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SECTION III

EMERGENCY PROCEDURES

INTRODUCTION

Emergencies due to aircraft, engine or systems failures are unlikely if preflight check and maintenance are conducted properly. Weather related emergencies can be minimized by adequate flight planning and correct assessment of the weather situation.

The following information should be used as a guideline for the pilot in order to prepare a precise scenario for any possible emergency which might occur during the operation of the airplane. Those procedures concerning emergencies which require immediate corrective action are presented as checklist procedures as far as practicable in order to improve correct response. In addition, this section contains amplified emergency procedures as necessary to give the pilot a better understanding of the procedures.

For emergency procedures related to the Emergency Locator Transmitter (ELT) and other optional equipment refer to Section IX.

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AIRSPEEDS FOR SAFE OPERATION

Flight Condition	KIAS	Configuration
Emergency Descent	140	Gear extended, Flaps retracted
Glide with Engine Stopped (Best Glide Ratio)	95* (2977 lbs/ 1350 kg)	Gear retracted, Flaps retracted, Cowl Flaps closed
	90 (2803 lbs/ 1271 kg)	
	85 (2119 lbs/ 961 kg)	
Approach with Engine Stopped	80 - 85	Gear extended, Flaps set to 30°
Flight in severe Turbulence	128* (2977 lbs/ 1350 kg)	Gear retracted, Flaps retracted
	124 (2803 lbs/ 1271 kg)	
	108 (2119 lbs/ 961 kg)	
* Linear Interpolation between given values		

Fig. 3-1: Airspeeds for Safe Operation

EMERGENCY PROCEDURES CHECKLISTS

ENGINE FAILURE

BEFORE TAKE-OFF

- Aborted Take-Off -

1. Throttle - CLOSE
2. Brakes - Apply
3. Wing Flaps - Retract

If necessary:

4. Mixture - IDLE CUT-OFF
5. Fuel Selector - CLOSE
6. Ignition Switch - OFF
7. Master Switch - OFF

IMMEDIATELY AFTER TAKE-OFF

1. Airspeed - 90 KIAS
2. Mixture - IDLE CUT-OFF
3. Fuel Selector - CLOSE
4. Ignition Switch - OFF
5. Wing Flaps - As required (recommended: 30°)

WARNING

Land straight ahead. Apply small direction changes only to avoid obstacles. Do not attempt a procedure turn back to the runway, as the altitude shortly after lift-off is usually not sufficient.

Just before touchdown

6. Master Switch - OFF

DURING FLIGHT

1. Airspeed - 100 KIAS
2. Auxilliary Fuel Pump - ON
3. Mixture - FULL RICH
4. Fuel Selector - Fullest Tank
5. Ignition Switch - BOTH (check left and right magneto)

If restarting of the engine fails, reduce speed to best glide speed and prepare for emergency landing with engine stopped. Refer to page 3-10 "Emergency Landing without Engine Power".

AIRSTART

1. Airspeed - 100 KIAS, Minimum speed for propeller windmilling
2. Fuel Selector - Fullest Tank
3. Mixture - RICH
4. Throttle - HALF OPEN
5. Ignition Switch - BOTH
6. Auxiliary Fuel Pump - ON

