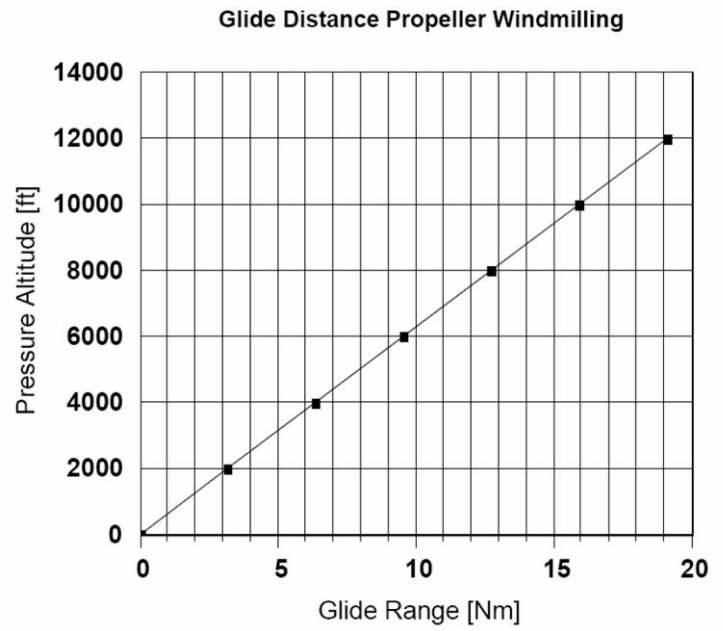

Figure 5a-5 Glide Range

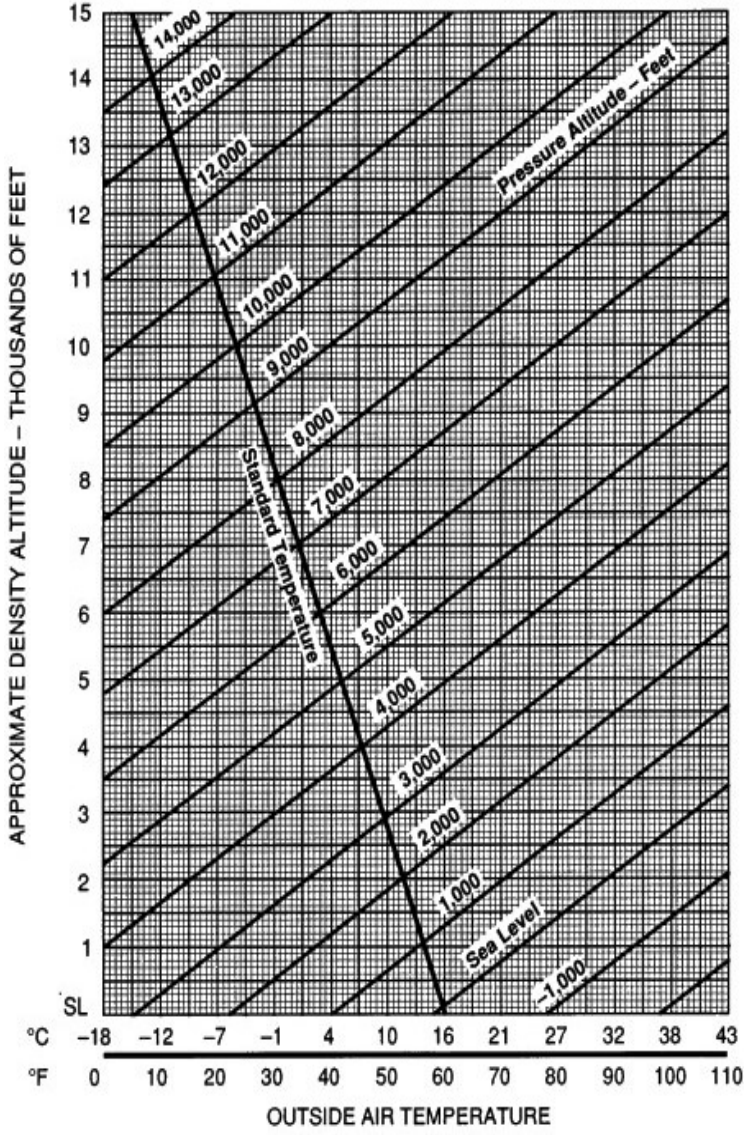

Figure 5a-6 Density Altitude

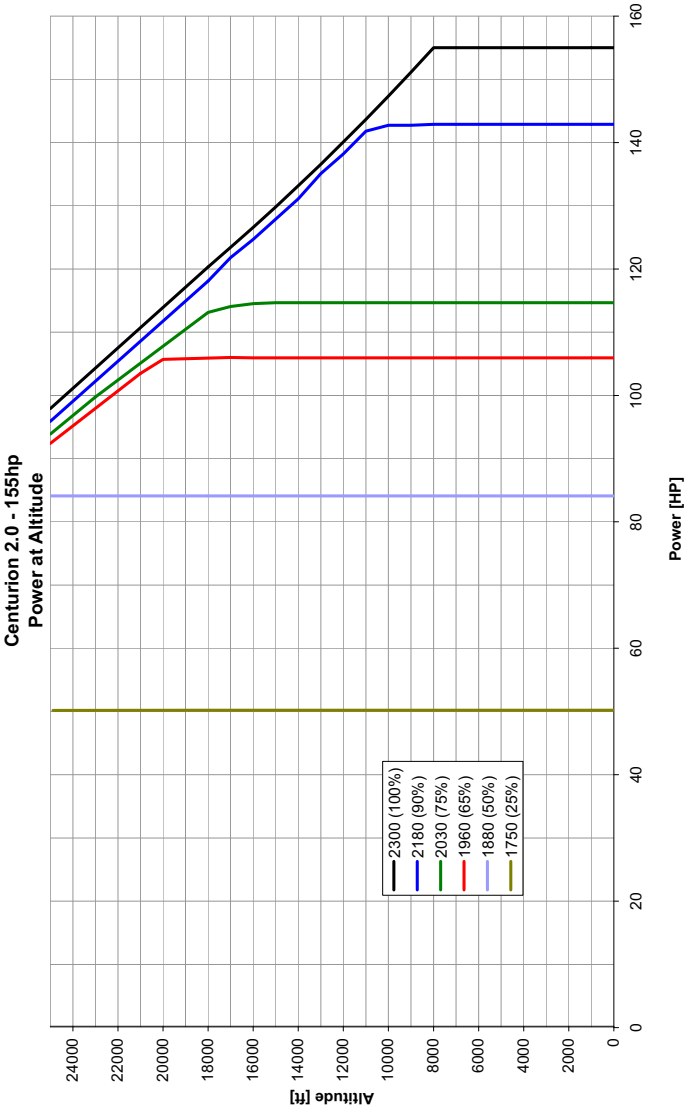

Figure 5a-7 Power at Altitude

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SECTION 5b
PERFORMANCE

◆ Note: This chapter applies to aircrafts with propellers **MTV-6-A/190-69**.
Determine the correct propeller designation located on the blades.

◆ Note: The chapter not relevant to the respective propeller can be omitted.

GROUND ROLL AND TAKE-OFF DISTANCE at 966 kg

(only **PA-28-181 Archer III**)

Conditions:
Weight 966 kg
Flaps 25°
Full Power Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift-off speed: 50 KIAS
Speed at 15 m (50 ft): 54 KIAS

Notes:

(1) Decrease distances 10% for each 9 Knots headwind; Increase distances 10% for each 2 knots of tailwind up to 10 Knots.

(2) For operation on dry, grass runway, increase distances by 15% of the ground roll figure.

(3) Consider additional distances (min. 20%) for wet grass runway, softened ground or snow.

Press. Alt.	Ground Roll and Take-Off Distance [m] Outside Air Temperature [°C]					
[ft]	[m]	ISA	ISA+10	ISA+20	ISA+30	ISA+35
0	Gnd Roll	175	188	203	231	241
	50ft (15m) obstacle	319	343	371	391	442
1000	Gnd Roll	186	199	215	226	255
	50ft (15m) obstacle	338	363	392	413	468
2000	Gnd Roll	196	211	228	239	270
	50ft (15m) obstacle	357	384	415	438	496
3000	Gnd Roll	208	223	241	253	286
	50ft (15m) obstacle	378	407	440	464	526
4000	Gnd Roll	220	237	256	268	304
	50ft (15m) obstacle	400	431	466	491	557
5000	Gnd Roll	233	251	271	284	322
	50ft (15m) obstacle	424	456	494	521	591
6000	Gnd Roll	247	266	287	302	342
	50ft (15m) obstacle	449	484	524	552	627
7000	Gnd Roll	267	287	311	326	370
	50ft (15m) obstacle	485	523	567	597	679
8000	Gnd Roll	288	311	337	353	401
	50ft (15m) obstacle	525	566	613	647	735
9000	Gnd Roll	315	340	368	386	438
	50ft (15m) obstacle	573	619	671	707	805
10000	Gnd Roll	344	371	402	422	480
	50ft (15m) obstacle	627	677	735	774	882

Table 5b-1a Take-off Distance at take-off weight 966 kg

GROUND ROLL AND TAKE-OFF DISTANCE
at 1055 kg

(only **PA-28-151 /-161**)

Conditions:
Weight 1055 kg
Flaps 25°
Full Power Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift-off speed: 53 KIAS
Speed at 15 m (50 ft): 56 KIAS

Notes:

(1) Decrease distances 10% for each 9 Knots headwind; Increase distances 10% for each 2 knots of tailwind up to 10 Knots.

(2) For operation on dry, grass runway, increase distances by 15% of the ground roll figure.

(3) Consider additional distances (min. 20%) for wet grass runway, softened ground or snow.

