

**SECTION 3  
EMERGENCY PROCEDURES**

**CONTENTS**

	<b>Page</b>
Definitions . . . . .	3-1
Power Failure – General . . . . .	3-1
Power Failure Above 500 Feet AGL . . . . .	3-2
Power Failure Between 8 Feet and 500 Feet AGL . . . . .	3-2
Power Failure Below 8 Feet AGL . . . . .	3-3
Maximum Glide Distance Configuration . . . . .	3-3
Minimum Rate of Descent Configuration . . . . .	3-3
Air Restart Procedure . . . . .	3-3
Emergency Water Landing – Power Off . . . . .	3-4
Emergency Water Landing – Power On . . . . .	3-4
Loss of Tail Rotor Thrust in Forward Flight . . . . .	3-5
Loss of Tail Rotor Thrust in Hover . . . . .	3-5
Headset Audio Failure . . . . .	3-5
Engine Fire During Start on Ground . . . . .	3-6
Engine Fire in Flight . . . . .	3-6
Electrical Fire in Flight . . . . .	3-6
Tachometer Failure . . . . .	3-7
Hydraulic System Failure . . . . .	3-7
Governor Failure . . . . .	3-7
Warning/Caution Lights . . . . .	3-8
Audio Alerts . . . . .	3-11

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## SECTION 3

### EMERGENCY PROCEDURES

#### DEFINITIONS

Land Immediately – Land on the nearest clear area where a safe normal landing can be performed. Be prepared to enter autorotation during approach, if required.

Land as soon as practical – Landing site is at pilot's discretion based on nature of problem and available landing areas. Flight beyond nearest airport is not recommended.

#### POWER FAILURE – GENERAL

A power failure may be caused by either an engine or drive system failure and will usually be indicated by the low RPM horn. An engine failure may be indicated by a change in noise level, nose left yaw, an oil pressure light, or decreasing engine RPM. A drive system failure may be indicated by an unusual noise or vibration, nose right or left yaw, or decreasing rotor RPM while engine RPM is increasing.

In case of power failure, immediately lower collective to enter autorotation and reduce air speed to power-off  $V_{ne}$  or below.

#### **CAUTION**

Aft cyclic is required when collective is lowered at high air speed.

#### **CAUTION**

Do not apply aft cyclic during touchdown or ground slide to prevent possible blade strike to tailcone.

**POWER FAILURE ABOVE 500 FEET AGL**

1. Lower collective immediately to maintain rotor RPM.
2. Establish a steady glide at approximately 70 KIAS. (For maximum glide distance or minimum rate of descent, see page 3-3.)
3. Adjust collective to keep RPM between 97 and 108% or apply full down collective if light weight prevents attaining above 97%.
4. Select landing spot and, if altitude permits, maneuver so landing will be into wind.
5. A restart may be attempted at pilot's discretion if sufficient time is available (See "Air Restart Procedure", page 3-3).
6. If unable to restart, turn unnecessary switches and fuel valve off.
7. At about 40 feet AGL, begin cyclic flare to reduce rate of descent and forward speed.
8. At about 8 feet AGL, apply forward cyclic to level ship and raise collective just before touchdown to cushion landing. Touch down in level attitude with nose straight ahead.

**POWER FAILURE BETWEEN 8 FEET AND 500 FEET AGL**

1. Lower collective immediately to maintain rotor RPM.
2. Adjust collective to keep RPM between 97 and 108% or apply full down collective if light weight prevents attaining above 97%.
3. Maintain airspeed until ground is approached, then begin cyclic flare to reduce rate of descent and forward speed.
4. At about 8 feet AGL, apply forward cyclic to level ship and raise collective just before touchdown to cushion landing. Touch down in level attitude with nose straight ahead.

**POWER FAILURE BELOW 8 FEET AGL**

1. Apply right pedal as required to prevent yawing.
2. Allow helicopter to settle.
3. Raise collective just before touchdown to cushion landing.

**MAXIMUM GLIDE DISTANCE CONFIGURATION**

1. Airspeed approximately 90 KIAS.
2. Rotor RPM approximately 90%.

Best glide ratio is about 4.7:1 or one nautical mile per 1300 feet AGL.

