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สำนักงานการบินพลเรือนแห่งประเทศไทย  
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เรื่อง การรับรองคู่มือ Operations Manual Part B, Part D และอนุญาตให้ใช้งานคู่มือ Emergency Procedure Checklist

เรียน กรรมการผู้จัดการ บริษัท ไทย เอเวอชั่น เซอร์วิส จำกัด

อ้างถึง หนังสือ บริษัท ไทย เอเวอชั่น เซอร์วิส จำกัด ที่ ฝป 279/2559 ลงวันที่ 4 เมษายน 2559  
ที่ ฝป 602/2559 ลงวันที่ 2 สิงหาคม 2559 ที่ ฝป 650/2559 ลงวันที่ 24 สิงหาคม 2559  
และที่ ฝป 691/2559 ลงวันที่ 6 กันยายน 2559

ตามหนังสือที่อ้างถึง หนังสือ บริษัท ไทย เอเวอชั่น เซอร์วิส จำกัด ขอให้ สำนักงานการบินพลเรือนแห่งประเทศไทย (กพท.) พิจารณาให้การรับรองคู่มือการปฏิบัติการและคู่มือ Emergency Procedure Checklist เพื่อใช้เป็นแนวทางการปฏิบัติการบิน ความละเอียดทราบแล้ว นั้น

กพท. พิจารณาแล้วจึงให้การรับรองคู่มือการปฏิบัติการ ดังนี้

1. Operations Manual Part B Publication Date: 2015 Apr 30
2. Operations Manual Part B Publication Date: 2016 Sep 01
3. Operations Manual Part D Revision 3 Publication Date: 2016 Aug 01

และอนุญาตให้ใช้งานคู่มือ Emergency Procedure Checklist สำหรับเฮลิคอปเตอร์แบบ S-76D เพื่อให้บริษัทฯ ใช้เป็นแนวทางการปฏิบัติการบินได้

ทั้งนี้ ให้บริษัทฯ ปรับปรุงคู่มือต่าง ๆ ให้เป็นปัจจุบันและสอดคล้องกับข้อมูลของบริษัทผู้ผลิตอากาศยานอยู่เสมอ ต่อไป

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายจุฬา สุขมานพ)

อธิบดีกรมท่าอากาศยาน รักษาการแทน

ผู้อำนวยการสำนักงานการบินพลเรือนแห่งประเทศไทย



**Thai Aviation Services**

**S-76D Emergency Procedure  
Checklist**

- 1. MAINTAIN AIRCRAFT CONTROL**
- 2. ANALYZE THE SITUATION**
- 3. TAKE APPROPRIATE ACTION**

PREAMBLE

---

SINGLE  
ENGINE  
FAILURE  
(SEF)

---

DUAL  
ENGINE  
FAILURE

---

ENGINE  
CONTROL



---

ENGINE  
AUXILIARY  
SYSTEMS

---

FUEL  
SYSTEM

---

GEAR  
BOX

---

ELECTRICAL  
SYSTEM



---

HYDRAULIC  
SYSTEM

---

LANDING  
GEAR

---

TAIL  
ROTOR

---

AUTOMATIC  
FLIGHT  
CONTROL  
SYSTEM

---

FIRE AND  
SMOKE

---



---

MISC  
SYSTEMS

---

ANTI -ICE /  
DEICE  
SYSTEM

---

FORCED  
LANDING

---

FLOTATION

---



## **Preamble:**

### **1. Fly the aircraft, and maintain N<sub>R</sub>**

In all emergency / abnormal situations, it is essential that a complete division of responsibility exists, such that the PF continues to ensure the safe operation of the aircraft and the PM deals with the situation.

The immediate and subsequent action of the PF is to FLY THE AIRCRAFT. The PM is to assist the PF by monitoring the flight path and the engine and system instruments.

Once the aircraft is on a stable flight path under control of the PF, the PM is to identify and state all displayed cautions and warnings, identify the malfunction together with the PF, then cancel the

It is implicit in the drills that the PF will continue to control the aircraft, and maintain desired flight path.

