Supplemental Pilot’s Operating Handbook
and
FAA Approved Airplane Flight Manual
Supplement
for the
Cessna 172 R & S
Equipped with
TAE 125-01 or TAE 125-02-99 Installation
Issue 2-1

MODEL No.  
SERIAL No.  
REGISTER No.  

This supplement must be attached to the Pilot’s Operating Handbook when the TAE 125-01 or TAE 125-02-99 installation has been installed in accordance with STC SA01303WI.

This manual constitutes a FAA approved AFM Supplement or Supplemental Pilot’s Operating Handbook for US registered airplanes in accordance with FAR 21.29.

The information contained in this supplement supersedes or adds to the 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 basic Pilot’s Operating Handbook and FAA approved AFM.

FAA APPROVED  
Manager, Wichita Aircraft Certification Office
Federal Aviation Administration
Wichita, Kansas
DATE: 10/9/2010

TAE-Nr.: 20-0310-22042
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## LOG OF REVISIONS

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GENERAL REMARK

The content of this POH supplement is developed on basis of the EASA-approved POH. The content of the EASA-approved POH is equivalent to the original, FAA-approved POH.
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### CONVERSION TABLES

#### VOLUME

<table>
<thead>
<tr>
<th>Unit [Abbr.]</th>
<th>Conversion factor SI to US / Imperial</th>
<th>Conversion factor US / Imperial to Si</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liter [l]</td>
<td>[l] / 3.7854 = [US gal]</td>
<td>[US gal] x 3.7854 = [l]</td>
</tr>
<tr>
<td></td>
<td>[l] / 0.9464 = [US qt]</td>
<td>[US qt] x 0.9464 = [l]</td>
</tr>
<tr>
<td></td>
<td>[l] / 4.5459 = [lmp gal]</td>
<td>[lmp gal] x 4.5459 = [l]</td>
</tr>
<tr>
<td></td>
<td>[l] x 61.024 = [in³]</td>
<td>[in³] / 61.024 = [l]</td>
</tr>
<tr>
<td>US gallon [US gal]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US quart [US qt]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imperial gallon [lmp gal]</td>
<td></td>
<td></td>
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<tr>
<td>Cubic inch [in³]</td>
<td></td>
<td></td>
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</table>

#### TORQUE

<table>
<thead>
<tr>
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<th>Conversion factor SI to US / Imperial</th>
<th>Conversion factor US / Imperial to Si</th>
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</thead>
<tbody>
<tr>
<td>Kilopondmeter [kpm]</td>
<td>[kpm] x 7.2331 = [ft.lb]</td>
<td>[ft.lb] / 7.2331 = [kpm]</td>
</tr>
<tr>
<td></td>
<td>[kpm] x 86.7962 = [in.lb]</td>
<td>[in.lb] / 86.7962 = [kpm]</td>
</tr>
<tr>
<td>Foot pound [ft.lb]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inch pound [in.lb]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### TEMPERATURE

<table>
<thead>
<tr>
<th>Unit [Abbr.]</th>
<th>Conversion factor SI to US / Imperial</th>
<th>Conversion factor US / Imperial to SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree Celsius [ºC]</td>
<td>[ºC] x 1.8 + 32 = [ºF]</td>
<td>([ºF] - 32) / 1.8 = [ºC]</td>
</tr>
<tr>
<td>Degree Fahrenheit [ºF]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### SPEED

<table>
<thead>
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<th>Conversion factor SI to US / Imperial</th>
<th>Conversion factor US / Imperial to Si</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilometers per hour [km/h]</td>
<td>[km/h] / 1.852 = [kts]</td>
<td>[kts] x 1.852 = [km/h]</td>
</tr>
<tr>
<td>Meters per second [m/s]</td>
<td>[km/h] / 1.609 = [mph]</td>
<td>[mph] x 1.609 = [km/h]</td>
</tr>
<tr>
<td>Miles per hour [mph]</td>
<td>[m/s] / 196.85 = [fpm]</td>
<td>[fpm] / 196.85 = [m/s]</td>
</tr>
<tr>
<td>Knots [kts]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feet per minute [fpm]</td>
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</tr>
</tbody>
</table>
### PRESSURE

<table>
<thead>
<tr>
<th>Unit [Abbr.]</th>
<th>SI to US / Imperial</th>
<th>US / Imperial to SI</th>
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</thead>
<tbody>
<tr>
<td>Bar [bar]</td>
<td>[bar] x 14.5038 = [psi]</td>
<td>psi / 14.5038 = [bar]</td>
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<tr>
<td>Hectopascal [hpa] = Millibar [mbar]</td>
<td>[hpa] / 33.864 = [inHg]</td>
<td>[mbar] / 33.864 = [inHg]</td>
</tr>
<tr>
<td>Pounds per square inch [psi] inches of mercury column [inHg]</td>
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### MASS

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<thead>
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<th>Unit [Abbr.]</th>
<th>SI to US / Imperial</th>
<th>US / Imperial to SI</th>
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<tbody>
<tr>
<td>Kilogramm [kg]</td>
<td>[kg] / 0.45359 = [lb]</td>
<td>[lb] x 0.45359 = [kg]</td>
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<tr>
<td>Pound [lb]</td>
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<td></td>
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</table>

### LENGTH

<table>
<thead>
<tr>
<th>Unit [Abbr.]</th>
<th>SI to US / Imperial</th>
<th>US / Imperial to SI</th>
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</thead>
<tbody>
<tr>
<td>Meter [m]</td>
<td>[m] / 0.3048 = [ft]</td>
<td>[ft] x = [m]</td>
</tr>
<tr>
<td>Millimeter [mm]</td>
<td>[mm] / 25.4 = [in]</td>
<td>[in] x = [mm]</td>
</tr>
<tr>
<td>Kilometer [km]</td>
<td>[km] / 1.852 = [nm]</td>
<td>[nm] x = [km]</td>
</tr>
<tr>
<td>Inch [&quot;]</td>
<td>[&quot;] x 0.0254 = [mm]</td>
<td>[mm] x = [&quot;]</td>
</tr>
<tr>
<td>Foot [&quot;]</td>
<td>[&quot;] x 0.3048 = [m]</td>
<td>[m] x = [&quot;]</td>
</tr>
<tr>
<td>Nautical mile [nm]</td>
<td>[nm] / 1.852 = [sm]</td>
<td>[sm] x = [nm]</td>
</tr>
<tr>
<td>Statute mile [sm]</td>
<td>[sm] / 1.609 = [km]</td>
<td>[km] x = [sm]</td>
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</tbody>
</table>

### FORCE

<table>
<thead>
<tr>
<th>Unit [Abbr.]</th>
<th>SI to US / Imperial</th>
<th>US / Imperial to SI</th>
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<tr>
<td>Newton [N]</td>
<td>[N] / 4.448 = [lb]</td>
<td>[lb] x 4.448 = [N]</td>
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<tr>
<td>Decanewton [daN]</td>
<td>[daN] / 0.4448 = [lb]</td>
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<tr>
<td>Pound [lb]</td>
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ABBREVIATIONS

TAE  Thielert Aircraft Engines GmbH, developing and manufacturing company of the TAE 125-01 and TAE 125-02-99 engine

FADEC  Full Authority Digital Engine Control

CED 125  Compact Engine Display of TAE 125 Multifunctional instrument for indication of engine data of the TAE 125-01 and TAE 125-02-99

AED 125  Auxiliary Engine Display Multifunctional instrument for indication of engine and airplane data
SECTION 1
GENERAL

CONVENTIONS IN THIS HANDBOOK

This manual contains following conventions and warnings. They should be strictly followed to rule out personal injury, property damage, impairment to the aircraft's operating safety or damage to it as a result of improper functioning.

▲ 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 TAE Service Bulletin TM TAE 000-0004.

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

Engine manufacturer: Thielert Aircraft Engines GmbH
Engine model: TAE 125-01 or TAE 125-02-99

The TAE 125-02-99 is the successor of the 125-01. Both engine variants have the same power output and the same propeller speeds but different displacement. While the TAE 125-01 has 1689 ccm, the TAE 125-02-99 has 1991 ccm. Both TAE 125 engine variants are liquid cooled in-line four-stroke 4-cylinder motor with DOHC (double overhead camshaft) and are direct Diesel injection engines with common-rail technology and turbocharging. Both engine variants are controlled by a FADEC system. The propeller is driven by a built-in gearbox (i = 1.69) with mechanical vibration damping and overload release. The engine variants have an electrical self starter and an alternator.

⚠️ WARNING

The engine requires an electrical power source for operation. If the main battery and alternator fail simultaneously, 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.

Due to this specific characteristic, all of the information from the Pilot's Operating Handbook and FAA approved AFM are no longer valid with reference to:

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

Manufacturer:.........................MT Propeller Entwicklung GmbH
Model: ........................................................... MTV-6-A/187-129
Number of blades:.................................................................3
Diameter: .................................................. 73.6 inches (1.87 m)
Type: .................................................................Constant speed

NOISE LEVEL

For TAE 125-01 installation:
The noise level has been established in accordance with:
  a) FAR 36, Appendix G as 77.4 db(A)
  b) ICAO Annex 16, Chpt. 10 as 77.4 db(A)

The noise level when the aircraft is equipped with muffler option "Akrapovic D4D-7808-10-00" has been established in accordance with
  a) FAR 36, Appendix G as 70.9 db(A)
  b) ICAO Annex 16, Chpt. 10 as 70.9 db(A)

For TAE 125-02-99 installation:
The noise level when the aircraft is equipped with muffler option "Akrapovic D4D-7808-10-00" has been established in accordance with
  a) FAR 36, Appendix G as 71.3 db(A)
  b) ICAO Annex 16, Chpt. 10 as 71.3 db(A)

No determination has been made by the FAA that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of, any airport.
FUELS/ OILS/ LIQUIDS

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

Fuel: ...................................... JET A-1 and JET A (ASTM 1655)

Engine oil: .............................. AeroShell Oil Diesel 10W-40
.............................................................. Shell Helix Ultra 5W-30
.............................................................. Shell Helix Ultra 5W-40

Gearbox oil: .................. Shell Getriebeöl EP 75W-90 API GL-4
................................................. Shell Spirax GSX 75W-80 GL-4

- **CAUTION:** Use the approved oil with exact designation only!

Coolant: .......................... Water/Radiator Protection at a ratio of 50:50

Radiator Protection: .......... BASF Glysantin Protect Plus/G48
.............................................................. Mobil Antifreeze Extra/G48
.............................................................. ESSO Antifreeze Extra/G48
............................................. Comma Xstream Green - Concentrate/G48
.............................................................. Zerex Glysantin G48

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

- **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 immediately.

