

## **3.1 INTRODUCTION**

### **3.1.1 GENERAL**

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

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

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

### **WARNING**

In each emergency, control over the flight attitude and the preparation of a possible emergency landing have priority over attempts to solve the current problem ("first fly the aircraft"). Prior to the flight the pilot must consider the suitability of the terrain for an emergency landing for each phase of the flight. For a safe flight the pilot must constantly keep a safe minimum flight altitude. Solutions for various adverse scenarios should be thought over in advance. Thus it should be guaranteed that the pilot is at no time shocked by an engine failure and that he can act calmly and with determination.

### 3.1.2 CERTAIN AIRSPEEDS IN EMERGENCIES

Event \ Flight Mass		850 kg	1000 kg	1150 kg	1200 kg
		1874 lb	2205 lb	2535 lb	2646 lb
Engine failure after take-off (Flaps T/O)		59 KIAS	66 KIAS	72 KIAS	74 KIAS
Airspeed for best glide angle (Flaps UP)		60 KIAS	68 KIAS	73 KIAS	76 KIAS
Emergency landing with engine off	Flaps UP	60 KIAS	68 KIAS	73 KIAS	76 KIAS
	Flaps T/O	59 KIAS	66 KIAS	72 KIAS	74 KIAS
	Flaps LDG	58 KIAS	63 KIAS	71 KIAS	73 KIAS

**3.2 ENGINE PROBLEMS**

**3.2.1 ENGINE PROBLEMS ON THE GROUND**

- 1. Throttle ..... IDLE
- 2. Brakes ..... as required
- 3. Engine ..... switch off, if considered necessary; otherwise establish the cause of the problem and re-establish engine performance

**CAUTION**

If the oil pressure is below the green sector, the engine must be switched off immediately.

**WARNING**

If the problem cannot be cleared, the airplane must not be flown.

**END OF CHECKLIST**

### **3.2.2 ENGINE PROBLEMS DURING TAKE-OFF**

#### **(a) Take-Off Can Still Be Aborted (Sufficient Runway Length Available)**

*Land Straight Ahead:*

1. Throttle ..... IDLE

*On the Ground:*

2. Brakes ..... as required

### **CAUTION**

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

- Fuel tank selector ..... OFF
- Mixture control lever ..... LEAN - shut engine off
- Ignition switch ..... OFF
- Master switch (ALT/BAT) ..... OFF

**CONTINUED**

█ (b) Take-Off Can No Longer Be Aborted

- █ 1. Airspeed ..... 74 KIAS (1200 kg, 2646 lb)  
 72 KIAS (1150 kg, 2535 lb)  
 66 KIAS (1000 kg, 2205 lb)  
 59 KIAS (850 kg, 1874 lb)

**WARNING**

█ If, in the event of an engine problem occurring during take-off, the take-off can no longer be aborted and a safe height has not been reached, then a straight-ahead emergency landing should be carried out. Turning back can be fatal.

*If Time Allows:*

- 2. Fuel tank selector ..... check selected tank
- 3. Electrical fuel pump ..... check ON
- 4. Ignition switch ..... check BOTH
- 5. Throttle ..... check MAX PWR
- 6. RPM lever ..... check HIGH RPM
- 7. Mixture control lever ..... check RICH (leaner above 5000 ft)
  
- 8. Alternate Air ..... OPEN

**WARNING**

If the problem does not clear itself immediately, and the engine is no longer producing sufficient power, then an emergency landing must be carried out.

**END OF CHECKLIST**

### 3.2.3 ENGINE PROBLEMS IN FLIGHT

#### (a) Engine Running Roughly

#### **WARNING**

An engine which is running very roughly can lead to the loss of the propeller. If the engine is running roughly operation should only be continued if there is no other alternative.

