

SECTION III

EMERGENCY PROCEDURES

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GENERAL

The emergency situations and procedures outlined in this section cover the common types of emergencies encountered; however, the procedures used in each actual emergency encountered must result from consideration of the complete situation. Compound emergencies may require departure from normal corrective procedures set forth below for any specific emergency. Due to the varied types of equipment installed, pilots and aircrewmembers must be thoroughly familiar with the emergency procedures in the succeeding paragraphs. The terms ABORT MISSION, and LAND AS SOON AS PRACTICABLE are used throughout this section for the purpose of standardizing phraseology. The absolute definitions of these specific terms have been intentionally omitted so as not to preclude the use of sound judgment on the part of the pilot in command under these conditions. A radio call and a switching of the transponder to an emergency code should be attempted in emergencies requiring a forced landing.

ENGINE EMERGENCIES DURING START**ENGINE FAILS TO LIGHT-OFF****Symptom**

Engine fails to light-off within 15 seconds after opening speed selector.

Corrective Action

1. Speed selector—STOPCOCKED.
2. Starter button—RELEASE.
3. Monitor T5.

Before attempting another start, investigate and analyze the conditions requiring the abort. If the situation justifies another start, wait 3 minutes for starter to cool and fuel to drain before repeating the start procedure. It is desirable to use external power for subsequent starts.

HOT START**Symptom**

T5 rises abnormally and/or appears that it will exceed 700°C.

Corrective Action

1. Speed selector—STOPCOCK.
2. Starter button—DEPRESSED UNTIL T5 FALLS BELOW 300°C.
3. Starter button—RELEASED.
4. T5—MONITOR.

NOTE

If starter has been released and T5 remains above 300°C., engage starter below 20% Ng. If any doubt exists or if overtemp limits were exceeded during start, do not attempt second start. Refer to Section VII for probable hot start causes.

COLD HANG UP**Symptom**

Ng fails to accelerate to ground idle and T5 remains low.

Corrective Action

1. T5—MONITOR.
2. Emergency Throttle—INCREASE TO OBTAIN 56% Ng.
3. Emergency Throttle—CLOSED.

NOTE

If Ng fails to remain in the idle range after closing emergency throttle, stopcock speed selector and investigate cause. For operation in cold weather refer to Section IX. Refer to Section VII for probable causes of a cold hang up.

ENGINE EMERGENCIES ON GROUND**ENGINE STALL****Symptoms**

1. Rapid rise in T5.

2. Hang up or decay of N_g .
3. Possible rumble or bangs.

Corrective Action

1. Speed Selector—STOPCOCK.
2. T_5 —MONITOR.

ENGINE FLAME-OUT

Symptoms

1. N_g , T_5 , and fuel pressure decrease.

Corrective Action

1. Speed selector—STOPCOCK.
2. T_5 —MONITOR.

CAUTION

Following a flame-out for any cause, a restart should not be attempted until the cause has been corrected.

ENGINE EMERGENCIES—IN-FLIGHT

The material contained herein assumes a certain knowledge of basic engine operation. In regard to cockpit indications it is particularly important to consider the relationship of N_g and T_5 . These two indicators, on a properly operating engine, will always rise and fall together as a function of engine power.

When analyzing any engine malfunction it is imperative that corrective action be based on an intelligent analysis of all indications of engine operation and not on any one source alone. Except where otherwise noted, other cockpit instruments remain normal.

Engine emergencies fall into two general categories. The first is a complete power loss. Transmission noise makes engine deceleration difficult to detect.

There may be an audible warning of imminent engine failure if a forward accessory gear or engine bearing failure occurs.

The second category of engine emergencies includes interruption, oscillation and decrease or increase from selected power. Fuel contamination and malfunctions

of the fuel control system, P3 bleed, Test No. 1, and N_f flexshaft are the primary causes. The power change could be slow or a very rapid loss/increase. The rapid power loss situation requires an immediate lowering of collective and analysis of the power instruments (N_g , fuel pressure, T_5 , N_f/N_r) to determine if the engine is still operating. This is difficult unless the pilot includes these instruments in his scan during practice. If the engine is still operating and T_5 has not overtemped, increase emergency throttle to 100% N_f/N_r and recover. If the engine has flamed out, emergency throttle will not correct the situation. If indicated, attempt a restart. In any case, if in an autorotation, do not allow attention to be diverted to the detriment of the autorotative landing.

ENGINE FAILURE IN A HOVER

The hover altitude and the nature of the engine power decrease will dictate the requirement for collective management. Hover altitudes below approximately 15 feet will not require lowering of the collective to preserve rotor RPM prior to raising collective for cushioning. Hover altitudes above approximately 15 feet, coupled with a sudden and complete loss of power, will require collective lowering in proportion to altitude to preserve sufficient rotor RPM for control and cushioning. Approximately 30 feet is sufficient altitude from which to fully lower the collective.

Symptoms

1. Rapid settling/ N_r decaying.
2. Left yaw.
3. Left drift.

Corrective Action

1. Collective—LOWER AS REQUIRED TO PRESERVE N_r .
2. Cyclic—STOP DRIFT.
3. Tail rotor pedals—STOP YAW.
4. Collective—RAISE TO CUSHION TOUCHDOWN; LOWER SMOOTHLY AFTER TOUCHDOWN.
5. Cyclic—PLACE IN NEUTRAL POSITION AFTER TOUCHDOWN.

ENGINE FAILURE DURING TRANSITION, CLIMB, AND APPROACH

Altitude, airspeed, and surface conditions are the primary factors which effect recovery after engine failure during transition and climb. Wind, aircraft weight, and density altitude will also affect aircraft performance. During transition, at altitudes below approximately 15 feet, lowering of the collective is not required. During climbout above 15 feet, the collective must be lowered in proportion to altitude to preserve adequate rotor rpm. Above 30 feet of altitude the collective should be lowered fully. The surface conditions will dictate the groundspeed allowable for touchdown.

WARNING

During climbout above 30 feet the collective must be lowered **IMMEDIATELY AND RAPIDLY** to minimum, and the aircraft must be rotated to a nose-up attitude to preserve sufficient rotor rpm for control.