- **Note:** The freezing point of the coolant is -32.8 °F (-36°C).
Quantity of fuel:

◆ Note: The maximum permissible tank capacity has been reduced due to the higher specific density of kerosene compared to AVGAS

**C172 R & S normal category:**
Total capacity: .......................................................... 180.2 litres (47.6 US gallons)
Total capacity of usable fuel: ..................... 168.8.0 litres (44.6 US gallons)
Total capacity each tank: ...................... 90.1 litres (23.8 US gallons)
Total capacity of usable fuel each tank: ...................................... 84.4 litres (22.3 US gallons)

**C172 R & S utility category:**
Total capacity: .......................................................... 117.4 litres (31 US gallons)
Total capacity of usable fuel: ..................... 106 litres (28 US gallons)
Total capacity each tank: ...................... 58.7 litres (15.5 US gallons)
Total capacity of usable fuel each tank: ...................................... 53 litres (14 US gallons)
WEIGHT LIMITS

C172 R & S normal category (C 172 S reduced):
Maximum Ramp Weight: ................ 2452 lbs (1112.3 kg)
Maximum Takeoff Weight: .............. 2450 lbs (1111.3 kg)
Maximum Landing Weight .............. 2450 lbs (1111.3 kg)

C172 R utility category:
Maximum Ramp Weight: .................. 2103 lbs (953.9 kg)
Maximum Takeoff Weight: ............... 2100 lbs (952.5 kg)
Maximum Landing Weight ............... 2100 lbs (952.5 kg)

C172 S utility category:
Maximum Ramp Weight: .................. 2204 lbs (1000 kg)
Maximum Takeoff Weight: ............... 2200 lbs (997.9 kg)
Maximum Landing Weight ............... 2200 lbs (997.9 kg)
SECTION 2
LIMITATIONS

▲ WARNING: The engine requires an electrical power source for operation. If the main battery and alternator fail simultaneously, 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.

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

ENGINE OPERATING LIMITS

Engine manufacturer: Thielert Aircraft Engines GmbH
Engine model: TAE 125-01 or TAE 125-02-99
Take-off and Max. continuous power: 99 kW (135 HP)
Take-off and Max. continuous RPM: 2300

By limitation, the FADEC System tests included in Section 4 must be performed before flight.

By limitation, the FADEC Backup Battery tests included in Section 4 must be performed before flight.

◆ Note: This change of the original aircraft is certified up to an altitude of 17,500 ft.

◆ 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 takeoff 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.

Min. oil temperature (engine starting temp.): ...........-32°C (-25.6°F)
Min. oil temperature (min. operating limit temp.): ......50°C (122°F)
Maximum oil temperature: ........................................140°C (284°F)
Min. cooling water temp. (engine starting temp.):.. -32° C (-25.6°F)
Min. cooling water temp. (min. operating limit temp.):60 °C(140 °F)
Max. cooling water temperature: ..............................105°C (221°F)
Min. gearbox temperature: ....................................... - 30°C (-22°F)
Max. gearbox temperature: ......................................120°C (248°F)
Min. fuel temperature limit in the fuel tank:

<table>
<thead>
<tr>
<th>Minimum permissible fuel temperature in the fuel tank before Take-off</th>
<th>Minimum permissible fuel temperature in the fuel tank during the flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30° C (-22° F)</td>
<td>-35°C (-31° F)</td>
</tr>
</tbody>
</table>

Table 2-3a Minimum fuel temperature limits in the fuel tank

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

Minimum oil pressure: ............................................. 1.2 bar (17.4 psi)
Minimum oil pressure (at Take-off power): ........ 2.3 bar (33.4 psi)
Minimum oil pressure (in flight):............................. 2.3 bar (33.4 psi)
Maximum oil pressure: ................................................ 6.0 bar (87 psi)
Maximum oil pressure (cold start < 20 sec.): ...... 6.5 bar (94.3 psi)
Maximum oil consumption: ........................................... 0.1 quart/h (0.1 l/h)
ENGINE INSTRUMENT MARKINGS

The engine data of the TAE 125-01 and TAE 125-02-99 to be monitored are integrated in the combined engine instrument CED-125.

The ranges of the individual engine monitoring parameters are shown in the following table.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Red range</th>
<th>Amber range</th>
<th>Green range</th>
<th>Amber range</th>
<th>Red range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachometer [RPM]</td>
<td>----</td>
<td>----</td>
<td>0-2300</td>
<td>----</td>
<td>&gt;2300</td>
</tr>
<tr>
<td>Oil pressure [bar]</td>
<td>0 - 1.2</td>
<td>1.2 - 2.3</td>
<td>2.3 - 5.2</td>
<td>5.2 - 6.0</td>
<td>&gt; 6.0</td>
</tr>
<tr>
<td></td>
<td>0 - 17.4</td>
<td>17.4 - 33.4</td>
<td>33.4 - 75.4</td>
<td>75.4 - 87.0</td>
<td>&gt; 87.0</td>
</tr>
<tr>
<td>Coolant temperature</td>
<td>&lt; -32.</td>
<td>-32 - 60</td>
<td>60 - 101</td>
<td>101-105</td>
<td>&gt; 105</td>
</tr>
<tr>
<td></td>
<td>&lt; -25.6</td>
<td>-25.6 - 140</td>
<td>140 - 214</td>
<td>214 - 221</td>
<td>&gt; 221</td>
</tr>
<tr>
<td>Oil temperature</td>
<td>&lt; -32.</td>
<td>-32 - 50</td>
<td>50 - 125</td>
<td>125 - 140</td>
<td>&gt; 140</td>
</tr>
<tr>
<td></td>
<td>&lt; -25.6</td>
<td>-25.6 - 122</td>
<td>122 - 257</td>
<td>257 - 284</td>
<td>&gt; 284</td>
</tr>
<tr>
<td>Gearbox temperature</td>
<td>---</td>
<td>---</td>
<td>&lt; 115</td>
<td>115 - 120</td>
<td>&gt; 120</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>---</td>
<td>&lt; 239</td>
<td>239 - 248</td>
<td>&gt; 248</td>
</tr>
<tr>
<td>Load [%]</td>
<td>---</td>
<td>---</td>
<td>0 - 100</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Table 2-3b Markings of the engine instruments

◆ Note: If an engine reading is in the amber or red range, the "CED Caution" lamp is activated. It only extinguishes when the "CED-Test/Confirm" button is pressed. If this button is pressed longer than a second, a self test of the instrument is initiated.
WEIGHT LIMITS

C172 R & S normal category (C 172 S reduced):
- Maximum Ramp Weight: ................ 2452 lbs (1112.3 kg)
- Maximum Takeoff Weight: .............. 2450 lbs (1111.3 kg)
- Maximum Landing Weight .............. 2450 lbs (1111.3 kg)

C172 R utility category:
- Maximum Ramp Weight: .................. 2103 lbs (953.9 kg)
- Maximum Takeoff Weight: ................ 2100 lbs (952.5 kg)
- Maximum Landing Weight ................ 2100 lbs (952.5 kg)

C172 S utility category:
- Maximum Ramp Weight: .................. 2204 lbs (1000 kg)
- Maximum Takeoff Weight: ............... 2200 lbs (997.9 kg)
- Maximum Landing Weight .............. 2200 lbs (997.9 kg)

MANEUVER LIMITS

- **CAUTION:** Intentionally initiating negative G maneuvers is prohibited.

Normal Category: No change

Utility Category: Intentionally initiating spins is prohibited
FLIGHT LOAD FACTORS
No change

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

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

PERMISSIBLE FUEL GRADES

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

Fuel: ............................................JET A-1, JET A (ASTM 1655)

MAXIMUM FUEL QUANTITIES
Due to the higher specific density of kerosene in comparison to Aviation Gasoline (AVGAS) with the TAE 125-01 and TAE 125-02-99 installation the permissible tank capacity has been reduced.

Cessna 172 R, S, Normal Category
2 tanks: ..........................each 22.3 US gallons (84.4 litres)
Total capacity: .............................47.6 US gallons (180.2 litres)
Total usable fuel: ..........................44.6 US gallons (168.8 litres)
Total unusable fuel: .........................3 US gallons (11.4 litres)

Cessna 172 R, S, Utility Category
2 tanks: ..........................each 14 US gallons (53 litres)
Total capacity: .............................31 US gallons (123 litres)
Total usable fuel: ..........................28 US gallons (117.4 litres)
Total unusable fuel: .........................3 US gallons (11.4 litres)
CAUTION: To prevent air from penetrating into the fuel system avoid flying the tanks dry. As soon as the "Low Level" warning lamp illuminates, switch to a tank with sufficient fuel or land.

CAUTION: With ¼ tank or less, prolonged uncoordinated flight is prohibited when operating on either left or right tank.

CAUTION: In turbulent air it is strongly recommended to use the BOTH position.

Note: The tanks are equipped with a Low Fuel Warning. If the fuel level is below 5 US gal (19 l) usable fuel in one of the tanks, the "Fuel L" or "Fuel R" Warning Lamp illuminates respectively.

PERMISSIBLE OIL TYPES

Engine oil: .................................... AeroShell Oil Diesel 10W-40
..........................Shell Helix Ultra 5W-30
..........................Shell Helix Ultra 5W-40

Gearbox oil:................. Shell Getriebeöl EP 75W-90 API GL-4
..........................Shell Spirax GSX 75W-80 GL-4

CAUTION: Use approved oil with exact designation only!
PERMISSIBLE COOLING LIQUID

Coolant:.............Water/Radiator Protection at a ratio of 50:50

Radiator Protection: .......... BASF Glysantin Protect Plus/G48
........................................................ Mobil Antifreeze Extra/G48
....................................................... ESSO Antifreeze Extra/G48
............................................ Comma Xstream Green - Concentrate/G48
................................................................. Zerex Glysantin G48

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

On fuel selector:
LEFT/ RIGHT/ BOTH

Near the fuel tank caps:

Normal Category
JET FUEL ONLY
JET A / JET A-1
CAP. 84.4 LITERS (22.3 US GALLONS)
USABLE TO BOTTOM OF FILLER INDICATOR TAB

Utility Category
JET FUEL ONLY
JET A / JET A-1
CAP. 53 LITERS (14 US GALLONS)

At the fuel selector valve:

Normal Category
Left and Right Position: 84.4 Ltr/ 22.3 gal
Both Position: 178 Ltr/ 47 gal

Utility Category
Left and Right Position: 53 Ltr/ 14 gal
Both Position: 106 Ltr/ 28 gal

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

"Oil, see POH supplement"

Next to the Alternator Warning Lamp:

"Alternator"

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

"ATTENTION 24 V DC OBSERVE CORRECT POLARITY"
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EMERGENCY PROCEDURES
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GENERAL

⚠️ WARNING: Due to an engine shut-off or a FADEC diagnosed failure there might be a loss of propeller valve current which leads to a low pitch setting of the propeller. This might result in overspeed. Airspeeds below 100 KIAS are suitable to avoid overspeed in failure case. If the propeller speed control fails, climbs can be performed at 65KIAS and a power setting of 100%.

ENGINE MALFUNCTION

DURING TAKE-OFF (WITH SUFFICIENT RUNWAY AHEAD)

(1) Thrust Lever - IDLE
(2) Brakes - APPLY
(3) Wing flaps (if extended) - RETRACT to increase the braking effect on the runway
(4) Engine Master - OFF
(5) Switches "Alternator" and "Battery" - OFF
IMMEDIATELY AFTER TAKE-OFF

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 corrections in direction to avoid obstacles.