1. Airspeed . . . . . 76 KIAS (1200 kg, 2646 lb)  
73 KIAS (1150 kg, 2535 lb)  
68 KIAS (1000 kg, 2205 lb)  
60 KIAS (850 kg, 1874 lb)
2. Electrical fuel pump . . . . . check ON
3. Fuel tank selector . . . . . check selected tank
4. Engine instruments . . . . . check
5. Throttle . . . . . check
6. RPM lever . . . . . check
7. Mixture control lever . . . . . set for smooth running
8. Alternate Air . . . . . OPEN
9. Ignition status light . . . . . check (only if the electronic  
ignition control unit is  
installed)
10. Ignition switch . . . . . check BOTH

**CONTINUED**

- 11. Ignition circuit breaker (IGN) ..... pull (only if the electronic ignition control unit is installed); if rough running is cleared by doing this, the circuit breaker should remain open
  
- 12. Throttle/RPM/Mixture ..... try various settings

**WARNING**

If the problem does not clear itself immediately, and the engine is no longer producing sufficient power, then an emergency landing should be carried out.

**END OF CHECKLIST**

(b) Loss of Oil Pressure

1. Check oil pressure warning light and oil pressure indicator.
2. Check oil temperature.
  - 2a. If the oil pressure indication drops below the green sector and the oil temperature is normal (oil pressure warning light does not illuminate or flash):
    - \* Monitor the oil pressure warning light: it is probable that the oil pressure indication is defective.
    - \* Monitor the oil and cylinder head temperatures.
  - 2b. If the oil pressure indication drops below the green sector while the oil or cylinder head temperature is rising, or  
If the oil pressure warning light illuminates or flashes, or  
If both of these occur together:
    - \* Reduce engine power to the minimum required.
    - \* Land as soon as possible.
    - \* Be prepared for engine failure and emergency landing.
  - 2c. Oil pressure tending to zero combined with:  
Vibration, loss of oil, possibly unusual metallic noise and smoke:
    - \* A mechanical failure in the engine is apparent.
    - \* Shut off engine immediately and
    - \* Carry out emergency landing in accordance with 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF.

**END OF CHECKLIST**



(c) High Oil Pressure

Check oil temperature.

- \* If the oil temperature is normal, it is probable that the fault lies in the oil pressure indication, which should thus be ignored (the airplane should be serviced).

**END OF CHECKLIST**(d) High Oil Temperature

Check cylinder head and exhaust gas temperature.

- \* If neither of these is high, it is probable that the fault lies in the oil temperature indication. The airplane should be serviced. A stable oil temperature indication of 26 °F (-3 °C) or 317 °F (158 °C) suggests a failure of the oil temperature sensor.
- \* If the cylinder head temperature or exhaust gas temperature is also high:
  - Check oil pressure. If the oil pressure is low, proceed as in 3.2.3 (b) - LOSS OF OIL PRESSURE.
  - If the oil pressure is in the green sector:
    - Check mixture setting, enrich mixture if necessary.
    - Reduce power; if this produces no improvement, land at the nearest appropriate airfield.

**END OF CHECKLIST**

(e) High Cylinder Head Temperature

Cylinder head temperature in yellow sector or above:

1. Check mixture setting, enrich mixture if necessary.
2. Check oil temperature.

\* If the oil temperature is also high:

- Check oil pressure. If the oil pressure is low, proceed as in 3.2.3 (b) - LOSS OF OIL PRESSURE.
- If the oil pressure is in the green sector:
  - Reduce power; if this produces no improvement, land at the nearest appropriate airfield.
  - Be prepared for possible emergency landing.

**END OF CHECKLIST**

(f) High RPM

RPM moves on its own into the yellow sector, or is in the red sector:

1. Check friction adjuster for throttle quadrant.
2. Check oil pressure: Following a loss of oil or oil pressure, the propeller governor sets a high RPM. In this case the RPM should be regulated using the throttle. Proceed as in 3.2.3 (b) - LOSS OF OIL PRESSURE.
3. If oil pressure is normal:
  - \* Pull RPM lever back and listen for an associated drop in RPM:
    - If the indication does not change in spite of an audible drop in RPM, it is probable that the RPM indication is defective, which should thus be ignored (the airplane should be serviced).
    - If there is no audible drop in RPM, it is probable that the governor system is defective. In this case the RPM should be regulated using the throttle.