Press. Alt.	Ground Roll and Take-Off Distance [m] Outside Air Temperature [°C]					
[ft]	[m]	ISA	ISA+10	ISA+20	ISA+30	ISA+35
0	Gnd Roll	221	237	256	268	303
	50ft (15m) obstacle	401	431	466	491	556
1000	Gnd Roll	233	251	271	284	321
	50ft (15m) obstacle	424	456	493	520	589
2000	Gnd Roll	247	265	287	301	340
	50ft (15m) obstacle	449	483	522	550	624
3000	Gnd Roll	261	281	303	318	360
	50ft (15m) obstacle	475	511	553	583	661
4000	Gnd Roll	277	297	322	337	382
	50ft (15m) obstacle	503	541	586	618	701
5000	Gnd Roll	293	315	341	358	405
	50ft (15m) obstacle	533	574	621	655	743
6000	Gnd Roll	310	334	361	379	430
	50ft (15m) obstacle	564	608	659	694	789
7000	Gnd Roll	335	361	391	410	465
	50ft (15m) obstacle	610	658	713	751	854
8000	Gnd Roll	363	391	423	444	504
	50ft (15m) obstacle	660	712	771	813	925
9000	Gnd Roll	396	427	463	486	551
	50ft (15m) obstacle	721	778	844	890	1012
10000	Gnd Roll	433	467	506	531	603
	50ft (15m) obstacle	789	851	924	974	1109

Table 5b-1b Take-off Distance at take-off weight 1055 kg

GROUND ROLL AND TAKE-OFF DISTANCE
at 1107 kg

(only **PA-28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA-28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:
Weight 1107 kg
Flaps 25°
Full Power Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift-off speed: 55 KIAS
Speed at 15 m (50 ft): 58 KIAS

Notes:

(1) Decrease distances 10% for each 9 Knots headwind; Increase distances 10% for each 2 knots of tailwind up to 10 Knots.

(2) For operation on dry, grass runway, increase distances by 15% of the ground roll figure.

(3) Consider additional distances (min. 20%) for wet grass runway, softened ground or snow.

Press. Alt.	Ground Roll and Take-Off Distance [m] Outside Air Temperature [°C]					
[ft]	[m]	ISA	ISA+10	ISA+20	ISA+30	ISA+35
0	Gnd Roll	250	268	290	323	343
	50ft (15m) obstacle	455	489	528	591	630
1000	Gnd Roll	264	284	307	342	363
	50ft (15m) obstacle	481	517	559	626	667
2000	Gnd Roll	280	300	324	362	385
	50ft (15m) obstacle	508	547	591	663	706
3000	Gnd Roll	296	318	344	384	408
	50ft (15m) obstacle	538	579	626	702	748
4000	Gnd Roll	313	337	364	407	432
	50ft (15m) obstacle	570	613	664	744	794
5000	Gnd Roll	332	357	386	413	459
	50ft (15m) obstacle	603	650	703	789	842
6000	Gnd Roll	351	378	409	458	487
	50ft (15m) obstacle	639	689	746	837	893
7000	Gnd Roll	380	409	443	495	527
	50ft (15m) obstacle	691	745	807	907	967
8000	Gnd Roll	411	443	479	536	570
	50ft (15m) obstacle	747	806	874	982	1047
9000	Gnd Roll	449	484	524	587	624
	50ft (15m) obstacle	817	881	956	1074	1147
10000	Gnd Roll	490	529	573	642	683
	50ft (15m) obstacle	893	964	1046	1177	1256

Table 5b-1c Take-off Distance at take-off weight 1107 kg

GROUND ROLL AND TAKE-OFF DISTANCE
at 1157 kg

(only **PA-28-181 Archer III**)

Conditions:
Weight 1157 kg
Flaps 25°
Full Power Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift-off speed: 55 KIAS
Speed at 15 m (50 ft): 60 KIAS

Notes:

(1) Decrease distances 10% for each 9 Knots headwind; Increase distances 10% for each 2 knots of tailwind up to 10 Knots.

(2) For operation on dry, grass runway, increase distances by 15% of the ground roll figure.

(3) Consider additional distances (min. 20%) for wet grass runway, softened ground or snow.

Press. Alt.	Ground Roll and Take-Off Distance [m] Outside Air Temperature [°C]					
[ft]	[m]	ISA	ISA+10	ISA+20	ISA+30	ISA+35
0	Gnd Roll	280	301	325	362	385
	50ft (15m) obstacle	510	548	592	663	706
1000	Gnd Roll	296	318	344	384	407
	50ft (15m) obstacle	539	580	627	702	748
2000	Gnd Roll	314	337	364	406	432
	50ft (15m) obstacle	570	613	663	743	792
3000	Gnd Roll	332	357	386	430	457
	50ft (15m) obstacle	604	649	703	788	840
4000	Gnd Roll	351	378	408	456	485
	50ft (15m) obstacle	639	688	744	835	890
5000	Gnd Roll	372	400	433	484	514
	50ft (15m) obstacle	677	729	789	885	944
6000	Gnd Roll	394	424	459	513	546
	50ft (15m) obstacle	717	773	837	939	1002
7000	Gnd Roll	426	459	497	556	591
	50ft (15m) obstacle	775	836	906	1017	1085
8000	Gnd Roll	461	497	538	602	640
	50ft (15m) obstacle	838	904	980	1101	1175
9000	Gnd Roll	503	543	588	658	700
	50ft (15m) obstacle	916	989	1072	1205	1286
10000	Gnd Roll	550	593	643	720	766
	50ft (15m) obstacle	1002	1082	1174	1320	1409

Table 5b-1d Take-off Distance at take-off weight 1157 kg

MAXIMUM RATE-OF-CLIMB at 966 kg

(only **PA-28-181 Archer III**)

Conditions:

Take-off weight 966 kg
Climb speed V_y = 76 KIAS
Flaps Up
Full Power

Notes:

1. For operation in air colder than this table provides, use coldest data shown.
2. For operation in air warmer than this table provides, use extreme caution.

Press. Alt.	Rate of Climb [ft/min]					
[ft]	ISA - 10°C	ISA	ISA + 10°C	ISA + 20°C	ISA + 30°C	ISA + 35°C
0	922	917	895	857	743	676
1000	918	912	890	852	738	671
2000	913	907	885	847	732	665
3000	908	902	880	842	727	660
4000	903	897	875	837	722	655
5000	898	892	870	831	716	649
6000	893	887	864	826	710	643
7000	888	881	859	820	705	637
8000	882	876	853	814	699	631
9000	852	845	823	785	671	605
10000	822	815	793	755	643	578
11000	791	784	762	725	615	552
12000	761	753	731	695	587	525
13000	730	723	701	664	559	498
14000	699	691	670	634	530	470
15000	668	660	639	603	502	443
16000	637	629	607	572	473	415

Table 5b-2a Maximum Rate of Climb at 966 kg

TIME, FUEL AND DISTANCE TO CLIMB at 966 kg

(only **PA-28-181 Archer III**)

Conditions:

Takeoff weight 966 kg
Climb speed v_y = 76 KIAS
Flaps Up; Full Power; Zero wind, Standard Temperature

Notes:

(1) Add 4 l of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 10°C above standard temperature.
(3) Distances shown are based on zero wind.
(4) Time, distance and fuel required are only valid from the point where the airplane climbs at v_y = 76 KIAS.

Press. Alt. [ft]	OAT [°C]	ROC [FPM]	Time [MIN]	Distance [NM]	Fuel used [l]	[US Gal]
0	15	917	0.0	0.0	0.0	0.0
1000	13	912	1.1	1.4	0.6	0.2
2000	11	907	2.2	2.9	1.2	0.3
3000	9	902	3.3	4.5	1.8	0.5
4000	7	897	4.4	6.0	2.5	0.7
5000	5	892	5.5	7.7	3.1	0.8
6000	3	887	6.7	9.4	3.7	1.0
7000	1	881	7.8	11.2	4.4	1.2
8000	-1	876	8.9	13.0	5.0	1.3
9000	-3	845	10.1	14.9	5.5	1.5
10000	-5	815	11.3	17.0	6.0	1.6
11000	-7	784	12.5	19.2	6.5	1.7
12000	-9	753	13.9	21.5	7.0	1.9
13000	-11	723	15.2	24.0	7.65	2.0
14000	-13	691	16.6	26.7	8.0	2.1
15000	-15	660	18.1	29.5	8.4	2.2
16000	-17	629	19.6	32.6	8.9	2.4

Table 5b-2b Time, Fuel and Distance to Climb at 966 kg

MAXIMUM RATE-OF-CLIMB at 1055 kg

(only **PA-28-151 /-161**)

Conditions:
Take-off weight 1055 kg
Climb speed V_y = 70 KIAS
Flaps Up
Full Power

Notes:

1. For operation in air colder than this table provides, use coldest data shown.
2. For operation in air warmer than this table provides, use extreme caution.

Press. Alt.	Rate of Climb [ft/min]					
[ft]	ISA - 10°C	ISA	ISA + 10°C	ISA + 20°C	ISA + 30°C	ISA + 35°C
0	804	798	778	742	637	575
1000	799	793	772	737	631	570
2000	794	788	767	732	626	564
3000	789	783	762	726	620	559
4000	784	778	757	721	615	553
5000	779	772	751	715	609	547
6000	773	767	745	709	603	541
7000	768	761	740	703	597	535
8000	762	755	734	697	591	528
9000	734	727	705	669	564	503
10000	705	698	677	641	538	478
11000	677	669	648	613	512	453
12000	648	640	619	584	485	427
13000	619	611	590	556	458	402
14000	590	582	561	527	432	376
15000	561	552	532	498	404	350
16000	531	523	502	469	377	324

Table 5b-3a Maximum Rate of Climb at 1055 kg

TIME, FUEL AND DISTANCE TO CLIMB
at 1055 kg

(only **PA-28-151 /-161**)

Conditions:

Takeoff weight 1055 kg
Climb speed v_y = 70 KIAS
Flaps Up; Full Power; Zero wind, Standard Temperature

Notes:

(1) Add 4 l of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 10°C above standard temperature.
(3) Distances shown are based on zero wind.
(4) Time, distance and fuel required are only valid from the point where the airplane climbs at v_y = 70 KIAS.

Press. Alt. [ft]	OAT [°C]	ROC [FPM]	Time [MIN]	Distance [NM]	Fuel used [l]	Fuel used [US Gal]
0	15	798	0.0	0.0	0.0	0.0
1000	13	793	1.3	1.7	0.7	0.2
2000	11	788	2.5	3.4	1.4	0.4
3000	9	783	3.8	5.1	2.1	0.6
4000	7	778	5.1	7.0	2.8	0.8
5000	5	772	6.4	8.9	3.6	0.9
6000	3	767	7.7	10.9	4.3	1.1
7000	1	761	9.0	12.9	5.0	1.3
8000	-1	755	10.3	15.0	5.8	1.5
9000	-3	727	11.6	17.3	6.4	1.7
10000	-5	698	13.0	19.7	7.0	1.8
11000	-7	669	14.5	22.2	7.5	2.0
12000	-9	640	16.0	25.0	8.1	2.1
13000	-11	611	17.6	27.9	8.7	2.3
14000	-13	582	19.3	31.1	9.3	2.4
15000	-15	552	21.1	34.5	9.8	2.6
16000	-17	523	22.9	38.1	10.4	2.7

Table 5b-3b Time, Fuel and Distance to Climb at 1055 kg

MAXIMUM RATE-OF-CLIMB at 1107 kg

(only **PA-28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA-28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:
Take-off weight 1107 kg
Climb speed V_y = 70 KIAS
Flaps Up, Full Power

Notes:
1. For operation in air colder than this table provides, use coldest data shown.
2. For operation in air warmer than this table provides, use extreme caution.