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

(1) Airspeed............................. 65 KIAS (wing flaps retracted)
......................................... 60 KIAS (wing flaps extended)
(2) Fuel Shut-off Valve - CLOSED
(3) Engine Master - OFF
(4) Wing flaps - as required (full down recommended)
(5) Switches "Battery" and "Alternator" - OFF

DURING FLIGHT

◆ Note: Flying a tank dry activates both FADEC lamps 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 BOTH
(2) Electrical Fuel Pump - ON
(3) Establish Best Glide Speed
(4) Check the engine (engine parameters, airspeed/altitude change, whether the engine responds to changes in the Thrust Lever position).
(5) If the engine acts normally, continue the flight and land as soon as practical

▲ WARNING: The high-pressure pump must be checked before the next flight.
RESTART AFTER ENGINE FAILURE

Whilst 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 (maximal 100 KIAS)
(2) If possible, glide below 13,000 ft
(3) Fuel Selector switch to BOTH
(4) Electrical Fuel Pump - ON
(5) Thrust Lever - IDLE
(6) Engine Master OFF and then ON
    (if the propeller does not turn, then additionally Starter ON)

◆ 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 more than 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 blocked, do not use the Starter.

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

(7) Check the engine power: Thrust lever 100%, engine parameters, check altitude and airspeed
FADEC MALFUNCTION IN FLIGHT

◆ 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.

a) One FADEC Lamp is flashing
1. Press FADEC-Testknob at least 2 seconds
2. FADEC Lamp extinguished (LOW warning category):
   a) Continue flight normally,
   b) Inform service center after landing.
3. FADEC Lamp steady illuminated (HIGH warning category):
   a) Observe the other FADEC lamp,
   b) Land as soon as practical,
   c) Select an airspeed to avoid engine overspeed
   d) Inform service center after landing.
b) Both FADEC Lamps are flashing

◆ Note: CED load display should be considered unreliable with both FADEC lights illuminated. Use other indications to assess engine condition.

1. Press FADEC-Testknob at least 2 seconds
2. FADEC Lamps extinguished (LOW category warning):
   a) Continue flight normally
   b) Inform service center after landing
3. FADEC Lamps steady 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 tank was flown empty, proceed at the first signs of insufficient fuel feed as follows:
   a) Immediately switch the Fuel Selector to BOTH
   b) Electrical Fuel Pump - ON
   c) Select an 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 normally, 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 abnormally during flight and the system does not automatically switch to the B-FADEC, it is possible 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 behavior.

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 shut down the engine.

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

ENGINE FIRE WHEN STARTING ENGINE ON GROUND
(1) Engine Master - OFF
(2) Fuel Shut-off Valve - CLOSED
(3) Electrical Fuel Pump - OFF
(4) Switch "Battery" - 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 IN FLIGHT
(1) Engine Master - OFF
(2) Fuel Shut-off Valve - CLOSED
(3) Establish Best Glide Speed
(4) Electrical Fuel Pump - OFF (if in use)
(5) Avionics Master Switch - OFF
(6) Cabin heat and ventilation OFF (closed) except the fresh air nozzles on the ceiling
   i) Shut Off Cabin Heat – PUSH FULL FORWARD
   ii) Cabin Heat – PUSH FULL FORWARD
   iii) Cabin Air – PUSH FULL FORWARD
(7) Perform emergency landing (as described in the procedure "Emergency Landing With Engine Out")
ELECTRICAL FIRE IN FLIGHT

The first sign of an electrical fire is the smell of burned cable insulation. In this event proceed as follows:

(1) Avionics Master Switch - OFF

(2) Cabin heat and ventilation OFF (closed) except the fresh air nozzles on the ceiling
   i) Shut Off Cabin Heat – PUSH FULL FORWARD
   ii) Cabin Heat – PUSH FULL FORWARD
   iii) Cabin Air – PUSH FULL FORWARD

(3) Actuate fire extinguisher (if installed)

(4) All electrical consumers (except Engine Master) - OFF

⚠️ WARNING The engine requires a source of power to operate. If the electrical fire is not stopped after switching off the Main Bus and the Avionics Master, the search for the fault can be continued through alternate switching off the battery or the alternator. Simultaneously switching off the battery and the alternator will lead to engine stop.

⚠️ WARNING Ventilate or extract air well from the cabin after using the fire extinguisher and after extinguishing the fire.

(5) Establish that the fire was put out completely

If the fire has been extinguished completely and electrical consumers are needed to continue the flight to the next airfield or landing strip:

(6) Circuit breakers check the circuit for damage, do not switch on again

(7) Radio - OFF

(8) Avionics Master Switch - ON

(9) Radio/electrical consumers - ON, one after the other with a delay in between, until the short circuit has been identified
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. Establish Best Glide Speed
2. Engine Master - OFF
3. Fuel Shut-off Valve - CLOSED
4. Electrical Fuel Pump - OFF (if in use)
5. If the propeller also has to be stopped (for instance, due to excessive vibrations)
   i) Reduce airspeed below 55 KIAS
   ii) When the propeller is stopped, continue to glide at 65 KIAS

EMERGENCY LANDING

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. Airspeed
   i) 65 KIAS (flaps retracted)
   ii) 60 KIAS (flaps extended)
2. Fuel Shut-off Valve CLOSED
3. Engine Master - OFF
4. Wing Flaps - as required (full down recommended)
5. Switches "Battery" and "Alternator" - OFF
6. Cabin Doors - unlock before touch-down
7. Touch-down - slightly nose up attitude
8. Brake firmly

◆ Note: Gliding Distance. Refer to "Maximum Glide" in the approved Pilot’s Operating Handbook
FLIGHT IN ICING CONDITIONS

▲ WARNING: It is prohibited to fly in known icing conditions.

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) Pull the "Shut Off Cabin Heat" and "Cabin Heat" control full aft 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 aspirated.
(6) Plan a landing at the nearest airfield. With an extremely rapid ice build up, select a suitable "off airfield" landing side.
(7) With an ice accumulation of 1/4 in. (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) Open left window, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
(10) Perform a landing approach using a forward slip, if necessary, for improved visibility.
(11) Approach at 65 to 75 KIAS depending upon the amount of the accumulation.
(12) Perform a landing in level attitude.
RECOVERY FROM SPIRAL DIVE

If a spiral is encountered in the clouds, proceed as follows:

(1) Retard Thrust Lever to idle position
(2) Stop the turn by using coordinated aileron and rudder control to align the symbolic airplane in the turn coordinator with the horizontal reference line.
(3) Cautiously apply elevator back pressure to slowly reduce the airspeed to 80 KIAS.
(4) Adjust the elevator trim control to maintain an 80 KIAS glide.
(5) Keep hands off the control wheel, using rudder control to hold a straight heading.
(6) Re-adjust the rudder trim (if installed) to relieve the rudder of asymmetric forces.
(7) Clear the engine occasionally, but avoid using enough power to disturb the trimmed glide. Monitor the engine parameters.
(8) Upon breaking out of clouds, resume normal cruising flight and continue the flight.
ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

CAUTION: The TAE 125-01 and TAE 125-02-99 require 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 may continue to operate up to 120 minutes based on electrical load and battery condition. Refer to section 7.

Continued on next page
ALTERNATOR WARNING LAMP ILLUMINATES DURING NORMAL ENGINE OPERATION.

(1) Ammeter - CHECK
(2) Switch "Alternator" CHECK - ON
(3) Switch "Battery" CHECK - ON

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

(4) Electrical Load - REDUCE IMMEDIATELY depending on situation, as follows:
   a) NAV/COM 2 - OFF
   b) Fuel Pump - OFF
   c) Landing Light - OFF (use as required for landing)
   d) Taxi light - OFF
   e) Strobe Light - OFF
   f) Nav Lights - OFF
   g) Beacon - OFF
   h) Interior Lights - OFF
   i) Pitot Heat - OFF (use as required)
   j) Autopilot - OFF
   k) 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

(1) Switch "Alternator" CHECK - ON
(2) Switch "Battery" CHECK - ON

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

(3) Electrical Load - REDUCE IMMEDIATELY depending on situation, as follows:
   a) NAV/COM 2 - OFF
   b) Fuel Pump - OFF
   c) Landing Light - OFF (use as required for landing)
   d) Taxi light - OFF
   e) Strobe Light - OFF
   f) Nav Lights - OFF
   g) Beacon - OFF
   h) Interior Lights - OFF
   i) Pitot Heat - OFF (use as required)
   j) Autopilot - OFF
   k) 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, engine remains running)

▲ WARNING: If the power supply from both alternator and main battery is interrupted simultaneously, continued engine operation is dependend on the remaining capacity of the FADEC backup battery. The engine has been demonstrated to continue operating for a maximum 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 light illuminated), the remaining engine operating time may be less than 30 minutes.

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

1) Switch "Alternator" CHECK - ON
2) Switch "Battery" CHECK - ON
3) Land as soon as possible
   a) Be prepared for an emergency landing
   b) Expect an engine failure
ROUGH ENGINE OPERATION OR LOSS OF POWER

DECREASE IN POWER
(1) Push Thrust Lever full forward (Take-off position)
(2) Fuel Selector to BOTH position
(3) Electrical Fuel Pump - ON
(4) Establish Best Glide Speed
(5) Check engine parameters (FADEC lamps, oil pressure and temperature, fuel quantity)

If normal engine power is not achieved, the pilot should:
   i) Land as soon as practical
   ii) Be prepared for an emergency landing
   iii) Expect an engine failure

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

SOILED SPARK PLUGS
   - N/A, since this is a Diesel engine -

IGNITION MAGNETO MALFUNCTIONS
   - N/A, since this is a Diesel engine -
OIL PRESSURE TOO LOW
(< 2.3 BAR IN CRUISE OR < 1.2 BAR AT IDLE):

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 longer climbouts at low airspeed engine temperatures could rise into the amber range and trigger the "Caution" lamp. This warning allows the pilot to avoid overheating of the engine as follows:

1. Increase the climbing airspeed, reduce angle of climb
2. Reduce power, if the engine temperatures approach the red area.

OIL TEMPERATURE "OT" TOO HIGH (RED RANGE):

1. Increase airspeed and reduce power as quickly as possible
2. Check oil pressure: if the oil pressure is lower than normal (< 2.3 bar in cruise or < 1.2 bar 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 the normal range:
   i) Land as soon as practical
COOLANT TEMPERATURE "CT" TOO HIGH (RED RANGE):
(1) Increase airspeed and reduce power as quickly as possible
(2) "Shut Off Cabin Heat" – PUSH FULL FORWARD (valve closed)
(3) If this reduces the coolant temperature to within the normal operating range quickly, continue to fly normally and observe coolant temperature.
(4) As far as this does not cause the coolant temperature to drop,
   i) Land as soon as practical
   ii) Be prepared for an emergency landing
   iii) Expect an engine failure

LAMP "WATER LEVEL" ILLUMINATES
(1) Increase airspeed and reduce power as quickly as possible
(2) Coolant temperature "CT" check and observe
(3) Oil temperature "OT" check and observe
(4) As far as 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

GEARBOX TEMPERATURE "GT" TOO HIGH (RED RANGE):
(1) Reduce power to 55% - 75% as quickly as possible
(2) Land as soon as practical.
PROPELLE RPM TOO HIGH:
With propeller RPM between 2,300 and 2,400 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, climb flights be performed at 65KIAS 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 2500rpm.