**END OF CHECKLIST**

(g) Loss of RPM

1. Electrical fuel pump . . . . . check ON
2. Fuel tank selector . . . . . check
3. Friction adjuster for throttle quadrant . . . . . check sufficiently tight
4. RPM lever . . . . . HIGH RPM

\* Listen for rise in RPM.

- If there is no audible rise in RPM, it is probable that the governor system is defective. In this case the RPM can be regulated within certain limits using the throttle.
  - Land at the nearest appropriate airfield.
  - Be prepared for possible emergency landing.
- If the indication does not change in spite of an audible rise in RPM, it is probable that the RPM indication is defective, which should thus be ignored (the airplane should be serviced).

**END OF CHECKLIST**

(h) High Fuel Flow

Fuel flow in the red sector:

1. Electrical fuel pump ..... ON
2. Fuel pressure ..... check after 10 - 15 sec:
  - \* If the fuel pressure is low, refer to 3.2.3 (i) - LOW FUEL PRESSURE WITH THE ELECTRICAL FUEL PUMP SET TO ON.
  - \* If the fuel pressure is in the green sector, or the fuel pressure warning light is not illuminated, the likely cause is a defective fuel flow indication, which should thus be ignored (the airplane should be serviced). Fuel flow data should be taken from the engine performance table in Chapter 5.
3. Check fuel quantity. A rapid reduction in fuel quantity confirms a high fuel flow.

**END OF CHECKLIST**

(i) Low Fuel Pressure with the Electrical Fuel Pump Set to ON

Fuel pressure warning light illuminates, or fuel pressure indication below the green sector:

1. Fuel flow ..... check:

- \* If the fuel flow is high, there is possibly a leak (between the injection system and the injectors). Land on the nearest suitable airfield.
- \* If the fuel flow is in the green sector and the engine is running smoothly, the likely cause is a defective fuel pressure indication, which should thus be ignored (the airplane should be serviced).

Monitor engine for power loss and rough operation that could indicate fuel starvation. If the engine is no longer producing sufficient power, then an emergency landing should be carried out.

**END OF CHECKLIST**

**3.2.4 RESTARTING THE ENGINE WITH WINDMILLING PROPELLER**

**NOTE**

Restarting the engine is possible at all airspeeds above 70 KIAS up to  $v_{NE}$  and up to the maximum demonstrated operating altitude.

**NOTE**

As long as an airspeed of at least 65 KIAS is maintained, and there is no major engine failure, the propeller will continue to windmill.

- 1. Airspeed ..... 80 KIAS
- 2. Fuel tank selector ..... fullest tank
- 3. Ignition switch ..... check BOTH
- 4. Mixture control lever ..... check appropriate position
- 5. Electrical fuel pump ..... check ON
- 6. Alternate air ..... OPEN

*If Engine Does Not Start:*

- 7. Mixture control lever ..... LEAN
- 8. Mixture control lever ..... push forward slowly until engine starts

**NOTE**

If it is not possible to start the engine:

- Adopt glide configuration as in 3.4 - GLIDING.
- Carry out emergency landing as in 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF.

**END OF CHECKLIST**

### **3.2.5 DEFECTIVE ENGINE CONTROLS**

#### Defective Mixture Control Cable

*(a) Flight and Landing:*

1. Maintain altitude to the nearest airfield.
2. During descent, test the reaction of the engine to a higher power setting. A lean mixture can lead to engine roughness and a loss of power. The landing approach must be planned accordingly.

### **WARNING**

Go-around may become impossible with the remaining power.

*(b) Engine Shut-Down:*

1. Parking brake . . . . . set
2. Engine instruments . . . . . check
3. Avionics master switch . . . . . OFF
4. All electrical equipment . . . . . OFF
5. Throttle . . . . . IDLE
6. Ignition switch . . . . . OFF
7. Master switch (ALT/BAT) . . . . . OFF

**END OF CHECKLIST**



Defective Throttle Control Cable*(a) Sufficient Engine Power Available to Continue Flight:*

1. Approach nearest airfield, control engine power with RPM lever.
2. Perform landing with shut-down engine.

*(b) No Sufficient Engine Power Available to Continue Flight:*

1. Carry out emergency landing as in 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF.

**END OF CHECKLIST**Defective RPM Lever Control Cable*(a) Sufficient Engine Power Available to Continue Flight:*

1. Approach nearest airfield, control engine power with throttle.
2. Perform normal landing.

**WARNING**

Go-around may become impossible with the remaining power.