Once the immediate actions are complete, if the commander is the PF, he should consider handing over the controls to the co-pilot in order to better manage the situation.

- a. MAINTAIN AIRCRAFT CONTROL
- b. ANALYZE THE SITUATION
- c. TAKE APPROPRIATE ACTION

The PM will make any selection of lever control, or switch as required by the procedure.

Before movement of any throttle, fuel control or systems switch, the PM shall call for confirmation of the selection by the PF.

The PF will make any distress calls when required (if necessary, after consultation with the commander); the PM will brief the passengers.

Drills are preceded by the following:

**INDICATIONS** - Cautions and warnings, sounds, faults and other indications that may occur.

### **ACTIONS:**

1. Immediate actions, outlined in black are to be carried out from memory, and verified from the checklist.

2. All required subsequent actions.

## **Definitions**

### **Land or Ditch Immediately**

The consequences of continued flight are likely to be more hazardous than, for example, ditching or landing in trees. Where the instruction "Land or ditch immediately" is given in the checklist, the procedure for "emergency landing" should be followed.

### **Land as Soon as Possible**

Land at the nearest site at which a safe landing can be carried out. Depending on the malfunction and where during the flight the malfunction occurs, this may require flight to a runway or, if offshore, to the nearest suitable landfall or the nearest helideck. The flight should be at an altitude and airspeed that will allow a safe ditching to be made if the abnormal condition deteriorates and an immediate landing is required.

### **Land as Soon as Practical**

Land at the nearest airfield at which technical support is available. If this is not practical, land at a safe landing site chosen for subsequent convenience. However, in making his decision, the commander shall give primary consideration to the effect of the existing malfunction on the continued safe and legal operation of the aircraft and the likelihood and implications of any subsequent failure.

### **Continue Flight**

If the fault persists or returns after clearing, the decision to continue as planned or to take alternative action shall consider:

- a. Whether the fault can be deferred under the MEL for a subsequent takeoff.
- b. The operational implications of being AOG after the next landing.
- c. The implications of further deterioration of the affected system.

### **Warning**

Draws attention to an operating procedure, practice or condition that may result in injury or death if not carefully observed or followed.

**Caution**

Draws attention to an operating procedure, practice or condition that may damage equipment if not carefully observed or followed.

**Note**

Draws attention to an operating procedure, practice or condition that is essential to emphasize.

**Considerations**

Addresses additional information that shall be considered that may be applicable to the checklist or malfunction. This informaton shall be consulted after completion of the ECL drill when safe to do so.

**Fly Attentively**

Maintain close control of the flight path using hands-on flying when required. Even when flying coupled, the pilot's hands shall be close to the flight controls in order to intervene when necessary.

**Fly Manually**

Use hands-on, un-coupled flying to control the flight path.

**Safe OEI Flight**

In general terms, Safe OEI flight can be defined as a power and airspeed configuration, set by the PF in the event of either a sudden single engine power loss or pilot-commanded single-engine condition that affords maximum performance along the intended or a safe flight path, within all OEI system limitations. It is critical that pilots have a thorough knowledge of Safe OEI configurations for all possible flight paths and be prepared to set such without notice.

The phrase ‘Set Safe OEI’ is used throughout the ECL to command the PF to configure the aircraft accordingly, in most cases without prompting by the PM.

When coupled, Safe OEI is considered set once the PF has correctly configured the flight director and stated “Safe OEI set,” even though the aircraft may not have reached its target flight condition (IAS, VS etc.).

Safe OEI configurations are noted in each drill and described in detail in the expanded ECL in the OMB.