FLUCTUATIONS IN PROPELLE 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 power 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, select a power setting where the propeller RPM fluctuations are minimum. Fly at an airspeed below 100 KIAS and land as soon as practical.
SECTION 4
NORMAL PROCEDURES

PREFLIGHT INSPECTION

Figure 4-1a Preflight Inspection

◆ Note: Visually check airplane for general condition during walk around inspection. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater (if installed) is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.
(1) **CABIN**

(1) Pitot Tube Cover - REMOVE. Check for pitot stoppage
(2) Pilot’s Operating Handbook - AVAILABLE IN THE AIRPLANE.
(3) Airplane Weight and Balance- CHECKED.
(4) Parking Brake- SET.
(5) Control Wheel Lock - REMOVE.
(6) Engine Master - OFF.
(7) Avionics Master Switch - 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.

(8) Battery - ON,
(9) Fuel Quantity Indicators and Fuel Temperature-CHECK and ENSURE LOW FUEL ANNUNCIATORS (L LOW FUEL R) ARE EXTINGUISHED
(10) Light "Water Level" - CHECK OFF.
(11) Avionics Master Switch - ON, CHECK Avionics Cooling Fan audibly for operation.
(12) Avionics Master Switch - OFF.
(13) Static Pressure Alternate Source Valve- OFF.
(14) Annunciator Panel Test Switch- PLACE AND HOLD IN TST POSITION and ensure all annunciators illuminate
(15) Annunciator Panel Test Switch- RELEASE. Check that appropriate annunciators remain on.

◆ **Note** When Battery is turned ON, some annunciators will flash for about 10 seconds before illuminating steadily. When panel TST switch is toggled up and held in position, all remaining lights will flash until the switch is released.
(16) Fuel Selector Valve- BOTH (CHECK fuel temperature)
(17) Fuel Shut-off Valve - ON (Push Full In).
(18) Cabin Heat - As required

◆ Note: For cabin heating "Shut Off Cabin Heat" must be pulled full aft (valve open) and "Cabin Heat" pulled aft as required for desired temperature.

(19) Cabin Air - As required
(20) Flaps - EXTEND.
(21) Pilot Heat - ON (Carefully check that the pilot tube is warm to the touch within 30 seconds.).
(22) Pilot Heat - OFF.
(23) Battery - OFF.
(24) Baggage Door - CHECK, lock with key.

(2) EMPENNAGE
(1) Rudder Gust Lock- REMOVE.
(2) Tail Tie-Down - DISCONNECT.
(3) Control Surfaces - CHECK freedom of movement and security.
(4) Trim Tab - CHECK security.
(5) Antennas - CHECK for security of attachment and general condition.

(3) RIGHT WING Trailing Edge
(1) Aileron - CHECK freedom of movement and security.
(2) Flap - CHECK for security and condition.
(4) RIGHT WING

(1) Wing Tie-Down - DISCONNECT.

(2) Main Wheel Tire - CHECK for proper inflation and general condition (weather checks, tread depth and wear, etc.).

⚠️ WARNING  If, after repeated sampling, evidence of contamination still exists, the airplane should not be flown. Tanks should be drained and system purged by qualified maintenance personnel. All evidence of contamination must be removed before further flight.

(3) Fuel Tank Sump Quick Drain Valves - DRAIN at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment and the right type of fuel (JET A-1) before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to above WARNING and do not fly airplane.

(4) Fuel Quantity - CHECK VISUALLY for desired level and not above bottom of filler indicator tab.

(5) Fuel Filler Cap - SECURE.

(5) NOSE

(1) Air Filter - Check for restrictions by dust or other foreign matter.

(2) Reservoir-tank Quick Drain Valve - DRAIN at least a cupful of fuel (using sampler cup) from valve to check for water, sediment and proper fuel grade (JET A-1) before each flight and after each refueling. If water is observed, take further samples until clear and then
gently rock wings and lower tail to the ground to move any additional contaminants to the sampling point. Take repeated samples until all contamination has been removed.

(3) Fuel Filter- Before first flight of the day and after each refueling- DRAIN the Fuel Strainer Quick Drain Valve with the sampler cup to remove water and sediment from the screen. Ensure that the screen drain is properly closed again. If water is discovered, there might be even more water in the fuel system. Therefore, take further samples from Fuel Strainer and the Tank Sumps.

(4) Landing Light - CHECK for condition and cleanliness.

(5) Engine Oil Dipstick/Filler Cap
   a) Oil level - CHECK
   b) Dipstick/ filler cap - SECURE
   Do not operate below the minimum dipstick indication

(6) Engine Cooling Air Inlets - CLEAR of obstructions.

(7) Propeller and Spinner- CHECK for nicks and security.

(8) Gearbox Oil Level - Check

(9) Nose Wheel Strut and Tire - CHECK for proper inflation of strut and general condition (weather checks, tread depth and wear, etc.) of tire.

(10) Left Static Source Opening- CHECK for stoppage.

(6) LEFT WING

(1) Fuel Quantity - CHECK VISUALLY for desired level and not above bottom of filler indicator tab.

(2) Fuel Filler Cap - SECURE.

(3) Fuel Tank Sump Quick Drain Valves- DRAIN at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment and the right type of fuel (JET-A1) before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the
sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to above WARNING and do not fly airplane.

(4) Main Wheel Tire - CHECK for proper inflation and general condition (weather checks, tread depth and wear, etc.)

(7) **LEFT WING Leading Edge**

(1) Fuel Tank Vent Opening - CHECK for stoppage.

(2) Stall Warning Opening - CHECK for stoppage. To check the system, place a clean handkerchief over the vent opening and apply suction; a sound from the warning horn will confirm system operation.

(3) Wing Tie-Down - DISCONNECT.

(4) Landing/Taxi Light(s) - CHECK for condition and cleanliness of cover.

(8) **LEFT WING Trailing Edge**

(1) Aileron - CHECK freedom of movement and security.

(2) Flap - CHECK for security and condition.

**BEFORE STARTING ENGINE**

(1) Preflight Inspection - COMPLETE.

(2) Passenger Briefing - COMPLETE.

(3) Seats, and Seat Belts - ADJUST and LOCK. Ensure inertia reel locking.

(4) Brakes - TEST and SET.

(5) Circuit Breakers - CHECK IN.

(6) Electrical Equipment, Autopilot (if installed) - OFF.

■ **CAUTION:** The Avionics Power Switch must be off during engine start to prevent possible damage to avionics.

(7) Avionics Master Switch - OFF.
(8) Avionics Circuit Breakers - CHECK IN.
(9) Switch Alternator - CHECK ON.
(10) Alternate Air Door - CLOSED.
(11) Battery - ON

■ CAUTION: The electronic engine control needs an electrical power source for its operation. For normal operation Battery, Alternator and Main Bus have to be switched on. Separate switching is only allowed for tests and in the event of emergencies.

(12) Fuel Quantity and Temperature - CHECK
(13) Fuel Selector Valve - BOTH
(14) Fuel Shut-off Valve - OPEN (Push Full In).
(15) Thrust Lever - CHECK for freedom of movement.
(16) Load Display - CHECK 0% at Propeller RPM 0.
STARTING ENGINE

**WARNING**  Do not use ground power unit for engine starts. It is not allowed to start up the engine using external power. If starting the engine is not possible using battery power, the condition of the battery must be verified before flight.

1. Electrical Fuel Pump - ON.
2. Thrust Lever - IDLE.
3. Propeller Area - CLEAR.
4. Engine Master - ON, wait until the Glow Control Lamp extinguishes.
6. Oil Pressure - CHECK.

**CAUTION:** If after 3 seconds the minimum oil pressure of 1 bar is not indicated: shut down the engine immediately!

7. CED Test Knob- PRESS (to delete Caution Lamp).
8. Ammeter- CHECK for positive charging current.
9. Voltmeter – CHECK for green range
10. FADEC Backup Battery test
   a) Alternator - OFF, engine must operate normally
   b) Battery - OFF, engine must operate normally
   c) Battery - ON. Perform a 10 second engine run. The voltmeter must remain in the green range. If not, do not continue with Take-Off, the battery has to be charged or, if necessary, exchanged prior to flight.
   d) Alternator - ON

**WARNING:** It must be ensured that both battery and alternator are ON!

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Note: There is no switch for the FADEC Back-up Battery; the reference to Battery switched OFF and ON in the above procedure is referring to the Aircraft’s Main Battery.

(11) Navigation Lights and Flashing Beacon - ON (as required).
(12) Avionics Master Switch - ON.
(13) Radios - ON.
(14) Ammeter - Check positive change, alternator warning light must be OFF
(15) Voltmeter - Check in green range
(16) Electrical Fuel Pump - OFF.
(17) Flaps - RETRACT.

WARM UP
(1) Let the engine warm up about 2 minutes at 890 RPM.
(2) Increase RPM to 1,400 until Oil Temperature 50° C (122°F), Coolant Temperature 60° C (140°F).
BEFORE TAKE-OFF

(1) Parking Brake - SET.
(2) Passenger Seat Backs - MOST UPRIGHT POSITION.
(3) Seats and Seat Belts - CHECK SECURE.
(4) Cabin Doors and Windows - CLOSED and LOCKED.
(5) Flight Controls - FREE and CORRECT.
(6) Flight Instruments - CHECK and SET.
(7) Fuel quantity - CHECK.
(8) Fuel Selector Valve - SELECT BOTH position.
(9) Elevator Trim and Rudder Trim (if installed) - SET for Take-off.

(10) FADEC and propeller adjustment function check:
   a) Thrust Lever - IDLE (both FADEC lamps should be OFF).
   b) FADEC Test Button - PRESS and HOLD button for entire test.
   c) Both FADEC lamps - ON, RPM increases to 1200 RPM approximately.

   ▲ WARNING: If the FADEC lamps 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 lamp is ON).
   e) The propeller control is excited, RPM decreases to 800 RPM approximately.
   f) The FADEC automatically switches to channel A (only FADEC A lamp is ON), RPM increases to 1200 RPM approximately.
   g) The propeller control is excited, RPM decreases to 800 RPM approximately.

Continued on next page
h) FADEC A light goes OFF, idle RPM is reached, the test is completed.
i) FADEC Test Button - RELEASE.

⚠️ **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 Lamps 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.

(11) Thrust Lever - FULL FORWARD, load display min. 94%, RPM 2240 - 2300.
(12) Thrust Lever - IDLE.
(13) Suction gage - CHECK.
(14) Engine Instruments and Ammeter - CHECK.
(15) Annunciator Panel - Ensure no annunciators are illuminated.
(16) Electrical Fuel Pump - ON.
(17) Thrust Lever Friction Lock - ADJUST.
(18) Strobe Lights - AS DESIRED.
(19) Radios and Avionics - SET.
(20) Autopilot (if installed) - OFF.
(21) Wing Flaps - SET for Take-off (0° or 10°).
(22) Brakes - RELEASE.

TAKE-OFF

NORMAL TAKEOFF
(1) Wing Flaps - 0° or 10°.
(2) Thrust Lever - FULL FORWARD.
(3) Elevator Control - LIFT NOSE WHEEL at 51 KIAS.
(4) Climb Speed - 65 to 80 KIAS.