Symptoms

1. Rotor rpm decaying.
2. Rapid settling.

Corrective Action

1. Collective—**LOWER AS REQUIRED TO PRESERVE Nr.**
2. Cyclic—**ADJUST ATTITUDE TO CONTROL GROUND SPEED AS DICTATED BY TERRAIN AND STOP DRIFT.**
3. Tail rotor pedals—**STOP YAW.**
4. Collective—**RAISE TO CUSHION TOUCHDOWN. LOWER SMOOTHLY AFTER TOUCHDOWN.**
5. Cyclic—**PLACE IN NEUTRAL POSITION AFTER TOUCHDOWN.**

ENGINE FAILURE DURING FLIGHT**Symptoms**

1. Rotor rpm decaying.

2. Rapid settling.

Corrective Action (Visual Autorotation)

1. Collective—**LOWER TO MINIMUM.**
2. Establish autorotative descent to arrive at selected landing site into the wind when practicable.
 - a. Engine instruments—**ANALYZE.**
 - b. Speed selector—**STOPCOCK.**
 - c. Wheels—**AS REQUIRED.**
 - d. Cabin occupants—**ALERTED.**
 - e. Shoulder harness—**LOCKED.**
 - f. Transponder—**EMERGENCY SQUAWK.**
 - g. Distress call—**TRANSMIT.**
 - h. Cockpit sliding windows and cabin door—**OPEN.**
 - i. If time, altitude, and cause of engine failure permit, attempt engine restart (refer to restarting engine inflight, this section).
 - j. Landing light/flood lights—**AS REQUIRED.**
3. Autorotate using practiced techniques.
4. Collective—**RAISE TO CUSHION TOUCHDOWN. LOWER SMOOTHLY AFTER TOUCHDOWN.**
5. Cyclic—**PLACE IN NEUTRAL POSITION AFTER TOUCHDOWN.**
6. Rotor brake—**AS REQUIRED.**
 - a. Land—**ON.**
 - b. Water—**ALLOW ROTOR TO COAST DOWN PRIOR TO APPLYING ROTOR BRAKE.**

NOTE

An autorotation over trees should be planned to arrive at zero ground speed at tree top level, allowing the trees to cushion the descent to ground contact.

Corrective Action (Instrument Autorotation)

1. Collective—LOWER TO MINIMUM, THEN ADJUST TO MAINTAIN 100% N_r .
2. Establish 55 knot autorotative descent into the wind when practicable. Place feet on the deck.
 - a. Engine instruments—ANALYZE.
 - b. Speed selector—STOPCOCK.
 - c. Wheels—AS REQUIRED.
 - d. Cabin occupants—ALERTED.
 - e. Shoulder harness—LOCKED.
 - f. Transponder—EMERGENCY SQUAWK.
 - g. Distress call—TRANSMIT.
 - h. Cockpit sliding windows and cabin door—OPEN.
 - i. If time, altitude, and cause of engine failure permit, attempt engine restart (refer to re-starting engine inflight, this section).
 - j. Landing light/flood lights—AS REQUIRED.
3. At 140 feet on RADALT—FLARE AT A RATE SO AS TO ARRIVE AT 20° NOSE- UP AT 70-90 FEET ON RADALT.
4. Maintain 20° nose-up attitude until airspeed has slowed to the desired exit speed.
5. Exit flare to 5° nose-up touchdown attitude.
6. Begin collective pull at approximately 35 feet on RADALT to control rate of descent and cushion landing. Lower smoothly after touchdown.
7. Cyclic—PLACE IN NEUTRAL POSITION AFTER TOUCHDOWN.
8. Rotor brake—AS REQUIRED.
 - a. Land—ON.
 - b. Water—ALLOW ROTOR TO COAST DOWN PRIOR TO APPLYING ROTOR BRAKE.

CAUTION

Smooth lowering of the collective after touchdown in any full autorotation is required. Holding the collective up, or rapidly slamming it down may cause the rotor blades to either stall or flex down and strike the tail boom. Holding aft cyclic may aggravate this tendency.

HIGH SPEED SHAFT FAILURE**Symptoms**

1. N_r —DECAYING.
2. N_r —INCREASING.
3. Zero torque indication possibly accompanied by loud noises from the transmission area.

NOTE

If N_r reaches 122%, the N_r overspeed protection will secure fuel at the fuel control. When N_r falls below 122%, fuel will again begin to flow and the engine may or may not relight.

Corrective Action

1. Collective—LOWER IMMEDIATELY TO MAINTAIN N_r .
2. Speed selector—STOPCOCK.
3. Autorotate using practiced techniques.

ENGINE POWER DECREASE CONDITION**Symptoms**

1. N_r —DECAYING
2. Engine instruments—LESS THAN SELECTED, STEADY OR FLUCTUATING.

Corrective Action

1. Collective—LOWER TO MAINTAIN N_r (enter autorotation if necessary).

2. Engine instruments—ANALYZE.
3. Emergency throttle—ADVANCE TO OBTAIN 100% Nr/Nr.

CAUTION

If power is not regained or T5 is an over-temp condition, stopcock speed selector. (Refer to ENGINE FAILURE DURING FLIGHT procedures this section.)

4. Collective—ADJUST AS REQUIRED FOR FLIGHT.
5. Speed selector—FLIGHT IDLE.
6. Land as soon as practicable.

CAUTION

When operating on emergency throttle, there is no automatic 110% Nr rotor overspeed protection against overspeed caused by mismanagement of emergency throttle.

CAUTION

Stopcock function is still controlled by the speed selector even when the engine is being controlled by emergency throttle.

ENGINE POWER INCREASE CONDITION

Symptoms

1. Nr—INCREASING.
2. Power instruments—GREATER THAN SELECTED, STEADY OR FLUCTUATING.
3. Nr—ZERO (FLEX SHAFT BROKEN) OR FLUCTUATING.

Corrective Action

1. Emergency throttle—ADVANCE TO CONTROL Nr FLUCTUATIONS.

2. Speed selector—FLIGHT IDLE.
3. Emergency throttle—ADJUST TO 100% Nr.
4. Collective—ADJUST AS REQUIRED FOR FLIGHT.
5. Land as soon as practicable.

CAUTION

In the event of Nr flex shaft failure, there is no 122% Nr overspeed stopcock feature.

NOTE

Controlling Nr with the collective during a flexshaft failure is not recommended. Torque in excess of 116% would have to be applied to the rotor system to contain Nr below 110%, resulting in a severe overtorque condition in addition to the rotor overspeed condition.

RESTARTING ENGINE IN FLIGHT

Altitude and mode of failure will dictate whether an in-flight engine restart should be attempted. The altitude at which air restart can be safely accomplished depends on pilot judgement.

Corrective Action

1. Speed selector stopcock—RECHECKED.
2. Emergency throttle closed—RECHECKED.
3. Starter switch—DEPRESS.
4. Ng accelerating through 14%—CHECKED.
5. Speed selector—ADVANCE TO GROUND IDLE.
6. After light off—MONITOR T5 and Ng ACCELERATION.
7. Observe 45% Ng—RELEASE STARTER BUTTON.

8. When engine reaches ground idle—ADVANCE EMERGENCY THROTTLE TO RE-ESTABLISH LEVEL FLIGHT. MONITOR T₅.
9. If restart attempt is successful:
 - a. Speed selector—FLIGHT IDLE.
 - b. Land as soon as practicable.
10. If restart attempt is unsuccessful:
 - a. Speed selector—STOPCOCK.
 - b. Complete autorotation.

CAUTION

Do not let attention be diverted to the detriment of the autorotation.

ENGINE LUBRICATION SYSTEM FAILURE

Symptoms

1. Engine oil pressure—BELOW NORMAL.
2. Engine oil temperature—ABOVE NORMAL.
3. N_g drops to zero—POSSIBLE OIL PUMP DRIVE FAILURE.