**Emergency Transponder Codes**

Emergency .....	7700
Communication Failure .....	7600
Unlawful Interference (hijack) .....	7500

## **ACTION:**

- |  |      |
|--|------|
| 1. Throttle (affected engine) -----    | STOP |
| 2. FUEL switch (affected engine) ----- | OFF  |

## **ACTION:**

1. Throttle (affected engine) ----- FLY
2. FUEL switch (affected engine) ----- XFD
3. MASTER START switch ----- ON
4. Engine start button (affected engine) ----- Press

Automatic hot start prevention is disabled when airborne.

If the restart attempt fails and/or no further attempts are to be made, shut down the engine.

Fuel crossfeed after an engine failure shall only be considered if necessary to permit flight to a suitable landing area. There is some possibility that fuel contamination or a fuel system malfunction was the cause of the first engine failure, and that crossfeeding might expose the remaining engine to a similar problem.

#### **ACTION:**

1. FUEL switch (affected engine) ----- OFF
2. FUEL switch (operating engine) -----XFD (if required)

Monitor operating engine fuel pressure, fuel flow,  $N_G$ , and ITT. If signs of unsteady operation are noted, quickly switch fuel switch back to DIRECT and discontinue attempts to crossfeed.

OR

OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

**CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

**ACTION:**

1. Adjust collective and cyclic to control descent and cushion landing.
2. After touchdown, neutralize controls.

OR

, OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

### **CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

Prior to reaching 30 KIAS:

### **ACTION:**

1. Rotate nose to maximum 10 degrees up, and increase collective to cushion landing.

At or after passing 30 KIAS up to and including  $V_{TDP}$  at 5 to 10 foot wheel height:

### **ACTION:**

1. Rotate nose to 10 to 25 degrees up, and adjust collective to control height and  $N_R$ .
2. When ground speed sufficiently slowed, lower nose to maximum 10 degrees up, and adjust collective to cushion landing.

OR

OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

### **CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

### **ACTION:**

1. Adjust cyclic and collective to land aircraft within rejected takeoff area available, while maintaining  $N_R$  and groundspeed within limits.

Limit nose up attitude to 10 degrees or less when within 10 feet of the ground.

OR

OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

**CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

**SINGLE ENGING FAILURE - CONTINUE TAKEOFF - PC1 RUNWAY**  
procedure should only be conducted if engine failure occurs after  $V_{TDP}$ .

**ACTION:**

1. Adjust cyclic and collective to climb at  $V_{TOSS}$  and  $N_R$  100%.

Do Not select 2 Minute Power until obstacle clearance is assured.

2. Collective OEI Limits Switch ----- Select 2MIN Power when  
30S Usage light starts to flash ( $N_R$  100%)  
or when conditions permit

3. Landing gear ----- Retract with positive Rate of Climb

4. Cyclic ----- Obstacles cleared, continue climb and accelerate to  $V_Y$

5. Collective OEI Limits switch ----- Select MCP when 2MIN usage  
light starts to flash or when conditions  
permit

6. Land as soon as practical.

Continued on the Next Page

For single-engine climb or cruise at airspeeds above  $V_Y$ , reduce collective as required to achieve minimum 106%  $N_R$ .

Consider air restart. Follow procedure. Retstart should be attempted only if the cause of the initial failure has been determined and corrected.

If restart fails or no attempt to restart is made because of conditions causing engine failure, complete procedure.

OR

OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

**CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

**ACTION:**

1. Adjust cyclic and collective to climb at  $V_{TOSS}$  and  $N_R$  100%.

Do Not select 2 Minute Power until obstacle clearance is assured.

2. Collective OEI Limits switch ----- Select 2MIN Power when  
30S Usage light starts to flash ( $N_R$  100%)  
or when conditions permit

3. Landing gear ----- Retract with positive Rate of Climb

4. Cyclic ----- Obstacles cleared, continue climb and accelerate to  $V_Y$

5. Collective OEI Limits switch ----- Select MCP when 2MIN usage  
light starts to flash or when  
conditions permit

6. Land as soon as practical

**Continued on the Next Page**

For single-engine climb or cruise at airspeeds above  $V_Y$ , reduce collective as required to achieve minimum 106%  $N_R$ .