SHORT FIELD TAKEOFF
(1) Wing Flaps - 10°.
(2) Brakes - APPLY.
(3) Thrust Lever - FULL FORWARD.
(4) Brakes - RELEASE.
(5) Elevator Control - SLIGHTLY TAIL LOW.
(6) Climb Speed - 57 KIAS (until all obstacles are cleared).

AFTER TAKEOFF
(1) Altitude about 300 ft, Airspeed more than 65 KIAS: Wing Flaps - RETRACT.
(2) Electrical Fuel Pump - OFF.

CLimb
(1) Airspeed - 70 to 85 KIAS.

◆ Note: If a maximum performance climb is necessary, use speeds shown in the "Maximum Rate Of Climb" chart in Section 5. In case that Oil Temperature and/or Coolant Temperature are approaching the upper limit, continue at a lower climb angle for better cooling if possible.

(2) Thrust Lever - FULL FORWARD.
CRUISE

(1) Power - maximum load 100% (maximum continuous power): 75% or less is recommended.

(2) Elevator Trim - ADJUST.

(3) Compliance with Limits for Oil Pressure, Oil Temperature, Coolant Temperature and Gearbox Temperature (CED 125 and Caution Lamp) - MONITOR constantly.

(4) Fuel Quantity and Temperature (Display and LOW LEVEL warning lamps) - MONITOR.

Whenever possible, the airplane should be flown with the fuel selector in the BOTH position to empty and heat both fuel tanks evenly. However, operation in the LEFT or RIGHT position may be desirable to correct a fuel quantity imbalance or during periods of intentional uncoordinated flight manoeuvres. During prolonged operation with the fuel selector in either the LEFT or RIGHT position the fuel balance and temperatures should be closely monitored.

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

■ CAUTION In turbulent air it is strongly recommended to use the BOTH position.

■ CAUTION With ¼ tank or less prolonged or uncoordinated flight is prohibited when operating on either the left or right tank.

(5) FADEC Warning Lamps - MONITOR.

DESCENT

(1) Fuel Selector Valve - SELECT BOTH position.

(2) Power - AS DESIRED.
BEFORE LANDING

(1) Pilot and Passenger Seat Backs - MOST UPRIGHT POSITION.
(2) Seats and Seat Belts - SECURED and LOCKED.
(3) Fuel Selector Valve - SELECT BOTH position.
(4) Electrical Fuel Pump - ON.
(5) Landing / Taxi Lights - ON.
(6) Autopilot (if installed) - OFF.

LANDING

NORMAL LANDING

(1) Airspeed - 69 to 80 KIAS (wing flaps UP).
(2) Wing Flaps - AS DESIRED (0°-10° below 110 KIAS; 10°- full below 85 KIAS).
(3) Airspeed -60 to 70 KIAS (Flaps DOWN).
(4) Touchdown - MAIN WHEELS FIRST.
(5) Landing Roll - LOWER NOSE WHEEL GENTLY.
(6) Brakes - MINIMUM REQUIRED.

SHORT FIELD LANDING

(1) Airspeed - 69 to 80 KIAS (Flaps UP).
(2) Wing Flaps - FULL DOWN (30°).
(3) Airspeed 62 KIAS (until flare).
(4) Power - REDUCE to idle after clearing obstacles.
(5) Touchdown - MAIN WHEELS FIRST.
(6) Brakes - APPLY HEAVILY.
(7) Wing Flaps - RETRACT.
BALKED LANDING
(1) Thrust Lever - FULL FORWARD.
(2) Wing Flaps - RETRACT TO 20°.
(3) Climb Speed - 58 KIAS.
(4) Wing Flaps - 10° (until all obstacles are cleared).
(5) Wing Flaps - RETRACT after reaching a safe altitude and 65 KIAS.

AFTER LANDING
(1) Wing Flaps - UP.
(2) Electrical Fuel Pump - OFF.

SECURING AIRPLANE
(1) Parking Brake - SET.
(2) Thrust Lever - IDLE.
(3) Avionics Power Switch, Electrical Equipment, Autopilot (if installed) - OFF.
(4) Engine Master - OFF.
(5) Switch Battery - OFF.
(6) Control Lock - INSTALL.
AMPLIFIED PROCEDURES

STARTING ENGINE

The TAE 125-01 and TAE 125-02-99 are direct diesel injection engines with common–rail technology and a turbocharger. It is controlled automatically by the FADEC, which makes a proper performance of the FADEC test important for safe flight operation.

All information relating to the engine are compiled in the CED 125 multifunction instrument. Potentiometers within the Thrust Lever transmit the load value selected by the pilot to the FADEC.

With the “Engine Master” in position ON the glow relay is triggered by the FADEC and the Glow Plugs are supplied with electrical power, in position OFF, the Injection Valves are not supplied by the FADEC and stay closed.

The switch/push button “Starter” controls the Starter.

TAXIING

When taxiing, it is important that speed and use of brakes be held to a minimum and that all controls be utilized to maintain directional control and balance.

The Alternate Air Door Control should be always pushed for ground operation to ensure that no unfiltered air is sucked in. Taxiing over loose gravel or cinders should be done at low engine speed to avoid abrasion and stone damage to the propeller tips.

BEFORE TAKE-OFF

WARM UP

To warm up the engine, operate the engine for about 2 minutes at idle RPM.

Let the engine run at propeller RPM of 1,400 to ensure normal operation of the TAE 125-01 or TAE 125-02-99 until it reaches an Engine Oil Temperature of 50°C (122°F) (green area) and a
Coolant Temperature of 60°C (140°F) (green area). Temperature of 50°C and a Coolant Temperature of 60°C.

MAGNETO CHECK

N/A since this is a Diesel engine.

ALTERNATOR CHECK

Prior to flights where verification of proper alternator and alternator control unit operation is essential (such as night and instrument flights), a positive verification can be made by loading the electrical system momentarily (3 to 5 seconds) with the landing light or by operating the wing flaps during the engine runup (20% load). The ammeter will remain within a needle width of zero if the alternator and alternator control unit are operating properly.

TAKE-OFF

POWER CHECK

It is important to check full load engine operation early in the takeoff roll. Any signs of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs, you are justified in making a thorough full load static runup before another takeoff is attempted.

After full load is applied, adjust the Thrust Lever Friction Control to prevent the Thrust Lever from creeping back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to maintain a fixed Thrust Lever setting.

WING FLAP SETTINGS

Flap deflections greater than 10° are not approved for normal and short field takeoffs. Using 10° wing flaps reduces the ground roll and total distance over a 50 ft. (15 m) obstacle by approximately 10%.
CLIMB

Normal climbs are performed with flaps up and full load and at speeds 5 to 10 knots higher than best rate-of-climb speeds for the best combination of engine cooling, climb speed and visibility. The speed for best climb is about 69 KIAS. If an obstruction dictates the use of a steep climb angle, climb at 62 KIAS and flaps up.

◆ Note: Climb at low speeds should be of short duration to improve engine cooling.

CRUISE

As guidance for calculation of the optimum altitude and power setting for a given flight use the tables in Figure 5-8a.

LANDING

BALKED LANDING

In a balked landing (go around) climb, reduce the flap setting to 20° immediately after full power is applied. If obstacles must be cleared during the go-around climb, reduce wing flap setting to 10° and maintain a safe airspeed until the obstacles are cleared. After clearing any obstacles, the flaps may be retracted as the airplane accelerates to the normal flaps up climb speed.
COLD WEATHER OPERATION

Special attention should be paid to operation of the aircraft and the fuel system in winter or before any flight at low temperatures. Correct preflight draining of the fuel system is particularly CAUTION and will prevent the accumulation of water.

The following limitations for cold weather operation are established due to temperature."Operating limits".
(Refer Section 2 "Limitations" also)

<table>
<thead>
<tr>
<th>Minimum permissible fuel temperature in the fuel tank before Take-off</th>
<th>Minimum permissible fuel temperature in the fuel tank during the flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30°C (-22°F)</td>
<td>-35°C (-31°F)</td>
</tr>
</tbody>
</table>

Figure 4-1 Minimum fuel temperature limits in the fuel tank

⚠️ WARNING: The fuel temperature of the fuel tank not in use should be observed if it is intended for later use.

◆ Note: It is advisable to refuel before each flight and to enter the type of fuel filled and the additives used in the log-book of the airplane.

Cold weather often causes conditions which require special care during airplane operations. Even small accumulations of frost, ice or snow must be removed, particularly from wing, tail and all control surfaces to assure satisfactory flight performance and handling. Also, control surfaces must be free of any internal accumulations of ice or snow.

If snow or slush covers the take-off surface, allowance must be made for take-off distances which will be increasingly extended as snow or slush depth increases. The depth and consistency of this cover can, in fact, prevent take-off in many instances.
When using an External Power Source, the Battery Switch must be in the OFF position before connecting the External Power Source to the airplane receptacle.

Cold weather starting procedures are the same as the normal starting procedures. Use caution to prevent inadvertent forward movement of the airplane during starting when parked on snow or ice.

HOT WEATHER OPERATION

◆ Note: Engine temperatures may rise into the amber range and activate the "Caution" Lamp when operating in hot weather or longer climbouts at low speed. This warning gives the pilot the opportunity to keep the engine from possibly overheating by doing the following:

  i) increase climbing speed
  ii) reduce power, if the engine temperatures approach the red range.

Should the seldom case occur that the fuel temperature is rising into the amber or red range, switch to the other tank.
SECTION 5
PERFORMANCE

SAMPLE PROBLEM
The following sample flight problem utilizes information from the various tables and diagrams of this section to determine the predicted performance data for a typical flight. Assume the following information has already been determined:

AIRPLANE CONFIGURATION
Takeoff Weight 2450 lbs (1,111 kg)
Usable Fuel 44.6 US gal (168.8 l)
Type of Fuel Selected JET A-1

TAKEOFF CONDITIONS
Field Pressure Altitude 1,500 ft
Temperature 82 °F (ISA+ 29°F)
28°C (ISA +16°C)
Wind Component along Runway 12 Knot Headwind
Field Length 3510 ft (1,070 m)

CRUISE CONDITIONS
Total Distance 460 NM (852 km)
Pressure Altitude 5,500 ft
Temperature 68 °F (ISA+ 29°F)
20°C (ISA +16°C)
Expected Wind Enroute 10 Knot Headwind

LANDING CONDITIONS
Field Pressure Altitude 2000 ft
Temperature 77° F (25°C)
Field Length 3000 ft (915 m)
TAKEOFF

The takeoff distance chart, Figure 5-5a (Takeoff Distance), 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 2450 lb (1,111 kg), pressure altitude of 2000 ft and a temperature of ISA + 36°F (ISA+20°C) should be used and results in the following:

Ground Roll 1138 ft (347 m)
Total Distance to clear a 50 ft (15 m) obstacle 2201 ft (671 m)

These distances are well within the available takeoff field length. However, a correction for the effect of wind may be made based on Note 2 of the takeoff chart. The correction for a 12 Knot Headwind is:

\[
\frac{12KN}{9KN} \times 10\% = 13\% \quad \text{Decrease}
\]

This results in the following distances, corrected for wind:

Ground Roll, zero wind 1138 ft (347 m)
Decrease at 12 Knot Headwind (1138 ft x 13%)= 147 ft (45 m)
Corrected Ground Roll 991 ft (302 m)
Total Distance to clear a 15 m obstacle, zero wind 2201 ft (671 m)
Decrease at 12 Knot Headwind (2201 ft x 13%)= 285 ft (87 m)
Corrected Total Distance to clear a 15 m (50 ft) obstacle 1916 ft (584 m)
CRUISE

The cruising altitude should be selected based on a consideration of trip length, winds aloft and the airplanes performance. A typical cruising altitude and the expected wind enroute have been given for this sample problem. However, the power setting selection for cruise must be determined based on several considerations. These include the cruise performance characteristics presented in Figures 5-8a. Considerable fuel savings and longer range result when lower power settings are used.