*(b) No Sufficient Engine Power Available to Continue Flight:*

1. Carry out emergency landing as in 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF.

**END OF CHECKLIST**

**3.2.6 RESTARTING THE ENGINE WITH STATIONARY PROPELLER**

**NOTE**

Restarting the engine is possible at all airspeeds above 80 KIAS up to  $v_{NE}$  and up to the maximum demonstrated operating altitude.

1. Airspeed . . . . . 80 KIAS
2. Electrical equipment . . . . . OFF
3. Avionics master switch . . . . . OFF
4. Master switch (BAT) . . . . . check ON
5. Mixture control lever . . . . . check
6. Fuel tank selector . . . . . check
7. Electrical fuel pump . . . . . check ON
8. Alternate air . . . . . OPEN
9. Ignition switch . . . . . START

**NOTE**

By increasing the airspeed above approximately 130 KIAS, the propeller will begin to rotate and the engine can thus be started. For this, the Ignition switch should be set at BOTH (see 3.2.4 - RESTARTING THE ENGINE WITH WINDMILLING PROPELLER). An altitude loss of at least 1000 ft (300 meter) must be allowed for.

if it is not possible to start the engine:

- Adopt glide configuration as in 3.4 - GLIDING
- Carry out emergency landing as in 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF.

**CONTINUED**

**CAUTION**

Engine restart following an engine fire should only be attempted if it is unlikely that a safe emergency landing can be made. It must be expected that engine restart is impossible after an engine fire.

**END OF CHECKLIST**

### **3.3 SMOKE AND FIRE**

#### **3.3.1 SMOKE AND FIRE ON THE GROUND**

##### (a) Engine Fire When Starting on the Ground

1. Fuel tank selector ..... OFF
2. Cabin heat ..... OFF
3. Brakes ..... apply

*After Standstill:*

4. Throttle ..... MAX PWR
5. Master switch (ALT/BAT) ..... OFF

*When the Engine Has Stopped:*

6. Ignition switch ..... OFF
7. Canopy ..... open
8. Airplane ..... evacuate immediately

**END OF CHECKLIST**

(b) Electrical Fire with Smoke on the Ground

- 1. Master switch (ALT/BAT) ..... OFF

*If the Engine is Running:*

- 2. Throttle ..... IDLE
- 3. Mixture control lever ..... LEAN - shut off engine

*When the Engine Has Stopped:*

- 4. Ignition switch ..... OFF
- 5. Canopy ..... open
- 6. Airplane ..... evacuate immediately

**END OF CHECKLIST**

**3.3.2 SMOKE AND FIRE DURING TAKE-OFF**

**(a) If Take-Off Can Still Be Aborted**

1. Throttle . . . . . IDLE
2. Cabin heat . . . . . OFF
3. Brakes . . . . . apply - bring the airplane to a stop
4. After stopping . . . . . proceed as in 3.3.1 - SMOKE AND FIRE ON THE GROUND

**END OF CHECKLIST**

**(b) If Take-Off Cannot Be Aborted**

1. Cabin heat . . . . . OFF
2. If possible, fly along a short-cut traffic circuit and land on the airfield.

**WARNING**

If, in the event of an engine problem occurring during take-off, the take-off can no longer be aborted and a safe height has not been reached, then a straight-ahead emergency landing should be carried out. Turning back can be fatal.

3. Airspeed . . . . . 74 KIAS (1200 kg, 2646 lb)  
72 KIAS (1150 kg, 2235 lb)  
66 KIAS (1000 kg, 2205 lb)  
59 KIAS (850 kg, 1874 lb)

**CONTINUED**

*After Climbing to a Height From Which the Selected Landing Area Can Be Reached Safely:*

- 4. Fuel tank selector ..... OFF
- 5. Electrical fuel pump ..... OFF
- 6. Cabin heat ..... OFF
- 7. Master switch (ALT/BAT) ..... OFF
- 8. Emergency window(s) ..... open if required
- 9. Carry out emergency landing with engine off. Allow for increased landing distance due to the flap position.