Corrective Action

1. Land as soon as practicable.

FUEL SYSTEM MALFUNCTIONS

ENGINE-DRIVEN FUEL PUMP

Symptoms

1. N_g, T₅, fuel pressure—DECREASING.
2. N_r/N_r—DECREASING.

Corrective Action

1. Refer to procedures for ENGINE EMERGENCIES-IN-FLIGHT in this section.

SINGLE FUEL BOOST PUMP FAILURE

Symptom

1. NO. 1 FUEL PUMP or NO. 2 FUEL PUMP caution light—ON.

Corrective Action.

1. Failed fuel boost pump switch—OFF.
2. If failed pump is the NO. 1 boost pump: DC NON ESS BUS OVRD—ON.
3. Abort mission.

DUAL FUEL BOOST PUMP FAILURE

Symptoms

1. NO. 1 FUEL PUMP caution light—ON.
2. NO. 2 FUEL PUMP caution light—ON.

Corrective Action

1. Failed fuel boost pump switches—OFF.
2. Land as soon as practicable.
3. Plan flight path to allow for an autorotation in event of a flameout.
4. Maintain as high a power setting as possible.
5. Avoid rapid power changes.

CAUTION

Do not reset the fuel boost pump circuit breakers.

NOTE

Fuel in the aft tank cannot be transferred to the forward tank.

FUEL TRANSFER SYSTEM FAILURE

It is possible to have fuel transfer system problems that can result in symptoms similar to a dual boost pump failure. Clogged, inoperative, or disconnected ejectors, or other plumbing failures could cause inadequate fuel

transfer to the collector can to keep the fuel boost pumps immersed in fuel. This would result in the loss of positive fuel pressure from the boost pumps and lighting of both fuel pump caution lights simultaneously or within a short period of time of each other. Engine failure due to fuel starvation is probable within a very short period of time. A fuel transfer system failure is distinguished from a dual boost pump failure by the simultaneous lighting of the caution lights and the probable absence of unusual noises.

Symptoms

1. Both FUEL PUMP caution lights—ON (simultaneously, or within a few seconds of each other).

Corrective Action

1. Turn toward the nearest landing area and land immediately.
2. Plan flight path to allow for an autorotation in the event of a flameout.

WARNING

Anticipate an engine failure within an extremely short period of time.

AIR FRAME FUEL FILTER CONTAMINATION

Symptom

1. FUEL BYPASS caution light—ON.

Corrective Action

1. Land as soon as practicable.

MAIN GEAR BOX MALFUNCTION

Impending failure of the main gear box may be indicated by lighting of the chip detector caution light or by abnormal transmission oil pressure indications. The chip detector light indicates the presence of metallic chips in the transmission oil system. Carefully monitor transmission oil pressure and temperature.

Symptoms

1. TRANS OIL PRESS caution light—ON.
2. Transmission oil pressure.—BELOW NORMAL.

3. Transmission oil temperature— ABOVE NORMAL.
4. CHIP DETECTED caution light—ON.

Corrective Action

If any of the above conditions are observed:

1. Enter an immediate descent and land as soon as practicable.
2. If a landing is not feasible due to terrain or sea conditions, air taxi to the nearest suitable landing site and land immediately.

WARNING

With a complete loss of transmission oil, the high speed portion of the main gear box may fail within an extremely short period of time.

WARNING

A complete transmission oil loss, indicated by zero transmission oil pressure, lighting of the transmission oil pressure caution light, zero torque indication, or visual confirmation of oil loss accompanied by rumbling or grinding noises or vibrations from the transmission area may dictate securing the engine and immediately entering an autorotation to prevent destructive failure of the high speed section, which could damage the flight control/rotor system, making further controlled flight impossible.

WARNING

Anytime main gear box oil is lost and the oil pressure goes to zero it must be assumed that internal damage has occurred. Further flight after landing shall not be attempted.

GROUND RESONANCE

Symptoms

1. One or more wheels touching the ground.

- Rotor system becomes severely unbalanced laterally at a rapidly increasing rate, jeopardizing the integrity of the airframe.

Corrective Action

- Get the helicopter airborne.

If impossible:

- Collective—FULL DOWN.
- Speed selector—STOPCOCK.
- Rotor brake—FULL ON.
- Wheel brakes—APPLY.

NOTE

Ground resonance will not occur during a water landing or takeoff.

ROTOR OVERSPEED

Symptom

- N_r exceeds 110%.

Corrective Action

- N_r 111% to 120%—LAND AS SOON AS PRACTICABLE, URGENT MISSION MAY BE COMPLETED.
- N_r over 120%—LAND AS SOON AS PRACTICABLE.

MAIN GEAR BOX OVERTORQUE

Symptoms

- Torquemeter indicates 116% or more.
- Event indicator displays red flag.

Corrective Action

- Land as soon as practicable.

MAIN ROTOR BLADE DAMPER MALFUNCTION

Symptom

- Rough head indications with associated fuselage vibrations, the magnitude of which varies with control inputs and RPM changes.

NOTE

These indications will be more evident at a high power condition.

Corrective Action

- Airspeed—55 KNOTS.
- Land as soon as practicable.

CAUTION

Ground resonance could be encountered during or after landing. (Refer to procedures for GROUND RESONANCE this section.)

IBIS PRESSURE WARNING

Symptoms

- BLADE PRESS caution light—ON.

Corrective Action

- IBIS AC circuit breaker—CHECK. RESET IF OUT.
- Land as soon as practicable.
- After landing and securing the helicopter, the IBIS indicators shall be visually inspected.
 - If any IBIS indicator shows red, maintenance action is required and shall be completed prior to further flight. The protective cover on the Standard SAR Board shall be placed over any red IBIS indicator to preclude radiation leakage.
 - If all IBIS indicators are yellow, the helicopter may be flown to a location where maintenance action can be performed. The IBIS circuit breakers should be pulled to eliminate the BLADE PRESS caution light.

NOTE

The **BLADE PRESS** caution light may go on if hovering close to a vessel with an operating radar. If this should occur the vessel's radar should be secured to confirm the validity of the caution light.

ROTOR BLADE DAMAGE

In the event of known or suspected rotor blade damage in flight, the helicopter shall be promptly landed at the first opportunity. Possible loss of the airframe subsequent to a safe landing is not sufficient cause to continue flight with rotor blade damage. Further flight of the helicopter with damage exceeding negligible and repairable as defined in the applicable maintenance manual shall not be attempted.

ROTOR BRAKE MALFUNCTION**Symptoms**

1. Rotor brake caution light goes on with rotor turning.

Corrective Action

1. Rotor brake handle in detent—**CHECKED**.
2. Land as soon as practicable.

FLIGHT CONTROL SERVO UNIT MALFUNCTION (HARDOVER)**AUXILIARY HYDRAULIC SERVO SYSTEM HARDOVER****Symptoms**

1. Probable extreme displacement of one flight control (cyclic, collective or pedals).
2. Erratic behavior of helicopter, uncontrollable maneuvers, possible locking of flight controls.

