SECTION 3

EMERGENCY PROCEDURES

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INTRODUCTION

Section 3 includes checklists and detailed procedures to be used in the event of emergencies. Emergencies caused by a malfunction of the aircraft or engine are extremely rare if appropriate maintenance and pre-flight inspections are carried out.

In case of emergency, suggestions of the present section should be considered and applied as necessary to correct the problem.

Before operating the aircraft, the pilot should become thoroughly familiar with the present manual and, in particular, with the present section. Further, a continued and appropriate training should be provided.

AIRSPEEDS FOR SAFE OPERATION IN EMERGENCY SITUATIONS - IAS

	550 kg MTOW	600 kg MTOW
Engine failure after takeoff	**60** Kts	**60** Kts
Engine failure during flight	**66** Kts	**69** Kts
Manoeuvring speed	**93** Kts	**97** Kts
Maximum glide	**66** Kts	**69** Kts

ENGINE FAILURES

Should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem.

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle: *idle* (fully out)
2. Brakes: *apply as needed*
3. Magnetos: *OFF*.
4. Flap: *retract*
5. Generator switch and Master switch: *OFF*.
6. Fuel shutoff valves: *OFF*
7. Electric fuel pump*: OFF*
8. Inform TWR

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. Speed 60 KIAS
2. Locate landing area
3. Throttle: *idle (*fully out)
4. Fuel shutoff valves: *OFF*.
5. Electric fuel pump: *OFF*
6. Magnetos *OFF*.
7. Flaps: *as needed*.
8. Generator switch and Master switch: *OFF*.
9. Inform TWR

ENGINE FAILURE DURING FLIGHT

IRREGULAR ENGINE RPM

1. Throttle: *check position and adjustment wheel*
2. Carb heat: *ON*
3. Electric fuel pump*: ON*
4. Fuel shutoff valves: *both ON*
5. If engine RPMs remain irregular land as soon as possible at closest airport.

LOW FUEL PRESSURE

If the fuel pressure indicator falls below the **2.2** psi limit, it is necessary to apply the following procedure:

1. Electric fuel pump: ON
2. Fuel shutoff valves: both ON
3. Land at closest airport

LOW OIL PRESSURE

1. Check oil temperature:
   If stable within green arc: Land as soon as possible at closest airport
   If increasing:
2. Reduce engine throttle to 70 KIAS
3. Land as soon as possible and be alert for impending engine fault and consequent emergency landing.

AIR START

1. Altitude: *preferably below 4000 ft*
2. Carb heat: *ON*
3. Fuel shutoff valves: *both ON*
4. Electric fuel pump*: ON*
5. Throttle: *middle position*
6. Generator switch and Master switch: *ON*.
7. Magnetos: *BOTH*.
8. Ignition key to *START*
9. If engine restarts, keep an eye on instrument readings and land as soon as possible, otherwise see procedure for: *Forced landing*

SMOKE AND FIRE

ENGINE FIRE WHILE PARKED OR DURING TAKEOFF

1. Fuel shutoff valves: *OFF*
2. Electric fuel pump: *OFF*
3. Cabin heat: *OFF*
4. Abort takeoff if possible.
5. If engine is running, use up remaining fuel in carburetors.
6. Magnetos: *OFF*.
7. Master switch: *OFF*.
8. Generator switch: *OFF*.
9. Warn bystanders to clear the area as fast as possible.
10. Without removing the engine cowling use a CO_2 or a powder fire extinguisher to put out flames directing spray towards cowling's air intakes.

WARNING

DO NOT USE WATER to put out fire and do not open engine cowling until absolutely confident that fire is extinguished.

ENGINE FIRE DURING FLIGHT

1. Fuel shutoff valves: *OFF*.
2. Electric fuel pump: *OFF*
3. Cabin heat: *OFF*
4. Throttle: *all in*.
5. Magnetos: *OFF*.
6. Do not attempt air start.
7. Flaps as necessary.
8. Carry out emergency procedure for *forced landing*.

CABIN FIRE DURING FLIGHT

1. Master switch: *OFF*
2. Cabin heat: *OFF*
3. Door vents: *open*
4. Direct fire extinguisher towards flame base
5. Carry out emergency procedure for *forced landing*

GLIDE

1. Flaps: *retract*
2. Speed at: **600** kg **69**KIAS
   550 kg **66**KIAS
   450 kg **60**KIAS
3. Glide ratio is **12.2** therefore with 1000ft elevation it is possible to cover ~3.8 km (~*2 nautical miles*) in zero wind conditions.