**CAUTION**

In case of extreme smoke development, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

**END OF CHECKLIST**

### **3.3.3 SMOKE AND FIRE IN FLIGHT**

#### **CAUTION**

In the event of smoke or fire, prepare to land the airplane without delay while completing fire suppression and/or smoke evacuation procedures. If it cannot be visually verified that the fire has been completely extinguished, whether the smoke has cleared or not, land immediately at the nearest suitable airfield or landing site.

#### **(a) Engine Fire in Flight**

1. Cabin heat . . . . . OFF
2. Select appropriate emergency landing field.

*When it Seems Certain that the Landing Field Will Be Reached:*

3. Fuel tank selector . . . . . OFF
4. Throttle . . . . . MAX PWR
5. Electrical fuel pump . . . . . OFF
6. Master switch (ALT/BAT) . . . . . ON
7. Emergency window(s) . . . . . open if required
8. Carry out emergency landing with engine off.

#### **CAUTION**

In case of extreme smoke development, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

**END OF CHECKLIST**



(b) Electrical Fire with Smoke in Flight

- 1. Emergency switch . . . . . ON if installed
- 2. Master switch (ALT/BAT) . . . . . OFF
- 3. Cabin heat . . . . . OFF
- 4. Emergency window(s) . . . . . open if required
- 5. Land at an appropriate airfield as soon as possible.

**CAUTION**

Switching OFF the Master switch (ALT/BAT) will lead to total failure of all electronic and electric equipment. Also affected from this are - if installed - the attitude gyro (artificial horizon) and the directional gyro.

However, by switching the Emergency switch ON (only installed in the IFR model), the emergency battery will supply power to the attitude gyro (artificial horizon) and the flood light.

**CAUTION**

In case of extreme smoke development, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

**END OF CHECKLIST**

### 3.4 GLIDING

1. Flaps ..... UP
2. Airspeed ..... 76 KIAS (1200 kg, 2646 lb)  
73 KIAS (1150 kg, 2535 lb)  
68 KIAS (1000 kg, 2205 lb)  
60 KIAS (850 kg, 1874 lb)

#### NOTE

The glide ratio is 8.8; i.e., for every 1000 ft (305 meter) of altitude loss the maximum horizontal distance traveled in still air is 1.45 NM (2.68 km). During this the propeller will continue to windmill.

With a stationary propeller the glide ratio is 10.3; this corresponds to a maximum horizontal distance of 1.70 NM (3.14 km) for every 1000 ft altitude. In consideration of a safe airspeed however, this configuration may not be attainable.

**END OF CHECKLIST**

**3.5 EMERGENCY LANDINGS**

**3.5.1 EMERGENCY LANDING WITH ENGINE OFF**

**CAUTION**

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

- 1. Adjustable backrests (if installed) . . . . . adjust to the upright position described by a placard on the roll-over bar and verify proper fixation.
- 2. Select suitable landing area. If no level landing area is available, a landing on an upward slope should be sought.
- 3. Consider wind.
- 4. Approach: If possible, fly along a short-cut rectangular circuit. On the downwind leg of the circuit the landing area should be inspected for obstacles from a suitable height. The degree of offset at each part of the circuit will allow the wind speed and direction to be assessed.
- 5. Airspeed . . . . . 76 KIAS (1200 kg, 2646 lb)  
73 KIAS (1150 kg, 2535 lb)  
68 KIAS (1000 kg, 2205 lb)  
60 KIAS (850 kg, 1874 lb)
- 6. If time allows . . . . . advise ATC
- 7. Fuel tank selector . . . . . OFF