Corrective Action

1. Servo shutoff switch—**AUX OFF**.
2. Airspeed—**60 KNOTS**.
3. Land as soon as practicable.

PRIMARY HYDRAULIC SERVO SYSTEM HARDOVER**CAUTION**

The auxiliary servo system will mask a malfunctioning primary servo. Feedback to the cyclic or collective may occur with the auxiliary system in operation. If a primary servo malfunction is suspected **DO NOT SECURE** the auxiliary servo system as a troubleshooting effort with rotor speeds greater than flight idle.

Symptoms

1. Possible primary pressure fluctuations associated with cyclic/collective movements.
2. Slightly erratic behavior of helicopter possible.

Corrective Action

1. Airspeed—**60 KNOTS**.
2. Land as soon as practicable.

NOTE

The indications of a primary hardover will probably be insufficient to warrant securing the system. As long as the aircraft is controllable, do not secure the primary hydraulic servo system.

SERVO HYDRAULIC PRESSURE FAILURE

Control of the helicopter can be maintained through either the primary or the auxiliary flight control system if one or the other should fail. Prolonged operation on one servo is not recommended.

Symptoms

1. **PRI HYD PRESS** or **AUX HYD PRESS** caution light—**ON**.
2. Corresponding pressure gauge indication—**BELOW NORMAL**.

Corrective Action

1. Servo switch (affected system)—**OFF**.

2. Airspeed—60 KNOTS.
3. Land as soon as practicable.

LOSS OF TAIL ROTOR DIRECTIONAL CONTROL

Loss of heading control could be the result of tail rotor blade loss or damage, failure of the tail rotor drive shaft between the transmission and the tail rotor, or a failure in the tail rotor control linkage. Tail rotor loss or failure of the drive shaft will result in a right yaw in powered flight, the amount of yaw being governed by the airspeed and the amount of power being applied to the main rotor. A failure in the control linkage may result in a loss of positive heading control. Direction and amount of yaw in this case will be determined by airspeed, torque, tail rotor rigging, and type of failure. A jammed control would result in a loss of positive heading control. The thrust produced by the tail rotor will be dependent upon the position of the control when it jams.

Tail rotor control system failures will likely fall into two categories: those resulting in loss of tail rotor pedal response and those resulting in a lockup of tail rotor control linkage. Loss of pedal response could probably result from separation of the control linkage. If the control linkage separates between the pedals and the AUX servo, the ASE yaw channel (with ASE engaged) will continue to maintain heading. In this situation heading can be controlled with the ASE yaw trim knob. If the control linkage separates between the AUX servo and the tail rotor, the tail rotor blade pitch will be controlled by the preset counterweights. This will result in a left, neutral or right yaw depending on airspeed, torque, and tail rotor rigging. Controlled flight is normally possible using cyclic for directional control while adjusting torque for minimum yaw.

TAIL ROTOR DRIVE SYSTEM FAILURE/TAIL ROTOR ASSEMBLY LOSS

Symptoms

1. Moderate to rapid RIGHT yaw of fuselage.

NOTE

The rate and amount of yaw are governed only by the power applied to the rotor system and the airspeed at the time of failure.

2. Loss of tail rotor pedal control.

NOTE

If the entire tail rotor assembly is lost, a forward shift in CG (pitch down) will accompany the above symptoms.

Corrective Action

1. During TAKEOFF, LANDING, or HOVERING (low altitude, slow airspeed).

- a. Speed selector—FLIGHT IDLE (STOPCOCK, TIME PERMITTING).

CAUTION

Increasing torque at a slow airspeed will cause the helicopters to rotate more rapidly to the right—thus aggravating the situation.

- b. Cyclic—MAINTAIN LEVEL ATTITUDE.

- c. Collective—INCREASE TO CONTROL RATE OF DESCENT AND CUSHION LANDING.

2. During FORWARD FLIGHT:

- a. Reduce power to establish a glide at 60-90 knots to regain some yaw control.
- b. Slowly add power to reduce rate-of-descent while compensating for right yaw with cyclic.
- c. Alert crew and lock shoulder harness.
- d. Maintain altitude and an airspeed of 60-90 knots.
- e. Burn off excess fuel.
- f. When over desired landing area—ENTER AUTOROTATIVE FLIGHT.
- g. Speed selector—AUTO DETENT.
- h. Flight path—MAINTAIN WITH CYCLIC.
- i. Speed selector—STOPCOCK WHEN SATISFIED THE APPROACH WILL PERMIT SUCCESSFUL COMPLETION OF THE AUTOROTATION TO THE DESIRED LANDING AREA.

- j. Complete autorotation.

NOTE

As airspeed decreases prior to touchdown, a yaw may develop. Control flight path over the ground with cyclic in order to touchdown moving in the direction the helicopter is pointed.

- k. After touchdown use wheel brakes for directional control.

TAIL ROTOR CONTROL SYSTEM FAILURE

Symptoms

1. Heading cannot be controlled with rudder pedals (Pedals may be locked or free to move.)
2. Left, right, or no yaw may be experienced depending upon the nature of the malfunction as well as the airspeed and torque.

Corrective Action

1. With locked tail rotor pedals:
 - a. Servo shutoff switch—AUX OFF.
 - b. If heading control is regained, land as soon as practicable.
 - c. If heading control is not regained, servo shutoff switch—ON. Refer to item 2.
2. With free pedals:
 - a. ASE yaw trim knob—TURN TO CHECK FOR HEADING RESPONSE.
 - (1) With heading response, land as soon as practicable using the yaw trim knob for heading control.
 - (2) Without heading response, evaluate the effects of changes in power and airspeed at altitude. A power/airspeed combination should be found that will produce minimum yaw for landing.

CAUTION

During this evaluation, the following yaw angle limitations should be observed when possible to prevent structural damage.

15° at 85 knots
 30° at 55 knots
 90° at 25 knots

3. Since it is possible for the tail rotor anti-torque thrust to be fixed at any setting in the range from 0% to above 100%, no one combination of power and airspeed can be specified for the proper recovery. Tail rotor control malfunctions can be placed into three distinct groups with respect to termination procedure:
 - a. Anti-torque thrust fixed to match low torque (0% to 35% torque).
 - b. Anti-torque thrust to match medium torque (35% to hover torque).
 - c. Anti-torque thrust fixed to match high torque (in excess of hover torque).
4. The termination procedures for each of the above groups will be different and are as follows:
 - a. Anti-torque thrust fixed to match low torque would require a modified normal approach, not too dissimilar from an autorotative approach, through a flare and touchdown in a running landing. Heading during the modified flare and touchdown must be controlled by maintaining a power setting near that determined at altitude for zero yaw angle. The rate of descent upon exit from the flare must be accepted and the primary emphasis must be on controlling the yaw angle with power.
 - b. Anti-torque thrust fixed to match medium torque would allow a somewhat normal approach to a running landing or hover. The approach should be executed by reducing power to simultaneously descend and decelerate to the back side of the power curve. This method would result in a left yaw whenever

engine power is set below the fixed anti-torque thrust. Minor heading changes prior to touchdown can be affected by minor changes in power. The termination—running landing or hover—is dependent upon the anti-torque thrust available and the aircraft performance.