Press. Alt.	Rate of Climb [ft/min]					
[ft]	ISA - 10°C	ISA	ISA + 10°C	ISA + 20°C	ISA + 30°C	ISA + 35°C
0	743	737	717	683	582	523
1000	738	732	712	678	577	518
2000	733	727	707	672	571	512
3000	728	721	701	667	565	506
4000	723	716	696	661	559	500
5000	717	711	690	655	554	494
6000	712	705	684	649	547	488
7000	706	699	678	643	541	482
8000	700	693	672	637	535	475
9000	673	666	645	610	510	451
10000	645	638	617	583	484	427
11000	618	610	589	555	458	402
12000	590	582	561	528	433	377
13000	562	554	533	500	406	352
14000	533	525	505	472	380	327
15000	505	497	476	444	354	302
16000	477	468	448	416	327	276

Table 5b-4a Maximum Rate of Climb at 1107 kg

**TIME, FUEL AND DISTANCE TO CLIMB
at 1107 kg**

(only **PA-28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA-28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:

Takeoff weight 1107 kg
Climb speed v_y = 70 KIAS
Flaps Up; Full Power; Zero wind, Standard Temperature

Notes:

(1) Add 4 l of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 10°C above standard temperature.
(3) Distances shown are based on zero wind.
(4) Time, distance and fuel required are only valid from the point where the airplane climbs at v_y = 70 KIAS.

Press. Alt. [ft]	OAT [°C]	ROC [FPM]	Time [MIN]	Distance [NM]	Fuel used [l]	[US Gal]
0	15	737	0.0	0.0	0.0	0.0
1000	13	732	1.4	1.8	0.8	0.2
2000	11	727	2.7	3.6	1.5	0.4
3000	9	721	4.1	5.6	2.3	0.6
4000	7	716	5.5	7.6	3.1	0.8
5000	5	711	6.9	9.6	3.9	1.0
6000	3	705	8.3	11.8	4.7	1.2
7000	1	699	9.7	14.0	5.5	1.4
8000	-1	693	11.2	16.3	6.3	1.7
9000	-3	666	12.7	18.8	6.9	1.8
10000	-5	638	14.2	21.4	7.6	2.0
11000	-7	610	15.8	24.2	8.2	2.2
12000	-9	582	17.5	27.2	8.9	2.3
13000	-11	554	19.2	30.4	9.5	2.5
14000	-13	525	21.1	33.9	10.1	2.7
15000	-15	497	23.0	37.7	10.8	2.8
16000	-17	468	25.1	41.8	11.4	3.0

Table 5b-4b Time, Fuel and Distance to Climb at 1107 kg

MAXIMUM RATE-OF-CLIMB at 1157 kg

(only **PA-28-181 Archer III**)

Conditions:

Take-off weight 1157 kg
Climb speed V_y = 76 KIAS
Flaps Up, Full Power

Notes:

1. For operation in air colder than this table provides, use coldest data shown.
2. For operation in air warmer than this table provides, use extreme caution.

Press. Alt.	Rate of Climb [ft/min]					
[ft]	ISA - 10°C	ISA	ISA + 10°C	ISA + 20°C	ISA + 30°C	ISA + 35°C
0	689	683	663	630	533	477
1000	684	678	658	625	528	471
2000	679	672	653	619	522	465
3000	673	667	647	614	516	460
4000	668	661	641	608	510	454
5000	663	656	636	602	504	447
6000	657	650	630	596	498	441
7000	651	644	624	590	492	435
8000	645	638	617	583	485	428
9000	619	611	591	557	460	404
10000	592	584	564	531	436	381
11000	565	557	537	504	411	356
12000	538	530	510	477	385	332
13000	511	502	482	450	360	308
14000	483	475	455	423	335	283
15000	456	447	427	395	309	259
16000	428	419	399	368	283	234

Table 5b-5a Maximum Rate of Climb at 1157 kg

TIME, FUEL AND DISTANCE TO CLIMB at 1157 kg

(only **PA-28-181 Archer III**)

Conditions:

Takeoff weight 1157 kg
Climb speed v_y = 76 KIAS
Flaps Up; Full Power; Zero wind, Standard Temperature

Notes:

(1) Add 4 l of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 10°C above standard temperature.
(3) Distances shown are based on zero wind.
(4) Time, distance and fuel required are only valid from the point where the airplane climbs at v_y = 76 KIAS.

Press. Alt. [ft]	OAT [°C]	ROC [FPM]	Time [MIN]	Distance [NM]	Fuel used [l]	[US Gal]
0	15	683	0.0	0.0	0.0	0.0
1000	13	678	1.5	1.9	0.8	0.2
2000	11	672	3.0	3.9	1.7	0.4
3000	9	667	4.4	6.0	2.5	0.7
4000	7	661	6.0	8.2	3.3	0.9
5000	5	656	7.5	10.4	4.2	1.1
6000	3	650	9.0	12.8	5.0	1.3
7000	1	644	10.5	15.2	5.9	1.6
8000	-1	638	12.1	17.7	6.8	1.8
9000	-3	611	13.7	20.4	7.5	2.0
10000	-5	584	15.4	23.2	8.2	2.2
11000	-7	557	17.1	26.3	8.9	2.4
12000	-9	530	19.0	29.6	9.6	2.5
13000	-11	502	20.9	33.1	10.3	2.7
14000	-13	475	23.0	36.9	11.0	2.9
15000	-15	447	25.1	41.1	11.7	3.1
16000	-17	419	27.4	45.6	12.4	3.3

Table 5b-5b Time, Fuel and Distance to Climb at 1157 kg

CRUISE PERFORMANCE, RANGE AND ENDURANCE at 1055 kg

(only **PA-28-151 /-161**)

Conditions:

Take-off weight 1055 kg
Flaps Up
Zero wind

Notes:

1. Endurance information are based on fuel tanks with a capacity of 162.8 l usable fuel and include 4 l for startup and taxi; time, fuel and distance to climb 45 min. reserve.
2. Increase true airspeed and range by 1% per 10°C above ISA temperature. Decrease true airspeed and range by 1% per 10°C below ISA temperature.
3. Cruise Power above 75% not recommended. For economic cruise set load 70% or less.

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
2000	100	126	33.6	8.9	500	3.9
2000	90	121	29.6	7.8	558	4.5
2000	80	116	25.8	6.8	625	5.3
2000	70	110	22.1	5.8	705	6.3
2000	60	103	18.6	4.9	797	7.7
2000	50	94	15.3	4.0	896	9.5
4000	100	129	33.6	8.9	508	3.8
4000	90	124	29.6	7.8	566	4.4
4000	80	118	25.8	6.8	633	5.2
4000	70	112	22.1	5.8	714	6.2
4000	60	105	18.6	4.9	806	7.6
4000	50	95	15.3	4.0	901	9.4
6000	100	131	33.6	8.9	515	3.7
6000	90	126	29.6	7.8	574	4.4
6000	80	120	25.8	6.8	642	5.1
6000	70	114	22.1	5.8	723	6.1
6000	60	106	18.6	4.9	814	7.5
6000	50	95	15.3	4.0	904	9.3
8000	100	134	33.6	8.9	523	3.7
8000	90	128	29.6	7.8	583	4.3
8000	80	123	25.8	6.8	651	5.0
8000	70	116	22.1	5.8	732	6.0
8000	60	108	18.6	4.9	822	7.3
8000	50	96	15.3	4.0	906	9.1

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
10000	90	131	29.6	7.8	592	4.2
10000	80	125	25.8	6.8	660	4.9
10000	70	118	22.1	5.8	741	5.9
10000	60	109	18.6	4.9	829	7.2
10000	50	97	15.3	4.0	905	9.0
12000	90	134	29.6	7.8	601	4.1
12000	80	127	25.8	6.8	669	4.8
12000	70	120	22.1	5.8	750	5.8
12000	60	111	18.6	4.9	837	7.1
12000	50	97	15.3	4.0	899	8.9
14000	80	130	25.8	6.8	679	4.7
14000	70	122	22.1	5.8	759	5.7
14000	60	112	18.6	4.9	843	7.0
14000	50	95	15.3	4.0	884	8.7
16000	80	132	25.8	6.8	688	4.6
16000	70	124	22.1	5.8	767	5.6
16000	60	114	18.6	4.9	849	6.8

Table 5b-6a Cruise Performance, Range and Endurance at 1055 kg

Cruise Performance, Range and Endurance at 1107 kg

(only **PA-28-161 Warrior II** S/N 28-8316001 through 28-8616057 & 2816001 through 2816109
PA-28-161 Warrior III S/N 2816110 through 2816119 & 2842001 and up)

Conditions:

Take-off weight 1107 kg
Flaps Up
Zero wind

Notes:

1. Endurance information are based on fuel tanks with a capacity of 162.8 l usable fuel and include 4 l for startup and taxi; time, fuel and distance to climb 45 min. reserve.
2. Increase true airspeed and range by 1% per 10°C above ISA temperature. Decrease true airspeed and range by 1% per 10°C below ISA temperature.
3. Cruise Power above 75% not recommended. For economic cruise set load 70% or less.