Figure 5-8a shows a range of 879 NM at zero wind with Jet A-1 fuel, a power setting of 70% and altitude of 6,000 ft.

With an expected headwind of 10 Knot at 5,500 ft altitude the range has to be corrected as follows:

Range at zero wind (standard tanks) 879 NM using JET A-1
Reduction due to Headwind  \( (9 \text{ h} \times 10 \text{ Knots}) = 90 \text{ NM} \)
Corrected Range 789 NM

This shows that the flight can be performed at a power setting of approximately 70% with full tanks without an intermediate fuel stop.

Figure 5-8a is based upon a pressure altitude of 6,000 ft and a temperature of 29°F (16°C) above ISA temperature, according to Note 2 true airspeed and maximum range are increased by 1.6 %.

The following values most nearly correspond to the planned altitude and expected temperature conditions. Engine Power setting chosen is 70%.

The resultants are:

<table>
<thead>
<tr>
<th>Engine Power:</th>
<th>True Airspeed:</th>
<th>Fuel Consumption in cruise:</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>102 Knot</td>
<td>5.1 US gal/h (19.4 l/h)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JET A-1</td>
</tr>
</tbody>
</table>
FUEL REQUIRED
The total fuel requirement for the flight may be estimated using the performance information in Figures 5-7a and 5-8a. For this sample problem, Figure 5 7a shows that a climb from 1,000 ft to 6,000 ft requires 1.2 US gal (4.55 l) of fuel. The corresponding distance during the climb is 10.9 NM. These values are for a standard temperature and are sufficiently accurate for most flight planning purposes.

However, a further correction for the effect of temperature may be made as noted in Note 2 of the climb chart in Figure 5-7a. An effect of 18°F (10°C) above the standard temperature is to increase time and distance by 10% due to the lower rate of climb.

In this case, assuming a temperature 29°F (16°C) above standard, the correction would be:

\[
\frac{29°F}{18°F} \times 10\% \quad = \quad 16\% \quad \text{Increase}
\]

With this factor included, the fuel estimate would be calculated as follows:

Fuel to climb, standard temperature:
1.2 US gal (4.55 l) of JET A-1

Increase due to non-standard temperature:
1.2 US gal (4.55 l) x 16% = 0.19 US gal (0.73 l)

Corrected fuel to climb:
1.39 US gal (5.28 l) of JET A-1

Using a similar procedure for the distance to climb results in 12.6 NM.

The resultant cruise distance is:
Total Distance 460.0 NM
Climbout Distance - 12.6 NM
Cruise Distance 447.4 NM
With an expected 10 Knot headwind, the ground speed for cruise is predicted to be:

\[
\begin{align*}
102 \text{ kt} \\
-10 \text{ kt} \\
92 \text{ kt}
\end{align*}
\]

Therefore, the time required for the cruise portion of the trip is:

\[
\frac{447.4 \text{ NM}}{92 \text{ kt}} = 4.9 \text{ h}
\]

The fuel required for cruise is:

\[
4.9 \text{ h} \times 5.1 \text{ US gal/h} = 25.1 \text{ US gal (95.06 l)}
\]

The total estimated fuel required is as follows:

- Engine Start, Taxi and Takeoff: 0.30 US gal (1.00 l)
- Climb: +1.39 US gal (5.28 l)
- Cruise: +25.10 US gal (95.06 l)
- Total fuel required: 26.79 US gal (101.34 l)

This gives with full tanks a reserve of:

\[
\begin{align*}
47.00 \text{ US gal (178.00 l)} \\
-25.79 \text{ US gal (101.34 l)} \\
21.21 \text{ US gal (67.66 l)}
\end{align*}
\]

Once the flight is underway, ground speed checks will provide a more accurate basis for estimating the time enroute and the corresponding fuel required.
TAKE-OFF DISTANCE

SHORT FIELD TAKEOFFS

Conditions:
- Flaps 10°
- Full Power Prior to Brake Release
- Paved, level, dry runway
- Zero Wind

Lift Off: 51 KIAS  
Speed at 50ft (15 m): 57 KIAS

Notes:
1. Short field technique
2. Decrease distances 10% for each 9 Knot headwind. For operation with tailwinds up to 10 Knot increase distances by 10% for each 2 Knot.
3. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.
4. Consider additionals for wet grass runway, softened ground or snow
### Takeoff Distance at 2450 lbs (1111 kg)

<table>
<thead>
<tr>
<th>Pressure Altitude (ft)</th>
<th>ISA</th>
<th>ISA + 18°F</th>
<th>ISA + 36°F</th>
<th>ISA + 54°F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ground Roll</td>
<td>Over 50 ft obstacle</td>
<td>Ground Roll</td>
<td>Over 50 ft obstacle</td>
</tr>
<tr>
<td>SL</td>
<td>919</td>
<td>1775</td>
<td>971</td>
<td>1880</td>
</tr>
<tr>
<td>1000</td>
<td>965</td>
<td>1867</td>
<td>1024</td>
<td>1975</td>
</tr>
<tr>
<td>2000</td>
<td>1014</td>
<td>1962</td>
<td>1076</td>
<td>2080</td>
</tr>
<tr>
<td>3000</td>
<td>1070</td>
<td>2064</td>
<td>1132</td>
<td>2188</td>
</tr>
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<td>2172</td>
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<td>2303</td>
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<td>6000</td>
<td>1247</td>
<td>2408</td>
<td>1322</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Altitude (ft)</th>
<th>ISA +30°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ground Roll</td>
</tr>
<tr>
<td>SL</td>
<td>280</td>
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<td>1000</td>
<td>294</td>
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<td>309</td>
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</tr>
<tr>
<td>5000</td>
<td>361</td>
</tr>
<tr>
<td>6000</td>
<td>380</td>
</tr>
</tbody>
</table>

Figure 5-5a Takeoff Distance at 2450 lbs (1111 kg)
### Takeoff Distance at (973 kg)

<table>
<thead>
<tr>
<th>Pressure Altitude</th>
<th>ISA</th>
<th>ISA + 18°F</th>
<th>ISA + 36°F</th>
<th>ISA + 54°F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ft)</td>
<td>(ft) Over 50ft obstacle</td>
<td>(ft)</td>
<td>(ft) Over 50ft obstacle</td>
</tr>
<tr>
<td>SL</td>
<td>496</td>
<td>1044</td>
<td>525</td>
<td>1105</td>
</tr>
<tr>
<td>1000</td>
<td>522</td>
<td>1096</td>
<td>551</td>
<td>1163</td>
</tr>
<tr>
<td>2000</td>
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<td>580</td>
<td>1224</td>
</tr>
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<td>673</td>
<td>1415</td>
<td>713</td>
<td>1502</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Altitude</th>
<th>ISA</th>
<th>ISA + 10°C</th>
<th>ISA + 20°C</th>
<th>ISA + 30°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ft)</td>
<td>(m) Over 15m obstacle</td>
<td>(m)</td>
<td>(m) Over 15m obstacle</td>
</tr>
<tr>
<td>SL</td>
<td>171</td>
<td>360</td>
<td>181</td>
<td>381</td>
</tr>
<tr>
<td>1000</td>
<td>180</td>
<td>378</td>
<td>190</td>
<td>401</td>
</tr>
<tr>
<td>2000</td>
<td>189</td>
<td>398</td>
<td>200</td>
<td>422</td>
</tr>
<tr>
<td>3000</td>
<td>199</td>
<td>419</td>
<td>211</td>
<td>444</td>
</tr>
<tr>
<td>4000</td>
<td>209</td>
<td>440</td>
<td>222</td>
<td>467</td>
</tr>
<tr>
<td>5000</td>
<td>220</td>
<td>464</td>
<td>234</td>
<td>492</td>
</tr>
<tr>
<td>6000</td>
<td>232</td>
<td>488</td>
<td>246</td>
<td>518</td>
</tr>
</tbody>
</table>

Figure 5-5b Takeoff Distance at 2145 lbs (973 kg)
TIME, FUEL AND DISTANCE TO CLIMB AT 2450 LBS

Conditions:
Takeoff weight 2450 lbs (1,111 kg)
Climb speed $V_y = 70$ KIAS
Flaps Up
Full Power
Standard Temperature

Notes:
(1) Add 0.3 US gal (1 l) of fuel for engine start, taxi and takeoff allowance.
(2) Increase time and distance by 10% for 18°F (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.

<table>
<thead>
<tr>
<th>Press. Alt. (ft)</th>
<th>Temp. (°C)</th>
<th>Rate of Climb (ft/min)</th>
<th>From Sea Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Time (min)</td>
<td>Dist. (NM)</td>
</tr>
<tr>
<td>SL</td>
<td>15</td>
<td>595</td>
<td>0.0</td>
</tr>
<tr>
<td>1000</td>
<td>13</td>
<td>582</td>
<td>1.7</td>
</tr>
<tr>
<td>2000</td>
<td>11</td>
<td>566</td>
<td>3.5</td>
</tr>
<tr>
<td>3000</td>
<td>9</td>
<td>548</td>
<td>5.2</td>
</tr>
<tr>
<td>4000</td>
<td>7</td>
<td>507</td>
<td>7.0</td>
</tr>
<tr>
<td>5000</td>
<td>5</td>
<td>485</td>
<td>9.0</td>
</tr>
<tr>
<td>6000</td>
<td>3</td>
<td>462</td>
<td>11.1</td>
</tr>
<tr>
<td>7000</td>
<td>1</td>
<td>438</td>
<td>13.2</td>
</tr>
<tr>
<td>8000</td>
<td>-1</td>
<td>414</td>
<td>15.5</td>
</tr>
<tr>
<td>9000</td>
<td>-3</td>
<td>390</td>
<td>17.9</td>
</tr>
<tr>
<td>10000</td>
<td>-5</td>
<td>365</td>
<td>20.5</td>
</tr>
<tr>
<td>11000</td>
<td>-7</td>
<td>340</td>
<td>23.2</td>
</tr>
<tr>
<td>12000</td>
<td>-9</td>
<td>314</td>
<td>26.2</td>
</tr>
</tbody>
</table>

Figure 5-7a Time, Fuel and Distance to Climb at 2450 lbs
CRUISE PERFORMANCE, RANGE AND ENDURANCE

Conditions:
Takeoff weight 2450 lbs (1,111 kg)
Flaps Up
Zero wind

Notes:
(1) Endurance information are based on 44.6 US gal (168.8 l) usable fuel. No reserve.
(2) Increase true airspeed (KTAS) and maximum range (NM) by 1% per 10°C above ISA temperature.