**CONTINUED**

*When It Is Certain That the Landing Field Will Be Reached:*

- 8. Flaps ..... LDG
- 9. Safety harnesses ..... tighten

**CAUTION**

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

- Ignition switch ..... OFF
- Master switch (ALT/BAT) ..... OFF

- 10. Touchdown with the lowest possible airspeed

**END OF CHECKLIST**

**3.5.2 LANDING WITH A DEFECTIVE TIRE ON THE MAIN LANDING GEAR****CAUTION**

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

1. Advise ATC.
2. Land the airplane at the edge of the runway that is located on the side of the intact tire, so that changes in direction which must be expected during roll-out due to the braking action of the defective tire can be corrected on the runway.
3. Land with one wing low. The wing on the side of the intact tire should be held low.
4. Direction should be maintained using the rudder. This should be supported by use of the brake. It is possible that the brake must be applied strongly - if necessary to the point where the wheel locks. The wide track of the landing gear will prevent the airplane from tipping over a wide speed range. There is no pronounced tendency to tip even when skidding.

**END OF CHECKLIST**

### **3.5.3 LANDING WITH DEFECTIVE BRAKES**

In general, a landing on grass is recommended in order to reduce the landing run by virtue of the greater rolling resistance.

#### **CAUTION**

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

- Fuel tank selector . . . . . OFF
- Mixture control lever . . . . . LEAN - shut off engine
- Ignition switch . . . . . OFF
- Master switch (ALT/BAT) . . . . . OFF

**END OF CHECKLIST**

### 3.6 RECOVERY FROM AN UNINTENTIONAL SPIN

#### CAUTION

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

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

*When Rotation Has Stopped:*

6. Rudder ..... neutral
7. Elevator (control stick) ..... pull carefully
8. Return the airplane from a descending into a normal flight attitude. In so doing do not exceed the 'never exceed speed',  $v_{NE}$ .

**END OF CHECKLIST**

### **3.7 OTHER EMERGENCIES**

#### **3.7.1 ICING**

##### Unintentional Flight Into Icing Conditions

1. Leave the icing area (by changing altitude or turning back, in order to reach zones with a higher ambient temperature).
2. Pitot heating . . . . . ON
3. Cabin heat . . . . . ON
4. Air distributor lever . . . . . ▲ (up)
5. RPM . . . . . increase, in order to prevent ice build-up on the propeller blades
6. Alternate air . . . . . OPEN
7. Emergency window(s) . . . . . open if required

#### **CAUTION**

Ice build-up increases the stalling speed. If required for safety reasons, engine speeds up to 2700 RPM are admissible without time limit.

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

#### **CAUTION**

When the Pitot heating fails, and the alternate static valve is installed:

- Alternate static valve . . . . . OPEN
- Emergency window(s) . . . . . close

**END OF CHECKLIST**



**3.7.2 FAILURES IN THE ELECTRICAL SYSTEM****(a) Complete Failure of the Electrical System**

Due to the strong mechanical design as well as due to the required check of the system during scheduled inspections, a total failure of the electrical system is extremely unlikely. If, nevertheless, a total failure should occur, all circuit breakers should be checked, pulled and re-set. If this does not help:

- Set Emergency switch to ON (if installed).
- When necessary, use the flood light for lighting the instruments as well as levers and switches, etc.
- Set power based on lever positions and engine noise.
- Prepare landing with flaps in the given position.
- Land on the nearest appropriate airfield.

**END OF CHECKLIST**

(b) Alternator Failure

An alternator failure is indicated by an illuminated or flashing alternator warning light (ALT or ALTERNATOR) on the annunciator panel and a flashing ammeter on the Vision Microsystems VM 1000 engine instrument.

**I** (i) *Alternator Failure During Flight*

1. Circuit breakers ..... check; if all are OK, proceed with step 2
2. Electrical equipment ..... switch OFF all equipment which is not needed
3. Voltmeter ..... check regularly

**CAUTION**

Those items of equipment which are not needed for the safe operation and secure landing of the airplane can be switched off with the Essential Bus switch (if installed). When the essential bus is switched ON, only the following items of equipment are supplied with power:

- NAV/COM 1.
- Transponder (XPDR).
- Flood light.
- Attitude gyro (artificial horizon).
- VM 1000 engine instrument.
- Annunciator panel.
- GPS (if installed).
- Landing light.
- Pitot heating system.
- Flaps.