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
2000	100	126	33.6	8.9	499	3.9
2000	90	121	29.6	7.8	557	4.6
2000	80	116	25.8	6.8	623	5.3
2000	70	109	22.1	5.8	701	6.4
2000	60	102	18.6	4.9	790	7.7
2000	50	91	15.3	4.0	876	9.5
4000	100	128	33.6	8.9	507	3.9
4000	90	123	29.6	7.8	565	4.5
4000	80	118	25.8	6.8	632	5.3
4000	70	111	22.1	5.8	711	6.3
4000	60	103	18.6	4.9	798	7.6
4000	50	92	15.3	4.0	878	9.4
6000	100	131	33.6	8.9	516	3.8
6000	90	126	29.6	7.8	574	4.4
6000	80	120	25.8	6.8	641	5.2
6000	70	113	22.1	5.8	720	6.2
6000	60	105	18.6	4.9	806	7.5
6000	50	92	15.3	4.0	877	9.3
8000	100	133	33.6	8.9	524	3.7
8000	90	128	29.6	7.8	583	4.4
8000	80	122	25.8	6.8	650	5.1
8000	70	115	22.1	5.8	729	6.1
8000	60	106	18.6	4.9	814	7.5
8000	50	92	15.3	4.0	870	9.3

Press. Alt.	Load	Speed	Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[l/h]	[US Gal/h]	[NM]	[Hrs]
10000	90	130	29.6	7.8	592	4.3
10000	80	124	25.8	6.8	660	5.1
10000	70	117	22.1	5.8	738	6.1
10000	60	107	18.6	4.9	821	7.4
10000	50	90	15.3	4.0	852	9.2
12000	90	133	29.6	7.8	602	4.2
12000	80	126	25.8	6.8	670	5.0
12000	70	119	22.1	5.8	748	6.0
12000	60	109	18.6	4.9	827	7.3
14000	80	129	25.8	6.8	679	4.9
14000	70	121	22.1	5.8	757	5.9
14000	60	110	18.6	4.9	832	7.2
16000	80	131	25.8	6.8	689	4.8
16000	70	122	22.1	5.8	766	5.8
16000	60	110	18.6	4.9	834	7.1

Table 5b-6b Cruise Performance, Range and Endurance at 1107 kg

Cruise Performance, Range and Endurance at 1157 kg

(only **PA-28-181 Archer III**)

Conditions:

Take-off weight 1157 kg
Flaps Up
Zero wind

Notes:

1. Endurance information are based on a capacity of 181.7 l usable fuel and include 4 l for startup and taxi; time, fuel and distance to climb 45 min. reserve.
2. Increase true airspeed and range by 1% per 10°C above ISA temperature. Decrease true airspeed and range by 1% per 10°C below ISA temperature.
3. Cruise Power above 75% not recommended. For economic cruise set load 70% or less.

Press. Alt.	Load	Speed		Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[mph]	[l/h]	[US Gal/h]	[NM]	[Hrs]
2000	100	126	145	33.6	8.9	498	3.9
2000	90	121	139	29.6	7.8	555	4.5
2000	80	115	132	25.8	6.8	619	5.3
2000	70	109	125	22.1	5.8	696	6.3
2000	60	101	116	18.6	4.9	779	7.7
2000	50	88	101	15.3	4.0	845	9.5
4000	100	128	147	33.6	8.9	505	3.8
4000	90	123	141	29.6	7.8	563	4.5
4000	80	117	135	25.8	6.8	628	5.2
4000	70	110	127	22.1	5.8	704	6.3
4000	60	102	117	18.6	4.9	785	7.6
4000	50	88	101	15.3	4.0	837	9.4
6000	100	130	150	33.6	8.9	513	3.8
6000	90	125	144	29.6	7.8	571	4.4
6000	80	119	137	25.8	6.8	636	5.2
6000	70	112	129	22.1	5.8	712	6.2
6000	60	103	119	18.6	4.9	791	7.5
6000	50	86	99	15.3	4.0	816	9.3
8000	100	133	153	33.6	8.9	521	3.7
8000	90	127	147	29.6	7.8	579	4.3
8000	80	121	139	25.8	6.8	644	5.1
8000	70	114	131	22.1	5.8	719	6.1
8000	60	104	120	18.6	4.9	795	7.4

Press. Alt.	Load	Speed		Fuel Flow		Distance	Endu-rance Time
[ft]	[%]	[KTAS]	[mph]	[l/h]	[US Gal/h]	[NM]	[Hrs]
10000	96	133	153	33.6	8.9	521	3.6
10000	90	130	149	29.6	7.8	587	4.2
10000	80	123	142	25.8	6.8	652	5.0
10000	70	116	133	22.1	5.8	727	6.0
10000	60	105	121	18.6	4.9	798	7.3
12000	92	133	154	29.6	7.8	601	4.1
12000	90	132	152	29.6	7.8	596	4.1
12000	80	125	144	25.8	6.8	661	4.9
12000	70	117	135	22.1	5.8	734	5.9
12000	60	106	122	18.6	4.9	799	7.1
14000	88	133	153	29.6	7.8	599	4.0
14000	80	128	147	25.8	6.8	669	4.8
14000	70	119	137	22.1	5.8	741	5.8
14000	60	106	122	18.6	4.9	797	7.0
16000	84	133	153	29.6	7.8	595	3.9
16000	80	130	149	25.8	6.8	678	4.7
16000	70	120	139	22.1	5.8	747	5.6
16000	60	105	121	18.6	4.9	789	6.9

Table 5b-6c Cruise Performance, Range and Endurance at 1157 kg

GLIDE RANGE

Conditions:
Propeller windmilling
Flaps 0°, Zero wind, 78 KIAS

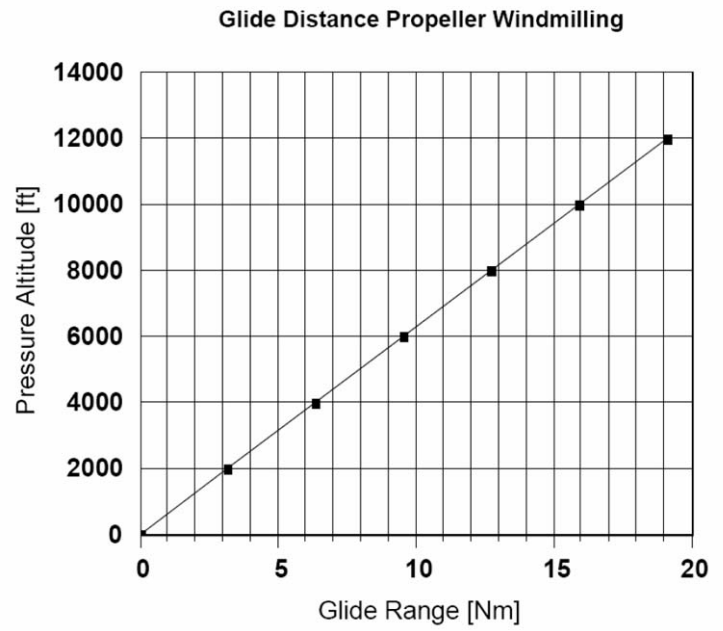

Figure 5b-5 Glide Range

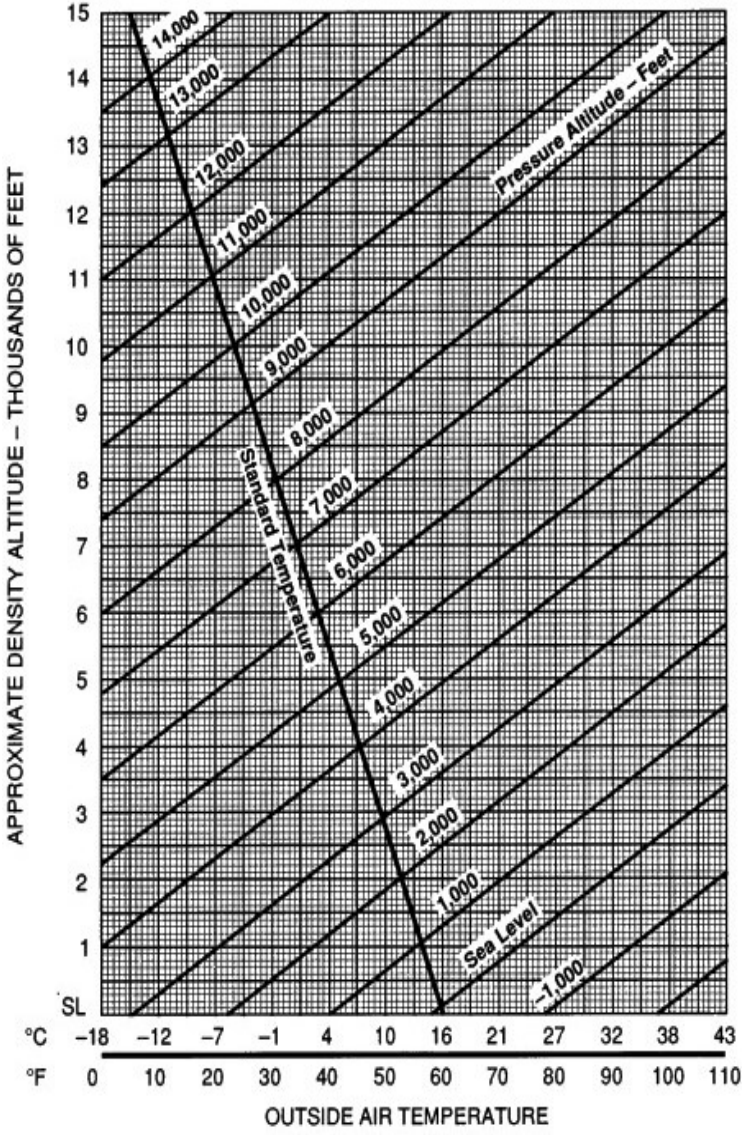

Figure 5b-6 Density Altitude

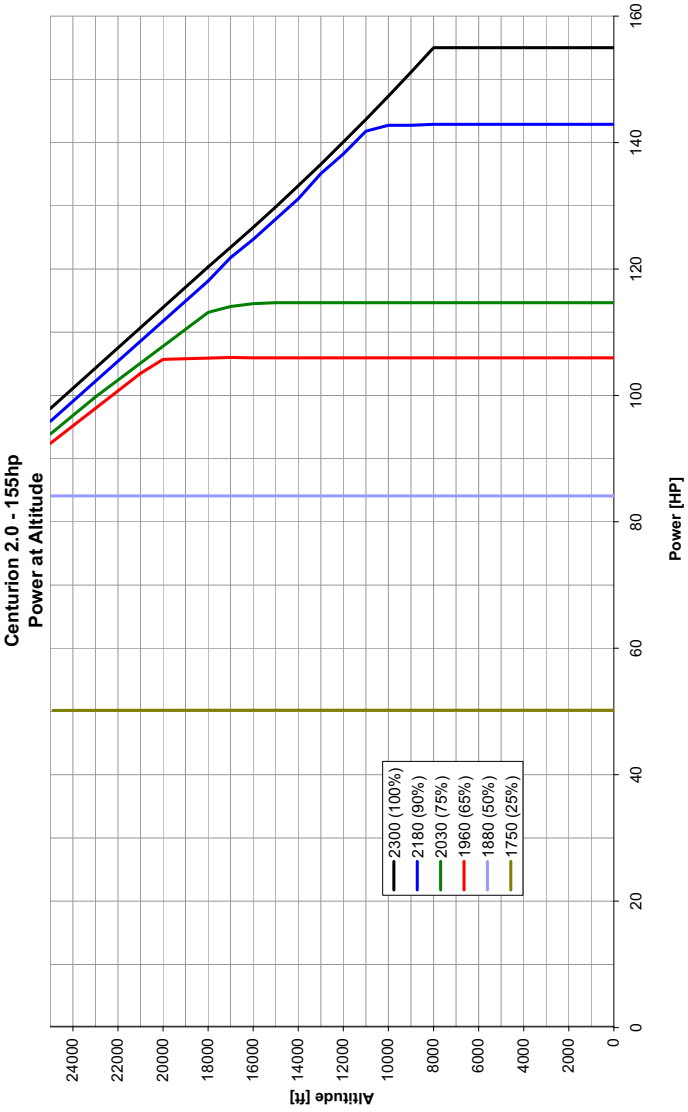

Figure 5b-7 Power at Altitude

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SECTION 6
WEIGHT & BALANCE

MODEL PA-28-151 (Cherokee Warrior)

Airplane Serial Number: _____

Registration Number: _____

Date: _____

AIRPLANE BASIC EMPTY WEIGHT

Item	Weight (kg)	x C.G. Arm (m/Aft of Datum)	= Moment (kgm)
Standard Empty Weight	Actual: Computed:		
Optional Equipment			
Basic Empty Weight			

* The standard empty weight includes full engine oil capacity, full gearbox oil capacity, full coolant capacity and 8 l unusable fuel.