<table>
<thead>
<tr>
<th>Press. Alt. [ft]</th>
<th>Load [%]</th>
<th>KTAS</th>
<th>Fuel flow US Gal/h</th>
<th>liter/h</th>
<th>Range NM</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>60</td>
<td>90</td>
<td>4.6</td>
<td>17.4</td>
<td>873</td>
<td>9.7</td>
</tr>
<tr>
<td>2000</td>
<td>70</td>
<td>98</td>
<td>5.1</td>
<td>19.4</td>
<td>853</td>
<td>8.7</td>
</tr>
<tr>
<td>2000</td>
<td>80</td>
<td>104</td>
<td>5.8</td>
<td>22.1</td>
<td>794</td>
<td>7.6</td>
</tr>
<tr>
<td>2000</td>
<td>90</td>
<td>110</td>
<td>6.8</td>
<td>25.6</td>
<td>725</td>
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</tr>
<tr>
<td>4000</td>
<td>60</td>
<td>92</td>
<td>4.6</td>
<td>17.4</td>
<td>893</td>
<td>9.7</td>
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<tr>
<td>4000</td>
<td>70</td>
<td>99</td>
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<td>19.4</td>
<td>861</td>
<td>8.7</td>
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<tr>
<td>4000</td>
<td>80</td>
<td>106</td>
<td>5.8</td>
<td>22.1</td>
<td>810</td>
<td>7.6</td>
</tr>
<tr>
<td>4000</td>
<td>90</td>
<td>112</td>
<td>6.8</td>
<td>25.6</td>
<td>739</td>
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<tr>
<td>6000</td>
<td>60</td>
<td>93</td>
<td>4.6</td>
<td>17.4</td>
<td>902</td>
<td>9.7</td>
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<tr>
<td>6000</td>
<td>70</td>
<td>101</td>
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<td>19.4</td>
<td>879</td>
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<td>6000</td>
<td>80</td>
<td>108</td>
<td>5.8</td>
<td>22.1</td>
<td>825</td>
<td>7.6</td>
</tr>
<tr>
<td>6000</td>
<td>90</td>
<td>114</td>
<td>6.8</td>
<td>25.6</td>
<td>752</td>
<td>6.6</td>
</tr>
<tr>
<td>8000</td>
<td>60</td>
<td>94</td>
<td>4.6</td>
<td>17.4</td>
<td>912</td>
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<tr>
<td>8000</td>
<td>70</td>
<td>102</td>
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<td>888</td>
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<tr>
<td>8000</td>
<td>80</td>
<td>110</td>
<td>5.8</td>
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<td>840</td>
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</tr>
<tr>
<td>8000</td>
<td>90</td>
<td>116</td>
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<td>25.6</td>
<td>765</td>
<td>6.6</td>
</tr>
<tr>
<td>Press. Alt. [ft]</td>
<td>Load [%]</td>
<td>KTAS</td>
<td>Fuel flow US Gal/h</td>
<td>Iter/h</td>
<td>Range NM</td>
<td>Hours</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------</td>
<td>------</td>
<td>-------------------</td>
<td>--------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>10000</td>
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<td>95</td>
<td>4.6</td>
<td>17.4</td>
<td>922</td>
<td>9.7</td>
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<tr>
<td>10000</td>
<td>70</td>
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<td>19.4</td>
<td>905</td>
<td>8.7</td>
</tr>
<tr>
<td>10000</td>
<td>80</td>
<td>111</td>
<td>5.8</td>
<td>22.1</td>
<td>848</td>
<td>7.6</td>
</tr>
<tr>
<td>10000</td>
<td>90</td>
<td>118</td>
<td>6.8</td>
<td>25.6</td>
<td>778</td>
<td>6.6</td>
</tr>
<tr>
<td>12000</td>
<td>60</td>
<td>97</td>
<td>4.6</td>
<td>17.4</td>
<td>941</td>
<td>9.7</td>
</tr>
<tr>
<td>12000</td>
<td>70</td>
<td>105</td>
<td>5.1</td>
<td>19.4</td>
<td>914</td>
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<td>80</td>
<td>113</td>
<td>5.8</td>
<td>22.1</td>
<td>863</td>
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</tr>
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<td>12000</td>
<td>90</td>
<td>120</td>
<td>6.8</td>
<td>25.6</td>
<td>791</td>
<td>6.6</td>
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</table>

Figure 5-8a Flying Cruise performance, range and endurance
Figure 5-9 Density Altitude Chart
Figure 5-10 Engine Power Over Altitude
## SECTION 6
### WEIGHT & BALANCE

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight x Arm = Moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty Weight (from table 6-1)</td>
<td></td>
</tr>
<tr>
<td>plus Engine Oil (6 l at 0.9 kg/l)</td>
<td>-0.31</td>
</tr>
<tr>
<td>plus Gearbox Oil (1 l at 0.9 kg/l)</td>
<td>-0.69</td>
</tr>
<tr>
<td>plus unusable fuel (11.4 l at 0.84 kg/l)</td>
<td>1.17</td>
</tr>
<tr>
<td>plus Coolant (4 l at 1.0 kg/l)</td>
<td>-0.26</td>
</tr>
</tbody>
</table>

Figure 6-2a Calculating the Basic Empty Weight
<table>
<thead>
<tr>
<th>Item</th>
<th>Weight x Arm = Moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty Weight (from table 6-1)</td>
<td></td>
</tr>
<tr>
<td>plus Engine Oil (1.6 US gal at 7.5 lbs/ US gal)</td>
<td>-12</td>
</tr>
<tr>
<td>plus Gearbox Oil (0.26 US gal @ 7.5 lbs/ US gal)</td>
<td>-27</td>
</tr>
<tr>
<td>plus unusable fuel (3 US gal at 6.75 lbs/ US gal)</td>
<td>46</td>
</tr>
<tr>
<td>plus Coolant (1 US gal at 8.3 lbs/ US gal)</td>
<td>-10</td>
</tr>
<tr>
<td>Changes in Equipment</td>
<td></td>
</tr>
<tr>
<td>Basic Empty Weight</td>
<td></td>
</tr>
</tbody>
</table>

Figure 6-2b Calculating the Basic Empty Weight
<table>
<thead>
<tr>
<th>Calculation of the loaded condition</th>
<th>Your aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mass kg</td>
</tr>
<tr>
<td>1. Basic Empty Weight::</td>
<td></td>
</tr>
<tr>
<td>Use the values for your airplane</td>
<td></td>
</tr>
<tr>
<td>with the present equipment. Unusable fuel, engine oil, gearbox oil and coolant are included.</td>
<td></td>
</tr>
<tr>
<td>2. Usable Fuel (at 0.84 kg/l),</td>
<td></td>
</tr>
<tr>
<td>max. 178l</td>
<td></td>
</tr>
<tr>
<td>3. Pilot and Front Passenger</td>
<td></td>
</tr>
<tr>
<td>(Station 0.86 to 1.17 m)</td>
<td></td>
</tr>
<tr>
<td>4. Rear Passenger</td>
<td></td>
</tr>
<tr>
<td>5. *Baggage Area 1 or</td>
<td></td>
</tr>
<tr>
<td>Passenger on the children’s seat</td>
<td></td>
</tr>
<tr>
<td>(Station 2.08 to 2.74; max. 54kg)</td>
<td></td>
</tr>
<tr>
<td>6. *Baggage Area 2</td>
<td></td>
</tr>
<tr>
<td>(Station 2.74 to 3.61; max. 23kg)</td>
<td></td>
</tr>
<tr>
<td>7. Ramp Weight and Miment</td>
<td></td>
</tr>
<tr>
<td>8. Fuel allowance for engine start, taxi and runup</td>
<td></td>
</tr>
<tr>
<td>9. Take-off Weight and Moment</td>
<td></td>
</tr>
<tr>
<td>(Subtrakt Step 8 from Step 7)</td>
<td></td>
</tr>
<tr>
<td>10. Locate this point in the c.g. moment envelope of the original POH. Check if its within the envelope.</td>
<td></td>
</tr>
</tbody>
</table>

*Maximum allowable combined weight capacity for Baggage Areas 1 and 2 is 54kg

Figure 6-5a
<table>
<thead>
<tr>
<th>Calculation of the loaded condition</th>
<th>Your aircraft</th>
<th>Mass lbs</th>
<th>Moment lbs-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic Empty Weight::</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use the values for your airplane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with the present equipment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unusable fuel, engine oil,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gearbox oil and coolant are</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>included.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Usable Fuel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(at 6.75 lbs/US gal), max. 47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US gal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Pilot and Front Passenger</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Station 34 to 46)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Rear Passenger</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. *Baggage Area 1 or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger on the children's seat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Station 82 to 106; 120 lbs max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. *Baggage Area 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Station 108 to 142; 50 lbs max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Ramp Weight and Moment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Fuel allowance for engine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>start, taxi and runup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Take-off Weight and Moment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Substrakt Step 8 from Step 7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Locate this point in the c.g.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>moment envelope of the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>original POH. Check if its</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>within the envelope.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Maximum allowable combined weight capacity for Baggage Areas 1 and 2 is 120 lbs

Figure 6-5b
Figure 6-6a Loading Graph

- **Rear Passengers**
- **Fuel (6.75 lbs/US Gal)**
- **Baggage Area 1**
- **Baggage Area 2**
- **Pilot and Front Passenger**
Figure 6-6b Loading Graph
SECTION 7
AIRPLANE & SYSTEMS DESCRIPTION

INSTRUMENT PANEL

Components of the new installation can be seen as example in the following figure.

Figure 7-2a Example of Instrument panel with TAE 125 installation

50. Lightpanel with:
   "Force B" switch for manually switching the FADEC
   "FADEC" test knob
   "A FADEC B" Warning Lamps for FADEC A and B
   "AED" Lamp (amber) for AED 125
   "CED" Lamp (amber) for CED 125
   "CED/AED" Test/Confirm Knob for CED 125, AED 125 and Caution Lamps
   "Glow" Glow Control Lamp (amber)

51. "Starter" - Push Button for Starter

52. "ALT" - Switch for Alternator

53. "BAT" - Switch for Battery

54. "Engine Master" - Switch electrical supply FADEC

55. "Alt. Air Door" Alternate Air Door

56. CED 125 (Tachometer -N/A-)
   The Compact Engine Display contains indication of Pro-
peller Rotary Speed, Oil Pressure, Oil Temperature, Coolant Temperature, Gearbox Temperature and Load.

57. AED 125 SR with indication of Fuel Temperature, Voltage, fuel flow and a caution lamp "Water Level" (amber) for low coolant level

FUEL SYSTEM
The fuel system of the TAE 125-01 and TAE 125-02-99 installation includes the original standard or long-range tanks of the Cessna 172. Additional sensors for fuel temperature and "Low Level" caution are installed.

The fuel flows out of the tanks to the fuel selector valve with the positions LEFT, RIGHT or BOTH, through a reservoir tank to the fuel shut-off valve and then via the electrically driven fuel pump to the fuel filter. Fuel can be shut off by the separate shutoff valve. The electrically driven fuel pump supports the fuel flow to the filter module if required. Upstream to the fuel filter module a thermostat-controlled fuel pre-heater is installed. Then, the engine-driven feed pump and the high-pressure pump supply the rail, from where the fuel is injected into the cylinders depending upon the position of the thrust lever and regulation by the FADEC.