Consider air restart. Follow procedure. Retstart should be attempted only if the cause of the initial failure has been determined and corrected.

If restart fails or no attempt to restart is made because of conditions causing engine failure, complete procedure.

OR

OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

**CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

**ACTION:**

- |   |
|---|
| <ol style="list-style-type: none"><li>1. Set safe OEI.</li><li>2. Select OEI MCP limit and control <math>N_R</math> to 106%</li></ol> |
|---|

3. Land as soon as practical.

Fuel crossfeed after an engine failure should only be considered if necessary to permit flight to a suitable landing area. There is some possibility that fuel contamination or a fuel system malfunction was the of the first engine failure, and that crossfeeding might expose the remaining engine to a similar problem.

**Continued on the Next Page**

Use care when operating in cruise flight and confirm the limiter selected following power reductions whether the result of intentional collective adjustments, airspeed, deceleration, or gust turbulence. The 30 second limit will be automatically rearmed at PLI values less than 70%.

Consider air restart. Follow procedure. Retstart should be attempted only if the cause of the initial failure has been determined and corrected.

If restart fails or no attempt to restart is made because of conditions causing engine failure, complete procedure.

OR

OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

**CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

**ACTION:**

1. Set safe OEI.

Do Not Select 2 Minute Power Until obstacle clearance is assured.

2. Climb at  $V_{TOSS}$  and OEI 30SEC limit until clear of obstacles.
3. Retract landing gear on positive rate of climb.
4. Select OEI 2MIN and MCP limit in sequence and climb to safe altitude.
5. Land as soon as practical.

**Continued on the Next Page**

For single-engine climb or cruise at airspeeds above  $V_Y$ , reduce collective as required to achieve minimum 106%  $N_R$ .

Consider air restart. Follow procedure. Restart should be attempted only if the cause of the initial failure has been determined and corrected.

If restart fails or no attempt to restart is made because of conditions causing engine failure, complete procedure.

OR

OR

"ENGINE ONE/TWO OUT" or "ENGINE ONE/TWO FAIL IDLE" aural alert.

**CONFIRMING:**

Torque decreases to zero (affected engine)

$N_G$  decreasing (affected engine)

$N_P$  decreasing (affected engine)

ITT decreasing (affected engine)

**ACTION:**

1. Establish an approach to arrive at the Landing Decision Point (LDP) at a point 150 feet above the touchdown elevation at 45 KIAS and a rate of descent of no more than 600 fpm.
2. 30 second power ----- Confirm armed
3. Passing 50 feet and 45 KIAS ----- Initiate a deceleration  
(up to 20 to 25 degree flare attitude)
4. Continue deceleration to running landing at or above translational lift.
5. Collective pitch ----- Apply to cushion touchdown

After touchdown:

6. Cyclic ----- Neutralize
7. Collective ----- Reduce to minimum
8. Brakes ----- Apply as necessary to stop within  
confines of the landing area

AND

AND

OR

AND

Rotor RPM will decrease to an unrecoverable state with resultant loss of control unless autorotation is entered immediately.

Excessive displacement of the cyclic control stick aft of neutral will decrease the main rotor blade-tail cone clearance and increase the possibility of striking the tail cone with a main rotor blade.

**ACTION:**

1. Autorotate.
2. Control  $N_R$  and airspeed as required within limits.
3. Landing gear ----- Down
4. Fuel switches ----- OFF
5. Throttles ----- STOP
- 6.

If time and altitude permit:

7. Try to restart one or both engines.
8. If engine start was unsuccessful, select Fuel switches to OFF and throttles to STOP and complete procedure.

The decision to attempt engine restart or commit to an autorotative landing is command discretion. If restart is attempted, check the Master Start switch is ON and perform a normal automatic start with engine lever in the FLY position.