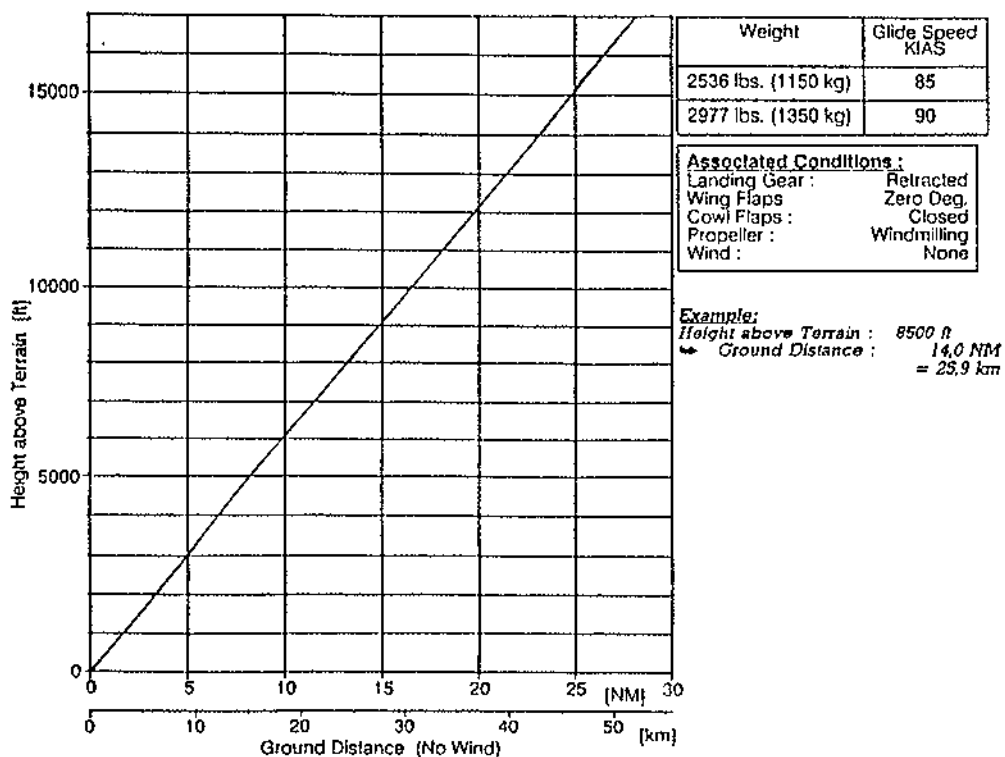
If engine does not windmill

7. Ignition Switch - START

After engine restart

8. Throttle - As required
9. Mixture - LEAN as required
10. Auxiliary Fuel Pump - OFF

MAXIMUM GLIDING DISTANCE



EMERGENCY LANDINGS

CAUTION

The final approach speeds given under "Emergency Landings" are determined with no wind. The approach speed has to be increased adequately in turbulence or wind sheer conditions (typical correction: +5 to +15 KIAS).

EMERGENCY LANDING WITHOUT ENGINE POWER

Approach

1. Airspeed - 90 KIAS
2. Mixture - IDLE CUT-OFF
3. Ignition Switch - OFF
4. Fuel Selector - CLOSE
5. Wing Flaps - Retracted
6. Landing Gear - Retracted
7. Cowl Flaps - Closed
8. ELT (if installed) - ON
9. Transponder - CODE 7700
10. Seats and Seat Belts - CHECK secured
11. Loose Items - Secure
12. Appropriate Landing Site - Select

On final approach

13. Landing Gear - Extend

Note

In case of a soft landing site or if landing on water is intended, it is recommended to not extend the landing gear.

14. Wing Flaps - 30°

15. Minimum Airspeed - 70 KIAS

Just before touchdown

16. Master Switch - OFF

WARNING

The stall warning system will be inoperable after switching off the master switch. In addition, the operation of landing gear and wing flaps will be impossible (Emergency Gear Extension is required).

PRECAUTIONARY FORCED LANDING WITH ENGINE POWER

Select appropriate landing site

Approach

1. Seats and Seat Belts - CHECK secured
2. Loose Items - Secure
3. ELT (if installed) - ON
4. Mixture - FULL RICH
5. Propeller - HIGH RPM
6. Landing Gear - Extend as appropriate *)
7. Wing Flaps - As required
8. Engine Power - As required

During final approach

9. Wing Flaps - 30°
10. Minimum Airspeed - 70 KIAS

After touchdown

12. Mixture - IDLE CUT-OFF
13. Fuel Selector - CLOSE
14. Master Switch - OFF
15. Ignition - OFF

*) according to surface condition

EMERGENCY LANDING WITHOUT ENGINE POWER AND WITH LANDING GEAR RETRACTED

Approach

1. Airspeed - 90 KIAS
2. Mixture - IDLE CUT-OFF
3. Ignition Switch - OFF
4. Fuel Selector - CLOSE
5. Wing Flaps - Retracted
6. Cowl Flaps - Closed
7. ELT (if installed) - ON
8. Transponder - CODE 7700
9. Seats and Seat Belts - CHECK secured
10. Loose Items - Secure

During final approach

12. Wing Flaps - 30°
13. Minimum Airspeed - 70 KIAS
14. Master Switch - OFF

Touchdown and skidding

15. Elevator - PULL full aft
16. Direction - Maintain using rudder

EMERGENCY LANDING ON WATER

Approach

1. Airspeed - 80 KIAS
2. ELT (if installed) - ON
3. Transponder - CODE 7700
4. Seats and Seat Belts - CHECK secured
5. Loose Items - Secure
6. Life Vests (for occupants) - Attach
7. Wing Flaps - Retracted
8. Landing Gear - Retracted
9. Cowl Flaps - Closed