AIRPLANE USEFUL LOAD

(Ramp Weight) - (Basic Empty Weight) = Useful Load
(Normal category: 1056 kg) - (.....kg) = kg
(Utility category: 886 kg) - (.....kg) = kg

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS INSPECTED AFTER MODIFICATION. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

WEIGHT & BALANCE DATA FORM

Figure 6-5a

MODEL PA-28-161 (Cherokee Warrior II)

Airplane Serial Number: _____

Registration Number: _____

Date: _____

AIRPLANE BASIC EMPTY WEIGHT

Item	Weight (kg)	x C.G. Arm (m/Aft of Datum)	= Moment (kgm)
Standard Empty Weight	Actual: Computed:		
Optional Equipment			
Basic Empty Weight			

* The standard empty weight includes full engine oil capacity, full gearbox oil capacity, full coolant capacity and 8 l unusable fuel.

AIRPLANE USEFUL LOAD

(Ramp Weight) - (Basic Empty Weight) = Useful Load
(Normal category: 1056 kg) - (.....kg) = kg
(Utility category: 917 kg) - (.....kg) = kg

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS INSPECTED AFTER MODIFICATION. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

WEIGHT & BALANCE DATA FORM

Figure 6-5b

MODEL PA-28-161

Warrior II (S/N 28-8316001 through 28-8616057 & 2816001 through 2816109)

Warrior III (S/N 2816110 through 2816119 & 2842001 and up)

Airplane Serial Number: _____

Registration Number: _____

Date: _____

AIRPLANE BASIC EMPTY WEIGHT

Item	Weight (kg)	x C.G. Arm (m/Aft of Datum)	= Moment (kgm)
Standard Empty Weight	Actual: Computed:		
Optional Equipment			
Basic Empty Weight			

* The standard empty weight includes full engine oil capacity, full gearbox oil capacity, full coolant capacity and 8 l unusable fuel.

AIRPLANE USEFUL LOAD

(Ramp Weight) - (Basic Empty Weight) = Useful Load
(Normal category: 1110 kg) - (.....kg) = kg
(Utility category: 917 kg) - (.....kg) = kg

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS INSPECTED AFTER MODIFICATION. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

WEIGHT & BALANCE DATA FORM

Figure 6-5c

MODEL PA-28-181 (Archer III)

Airplane Serial Number: _____
Registration Number: _____
Date: _____

AIRPLANE BASIC EMPTY WEIGHT

Item	Weight (kg)	x C.G. Arm (m/Aft of Datum)	= Moment (kgm)
Standard Empty Weight	Actual: Computed:		
Optional Equipment			
Basic Empty Weight			

* The standard empty weight includes full engine oil capacity, full gearbox oil capacity, full coolant capacity and 8 l unusable fuel.

AIRPLANE USEFUL LOAD

(Ramp Weight)	-	(Basic Empty Weight)	=	Useful Load
(Normal category:	1157 kg)	- (.....kg)	=	kg
(Utility category:	966 kg)	- (.....kg)	=	kg

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS INSPECTED AFTER MODIFICATION. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

WEIGHT & BALANCE DATA FORM

Figure 6-5d

WEIGHT & BALANCE DETERMINATION FOR FLIGHT

(a) Add the weight of all items to be loaded to the basic empty weight.

(b) Use the Loading Graph (Figure 6-7a) to determine the moment of all items to be carried in the airplane.

(c) Add the moment of all items to be loaded to the basic empty weight moment.

(d) Divide the total moment by the total weight to determine the C.G. location.

(e) By using the figures of item (a) and (d) (above), locate a point on the appropriate C.G. range and weight graph (Figure 6-8a to Figure 6-8d). If the point falls within the C.G. envelope, the loading meets the weight and balance requirements.

	Weight (kg)	Arm Aft Datum (m)	Moment (kgm)
- Basic Empty Weight			
- Pilot and Front Passenger		2.04	
- Passengers (Rear Seats)*		3.00	
- Fuel (max. 162 l usable)		2.41	
- Baggage* (max. 90 kg, PA 28-161 Cadet max. 23 kg)		3.63	
- Ramp Weight* *			
- Fuel Allowance for Engine Start, Taxi and Run up	-1	2.41	-2.41
- Take-off Weight* *			

* Utility Category Operation - No baggage or aft passengers allowed. Maximum baggage as per original POH

**Maximum Take-off Weight and Ramp Weight in accordance with original POH

Totals must be within approved weight and C.G. limits. It is the responsibility of the airplane owner and the pilot to insure that the airplane is loaded properly. The Basic Empty Weight C.G. is noted on the Weight & Balance Data Form (Figure 6-6). If the airplane has been altered, refer to the Weight and Balance Record for this information.

WEIGHT & BALANCE LOADING FORM
Figure 6-6

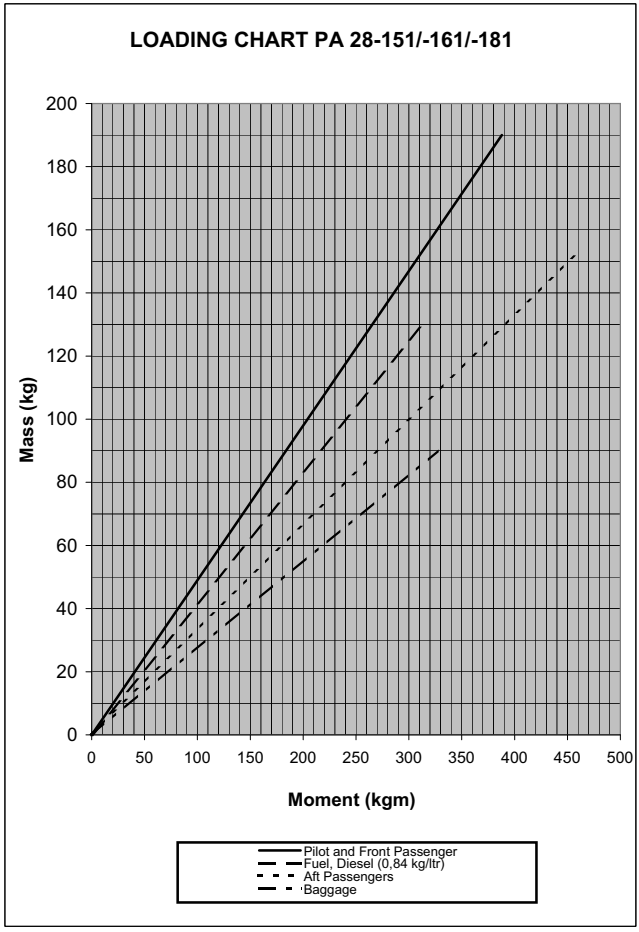

Figure 6-7a Loading Graph

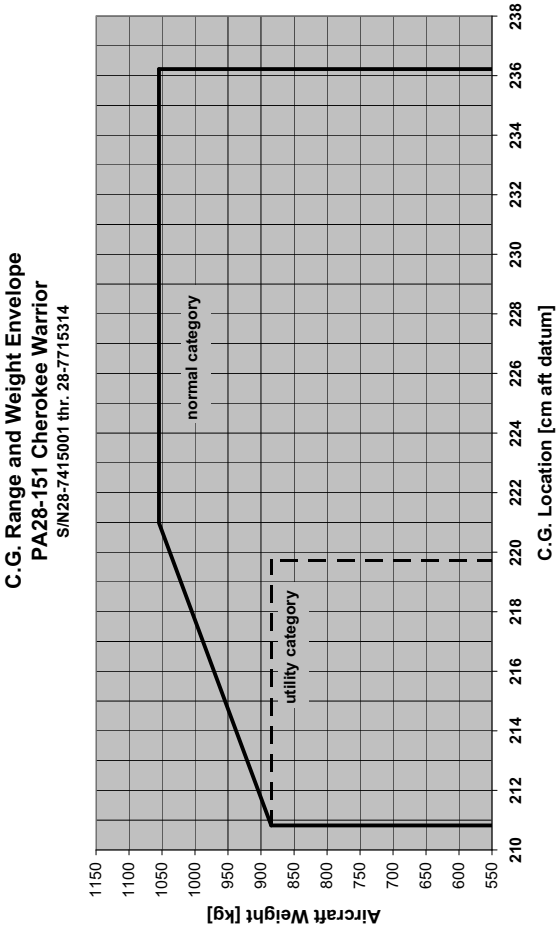
C.G. Range and Weight Envelope
PA28-151 Cherokee Warrior
S/N28-7415001 thr. 28-7715314
normal category
utility category
Aircraft Weight [kg]
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
C.G. Location [cm aft datum]
210
212
214
216
218
220
222
224
226
228
230
232
234
236
238