**MINIMUM RATE OF DESCENT CONFIGURATION**

1. Airspeed approximately 55 KIAS.
2. Rotor RPM approximately 90%.

Minimum rate of descent is about 1350 feet per minute. Glide ratio is about 4:1 or one nautical mile per 1500 feet AGL.

***CAUTION***

Increase rotor RPM to 97% minimum or full down collective when autorotating below 500 feet AGL.

**AIR RESTART PROCEDURE**

***CAUTION***

Do not attempt restart if engine malfunction is suspected or before safe autorotation is established.

1. Mixture – full rich.
2. Throttle – closed, then cracked slightly.
3. Actuate starter with left hand.

**EMERGENCY WATER LANDING – POWER OFF**

1. Follow same procedures as for power failure over land until contacting water. If time permits, unlatch doors prior to water contact.
2. Apply lateral cyclic when aircraft contacts water to stop rotors.
3. Release seat belt and quickly clear aircraft when rotors stop.

**EMERGENCY WATER LANDING – POWER ON**

1. Descend to hover above water.
2. Unlatch doors.
3. Passengers exit aircraft.
4. Fly to safe distance from passengers to avoid possible injury by rotors.
5. Switch battery and alternator OFF.
6. Roll throttle off into overtravel spring.
7. Keep aircraft level and apply full collective as aircraft contacts water.
8. Apply lateral cyclic to stop rotors.
9. Release seat belt and quickly clear aircraft when rotors stop.

### **LOSS OF TAIL ROTOR THRUST IN FORWARD FLIGHT**

Failure is usually indicated by nose right yaw which cannot be corrected by applying left pedal.

1. Immediately enter autorotation.
2. Maintain at least 70 KIAS if practical.
3. Select landing site, roll throttle off into overtravel spring, and perform autorotation landing.

#### ***NOTE***

When a suitable landing site is not available, the vertical stabilizers may permit limited controlled flight at low power settings and airspeeds above 70 KIAS; however, prior to reducing airspeed, enter full autorotation.

### **LOSS OF TAIL ROTOR THRUST IN HOVER**

Failure is usually indicated by nose right yaw which cannot be stopped by applying left pedal.

1. Immediately roll throttle off into overtravel spring and allow aircraft to settle.
2. Raise collective just before touchdown to cushion landing.

### **HEADSET AUDIO FAILURE**

If headset audio fails, land as soon as practical.

#### ***CAUTION***

For aircraft which provide low RPM horn through the audio system, pilot will not hear horn with a failed headset.

### **ENGINE FIRE DURING START ON GROUND**

1. Cranking – Continue and attempt to start which would suck flames and excess fuel into engine.
2. If engine starts, run at 60-70% RPM for a short time.
3. Fuel mixture – OFF.
4. Fuel valve – OFF.
5. Battery switch – OFF.
6. If time permits, apply rotor brake to stop rotors.
7. Exit helicopter.

### **ENGINE FIRE IN FLIGHT**

1. Enter autorotation.
2. Cabin heat – OFF (if time permits).
3. Cabin vent – ON (if time permits).
4. **If engine is running**, perform normal landing, then pull fuel mixture OFF and shut fuel valve OFF.  
**If engine stops running**, shut fuel valve OFF and complete autorotation landing.
5. Battery switch – OFF.
6. If time permits, apply rotor brake to stop rotors.
7. Exit helicopter.

### **ELECTRICAL FIRE IN FLIGHT**

1. Battery and alternator switches – OFF.
2. Open cabin vents.
3. Land immediately.
4. Pull fuel mixture OFF and shut fuel valve OFF.
5. If time permits, apply rotor brake to stop rotors.
6. Exit helicopter.

#### ***NOTE***

Low RPM warning system and governor are inoperative with battery and alternator switches both off.



### **TACHOMETER FAILURE**

If rotor or engine tach malfunctions in flight, use remaining tach to monitor RPM. If it is not clear which tach is malfunctioning or if both tachs malfunction, allow governor to control RPM and land as soon as practical.

#### ***NOTE***

Each tach, the governor, and the low RPM horn are on separate power circuits. A special circuit allows the battery to supply power to the tachs with the battery and alternator switches both off.

### **HYDRAULIC SYSTEM FAILURE**

Hydraulic system failure is indicated by heavy or stiff cyclic and collective controls. Loss of hydraulic fluid may cause intermittent and/or vibrating feedback in the controls. Control will be normal except for the increase in stick forces.