During final approach

11. Wing Flaps - 30°
12. Minimum Airspeed - 70 KIAS
13. Landing Gear - Retracted
14. Propeller - HIGH RPM
15. Master Switch - OFF
16. Fuel Selector - CLOSE

Touchdown

17. Elevator - PULL full aft

EMERGENCY DESCENT FOR MINIMUM DESCENT TIME

1. Landing Gear - Extend below 140 KIAS
2. Wing Flaps - Retracted
3. Cowl Flaps - Closed
4. Throttle - IDLE
5. Propeller - HIGH RPM
6. Bank Attitude - Depending on visibility up to 45°
7. Airspeed - 140 KIAS

LANDING WITH WING FLAPS RETRACTED

1. Landing Gear - Extended below 140 KIAS
2. Engine Power - As required
3. Mixture - FULL RICH
4. Approach Speed - 90 KIAS
5. Propeller - HIGH RPM
6. Airspeed in 50 ft above GND - 80-85 KIAS
7. Airspeed at Touchdown - 70-75 KIAS

CAUTION

Landings with wing flaps retracted may result in landing distances increased by up to 50%.

The final approach speeds given above are determined with no wind. The approach speed has to be increased adequately in turbulence or wind shear conditions (typical correction: +5 to +15 KIAS).

LANDING GEAR FAILURE

LANDING GEAR RETRACTION FAILURE

GEAR UNSAFE, red light is on.

1. Landing Gear Switch - Re-cycle
2. Circuit-Breaker (GEAR ACT) - CHECK
3. Control Lever of Emergency Release Valve - CHECK Position

If the warning light is still on proceed as follows:

4. Landing Gear Switch - DOWN
5. Check three green lights to confirm landing gear is down and locked.
6. Land as soon as practicable

CAUTION

Note that range is reduced considerably with landing gear extended.

LANDING GEAR EXTENSION FAILURE

One or more green landing gear lights are not illuminated.

1. Dimming of Lamps - CHECK
2. Lamps of Landing Gear Position Indicator - CHECK for burned out lamps by pressing the "Test" button in the annunciator panel
3. Circuit-Breaker (GEAR ACT) - CHECK
4. Landing Gear Switch - Re-cycle

If the warning light is still on proceed as follows:

5. Landing Gear Switch - DOWN
6. Circuit-Breaker (GEAR ACT) - PULL
7. Throttle - Set to minimum power (idle)
8. Airspeed - 80 KIAS maximum
9. Control Lever of Emergency Release Valve - PULL up

Note

If the landing gear does not extend it might be necessary to push the rudder pedals repeatedly and to reduce engine power and/or airspeed.

10. Indication of the three green lights - CHECK

LANDING WITH LANDING GEAR RETRACTED

Note

Select a smooth grass runway for landing if possible.

Approach

1. Seats and Seat Belts - CHECK secured
2. Loose Items - Secure
3. Mixture - FULL RICH
4. Propeller - HIGH RPM
5. Landing Gear - Retracted
6. Engine Power - As required

During final approach

7. Wing Flaps - 30°
8. Minimum Airspeed - 70 KIAS

Touchdown and skidding

9. Elevator - PULL
10. Direction - Maintain by using rudder
11. Mixture - IDLE CUT-OFF
12. Fuel Selector - CLOSE
13. Master Switch - OFF
14. Ignition - OFF

LANDING WITH LANDING GEAR RETRACTED ON ONE SIDE OR NOT LOCKED

Approach

1. Seats and Seat Belts - CHECK secured
2. Loose Items - Secure
3. Mixture - FULL RICH
4. Propeller - HIGH RPM
5. Landing Gear - Extend

Note

If possible select runway with crosswind from the side of the extended main gear.

Note

If possible, ask an observer on the ground to determine whether the landing gear is completely down or if one gear is not in the extended position.

If it is confirmed that one gear is not completely extended, conduct landing with gear retracted (see page 3-17).