- c. Anti-torque thrust fixed in excess of that required in a hover would require a modified normal approach to a hover followed by a reduction of N_f/N_r with the speed selector. The approach would be accomplished by a power reduction and deceleration, with an adverse left yaw. Termination in a hover would result in a hover with a left turn. Reduction of power in an effort to land would increase the rate of left turn. Landing with this condition must be accomplished by reducing N_f/N_r with the speed selector. This decrease in N_f/N_r would require more torque (higher collective position) to hover, and decrease the tail rotor rpm, and thus anti-torque thrust. The proper N_f/N_r and torque combination should be found to allow for landing with minimum turn rate.

5. After touchdown use wheel brakes for directional control.

WARNING

Avoid rapid reduction of collective at touchdown as an uncontrollable left turn may result.

VERTICAL GYRO FAILURE

Symptoms

1. Failed VGI OFF flag—EXPOSED.
2. GYRO caution light—ON (starboard gyro failure only).
3. Erratic or precessing VGI.
4. If failed gyro is selected on channel monitor panel—PITCH AND ROLL OSCILLATIONS FOLLOWING FLIGHT DIRECTOR (ASE mode) BARS.

Corrective Action

1. Forward circuit breaker panel—CHECKED.

2. If all circuit breakers are in and failed gyro is selected on the Channel Monitor Panel—SELECT OPPOSITE GYRO.

NOTE

If the newly selected gyro instantly fails and the previously failed gyro returns to operation, check ϕB AUTO STAB circuit breaker. If the breaker cannot be reset, the ASE cannot be recovered.

AUTOMATIC STABILIZATION EQUIPMENT MALFUNCTION

ASE HARDOVER

Symptoms

1. In pitch or roll channel:
 - a. Displacement of rotor disc without a corresponding movement of the cyclic.
 - b. Flight director (ASE mode)—PITCH OR ROLL BAR FULL DISPLACEMENT.
2. In yaw channel:
 - a. Displacement of anti-torque pedals.
 - b. The displacement can be overridden by the pilot.
 - c. Flight director (ASE mode)—YAW POINTER FULL DISPLACEMENT.

NOTE

An ASE hardover may occur with the ASE disengaged or engaged.

Corrective Action

1. Flight controls—OVERRIDE THE HARDOVER.
2. Flight director (ASE mode)—ANALYZE TO DETERMINE AFFECTED CHANNEL.
3. Channel monitor panel—DISENGAGE DEFECTIVE CHANNEL.

NOTE

If the cause of the hardover is moisture in the channel monitor panel, it is possible that the disengage switch will not remove the hardover. In this case it may be possible to remove the hardover by pulling the DC AUTO STAB circuit breaker. Actual flight conditions will dictate the procedure to be followed. It may be more advisable to override the hardover than to secure additional equipment.

ASE FAILURE**Symptoms**

1. ASE OFF caution light—ON
2. Flight director (ASE mode)—OFF FLAGS WITH BARS CENTERED.
3. ASE engage light—OFF.

Corrective Action

1. Flight controls—STABILIZE THE AIRCRAFT.
2. DC AUTO STAB circuit breaker—CHECK AND RESET.
3. ASE engage switch—ENGAGE.
4. If this does not restore the ASE, mission urgency and flight conditions will determine the action to be taken.

ASE AMPLIFIER MALFUNCTION**Symptoms**

1. Loss of stabilization in one or more channels.
2. Flight director (ASE mode)—INDICATOR FOR AFFECTED CHANNEL CENTERED.

NOTE

The OFF flags on the flight director (ASE mode) will NOT be displayed.

Corrective Action

1. Channel monitor panel—DISENGAGE AFFECTED CHANNEL.
2. Mission urgency and flight conditions will determine the action to be taken.

φB AUTO STAB CIRCUIT MALFUNCTION**Symptoms**

1. ASE—INEFFECTIVE.
2. Flight director (ASE mode)—ALL INDICATOR BARS CENTERED.
3. Selected gyro's VGI—OFF FLAG VISIBLE.
4. φB AUTO STAB circuit breaker—POPPED.

Corrective Action

1. Flight controls—STABILIZE THE AIRCRAFT.
2. φB AUTO STAB circuit breaker—CHECK AND RESET.
3. If the circuit breaker does not reset, the ASE cannot be regained. Mission urgency and flight conditions will determine the action to be taken.

NOTE

With the φB AUTO STAB circuit breaker popped, the selected gyro's VGI will be lost. If the circuit breaker cannot be reset, the selected VGI cannot be regained.

STICK TRIM SYSTEM MALFUNCTION**RUNAWAY BEEPER TRIM****Symptoms**

1. Cyclic stick begins a steady movement in any direction.

Corrective Action

1. Trim release button—DEPRESS AND REPOSITION CYCLIC.

2. If movement continues, beeper trim switch—OFF.

NOTE

Placing the cyclic stick to a desired position and then pulling the BEEPER TRIM circuit breaker will provide the pilot with a trimmed cyclic in that position. Stick trim forces may still be overridden.

LOSS OF ELECTRICAL POWER

Symptoms

1. Cyclic cannot be trimmed to a new position.

Corrective Action

1. BEEPER TRIM circuit breaker—CHECK AND RESET.
2. If the circuit breaker does not reset, the stick trim forces can be overridden by the pilot.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTION

GENERATOR FAILURE

Symptoms

1. NO. 1 GENERATOR or NO. 2 GENERATOR caution light—ON.

NOTE

The No. 2 transformer-rectifier will be lost with the loss of either generator causing the NO. 2 RECTIFIER caution light to go on. If the dc non-essential bus override switch has not been selected ON, the No. 2 fuel pump will be lost and the NO. 2 FUEL PUMP caution light will go on. In the case of a No. 1 generator failure, there is a momentary loss of power to the MA-1 Compass, which causes the SLAVE COMPASS caution light to go on.

Corrective Action

1. Move the corresponding generator switch to OFF-RESET, then back to ON.

2. Should this fail to restore power:

- a. Generator switch—OFF.
- b. DC Non-essential bus override switch—ON.
- c. Ammeter—MONITOR.
- d. Abort mission.

CAUTION

If vibrations, low rumbling sounds, or smells of burning insulation precede or accompany the illumination of the generator caution light, LAND AS SOON AS PRACTICABLE, and inspect the generators for possible fire.

DUAL GENERATOR FAILURE

Symptoms

1. NO. 1 GENERATOR and NO. 2 GENERATOR caution lights—ON.
2. Loss of ASE, both VGIs, and MA-1 compass.

NOTE

The only flight instruments remaining will be: turn and slip indicators, pitot static instruments, and standby compass. The only communication radios remaining will be: VHM-FM and VHF radios. The only navigational systems remaining will be: ILS localizer receiver and glide-slope receiver.