Figure 6-8a

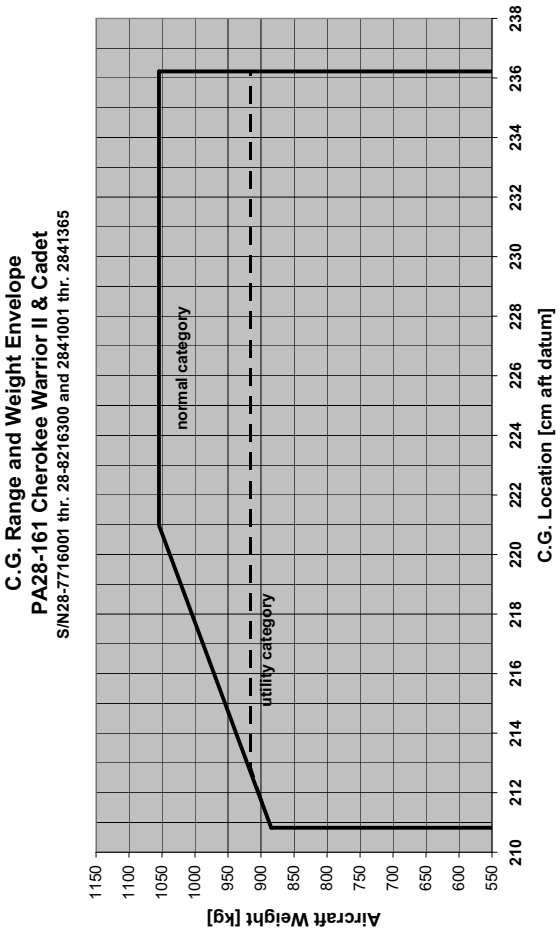
C.G. Range and Weight Envelope
PA28-161 Cherokee Warrior II & Cadet
S/N28-7716001 thr. 28-8216300 and 2841001 thr. 2841365
normal category
utility category
Aircraft Weight [kg]
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
C.G. Location [cm aft datum]
210
212
214
216
218
220
222
224
226
228
230
232
234
236
238

Figure 6-8b

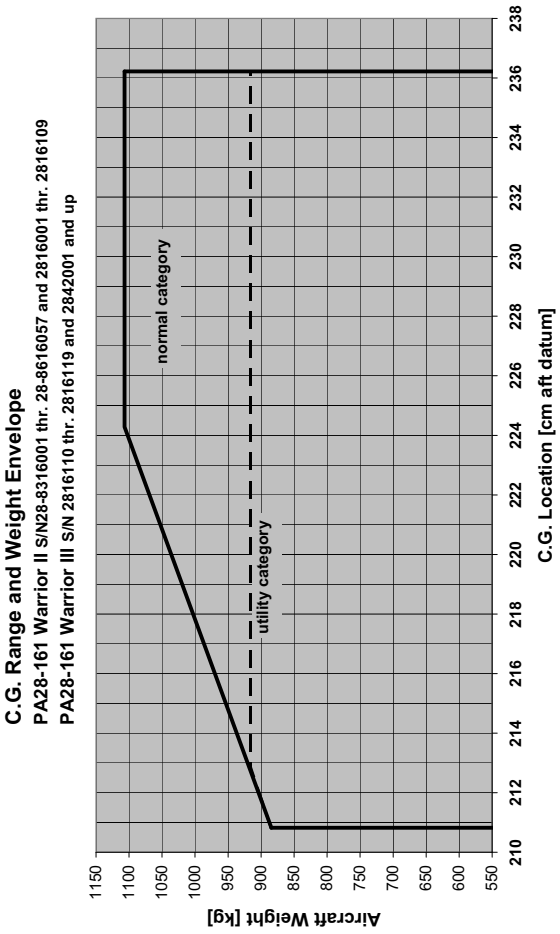
C.G. Range and Weight Envelope
PA28-161 Warrior II S/N28-8316001 thr. 28-8616057 and 2816001 thr. 2816109
PA28-161 Warrior III S/N 2816110 thr. 2816119 and 2842001 and up
normal category
utility category
Aircraft Weight [kg]
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
C.G. Location [cm aft datum]
210
212
214
216
218
220
222
224
226
228
230
232
234
236
238

Figure 6-8c

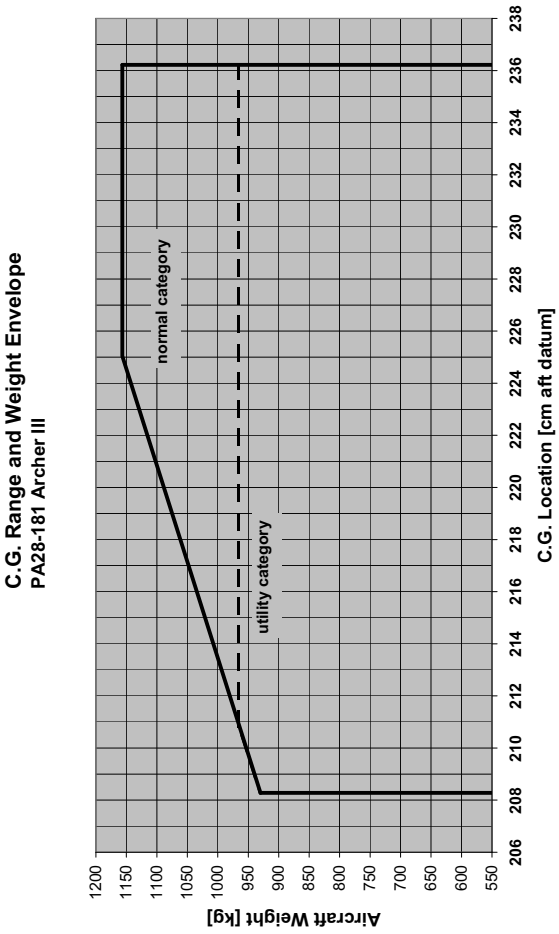
C.G. Range and Weight Envelope
PA28-181 Archer III
normal category
utility category
C.G. Location [cm aft datum]
206
208
210
212
214
216
218
220
222
224
226
228
230
232
234
236
238
Aircraft Weight [kg]
1200
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550

Figure 6-8d

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SECTION 7
DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

ENGINE AND PROPELLER

The TAE 125-02-114 is a liquid cooled in-line four-stroke 4-cylinder turbocharged engine with DOHC (double overhead camshaft), direct fuel injection and common-rail technology. It has a displacement of 1991 ccm. The engine is controlled by a FADEC system. The propeller is driven by a built-in gearbox (i = 1.69) with mechanical vibration dampening and overload release. The engine has an electrical self starter and an alternator.
The constant speed propeller MTV-6-A has three propeller blades and is electronically controlled by the FADEC.

◆ Note: “Load“ describes the available percentage of maximum engine power

ENGINE CONTROLS

The engine is operated by the pilot exclusively by means of the Thrust Lever (Figure 7-1). The friction lock is the lower knob on the Thrust Lever and can easily be operated with the forefinger and middle finger.
Due to the Diesel principle, carburetor preheating, magneto ignition, sparkplugs, and an engine priming system are not required for engine operation.
An alternate air door has been added and can be opened by the pilot in case of a blocked air filter. The control is located to the right of the Thrust Lever.

Figure 7-1 Thrust Lever

FUEL SYSTEM

The fuel system includes the original fuel tank of the Piper PA-28. Additional sensors for fuel temperature and "Low Level" Warning are installed.
The fuel flows out of the tank to the fuel selector valve (located on the left side panel forward of the pilot´s seat) with 3 positions: LEFT, RIGHT and OFF. The safety knob must be lifted to move the fuel selector into OFF position.
The electric fuel pump supports the fuel flow to the filter module if required. Upstream of the fuel filter module a thermostat-controlled fuel pre-heater is installed.
After the fuel pre-heater the engine-driven feed pump and the high pressure pump supply the rail, where the fuel is injected into the cylinders depending upon the position of the thrust lever and fuel regulation by the FADEC.
Surplus fuel flows to the filter module and then back through the fuel selector valve into the pre-selected tank.
A temperature sensor in the filter module controls the heat exchange between the fuel feed and return.
Since Diesel and Kerosene fuel tends to form paraffin at low temperatures, the information in SECTION 2 pertaining to fuel temperature must be observed. The return fuel ensures a rapid warm up of the fuel in the tank in use.
Diesel according DIN EN 590 has to be used exclusively.

◆ Note: Approved fuels for use appear in Section 2.

Fuel Capacity			
Tanks	Total Usable Fuel	Total Unusable Fuel	Total Capacity
2 Standard Tanks: each 85 l	162.8 l	7.6 l	170.4 l
2 Standard Tanks: each 94 l (PA-28-181 only)	181.7 l	7.6 l	189.3 l

■ CAUTION: In flight conditions with one wing pointing downward continuously (e.g. slipping), switch the fuel selector to the upward pointing fuel tank.

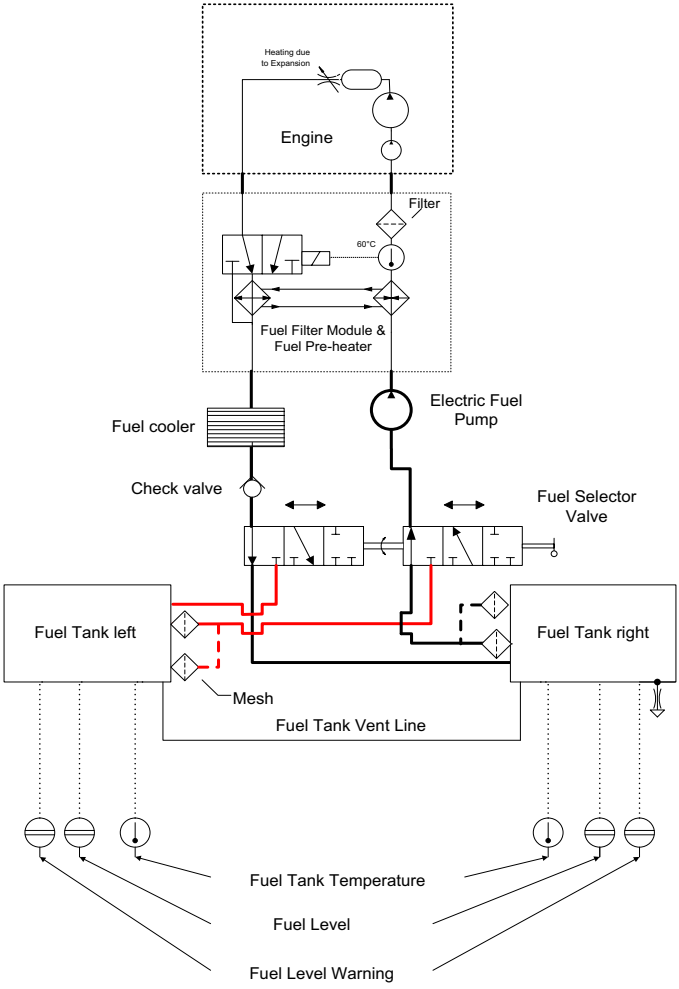

Figure 7-2 Scheme of the Fuel System

ELECTRICAL SYSTEM

The electrical system of the TAE 125-02-114 differs from the previous installation and is equipped with the following operating and display elements:

1. Main Bus Switch (except G1000)
   This switch controls the Main Bus. The Main Bus is required to be able to run FADEC and engine with the Battery/Alternator in the event of electrical system malfunctions. In normal operation Alternator, Main Bus and Battery must be ON.
2. Alternator Switch
   Controls the alternator. The guarded switch must be closed during normal operation.
3. Battery Switch
   Controls the Main Battery.
4. Starter Push Button
   Controls the magneto switch of the starter.
5. Ammeter (AED/G1000 display)
   The Ammeter shows the charging or discharging current to/from the battery.
6. Alternator Warning
   Illuminates when the power output of the alternator is too low or the Alternator switch is switched off. Normally, this warning light always illuminates when the Engine Master is switched on without the engine running and extinguishes immediately after starting the engine.
7. Fuel Pump Switch (if installed)
   This switch controls the electric fuel pump.
8. Engine Master Switch
   The Engine Master Switch controls the two redundant FADEC components and the Alternator Excitation Battery with two independent contacts. The Alternator Excitation Battery is used to ensure that the Alternator continues to function properly even if the main battery fails.