During final approach

6. Wing Flaps - 30°
7. Minimum Airspeed - 70 KIAS

Touchdown and landing run

8. Touchdown - On the extended gear first
9. Aileron - Use full aileron to keep the defective gear from the ground as long as possible
10. Mixture - IDLE CUT-OFF
11. Fuel Selector - CLOSE
12. Master Switch - OFF
13. Ignition - OFF

LANDING WITH ONE FLAT MAIN GEAR TIRE

Approach

1. Seats and Seat Belts - CHECK secured
2. Loose Items - Secure
3. Mixture - FULL RICH
4. Propeller - HIGH RPM
5. Landing Gear - Extend

Note

If a defective tire is evident after take-off it is recommended not to retract the landing gear (Note that range is decreased considerably!).

6. Wing Flaps - As required
7. Engine Power - As required

Note

If possible select runway with crosswind from opposite the side of the defective main gear.

During final approach

8. Wing Flaps - 30°
9. Minimum Airspeed - 70 KIAS

Touchdown and landing run

10. Touchdown - on the intact wheel
11. Landing Run - Use full aileron to keep the defective tire from the ground as long as possible. Maintain direction by means of nose wheel steering and brake.

LANDING WITH FLAT NOSE GEAR TIRE

Approach

1. Seats and Seat Belts - CHECK secured
2. Loose Items - Secure
3. Mixture - FULL RICH
4. Propeller - HIGH RPM
5. Landing Gear - Extend

Note

If a defective tire is evident after take-off it is recommended not to retract the landing gear (Note a considerable decrease in range!).

6. Wing Flaps - As required
7. Engine Power - As required

During final approach

8. Wing Flaps - 30°
9. Minimum Airspeed - 70 KIAS

Touchdown and landing run

10. Touchdown - on main gear first
11. Mixture - IDLE CUT-OFF
12. Landing Run - Keep nose gear from ground as long as possible

LANDING WITH DEFECTIVE NOSE GEAR

It is highly recommended to use a hard surface runway for landing

Approach

1. Seats and Seat Belts - CHECK secured
2. Loose Items - Secure
3. Mixture - FULL RICH
4. Propeller - HIGH RPM
5. Landing Gear - Extend

During final approach

6. Wing Flaps - 30°
7. Minimum Airspeed - 70 KIAS

Touchdown and landing run

8. Touchdown - On main gear first
9. Elevator - Pull

Note

During landing run, try to keep aircraft nose as long as possible from the runway.

10. Mixture - IDLE CUT-OFF
11. Fuel Selector - CLOSE
12. Master Switch - OFF
13. Ignition - OFF

Note

If possible, ask an observer on the ground to determine whether the nose gear is not or not completely down.

If it is confirmed that the nose gear is not completely extended, a landing with gear retracted is recommended in case no hard surface runway is available.

SMOKE AND FIRE

WARNING

In any emergency situation - e.g. on board smoke or fire - the first priority for the pilot is to maintain control of attitude, altitude, and airspeed of the airplane. Countermeasures for the emergency situation are of secondary priority.

ELECTRICAL FIRE ON GROUND

1. Master Switch - OFF
2. All Electrical Switches - OFF
3. Mixture - IDLE CUT-OFF
4. Fuel Selector - CLOSE
5. Fire Extinguisher (if available) - Use

WARNING

Do not operate the airplane until the cause of the fire has been identified and adequate corrective measures have been taken.

ENGINE FIRE ON GROUND

In case of fire in the engine induction system after starting, it is recommended to continue cranking the engine for another few seconds. If the fire does not extinguish, the following measures are to be taken:

1. Mixture - IDLE CUT-OFF
2. Fuel Selector - CLOSE
3. Ignition Switch - OFF
4. Master Switch - OFF
5. Cowl Flaps - Closed
6. Aircraft - Evacuate
7. Fire Extinguisher (if available) - Use as required

<i>WARNING</i>

Do not operate the airplane until the cause of the fire has been identified and adequate corrective measures have been taken.

FIRE DURING TAKE-OFF

1. Throttle - IDLE
2. Brakes - Apply
3. Mixture - IDLE CUT-OFF
4. Master Switch - OFF
5. Fuel Selector - CLOSE
6. All Electrical Switches - OFF
7. Aircraft - Evacuate
8. Fire Extinguisher (if available) - Use as required

INFLIGHT ELECTRICAL FIRE

(Smell like burned insulation material!)