Corrective Action

1. Move each GEN switch to OFF-RESET, then ON. If this does not restore power:
2. GEN switches—OFF.
3. BATT switch—ON.
4. NON ESS BUS OVRD switch—OFF.
5. Reduce electrical load.
6. Land as soon as practicable.

NOTE

The battery is the sole source of electrical power. As it becomes discharged the NO. 1 FUEL PUMP caution light will go on.

TRANSFORMER-RECTIFIER FAILURE**Symptom**

1. NO. 1 or NO. 2 RECTIFIER caution light—ON.

NOTE

If the DC non-essential bus override switch has not been selected ON, the No. 2 fuel boost pump will be lost and the NO. 2 FUEL PUMP caution light will go on.

Corrective Action

1. Associated GEN switch—OFF-RESET then ON.
If this does not restore power:
2. Circuit breaker—CHECK and RESET.
3. NON ESS BUS OVRD switch—ON.
4. Ammeter—MONITOR.

DUAL TRANSFORMER-RECTIFIER FAILURE

1. NO. 1 RECTIFIER and NO. 2 RECTIFIER caution lights—ON.

Corrective Action

1. GEN switches—OFF-RESET, then ON.
2. Circuit breakers—CHECK and RESET.
3. BATT switch—ON.
4. NON ESS BUS OVRD—OFF.
5. Reduce dc electrical load.
6. Land as soon as practicable.

NOTE

The battery is the sole source of dc

electrical power. As it becomes discharged the NO. 1 FUEL PUMP caution light will go on.

NUMBER ONE SUPERVISORY PANEL MALFUNCTION

Malfunction of the No. 1 supervisory panel may cause loss of power to the ac essential bus and failure of the automatic switching circuit that normally shifts the number two generator to the ac essential bus. Equipment powered by the dc non-essential bus will be lost unless the override switch is on. The symptoms below are listed under the assumption that the ASE gyro select switch is on PORT.

Symptoms

1. NO. 1 RECTIFIER caution light—ON.
2. BLADE PRESS caution light—ON.
3. ASE—INEFFECTIVE. ALL INDICATOR BARS CENTERED.
4. Loss of all equipment powered by the ac essential bus except ground inverter items.

Corrective Action

1. No. 1 generator switch—OFF.
2. DC non-essential bus override switch—ON.
3. Ammeter—MONITOR.
4. Land as soon as practicable.

CAUTION

Do not attempt to reset the affected generator, as circuit protection is lost with the failure of the supervisory panel.

NOTE

When power is restored to the port gyro there will be a delay of up to 90 seconds before the off flag will disappear.

NOTE

The symptoms of supervisory panel malfunctions vary greatly. The above symptoms are the most common and the corrective actions prescribed may allow recovery of the affected equipment.

NUMBER TWO SUPERVISORY PANEL MALFUNCTION

Malfunction of the No. 2 supervisory panel may cause loss of power to the ac non-essential bus and failure of the automatic switching circuit that normally shifts the starboard gyro to the ac essential bus. Equipment powered by the dc non-essential bus will be lost unless the override switch is on. The symptoms below are listed under the assumption that the ASE gyro select switch is on PORT.

Symptoms

1. NO. 2 RECTIFIER caution light—ON.
2. GYRO caution light—ON.
3. Pilot's VGI off flag—VISIBLE.

Corrective Action

1. No. 2 generator switch—OFF.
2. DC non-essential bus override switch—ON.
3. Ammeter—MONITOR.
4. Land as soon as practicable.

CAUTION

Do not attempt to reset the affected generator, as circuit protection is lost with the failure of the supervisory panel.

NOTE

When power is restored to the starboard gyro there will be a delay of up to 90 seconds before the off flag disappears.

NOTE

The symptoms of supervisory panel malfunctions vary greatly. The above symptoms are the most common and the corrective actions prescribed may allow recovery of the affected equipment.

RADIO AUTOTRANSFORMER (ϕ B) FAILURE**Symptoms**

1. Loss of the following equipment: BDHI, RMI,

NO. 1 and NO. 2 NEEDLE information, TACAN Course Indicator Information, OMNI Course Indicator Information (except ILS course information will continue to be displayed), and DME.

NOTE

The TACAN Course Indicator bars will center but the off flags will NOT appear.

2. ϕ B AUTO XMFR circuit breaker—POPPED.

Corrective Action

1. ϕ B AUTO XMFR circuit breaker—CHECK AND RESET.
2. If the circuit breaker cannot be reset, mission urgency and flight conditions will dictate the action to be taken.

NOTE

If the circuit breaker cannot be reset, the only instrument approach system available is an ILS, LOC, PAR, or ASR. The UHF/VHF Homer will still be operative.

GROUND INVERTER/AUTOTRANSFORMER ϕ C FAILURE**Symptoms**

1. Engine and transmission pressure instruments—NO MOVEMENT. (Ground inverter or autotransformer malfunction.)
2. Torquemeter—NO MOVEMENT. (Ground inverter or autotransformer malfunction.)
3. Fire detection and fuel quantity Press to Test feature—INOPERATIVE. (Ground inverter malfunction.)

Corrective Action

1. INV INPUT circuit breaker—CHECK AND RESET.
2. AUTO XMFR ϕ C circuit breaker—CHECK AND RESET.
3. Individual instrument circuit breakers—CHECK AND RESET.

4. If this does not recover instruments and systems, land as soon as practicable.

BATTERY OVERTEMPERATURE

CGTO 1H-52A-501 modified the HH-52A battery overtemperature switch to activate at 135°F. Although the system activates an advisory light, the higher temperature indicates a probable malfunction.

Symptom

1. BAT OVTEMP advisory light—ON.

Corrective Action

1. Battery switch—OFF.

NOTE

If the BAT OVTEMP advisory light goes out after a period of time, the battery should be left off unless absolutely needed. The remaining procedures shall be followed even if the light goes out.

2. Flight mechanic, with all protective clothing on and visor down, monitor the battery for thermal runaway conditions.



Make no attempt to disconnect or jettison the battery inflight.

3. Land as soon as practicable.
4. If the battery is not in thermal runaway, allow it to cool prior to removing it. Further flight with the battery should not be attempted.

BATTERY THERMAL RUNAWAY

Symptoms

1. Smoke or fumes from battery compartment.
2. Sounds such as “bangs” or “thuds” from battery compartment.

Corrective Action

1. Battery switch—OFF.
2. Land as soon as practicable.

3. Standby with fire fighting equipment.
4. Check for the following conditions and take the actions indicated (to be performed by a crewman or crashcrewman outfitted in a hot suit):
 - a. If flame is present, use any available extinguishing agent.
 - b. If no fire, but smoke, fumes or electrolyte is being emitted from the battery, use water fog to lower the battery temperature.