Surplus fuel flows to the filter module and then through the fuel selector valve back into the pre-selected tank, if BOTH is selected the fuel return to both tanks. A temperature sensor in the filter module controls the heat exchange between the fuel feed and return. Since the density of jet fuel (6.75 lb/US Gal, 0.84 kg/l) is higher than of AVGAS (6 lb/US Gal, 0.715 kg/l), the usable fuel capacity was reduced by this factor through the fuel filler neck, to stay within the approved wing load.

Total capacity: .........................50 US gallons (189.4 litres)
Total capacity of usable fuel: ............47 US gallons (178.0 litres)

Total capacity each tank: ...............25 US gallons (94.7 litres)
Total capacity of usable fuel each tank: ..................................23.5 US gallons (89.0 litres)
Figure 7-6a Schematic of the Fuel System
ELECTRICAL SYSTEM

The electrical system of both TAE125 installations differs from the previous installation and is equipped with the following operating and display elements:

1. Switch "Alternator"
   Controls the alternator. Must be ON in normal operation.

2. Switch "Battery"
   Controls the Battery.

3. Push Button "Starter"
   Controls the magneto switch of the starter.

4. Ammeter
   The Ammeter shows the charging or discharging current to/from the battery.

5. Warning Lamp "Alternator"
   Illuminates when the power output of the alternator is too low or the Switch "Alternator" is switched off. Normally, this warning lamp always illuminates when the "Engine Master" is switched on without revolution and extinguishes immediately after starting the engine.

6. Switch "Fuel Pump"
   This switch controls the electrical fuel pump.

7. Switch "Engine Master"
   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.

8. Switch "Force B"
   If the FADEC does not automatically switch from A-FADEC to the B-FADEC in case of an emergency despite of obvious necessity, this switch allows to switch manually to the B-FADEC.
9. Backup Battery
The electrical system includes a FADEC backup battery to ensure power supply to A-FADEC in case that supply from both battery and alternator is interrupted. The engine can be operated for a maximum 30 minutes when powered by the FADEC backup battery only. Only A-FADEC is connected to the backup battery.

⚠️ WARNING ⚠️ When operating on FADEC backup battery only, the "Force B" switch must not be activated. This will shut down the engine.
Figure 7-7a Basic wiring schematic of the Electrical System
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 can be operated for a maximum of 30 minutes when powered by the FADEC backup battery only. In this case, all electrical equipment will not operate:
- land as soon as possible
- do not switch the "FORCE-B" switch, this will shut down the engine.

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. If deviated from this recommendation, the remaining engine operating time may change.

Continued on next page
Note: The TAE 125-01 and TAE 125-02-99 require 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:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Time switched on</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in [min]</td>
</tr>
<tr>
<td>NAV/COM 1 receiving</td>
<td>ON</td>
</tr>
<tr>
<td>NAV/COM 1 transmitting</td>
<td>ON</td>
</tr>
<tr>
<td>NAV/COM 2 receiving</td>
<td>OFF</td>
</tr>
<tr>
<td>NAV/COM 2 transmitting</td>
<td>OFF</td>
</tr>
<tr>
<td>Annunciator</td>
<td>ON</td>
</tr>
<tr>
<td>Transponder</td>
<td>ON</td>
</tr>
<tr>
<td>Fuel Pump</td>
<td>OFF</td>
</tr>
<tr>
<td>AED-125</td>
<td>ON</td>
</tr>
<tr>
<td>Battery</td>
<td>ON</td>
</tr>
<tr>
<td>CED-125</td>
<td>ON</td>
</tr>
<tr>
<td>Landing Light</td>
<td>ON</td>
</tr>
<tr>
<td>Flood Light</td>
<td>ON</td>
</tr>
<tr>
<td>Pitot Heat</td>
<td>ON</td>
</tr>
<tr>
<td>Wing Flaps</td>
<td>ON</td>
</tr>
<tr>
<td>Interior Lighting</td>
<td>OFF</td>
</tr>
<tr>
<td>Nav Lights</td>
<td>OFF</td>
</tr>
<tr>
<td>Beacon</td>
<td>OFF</td>
</tr>
<tr>
<td>Strobes</td>
<td>OFF</td>
</tr>
<tr>
<td>ADF</td>
<td>OFF</td>
</tr>
<tr>
<td>Intercom</td>
<td>OFF</td>
</tr>
<tr>
<td>Engine Control</td>
<td>ON</td>
</tr>
</tbody>
</table>

Table 7-1a
**FADEC-RESET**

In case of a FADEC-warning, one or both FADEC warning lamps are flashing. If then the "FADEC" Test Knob is pressed for at least 2 seconds,

a) the active warning lamps will extinguish if it was a LOW category warning.

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

**CAUTION**

If a FADEC-warning occurred, contact your service center.

When a high category warning occurs the pilot should land as soon as practical, since the affected FADEC ECU has diagnosed a severe fault. A low category fault has no significant impact on engine operation. Refer also to the engine OM-02-01 or OM-02-02 for additional information.

**COOLING**

The TAE 125-01 and TAE 125-02-99 are fitted with a fluid-cooling system whose three-way thermostat regulates the flow of coolant in the large (external) and small cooling circuit (Ref. Figure 1-5a). Coolant also continuously flows unregulated through the cabin heating radiator circuit. The coolant flows through the small circuit up to a coolant temperature of 84°C. Between 84°C and 94°C the coolant flows through both the small and the large circuit. If the coolant temperature rises above 94°C, the complete volume of coolant flows through the large circuit and therefore through the coolant radiator. This ensures that the maximum coolant temperature of 105°C will not be exceeded.

For all normal operations the control "Shut Off Cabin Heat" must be pushed full forward (valve closed). In this position, air is routed through the cabin heating radiator and then discharged into the engine compartment, not to the cabin. If the control...
"Shut Off Cabin Heat" is pulled full aft (valve open) air is routed through the cabin heating radiator where it is warmed and then flows into the cabin heat system upstream of the "Cabin Heat" control valve.

The control "Cabin Heat" regulates the amount of heated air from the heating radiator allowed to enter the cabin. For cabin heating, both the "Shut Off Cabin Heat" and "Cabin Heat" control must be used. The "Shut Off Cabin Heat" control should be pulled aft (valve open) and the "Cabin Heat" control should be pulled aft (valve open) as required for desired temperature.

The control 'Cabin Air" operation and function remains unchanged.

In case of certain emergencies (Ref. Section 3) the controls, "Shut Off Cabin Heat" and "Cabin Heat" have to be pushed full forward (valve closed) according to the appropriate procedures.

There is a sensor in the expansion reservoir which sends a signal to the caution lamp "Water Level" on the AED 125 display if the coolant level is low.

The coolant temperature is measured at the thermostat and passed on to the FADEC and CED 125.
Figure 7-8a Cooling system of the TAE 125-01 and TAE 125-02-99
SECTION 8
AIRPLANE HANDLING, SERVICE AND MAINTENANCE

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

■ 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.

ENGINE OIL
Both TAE 125-01 and TAE 125-02-99 are filled with 4.7 – 6.3 qt. (4.5 – 6 l) engine oil (refer to section 1 of this supplement for specification).
A dip stick is used to check the oil level. It is accessible by a flap on the upper right-hand side of the engine cowling.
Notice that on warm engines 5 minutes after engine shut-off there are 80% of the entire engine oil in the oil pan and therefore visible on the oil dipstick. On warm engines oil should be added if the oil dip stick shows oil levels below 50%. After 30 minutes the real oil level is visible on the dip stick.
The drain screw is located on the lower left-hand outside of the oil pan, the oil filter is on the upper left-hand side of the housing. The oil system has to be checked for sealing after the first 5 operating hours (visual inspection). Checks and changes of oil and oil filter have to be performed regularly according to the engine Operation and Maintenance Manual. See OM-02-01 for the TAE 125-01 engine or OM-02-02 for the TAE 125-02-99 engine.
The Supplement of the Aircraft Maintenance Manual has to be considered as well. See AMM-20-01 for the TAE 125-01 engine or AMM-20-02 for the TAE 125-02-99 engine.
GEARBOX OIL

To ensure the necessary propeller speed, both TAE 125-01 and TAE 125-02-99 engine variants are equipped with a reduction gearbox filled with 0.3 US gal. (1.0 l) gearbox oil (refer to section 2 of this supplement for specification). The level can be checked through a viewing glass on the lower leading edge of the gearbox. To do so, open the flap 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 microfilter in the Constant Speed Unit. Check the gearbox for sealing after the first 5 hours of operation (visual inspection). Regular checks as well as oil and filter changes have to be performed in accordance with the Operation and Maintenance Manual. See OM-02-01 for the TAE 125-01 engine or OM-02-02 for the TAE 125-02-99 engine. The Supplement of the Aircraft Maintenance Manual has to be considered as well. See AMM-20-01 for the TAE 125-01 engine or AMM-20-02 for the TAE 125-02-99 engine.

⚠️ WARNING: It is not allowed to start the engine with low gearbox oil level.

⚠️ CAUTION: Between scheduled maintenance topping-up gearbox oil should not be necessary. If low gearbox oil level is detected, inform your service center immediately.
FUEL

Both TAE 125-01 and TAE 125-02-99 engine variants can be operated with kerosene fuels (JET A-1, Jet-A). Due to the higher specific density of turbine engine fuel in comparison to aviation gasoline (AVGAS) the permissible capacity for standard tanks was reduced as mentioned in Section 2. Appropriate placards are attached near the fuel filler connections. For temperature limitations refer to Section 2 "Limitations" and Section 4 "Normal Operation".

It is recommended to refuel before each flight and to enter the type of fuel into the log-book.

COOLANT

To cool the engine a liquid cooling system was installed with a water/approved radiator protection mixture at a ratio of 1:1. A heat exchanger for cabin heating is part of the cooling system. Check the cooling system for sealing after the first 5 hours of operation (visual inspection).

The coolant has to be changed in accordance with the Operations and Maintenance Manual. See OM-02-01 for the TAE 125-01 engine or OM-02-02 for the TAE 125-02 engine. The Supplement of the Aircraft Maintenance Manual has to be considered as well. See AMM-20-01 for the TAE 125-01 engine or AMM-20-02 for the TAE 125-02-99 engine.

⚠️ WARNING

It is not allowed to start the engine with low coolant level.

⚠️ CAUTION

Between scheduled maintenance topping-up coolant or gearbox oil should not be necessary. If low coolant or low gearbox oil level is detected, inform your service center immediately.
CAUTION: The water has to satisfy the following requirements:

1. Visual appearance: colorless, clear and no deposits allowed
2. pH-value: 6.5 to 8.5
3. Maximum water hardness: 2.7 mmol/l
4. Maximum hydrogen carbonate concentration: 100 mg/l
5. Maximum chloride concentration: 100 mg/l
6. Maximum sulfate concentration: 100 mg/l

Note: The waterworks also provide information. In general, tap water may be diluted with distilled water. Pure distilled water may not be used to mix with approved radiator protection.

Note: The freezing point of the coolant is -32.8 °F (-36°C).