1. Master Switch - OFF
2. Electrical Switches and Circuit-Breakers - OFF
3. Heater - OFF

If smoke and fire stop:

4. Master Switch - ON
5. Switches and Circuit-Breakers - Reset as necessary for continued safe flight
6. Defective Load - Keep disengaged
7. Land - As soon as practical

If smoke and fire continue:

8. Fire Extinguisher (if available) - Use
9. Oxygen (if available) - Don masks
10. Fresh Air Outlets - As required
11. Emergency Descent - Perform
12. Land - As soon as possible

INFLIGHT ENGINE FIRE

1. Mixture - IDLE CUT-OFF
2. Fuel Selector - CLOSE
3. Master Switch - OFF
4. Ignition Switch - OFF
5. Cabin Heating and Defrost Control Buttons - Close
6. Emergency Descent - Perform as necessary

If the fire continues perform emergency landing as soon as possible with engine stopped according to the information provided in the "Emergency Landings" Section. Engage master switch for a short period in order to extend the landing gear and/or wing flaps, if required.

CAUTION

With master switch OFF, the stall warning and the gear warning is inoperable. Furthermore, the normal operation of wing flaps and landing gear is not possible.

INFLIGHT CABIN FIRE

1. Cabin Heating and Defrost Control Buttons - Close
2. Fresh Air Outlets - As required
3. Fire Extinguisher (if available) - Use

<i>WARNING</i>

After the fire extinguisher has been used inside the closed cabin, thorough ventilation is required.

If smoke and fire continue, the following measures are to be taken:

6. Oxygen Masks (if available) - Don
7. Oxygen System (if installed) - EMERGENCY
8. Emergency Descent - Perform
9. Land - As soon as possible

INFLIGHT WING FIRE

1. Position Lights - OFF
2. Anti-Collision Lights - OFF
3. Landing Light - OFF
4. Pitot Heat - OFF
5. Emergency Descent - If necessary
6. Land - As soon as possible

ELECTRICAL SYSTEM FAILURE

AMPEREMETER INDICATES HIGH BATTERY CHARGING CURRENT

1. Alternator Master Switch - OFF
2. Any not Necessarily Required Electrical System - OFF

Battery charging current too low (see page 3-41)

ALTERNATOR FAILURE (WARNING LIGHT ON)

1. Avionics Master Switch - OFF
2. Master Switch - Turn on and off repeatedly

Note

The alternator excitation might require battery current. Therefore, the battery master switch has to remain engaged.

3. Circuit-Breaker ALT(ernator) - CHECK

If alternator cannot be reset proceed as follows:

4. Alternator Master Switch - OFF
5. Any not Necessarily Required Electrical System - OFF

Note

In order to obtain the required residual endurance of 30 minutes it is necessary to shut off electrical equipment until the ammeter shows a battery discharge current of max. 10 - 12 A. During cruise, the largest electrical loads, in the order of electrical consumption, are anti-collision lights, pitot-heat, radio transmissions, position lights, the entire cabin lighting, autopilot, and GPS receiver. Internal lighting can be replaced by the red overhead lights. It is the pilot's discretion to decide which electrical equipment is necessary for the safe termination of the flight.

6. Land as soon as practical.

TRIPPING OF SWITCH- AND CIRCUIT-BREAKERS

1. Switch- or Circuit-Breaker Concerned - Reset after cool down time

If the switch-/circuit-breaker continues tripping proceed as follows:

2. Switch-/Circuit-Breaker - Leave disengaged
3. Electrical System Concerned - OFF

TOTAL LOSS OF AVIONICS

Note

In case a radio has a short circuit, the corresponding circuit breaker will trip which can be seen from the protruding button. The different circuit breakers are located on the right side of the instrument panel.

1. Avionics Master Switch - ON

If already engaged:

2. Avionics Master Switch - OFF
3. Avionics Emergency Switch - ON

POWERPLANT FAILURE

NO OIL PRESSURE INDICATION

1. Engine Power - Reduce
2. Engine RPM - Reduce
3. Oil Temperature - CHECK

CAUTION

Loss of oil pressure usually is accompanied by high oil temperature. In this case, immediate landing has to be prepared and performed. If oil temperature is normal land as soon as practical.

HIGH OIL PRESSURE

1. Engine RPM - Reduce
2. Engine Oil Temperature - Wait until stabilized

CAUTION

If oil pressure remains too high land as soon as practical.

HIGH OIL OR CYLINDER-HEAD TEMPERATURE

1. Cowl Flaps - OPEN
2. Airspeed - Increase
3. Mixture - FULL RICH
4. Engine Power - Reduce

ROUGH ENGINE RUN OR LOSS OF POWER

1. Mixture - FULL RICH
2. Fuel Selector - Fullest tank
3. Magnetos - BOTH (check left and right)

Note

If the engine run is smooth with one magneto continue operation with this magneto only.