1. HYD Switch – verify ON.
2. If hydraulics not restored, HYD Switch – OFF.
3. Adjust airspeed and flight condition as desired for comfortable control.
4. Land as soon as practical.

### **GOVERNOR FAILURE**

If engine RPM governor malfunctions, grip throttle firmly to override the governor, then switch governor off. Complete flight using manual throttle control.

**WARNING/CAUTION LIGHTS**

***NOTE***

If a light causes excessive glare at night, bulb may be unscrewed or circuit breaker pulled to eliminate glare during landing.

- OIL** Indicates loss of engine power or oil pressure. Check engine tach for power loss. Check oil pressure gage and, if pressure loss is confirmed, land immediately. Continued operation without oil pressure will cause serious engine damage and engine failure may occur.
- ENG FIRE** Indicates possible fire in engine compartment. See procedures on page 3-6.
- MR TEMP** Indicates excessive temperature of main rotor gearbox. See note below.
- MR CHIP** Indicates metallic particles in main rotor gearbox. See note below.
- TR CHIP** Indicates metallic particles in tail rotor gearbox. See note below.

***NOTE***

If light is accompanied by any indication of a problem such as noise, vibration, or temperature rise, land immediately. If there is no other indication of a problem, land as soon as practical.

Break-in fuzz will occasionally activate chip lights. If no metal chips or slivers are found on detector plug, clean and reinstall (tail gearbox must be refilled with new oil). Hover for at least 30 minutes. If chip light comes on again, replace gearbox before further flight.

**WARNING/CAUTION LIGHTS (cont'd)**

**LOW FUEL** Indicates approximately three gallons of usable fuel remaining. The engine will run out of fuel after ten minutes at cruise power.

***CAUTION***

Do not use low fuel caution light as a working indication of fuel quantity.

**CLUTCH** Indicates clutch actuator circuit is on, either engaging or disengaging clutch. When switch is in the ENGAGE position, light stays on until belts are properly tensioned. Never take off before light goes out.

***NOTE***

Clutch light may come on momentarily during run-up or during flight to re-tension belts as they warm-up and stretch slightly. This is normal. If, however, the light flickers or comes on in flight and does not go out within 10 seconds, pull CLUTCH circuit breaker and land as soon as practical. Reduce power and land immediately if there are other indications of drive system failure (be prepared to enter autorotation). Have drive system inspected for a possible malfunction.

**ALT** Indicates low voltage and possible alternator failure. Turn off nonessential electrical equipment and switch ALT off then back on after one second to reset alternator control unit. If light stays on, land as soon as practical. Continued flight without functioning alternator can result in loss of power to tachometers, producing a hazardous flight condition.

**WARNING/CAUTION LIGHTS (cont'd)**

**STARTER ON** Indicates starter motor is engaged. If light does not go out when ignition switch is released from start position, immediately pull mixture off and turn battery switch off. Have starter motor serviced.

**LOW RPM** Indicates rotor speed below 97% RPM. To restore RPM, immediately lower collective, roll throttle on and, in forward flight, apply aft cyclic. Light is disabled when collective is full down.

**GOV OFF** Indicates engine RPM governor is switched off.

**CARBON MONOXIDE** Indicates elevated levels of carbon monoxide (CO) in cabin. Shut off heater and open nose and door vents. If hovering, land or transition to forward flight. If symptoms of CO poisoning (headache, drowsiness, dizziness) accompany light, land immediately.

**BRAKE** Indicates rotor brake is engaged. Release immediately in flight or before starting engine.

**FULL THROTTLE (if installed)** Indicates engine near full throttle. The governor will be ineffective because it cannot increase throttle to maintain RPM. Lower collective as required to extinguish light.

**HYD (if installed)** Indicates hydraulic system is switched off.

## **AUDIO ALERTS**

### **LOW RPM HORN**

Horn is provided by speakers in the side of the instrument console on earlier aircraft or through the audio system on later aircraft. The horn activates simultaneously with the LOW RPM caution light and indicates rotor speed below 97% RPM. To restore RPM, lower collective, roll throttle on and, in forward flight, apply aft cyclic. Horn and light are disabled when collective is full down.

### **HIGH RPM WARBLE**

On later aircraft, a warble (high/low tone) in the audio system indicates rotor speed is approaching the 108% RPM limit. Raise collective as required to control RPM.

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