In no case should CO2 be directed into a battery compartment to effect cooling or displace explosive gases. The static electricity generated by CO2 could cause the hydrogen/oxygen gases trapped in the compartment to explode. CO2 is an acceptable fire extinguishing agent once a fire has developed.



Make no attempt to disconnect or jettison the battery.

FIRE

INTERNAL ENGINE FIRE

An internal engine fire is a fire that occurs in an engine that is stopped or coasting down.

Symptoms

1. T5 rises above 300°.
2. Flames and-or smoke coming from engine.

Corrective Action

1. Speed selector—STOPCOCK.
2. Battery switch—ON.
3. Starter—ENGAGE AND MOTOR UNTIL FIRE IS EXTINGUISHED.
4. External power switch—OFF.
5. Battery switch—OFF.

6. Exit aircraft.
7. Fight fire externally.

ENGINE COMPARTMENT FIRE ON THE GROUND

Symptoms

1. Fire warning light—ON.
2. Flames and/or smoke coming from engine compartment.
3. Ground crew engine fire signal.

Corrective Action

1. Stop aircraft.
2. Speed selector—STOPCOCK.
3. Battery switch—ON.
4. T-handle—FIRE EXT ARMED.
5. Engine compartment fire extinguisher switch—DISCHARGE.
6. External power switch—OFF.
7. Battery switch—OFF.
8. Rotor brake—ON.
9. Parking brake—SET.
10. Exit aircraft.
11. Fight fire externally.

ENGINE COMPARTMENT FIRE IN FLIGHT

Symptoms

1. Fire warning light—ON.
2. Flames and/or smoke coming from engine compartment.

Corrective Action

1. Enter autorotation.
2. Fire indications—ANALYZE.

NOTE

Severity of the fire, actual flight conditions and terrain conditions will dictate the immediate procedure to be followed.

3. Speed selector—STOPCOCK.
4. T-handle—FIRE EXT ARMED.
5. Engine compartment fire extinguisher—DISCHARGE.
6. Alert cabin occupants.
7. Complete autorotative landing.
8. Secure cockpit.
9. Exit aircraft.

CABIN FIRE

Corrective Action

1. Cockpit windows—CLOSED.
2. Cabin door—CLOSED.
3. Ventilation switch—NORM.
4. Windshield defrost switch—OFF.
5. Portable fire extinguisher—USE.

CAUTION

CO₂ is not toxic; however, it does reduce the oxygen content of the air.

6. Ventilate as soon as practicable.
7. Land as soon as practicable.

ELECTRICAL FIRE

Corrective Action

1. Affected equipment—TURN OFF.
2. Circuit breaker (for affected circuits)—PULL.

If fire persists:

3. Battery switch—BATT START.

4. Generator switches—OFF.
5. Portable fire extinguisher—USE.
6. Land as soon as practicable.

CAUTION

Severity of the fire and actual flight conditions (night or instrument) will dictate the immediate procedure to be followed. It may be more advisable to let the fire burn, if it is isolated, than to secure all electrical power and lose ASE and flight instruments prior to achieving VFR conditions.

SMOKE AND FUME ELIMINATION

Corrective Action

1. CARGO DOOR—OPEN.
2. COCKPIT WINDOWS—OPEN.
3. Land as soon as practicable.
4. Speed selector—STOPCOCK.
5. Battery switch—OFF.
6. Secure cockpit.

CAUTION

Do not use the radios if fuel fumes are present. The severity of the situation will determine the necessity for securing all electrical power sources and whether an immediate landing is necessary.

CAUTION

To prevent the venting of smoke or fumes through the cockpit, do not open the cockpit windows if cargo door is closed.

CAUTION

To avoid the possibility of any rotor blade damage, do not jettison any windows or the cargo door while the helicopter is in forward flight.

RETREATING BLADE STALL

Symptoms

1. Increase in general vibration level of helicopter.
2. Occasional shudders in the airframe.
3. Abrupt pitch-up of the nose of the helicopter.

Corrective Action

1. Collective pitch—DECREASE.
2. Rotor rpm—INCREASE.
3. Decrease severity of the maneuver.
4. Airspeed—GRADUALLY DECREASE.
5. Descend to lower altitude.

POWER SETTLING

Symptoms

1. Rotor roughness.
2. Loss of control effectiveness.
3. Uncontrollable settling.

Corrective Action

1. Collective—ABRUPT INCREASE.
2. Airspeed—INCREASE, IF STEPS 1 AND 2 ARE INEFFECTIVE.
3. Collective—BOTTOM TO RESTORE CONTROLLABILITY.
4. Collective—REAPPLY AS TRANSLATIONAL LIFT IS ATTAINED.

TURBULENCE

Corrective Action

1. Airspeed—55 knots.
2. Nr/Nr—100%.
3. Reverse course if possible.

ICING**Symptoms**

1. Vibrations in airframe.
2. Visible accumulation of ice.
3. Decrease in Ng.
4. Increase in Ts.

Corrective Action

1. Fly helicopter from icing conditions as soon as possible.
2. Emergency throttle—INCREASE IF REQUIRED TO REGAIN DESIRED POWER.
3. Heater—OFF.
4. Airspeed—55 knots.
5. Land as soon as practicable.

HEAVY RAIN**Symptoms**

1. Engine instruments will indicate a loss of power and a corresponding decrease in Nr/Nr will result.

NOTE

The characteristics of the T-58-8B engine are such that engine flameout is not probable.

Corrective Action

1. Speed selector—FULL INCREASE.
2. Emergency throttle—INCREASE IF REQUIRED TO REGAIN DESIRED POWER.

NOTE

A power loss may be experienced even utilizing emergency throttle if rain is extremely heavy.

3. Airspeed—55 knots.

4. Conditions permitting—SECURE EMERGENCY THROTTLE AND REESTABLISH CRUISE FLIGHT.

NOTE

As rain intensity decreases, power will increase. This will be indicated by an increase in Nr/Nr and power.

RESCUE HOIST MALFUNCTION**ELECTRICAL SYSTEM FAILURE****Symptoms**

1. Hoist cable does not respond to control inputs.

Corrective Action

1. Advise pilot.
2. Check hoist drum for a fouled hoist cable or stuck up-limit switch.
 - a. If the hoist cable is fouled—DO NOT ACTUATE THE HOIST.
 - b. If the hoist cable is not fouled:
 - (1) If conditions permit, check the hoist circuit breaker.
 - (2) Operate the hoist using manual override.

CAUTION

DO NOT raise the hoist hook to the full up position when operating on manual override. The up limit protection is bypassed and the hook and cable may be damaged or disconnected.

HYDRAULIC SYSTEM FAILURE**Symptoms**

1. Hoist cable does not respond to either electrical control inputs or manual override inputs.

Corrective Action

1. Advise pilot.

2. Discontinue hoist operation. Retrieve the hoisting rig if possible.

HOIST COMMUNICATIONS FAILURE (ICS)

Symptoms

1. Loss of communications between the flight mechanic and the pilot.

Corrective Action

1. Check to insure that HOT MIKE is selected.
2. Check to insure that helmet cord is plugged in.
3. Utilize another ICS control panel.
4. Use another helmet if one is available.
5. Check the ICS PLT circuit breaker on the radio circuit breaker panel.