▲ **WARNING:** If the Engine Master is switched off, the power supply to the FADEC is disconnected and the engine will shut down.

9. Backup Battery
   The electrical system includes a backup battery to ensure power supply to A-FADEC in case the battery and alternator fail or are disconnected. The engine has been demonstrated to continue operating for 30 minutes when powered by the FADEC backup battery only. Only A-FADEC is connected to the backup battery.
10. FADEC Force B Switch
    If the FADEC does not automatically switch from A-FADEC to the B-FADEC in an emergency, this switch allows the pilot to manually switch to the B-FADEC.

▲ **WARNING:** When operating on FADEC backup battery only, the Force B switch must NOT be activated. This will shut down the engine.

The basic wiring is available in 14V as well as 28V versions.

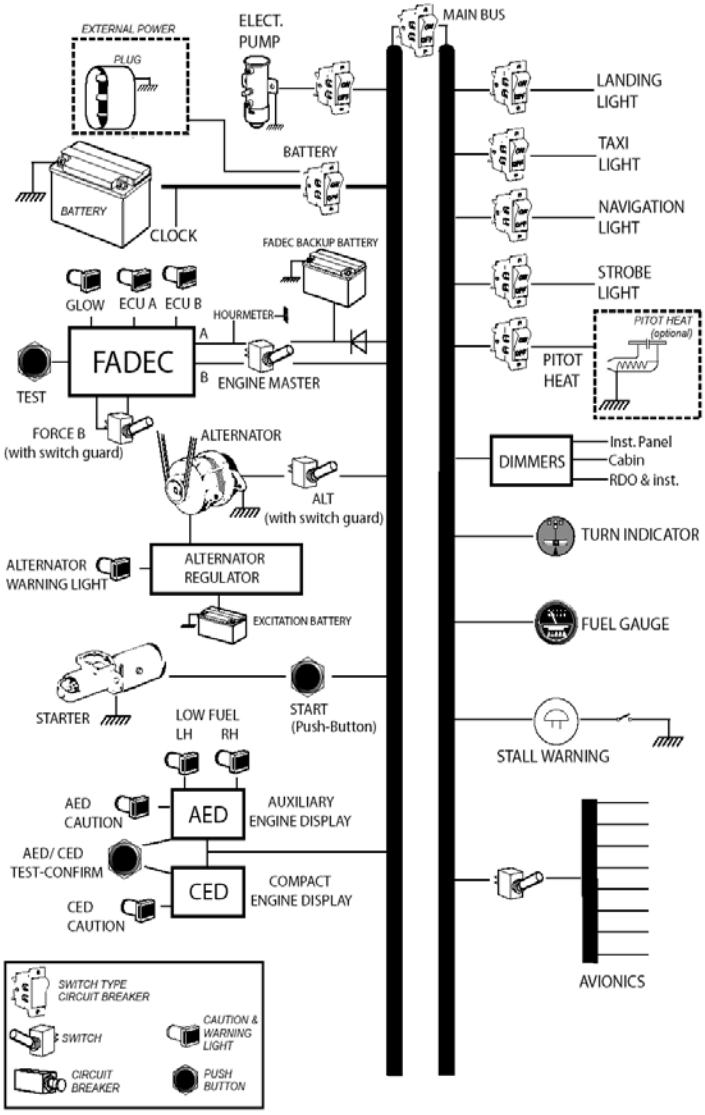

Figure 7-3 Basic Wiring of the Electrical System with alternator switch and FADEC Backup Battery

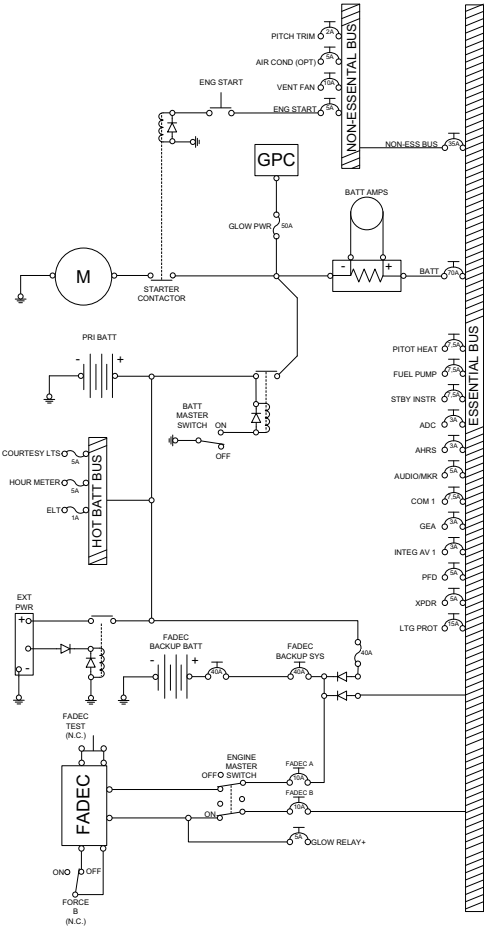

Figure 7-4 Wiring Schematic PA-28-181 Archer III with G1000 (Page 1)

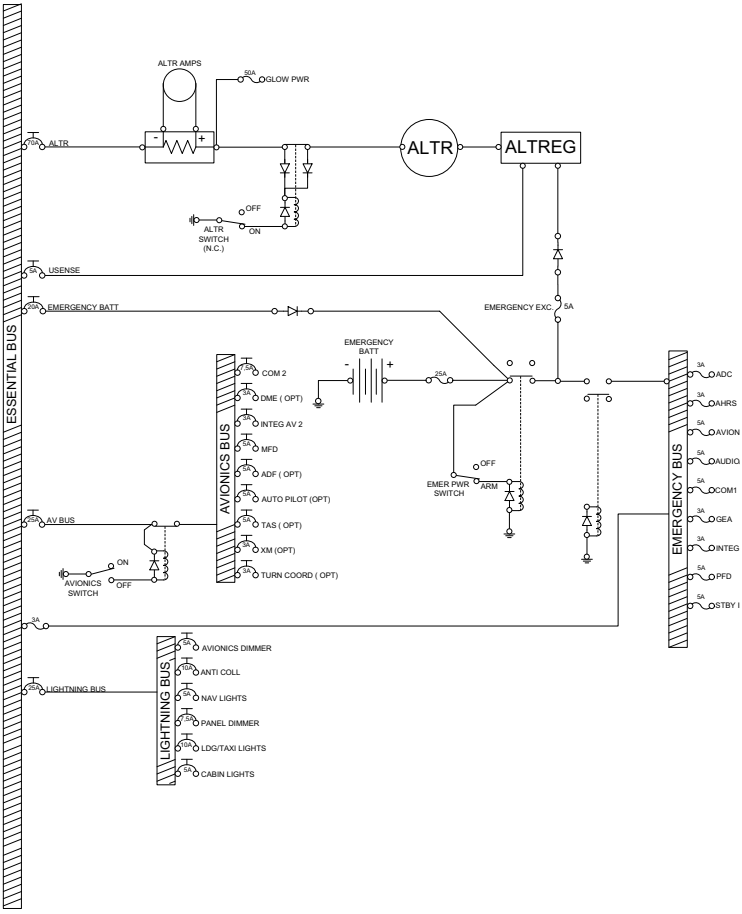

Figure 7-5 Wiring Schematic PA-28-181 Archer III with G1000 (Page 2)

INSTRUMENT PANEL

The following information relate to Figure 7-15 of the original approved POH. Components of the new installation can be seen as an example in the following Figures.

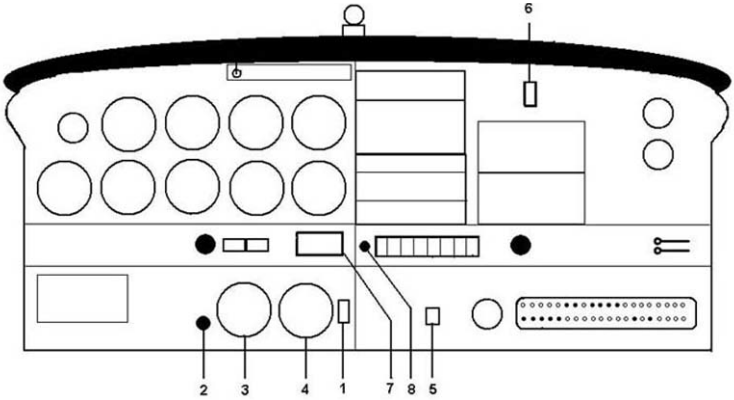

Figure 7-15a Example Warrior & Warrior II

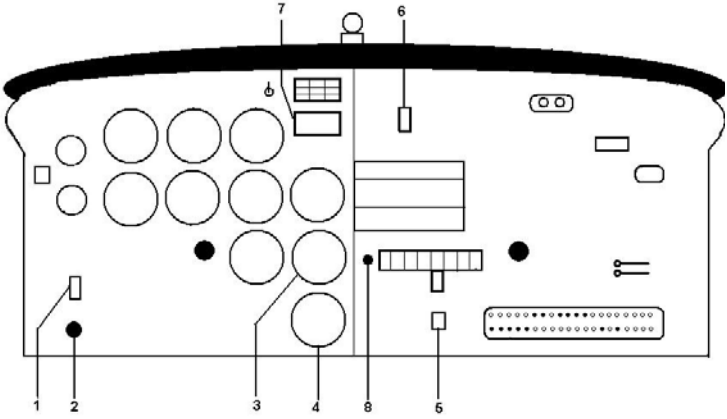

Figure 7-15b Example Warrior III

(1) "Engine Master" - Master Switch for Engine
(2) "Starter" Push Button for Starter
(3) AED 125 SR with indication of Fuel Temperature, Voltage, Fuel Flow and a caution light "Water Level" (amber) for low coolant level
(4) CED 125, combined engine monitoring instrument for Propeller Rotary Speed, Oil Pressure, Oil Temperature, Coolant Temperature, Gearbox Temperature and Load.
(Engine instrument for Oil Temperature, Oil Pressure and Fuel Pressure N/A)
(5) "Alt. Air Door" Alternate Air Door (Carburetor Heat Button N/A)
(6) "Force B" Switch for manually switching the FADEC
(7) Lightpanel with:
"FADEC" test knob
"A FADEC B" warning lights for FADEC A and B
"Alt" Alternator warning light (red)
"AED" caution light (amber) for AED 125
"CED" caution light (amber) for CED 125
"CED/AED" Test/Confirm Knob for CED 125, AED 125 and caution lights
"Fuel L"; "Fuel R"- caution lights for low fuel level (amber)
"Glow" Glow Control Light (amber)