4. Auxiliary Fuel Pump - ON; in case of no reaction, turn OFF
5. Mixture - Lean; in case of no reaction, enrich again.
6. If this situation continues land as soon as practical or prepare emergency landing respectively. (see page 3-12).

PROPELLER OVERSPEED

1. In case of governor oil pressure loss or control failure, the propeller blades will move towards the low pitch stop (high RPM).
2. Throttle - Pull immediately (to reduce RPM)
3. Airspeed - Reduce
4. Speed Limit - Keep speed below 2575 RPM by means of throttle

CAUTION

Fly to next available airfield at reduced power and airspeed.

FUEL SYSTEM FAILURE

1. Auxiliary Fuel Pump - ON
2. Mixture - FULL RICH
3. Fuel Gauges - CHECK
4. Fuel Selector - Fullest tank
5. Fuel Flow Indication - CHECK

MISCELLANEOUS EMERGENCIES

UNINTENDED FLIGHT INTO ICING CONDITIONS

1. Pitot Heat - ON
2. Engine Speed - Increase

WARNING

Icing Conditions must be left immediately after first signs of icing have become visible.

3. Altitude - Change to enter altitudes less critical to icing.
4. Heading - Change or Return, as required to avoid icing.
5. Mixture - Adjust as required.
6. Approach Speed - Increase by 5 to 20 KIAS, depending on ice accretion.

FLIGHT IN SEVERE TURBULENCE

1. Airspeed - Reduce to maneuvering speed (Observe speed limits according to actual weight).
2. Wing Flaps - Retracted
3. Landing Gear - Retracted
4. Seat Belts - CHECK secured
5. Loose Items - Secure

Note

Avoid significant changes of pitch attitude.

BLOCKED STATIC PORTS

1. Alternate Static Pressure Valve - ON
2. Heating and Defrosting System Buttons - ON
3. Fresh Air Outlets - Close

Note

The correction data for altitude and airspeed indication can be seen from the correction table for the alternate static pressure valve (page 5-9 to 5-15).

BLOCKED PITOT TUBE

1. Pitot Heat - ON

Note

If airspeed indication seems to be unreliable use usual pitch attitude and power setting in order to get the desired airspeed.

LANDING WITHOUT ELEVATOR CONTROL

Control the airplane by means of trim and power. Do not exceed 15° bank.

Long, flat final approach

1. Landing Gear - DOWN
2. Approach Speed - 80 KIAS
3. Wing Flaps - Extend stepwise to 30°
4. Auxiliary Fuel Pump - ON
5. Mixture - FULL RICH
6. Propeller - HIGH RPM
7. Engine Power and Trim - Adjust to maintain a descent rate of 300 - 400 ft/min (manifold pressure appr. 15 - 16 inHg).
8. Close to the Ground - Flare by using trim.

<i>WARNING</i>

Do not reduce engine power before main gear touchdown.

UNINTENTIONAL SPIN

<i>WARNING</i>

A single spin revolution with successive levelling off can result in an altitude loss of up to 1500 ft.

In case of unintentional spin proceed as follows:

1. Rudder - Apply full opposite to spinning direction.
2. Elevator - Move to neutral to slightly nose down.
3. Aileron - Neutral
4. Throttle - Idle

Hold controls until spinning stops.

5. Wing Flaps - If extended retract as soon as possible.
6. Rudder - Neutral when rotation stops
7. Level off softly

AMPLIFIED EMERGENCY PROCEDURES

LANDING GEAR FAILURE

In case of landing gear failure some general checks are to be performed first, before corrective action will be initiated. Initially make sure that the landing gear circuit breakers are engaged; if this is not the case, reset circuit breakers. Then check landing gear position indication lights for blown lamps by pressing the "Test"-button on the annunciator panel.

LANDING GEAR RETRACTION FAILURE

In case the landing gear does not retract normally, which is indicated by the fact that the UNSAFE light does not extinguish and the motor of the hydraulic landing gear system continues running, extend and retract the gear once again. Check the position of the control lever of the emergency release valve. The landing gear cannot be fully retracted, if the control lever is not exactly positioned at the stop for normal operation. If no safe indication is obtained (all lights extinguished), extend the landing gear and maintain extended position. After landing contact an appropriate maintenance shop for failure removal.