CAUTION

The hoisting operation should be discontinued if possible until intercommunications can be reestablished.

EMERGENCY HOIST CABLE SHEAR

Symptoms

1. Hoist cable fouled with vessel or other structure and is endangering personnel and/or the helicopter.

Corrective Action

1. Inform pilot immediately.
2. Pay out hoist cable until slack.
3. Attempt to free cable or rig.
4. If the above steps are ineffective, or if personnel or the helicopter is in danger:
 - a. Pilot or flight mechanic report—SHEAR! SHEAR! SHEAR!
 - b. Flight mechanic actuate EMERG CABLE CUT-OFF switch.

- c. Pilot or copilot actuate HOIST SHEAR switch.

CAUTION

This procedure should be used ONLY in the most EXTREME situation where aircraft or personnel safety depend on the immediate shearing of the hoist cable to avoid a disaster. Except in the most extreme situation, the pilot will make the decision to shear, upon the recommendation of the flight mechanic.

NOTE

Normally, the copilot will be able to shear most expeditiously, but when the report "SHEAR! SHEAR! SHEAR!" is heard, both the EMERG CABLE CUT-OFF switch in the cabin and the HOIST SHEAR switch in the cockpit should be actuated.

CARGO SLING EMERGENCY JETTISON

Symptoms

1. Sling load is uncontrollable.
2. Engine failure, power decrease, or other critical emergency.

Corrective Action

1. Cargo sling master switch—ON.
2. Cargo release switch—DEPRESS.
3. If necessary, transmit to flight mechanic—"JETTISON THE SLING LOAD."
4. Flight mechanic, upon command from the pilot:
 - a. Cargo hook manual release handle—PULL.
 - b. Strap in securely.
5. When hovering, move left before landing, if possible.

EMERGENCY WATER OPERATIONS

Following an emergency water landing, allow the rotor to coast to a stop. Apply rotor brake only if it would be more hazardous to allow the rotor to continue to turn.

NOTE

Torque resulting from rotor brake application will cause the helicopter to rotate in the water and could cause it to capsize.

The helicopter's stability limits may be exceeded in rough water in a power off condition. The power off helicopter can right itself from a roll up to approximately 16° without the aid of auxiliary flotation. A wind of 15 knots or more, creating waves of 2 feet or higher, will probably drive the helicopter into the trough of a wave and cause excessive roll. The auxiliary flotation equipment will increase stability and shall be deployed after an emergency water landing. The sea drogue and/or Danforth anchor should be deployed to prevent drifting into shallow water where the helicopter may be damaged. This should be done even though water depth may initially exceed the effective length of the anchor line.

AUXILIARY FLOTATION SYSTEM DEPLOYMENT

Inflate the bags after the helicopter is resting on the water. The bags are inflated by pulling the manual release handle to the extended position. If flight is necessary after the bags are inflated, airspeed should not exceed 70 knots.

CAUTION

Pilots should exercise caution when landing on a vessel or land after deployment of the auxiliary flotation bags. Rotor downwash will cause the bags to tuck under the sponsons while in a hover and may cause the bags to burst upon touchdown.

See figures A-19 and A-20 for sea state capabilities.

SEA DROGUE DEPLOYMENT

The sea drogue can be deployed from either the pilot's or copilot's window.

1. Red hook on end of ripcord line—ATTACH TO PEDAL ADJUSTER FLEXIBLE CABLE.
2. Sea drogue snap hook—ATTACH TO BOW LINE THIMBLE.

CAUTION

Do not attach snap hook to large ring in thimble.

3. Sea drogue—CAST OVERBOARD FORWARD OF SPONSON.
4. Ripcord—PULL.
5. Retrieve ripcord.

DANFORTH ANCHOR DEPLOYMENT

The Danforth Anchor can be deployed from either the pilot's or copilot's window.

1. Anchor line snap hook—ATTACH TO BOW LINE THIMBLE.
2. Anchor line bundle—CAST OVERBOARD FORWARD OF SPONSON.
3. Anchor—CAST OVERBOARD FORWARD OF SPONSON.

CAUTION

Do not attach snap hook to large ring in thimble.

TOWING OF THE HELICOPTER ON WATER

Each case of a disabled helicopter on the water presents a unique set of circumstances and problems. No standard towing method will be described. The information contained here and in CG-384-2, Chapter 15, Salvage, will provide background information to those concerned with the towing operation.

The helicopter can be towed forward by attaching a towline to the bow eye on the nose fitting. The bow eye was designed for use with the anchor or sea drogue—not for towing. However, the helicopter has been successfully towed using the bow eye. If the sea drogue or anchor can be deployed, one procedure is to run a boat across the submerged anchor line, fish out the line with a boat hook, and use this line for the towline.

The helicopter can be towed forward by attaching a bridle to the Sponson braces (see CG-384-2, Chapter 15, Salvage).

When underway, the nose of the helicopter has a tendency to wander left and right. This can be controlled somewhat by attaching the sea drogue to the tailwheel tiedown ring.

The helicopter can also be towed backwards by attaching a towing line to the tailwheel tiedown ring. This eliminates the wandering tendency associated with towing forward. Faster towing speeds can be used towing backwards.

Exercise care to avoid damage to the helicopter if the tow boat comes alongside. If possible, the boat should stay to windward of the helicopter since the boat's leeway will be less than that of the helicopter.

Avoid heading parallel to troughs of waves as this may cause excessive roll (see figure A-19). Use ample (50-60 feet) towline to prevent the helicopter from surging up on the tow boat.

WATER TUCK RECOVERY

Symptoms

1. Nose pitches down dipping bow below surface of the water.

Corrective Action

1. Collective—LOWER.
2. Cyclic—NEUTRAL.

ABANDON INVERTED AIRCRAFT (WATER)

1. Remain seated and strapped in until all aircraft movement ceases.
2. Use the EMERGENCY EXIT LIGHTS, as necessary, to locate exit locations.
3. Open emergency escape window or door.
4. Swim clear of aircraft.

5. Inflate personal flotation device.

WARNING

Do not inflate personal flotation device until clear of emergency exit and aircraft.

6. Once on the surface, determine if anyone is still in the aircraft.
7. Check survival equipment.
8. Stay with the aircraft. If possible, climb out of the water and onto the aircraft hull.

WARNING

If fuel covers the water surface, do not ignite signal devices.

ABANDON AIRCRAFT PROCEDURES

PILOTS:

1. Provide first aid kit.
2. Provide PRC-63/90 radio.
3. Exit aircraft.

FLIGHT MECHANIC:

1. Assist passengers and direct their exit.
2. Set and launch Datum Marker Buoy, if available.
3. Provide flashlight and other SAR equipment board items as possible.
4. Deploy rafts (water only).
5. Exit aircraft.

Refer to figure 1-31, Emergency Entrances and Exits.