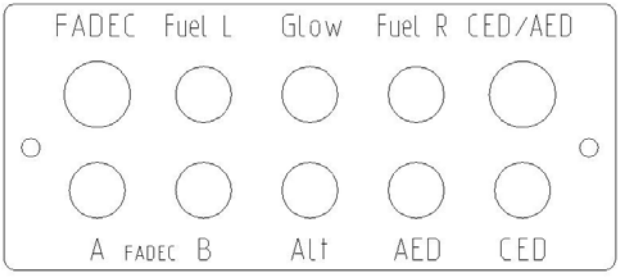

Figure 7-15c Lightpanel

(8) Guarded switch for Alternator

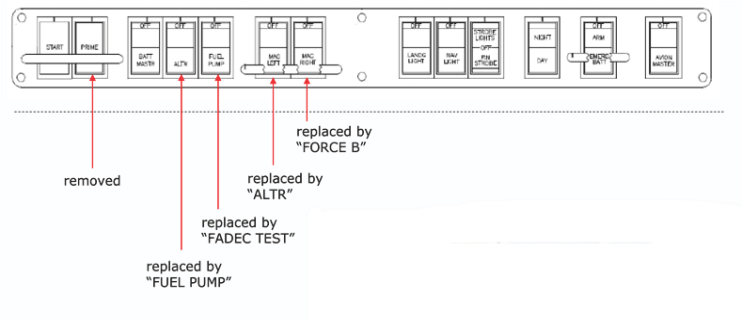

Figure 7-15d Overhead Panel PA-28-181 Archer III with G1000

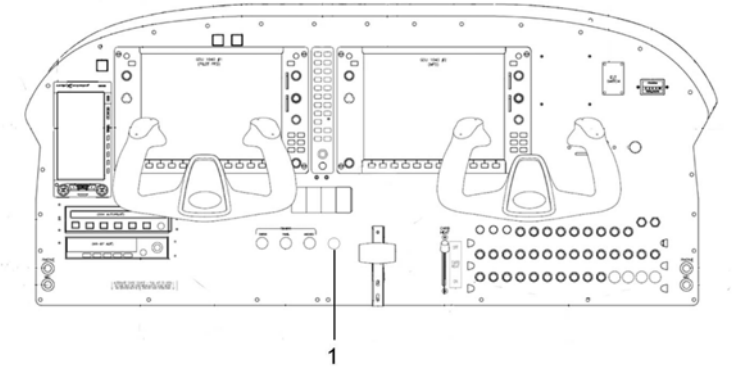

Figure 7-15e Example PA-28-181 Archer III with G1000

(1) "Engine Master" - Master Switch for Engine

FADEC Reset

In case of a FADEC warning, one or both FADEC warning lights are flashing (conventional avionics) or a warning is triggered (G1000 - ECU A FAIL or ECU B FAIL). If the FADEC test knob/ master warning switch is pressed for at least 2 seconds,

Conventional avionics:

a) the active warning lights will extinguish if it was a LOW category warning.
b) the active warning lights will be illuminated steady if it was a HIGH category warning

G1000:

a) the message text will change to red text on black background.

■ CAUTION: If a FADEC warning occurred, contact your service center.

COOLING

The TAE 125-02-114 is equipped with a fluid-cooling system. A three-way thermostat regulates the flow of coolant between the large and small cooling circuit.
At a coolant temperature of up to 84°C the coolant flows exclusively through the small circuit, between 84 and 94°C through the small and the large circuit simultaneously. If the coolant temperature rises above 94°C, the complete volume of coolant flows through the large circuit and through the radiator. This ensures a maximum coolant temperature of 105°C. A sensor in the expansion reservoir sends a signal to the caution Light "Water Level" on the instrument panel, if the coolant level is low.
The coolant temperature is measured in the housing of the thermostat and passed on to the FADEC and CED 125.
The connection to the heat exchanger for cabin heating is always open; the warm air supply is regulated by the pilot through the heating valve. See Figure 7-16.
The supply of warm air into the cabin is controlled through the cabin heat control knob. In normal operation, the cabin heat control knob must be in the OPEN position
In case of emergencies (SECTION 3), the control knob "Shut-off Cabin Heat" has to be closed according to the appropriate procedures.

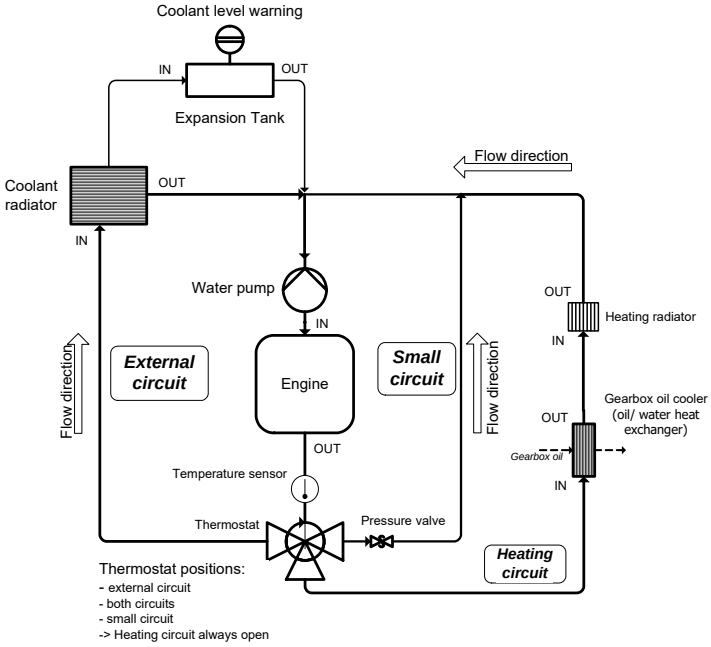

Figure 7-16 Cooling System

CABIN HEATING AND VENTILATION SYSTEM

Warm air for cabin heating and windscreen defrosting system is delivered from the heat exchanger of the TAE 125-02-114 installation cooling system. See Figure 7-16 above.

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SECTION 8
AIRPLANE HANDLING, SERVICING AND MAINTENANCE

■ CAUTION: Normally, a refill of coolant or gearbox oil between service intervals is not necessary. In case of low coolant or gearbox oil levels, inform the maintenance company immediately.

▲ **WARNING:** Do not start the engine in any case when fluid levels are below the minimum marking.

ENGINE AIR FILTER

Checks and exchanges of the engine air filter have to be performed regularly according to the Operation and Maintenance Manual OM-02-02. See also Supplement AMM-40-02.

PROPELLER SERVICE

Avoid high propeller RPM‘s on stationary ground runs to avoid nicks in the propeller blades due to stones.
Clean the propeller regularly from dirt and oil. A small amount of oil is acceptable since assembly oil can leak out during the first operating hours. Do not push or pull the aircraft on the propeller spinner!

ENGINE OIL

The TAE 125-02-114 is filled with 4.5 - 6 l engine oil. A dip stick is used to check the oil level. It is accessible by a door on the upper right-hand side of the engine cowling.
The drain screw is located on the lower left-hand outside of the oil pan. The oil filter is on the upper left side of the housing.
Checks and exchanges of oil and oil filter have to be performed regularly according to Operation and Maintenance Manual OM-02-02. See also Supplement AMM-40-02.

GEARBOX OIL

To ensure the necessary propeller speed, the TAE 125-02-114 is equipped with a reduction gearbox filled with gearbox oil according to Operation and Maintenance Manual OM-02-02, see also Supplement AMM-40-02. The level can be checked through a viewing glass on the lower leading edge of the gearbox. To do so, open the door on the left front side of the engine cowling.
The drain screw is located at the lowest point of the gearbox. A filter is installed upstream of the pump, as well as a microfilter in the Constant Speed Unit.
Regular checks as well as oil and filter exchanges have to be performed according to Operation and Maintenance Manual OM-02-02, see also Supplement AMM-40-02.

FUEL SYSTEM

Regular checks as well as fuel filter exchanges have to be performed according to Operation and Maintenance Manual OM-02-02, see also Supplement AMM-40-02.
The TAE 125-02-114 can be operated with JET A-1 Kerosene or Diesel.
Due to the higher specific density of JET A-1 or Diesel in comparison to aviation gasoline (AVGAS) the permissible capacity for fuel tanks is reduced to a total of 170 l.
Appropriate placards are attached near the fuel filler caps.
For temperature limitations refer to SECTION 3 and SECTION 4.
It is recommended to refuel before each flight and to enter the type of fuel into the log-book.

BATTERY SERVICE

Regular checks and exchanges of the battery, FADEC backup battery and the alternator excitation battery have to be performed according to Operation and Maintenance Manual OM-02-02, see also Supplement AMM-40-02.

EXTERNAL POWER

External power may be used to charge the battery or for maintenance purposes. To charge the battery with external power the battery switch must be ON.
Starting the engine with external power is not allowed. If starting the engine is not possible using battery power, the condition of the battery must be verified before flight.

ENGINE CLEANING

Cleaning the engine has to be performed according to Operation and Maintenance Manual OM-02-02, see also Supplement AMM-40-02.

COOLANT

Regular checks and exchanges of coolant and hoses have to be performed according to Operation and Maintenance Manual OM-02-02, see also Supplement AMM-40-02.

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