CAUTION

Maximum gear extended speed is 140 KIAS.

Note considerably decreased range!

LANDING GEAR EXTENSION FAILURE

In case no safe indication is obtained at normal landing gear extension (landing gear position indication lights are illuminated, gear warning light UNSAFE is extinguished and gear warning horn does not sound even with wing flaps extended or engine power reduced), the function of the indication lights is to be checked first by pressing the "Test"-button on the annunciator panel; if none of the gear position indication lights is defective, retract and extend the gear once again. If this second extension trial does not result in a safe indication, use the emergency landing gear extension system.

As the nose gear is extended opposite the airstream, reduce airspeed and engine power.

1. Circuit Breaker GEAR ACT - Pull
2. Landing Gear Lever - DOWN
3. Airspeed - 80 KIAS
4. Throttle - IDLE
5. Emergency Landing Gear Release (at center console, near pilot's right knee) - Pull up
6. Check if three green landing gear indication lights are illuminated. Otherwise proceed according to page 3-17/3-18 (landing with landing gear retracted).

ELECTRICAL SYSTEM FAILURE

HIGH BATTERY CHARGING CURRENT

After application of high electrical load - e.g. after repeated cranking of the engine, at cold weather or extended taxiing periods - the battery might be discharged to a level that requires an increased charging current for the initial period of the flight. However, after an adequate period of time (appr. 30 min.) the amperemeter indication has to decrease to zero steadily and the voltmeter indication should read between 24 and 30 V. If the amperemeter indicates a charging current of more than 10 A for a longer period, overheating of the battery becomes possible, resulting in accelerated vaporization of the electrolyte. In order to avoid overcharging of the battery, turn OFF the alternator master switch and terminate the flight. If immediate landing is impossible, reduce power consumption from the battery to minimum.

INSUFFICIENT CHARGING CURRENT

If the amperemeter indicates continuous discharging of the battery during flight this means:

- a) Alternator and/or voltage regulator failure
or
- b) loading of power supply system too high.

Electrical load has to be reduced first. If the amperemeter continues indicating discharge turn off the alternator master switch in order to disconnect the alternator from the power distribution bus. With the alternator switched off, the total electrical load is connected to the battery and any not absolutely necessary electrical equipment should be switched off to reduce power consumption from the battery.

Operation with master switch turned off:

If the master switch is in the OFF position any electrical equipment and systems are out of order, except the emergency locator transmitter (ELT - if installed).

The engine is equipped with a magneto ignition system and does not require electrical power from the airplane power supply. The electrical fuel pump will not be available any more.

UNINTENTIONAL SPIN

Note

The best method of avoiding spins is to avoid flight attitudes which might lead to spinning.

At slow airspeeds, which lead to the proximity of stall, extreme caution and attention is required. Abrupt and large control movements as well as sudden changes in engine power are to be avoided in these flight attitudes.

If the airplane should enter a spin during stalling, immediately apply controls (see page 3-38).

LANDING AFTER LOSS OF PRIMARY CONTROLS

Primary control failure is extremely remote. However, a safe landing is still possible in this case.

LOSS OF RUDDER

The airplane can be controlled by aileron only.

Maintain a sufficient margin from the stall speed because spin recovery, for instance, is not possible.

Select landing site without any crosswind component if possible. Increase approach speed by 5 to 10 kts. After touchdown lower the nose gear immediately and maintain direction by means of nose wheel steering and braking.

LOSS OF ROLL CONTROL

The airplane can be controlled by rudder. Propeller twist supports left turns and delays right turns.

Do not exceed 15° bank during turns. No abrupt power changes. Plan for long approach. Select landing site with no crosswind component if possible. Increase approach speed by 5 to 10 kts.

WARNING

Bank angles of more than 15° may result in a spiral dive, recovery from which is difficult and combined with a high loss of altitude.

LOSS OF ELEVATOR CONTROL

Immediately trim the airplane for level flight at a medium power setting.

Avoid turns of more than 15° Bank.

If power is increased at a trimmed attitude the airplane will raise its nose above the horizon and climb.

If power is reduced the nose will fall below the horizon. If power is reduced to idle the nose will drop distinctly below the horizon and considerable descent rates may occur.

<i>WARNING</i>

Perform power changes carefully and in small steps.

Trim must be used carefully too, in order to avoid oscillations due to overcontrol.

Landing

Whenever possible, select a long runway with a low crosswind component.