LANDING EMERGENCIES

FORCED LANDING WITHOUT ENGINE POWER

1. Suggested airspeed 69 KIAS for 600kg MTOW, 66 KIAS for 550kg MTOW, 60 KIAS for 450kg.
2. Locate most suitable terrain for emergency landing, possibly upwind.
3. Fuel shutoff valves: *OFF*.
4. Electric fuel pump: *OFF*.
5. Magnetos: *OFF*.
6. Tighten safety belts, release door safety lock and unlatch doors.
7. Flaps: *full*
8. When certain to land, Generator switch and Master switch: *OFF*.
9. Touchdown at 42 KIAS

POWER-ON FORCED LANDING

1. Prompt descent slope.
2. Flaps as required.
3. Select terrain area most suitable for emergency landing and flyby checking for obstacles and wind direction.
4. Tighten safety belts, release door safety lock and unlatch doors.
5. Before touchdown: fuel shutoff valves: *OFF*.
6. Electric fuel pump: *OFF*
7. Carb heat: *OFF*
8. Flaps: *full*
9. After touchdown: magnetos: *OFF*.
10. Generator switch and Master switch: *OFF*.

LANDING WITH A FLAT NOSE TIRE

1. Pre-landing checklist: *complete*
2. Flaps: *full*
3. Land and maintain aircraft *NOSE HIGH* attitude as long as possible. After touchdown.

LANDING WITH A FLAT MAIN TIRE

1. Pre-landing checklist: *complete*
2. Landing approach as usual.
3. Touchdown with GOOD TIRE FIRST and hold aircraft off flat tire as long as possible.

RECOVERY FROM UNINTENTIONAL SPIN

Should an unintentional spin occur, the following recovery procedure should be used:

1. Adjust throttle to idle (full outward position)
2. Apply and hold full rudder opposite to the direction of spin.
3. Move and hold stick forward until spin is halted.
4. Neutralize rudder
5. Make a smooth recovery by pulling the stick back gently averting speeds in excess of V_{NE} and maximum load factor.
6. Readjust throttle to restore engine power.

OTHER EMERGENCIES

UNINTENTIONAL FLIGHT INTO ICING CONDITIONS

1. Get away from icing conditions by changing altitude or direction of flight in order to reach an area with warmer external temperature.
2. Avoid possible freeze-up of control surfaces by recurrently moving them.
3. Carb heat: *ON*
4. Increase RPMs to avoid ice formation on propeller blades.
5. Cabin heat: *ON*

WARNING

In case of ice formation on wing leading edge, stall speed may increase.

CARBURETOR HEAT

AT TAKEOFF

At takeoff, given the unlikely possibility of ice formation at full throttle, carburetor heat is normally OFF.

IN FLIGHT

With external temperatures below 15° C, or on rainy days or with humid, cloudy, hazy or foggy conditions or whenever a power loss is detected, turn carb heat to ON until engine power is back to normal.

ELECTRIC POWER SYSTEM MALFUNCTION

Electric power supply system malfunctions may be avoided by carrying out inspections as scheduled and prescribed in the Service Manual. Causes for malfunctions are hard to establish but, in any case, problems of this nature must be dealt with immediately. The following may occur:

GENERATOR LIGHT ILLUMINATES

Generator light may illuminate for a faulty alternator or when voltage is above 16V, in this case the overvoltage sensor automatically shuts down the alternator.

In both cases proceed as follows:

1. Generator switch and master switch: *OFF*.
2. Generator switch and master switch: *ON*.

If the problem no longer persists, normal alternator charging will resume and the warning light will turn off proving voltage surcharge was temporary; no further action is required.

If light remains illuminated, a generator malfunction is confirmed. In this case, set Generator switch to *OFF* and continue flight on battery power alone; the battery is capable of supplying the electrical system for about 26 min. with normal flight loads including operation of: com/nav, flap and trim.

TRIM SYSTEM FAILURE

LOCKED CONTROL

In case the trim control should not respond, act as follows:

1. Check switch for correct position
2. Adjust speed to control aircraft without excessive stick force
3. Land aircraft as soon as possible.

RUNAWAY

If trim position indicator reads displacement without pilot's action on trim control, follow procedure below:

1. Trim power switch OFF
2. Adjust speed to control aircraft without excessive stick force
3. Land aircraft as soon as possible.