**CONTINUED**

These items of equipment can be supplied with power by the battery for at least 30 minutes. Economical use, in particular of the Pitot heating, and switching off equipment that is not needed extends the time during which the other equipment remains available. During the 30 minutes period, the airplane must be landed at a suitable airfield.

For cases in which the battery capacity is not sufficient to reach a suitable airfield, an emergency battery is installed in the IFR model, serving as an additional back-up system for the attitude gyro (artificial horizon) and flood light. This battery is switched on with the Emergency switch. It lasts for 1 hour and 30 minutes when the flood light is switched on.

|| (ii) *Alternator Failure on the Ground*

|| **NOTE**

|| An alternator failure may also be indicted on ground with the engine running on IDLE.

- || 1. Engine speed ..... 1200 RPM
- || 2. Electrical equipment ..... OFF
- || 3. Ammeter ..... check

|| If the caution light does not extinguish, and the ammeter flashes and reads zero:

- || - Terminate flight preparation.

**END OF CHECKLIST**

(c) Starter Malfunction

If the starter does not disengage from the engine after starting (starter warning light (START) on the annunciator panel remains illuminated or flashing after the engine has started):

1. Throttle . . . . . IDLE
2. Mixture control lever . . . . . LEAN - shut off engine
3. Ignition switch . . . . . OFF
4. Master switch (ALT/BAT) . . . . . OFF

Terminate flight preparation!

**END OF CHECKLIST**

(d) Overvoltage

If a voltage in the upper red sector (above 32 Volts) is indicated:

1. Essential bus . . . . . ON, if installed
2. Master switch (ALT) . . . . . OFF

**WARNING**

Leave Master switch (BAT) ON!

3. Equipment that is not needed,  
in particular Pitot heating . . . . . OFF
4. Land on the nearest appropriate airfield.

**END OF CHECKLIST**

**3.7.3 SUSPICION OF CARBON MONOXIDE CONTAMINATION IN THE CABIN**

Carbon monoxide (CO) is a gas which is developed during the combustion process. It is poisonous and without smell. Since it occurs however usually together with fuel gases, it can be detected. Increased concentration of carbon monoxide in closed spaces can be fatal. The occurrence of CO in the cabin is possible only due to a defect. If a smell similar to exhaust gases is noticed in the cabin, the measures in the checklist below should be taken:

The DA 40 may be equipped with a CO detector (optional equipment, OÄM 40-253). If the visual alert annunciator illuminates in flight, press the TEST/RESET button. If the alert continues with the remote light staying ON or a smell similar to exhaust gases is noticed in the cabin, the following measures should be taken:

- 1. Cabin heat . . . . . OFF
- 2. Ventilation . . . . . open
- 3. Emergency window(s) . . . . . open
- 4. Forward canopy . . . . . open

**CAUTION**

In case of suspicion of carbon monoxide contamination in the cabin, the front canopy may be unlatched during flight. This allows it to partially open, in order to improve ventilation. The canopy will remain open in this position. Flight characteristics will not be affected significantly.

**NOTE**

The presence of carbon monoxide is indicated by a visual alarm if OÄM 40-253 is carried out.

**END OF CHECKLIST**

**3.7.4 'DOOR'-WARNING LIGHT ON**

- 1. Airspeed ..... reduce immediately
- 2. Canopy ..... check visually if closed
- 3. Rear passenger door ..... check visually if closed

**Canopy Unlocked**

- 4. Airspeed ..... below 140 KIAS
- 5. Land at the next suitable airfield.

**Rear Door Unlocked**

- 4. Airspeed ..... below 140 KIAS
- 5. Land at the next suitable airfield.

**WARNING**

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

**NOTE**

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

**END OF CHECKLIST**

**3.7.5 EMERGENCY EXIT**

In case of a roll-over of the airplane on ground, it can be evacuated through the rear door. For this purpose release the front hinge of the rear door. The function is displayed on a placard next to the hinge.

**END OF CHECKLIST**