Plan for a long approach. Extend landing gear and flaps early (Flaps 30°).

Set propeller to fine pitch and manifold pressure to appr. 14 - 15 inHg initially.

Adjust trim and power in small increments for a stabilized descent rate of 300 - 400 ft/min. at appr. 80 KIAS. Maintain this stabilized descent until approaching 3 ft above ground. Flare carefully by using little trim.

WARNING

Do not reduce power tight to the ground in any case as this will result in a heavy nose down moment and force the nose wheel to impact the runway.

Reduce power only after touchdown of the main wheels.

DOOR NOT LOCKED DURING FLIGHT

<i>WARNING</i>

Opening of the doors during flight is prohibited.

If it is determined during flight that only the front latch of one of the doors is locked and the rear latch is outside the fuselage wall maintain this configuration and land as soon as practical. Airspeed has to be limited to 140 KIAS.

Trying to lock the door correctly during flight will not be successful, as the opening of the door will result in overpressure in the cockpit. Yawing does not improve the situation.

If a door has not been locked at all on the ground you will observe at full power that the door will be slightly sucked to the outside. A strong noise of wind will form in the cockpit. If, however, this distinct sign has not been noticed the following procedure is to be applied.

IT IS DETERMINED AFTER TAKEOFF THAT THE PILOT'S DOOR IS STILL OPEN.

Continue normal climb. Keep the door by the handle and pull it easily towards the fuselage. After reaching a safe altitude, set flaps to 30°, airspeed to 80 KIAS and power to idle, then lock the front latch. Land as soon as practical.

Note

At airspeeds below 80 KIAS it is possible to give the door free for a short time to operate flaps, landing gear, or engine.

IT IS DETERMINED AFTER TAKEOFF THAT THE COPILOT'S DOOR IS STILL OPEN.

- If the copilot's seat is not occupied: Leave the door open, airspeed below 80 KIAS, flaps 30°. The door will remain stable in a slightly opened position as long as the airspeed does not exceed 80 KIAS. At higher speeds, the door may flutter. Complete a circuit pattern and land.

WARNING

The attempt to close an open right door from the left seat without the help of a copilot or to close the front latch might result in dangerous flight attitudes and therefore is to be omitted.

- If the copilot's seat is occupied the copilot or passenger may keep the door until landing or try to close the front latch.

LOSS OF PROPELLER SPEED CONTROL

Propeller speed control is by a hydraulic governor, which is supplied with oil from the engine. In case of loss of oil pressure, the propeller blades will move towards the mechanical low pitch stop. This stop is adjusted to allow the continuation of the flight with reduced power and airspeed.

The installed engine is derated to max. 2400 RPM for the R 90-230 RG. Maximum certified RPM, however, concerning the engine itself is 2575 RPM.

In an emergency situation, i.e. at propeller governor failure, the engine may be operated up to 2575 RPM. Any other engine limitations however, have to be observed.

ENGINE INDUCTION SYSTEM FAILURE

At icing or blocking of the air inlet or the combustion air filter, a flap in the filter housing is sucked open and air is fed from the engine compartment.

In this case, a power reduction of up to 14% might result.

There is no indication for the pilot whether the induction air is supplied via this flap.

FLIGHT WITH FUEL TANK NOT CLOSED

If you notice in flight that fuel is leaking from one of the filler caps, land as soon as practical.

Try to keep yaw-angles minimized until landing. If no malfunction occurs, set fuel selector to the open tank. With less than 26.4 US Gal (100 l) of usable fuel remaining in the respective tank, no considerable loss will occur any more during yaw-free flight.

STARTER SYSTEM MALFUNCTION

If starter relays or ignition switch malfunction occurs, it is possible that the starter continues cranking (ignition switch "BOTH"). This is indicated by the starter warning light which will remain illuminated after starting. If no warning light is installed or the warning light is defective (perform lamp test) a starter system malfunction is to be assumed at the following indications:

1. Voltmeter indicates a supply voltage of 24 V or less.
2. Ammeter indicates high battery charging current.

The same indications occur with a discharged battery. A discharged battery, however, should have reached a sufficient charging status until takeoff and the charging current should be reduced. If a starter system malfunction is assumed the engine has to be shut down immediately. In case of a starter system malfunction, the starter will continue cranking the engine until the battery is completely discharged.

WARNING

If there is any doubt about the proper operation of the starter system a takeoff may not be performed under any circumstances.