## **ACTION:**

1. Enter autorotation
  - a. Airspeed ----- 75 KIAS, then as required
  - b.  $N_R$  ----- 100 to 105%, then as required
  - c. Heading ----- As required
2. Landing gear ----- Down
3. Floats ----- Arm over water
4. Engines ----- Consider restart
5. If NO RESTART ----- Fuel switches OFF
6. Floats ----- Over water, deploy below 75 KIAS
7. MAYDAY ----- Complete
8. Transponder ----- 7700
9. Passengers ----- Brief
10. Touchdown:
  - a. 150 feet:  
Collective - Freeze or down as required.  
Cyclic - 10 degrees nose up.
  - b. 40 feet:  
Collective and cyclic to complete landing.
  - c. Neutralize controls.
11. Evacuate aircraft as directed by commander.

Practice autorotative landings are prohibited.

OR

**ACTION:**

If one FADEC OVERTEMP caution is illuminated:

1. Land as soon as practical.

If both FADEC OVERTEMP cautions are illuminated:

2. Land as soon as possible.

A FADEC 1 OVERTEMP or FADEC 2 OVERTEMP caution indicates that both channels of the engine FADEC have exceeded the operational temperature limit and component failure could result.

OR

**ACTION:**

1. Avoid high engine power settings and rapid collective movements.
2. Land as soon as practical.

The engine experiencing a FADEC cross communications fault will arm 30 second power. Engine load sharing will be lost so large torque splits are possible.

OR

Engine start sequence does not initiate after engine start button is pressed and released.

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

1. Master start switch ----- ON
2. Reattempt engine start.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

In Flight:

1. Land as soon as practical.

On the ground:

1. Avoid start if practical.
2. If start is attempted, anticipate a slower and hotter start.

An ENG DGRD START caution can be caused by a low battery voltage condition. If this is the case, consider starting the engine using an external power source.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

1. Execute appropriate single-engine failure procedure.

Shutting an engine down with an ENG 1 DGRD SHUTDOWN or ENG 2 DGRD SHUTDOWN caution illuminated may require use of the fuel selector switch to fuel starve the engine, should the engine not shutdown when the throttle is selected to STOP.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

1. Execute appropriate single-engine failure procedure.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

1. Avoid rapid collective movements.
2. Land as soon as practical.

An ENG 1 DGRD HANDLING or ENG 2 DGRD HANDLING caution indicates an engine control malfunction. Full engine power will be available, but engine response to collective inputs may be different on each engine.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

1. Avoid high engine power settings and rapid collective movements.
2. Land as soon as practical.

An ENG 1 DGRD LIMITING or ENG 2 DGRD LIMITING caution indicates an engine control malfunction. Full engine power may not be available.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

Possible torque split upon power application.

**ACTION:**

1. Avoid high engine power setting and rapid collective movements.
2. Land as soon as practical.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

1. Avoid high engine power setting and rapid collective movements.
2. Land as soon as practical.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

One or more of the engine indications are incorret or missing

**ACTION:**

1. Cross check engine information with other associated indicators.
2. Land as soon as practical.

OR

**CONFIRMING:**

Engine EEC fault(s) present on EPAC Status page.

**ACTION:**

In flight:

1. Land as soon as practical

**ACTION:**

1. Check ENG page for any abnormalities.

OR

**ACTION:**

1. Associated engine throttle ----- FLY

OR

**ACTION:**

1. Set Safe OEI.
2. Affected engine throttle ----- IDLE
3. Engine instruments (affected engine) ----- Monitor
4. Land as soon as practical.
5. Associated engine throttle ----- FLY, on final, if dual  
engine power is required for landing
6. Shutdown the affected engine after landing.

If abnormal noises or erratic engine instrument indications are observed, accomplish procedure on the affected engine.

An ENG 1 CHIP or ENG 2 CHIP caution is a indication of metal particles in the affected oil system. No action is required until safe single-engine airspeed is obtained.

OR

OR

OR

Do not shut down an engine for an oil system malfunction if that engine power is required for continued safe flight.

**ACTION:**

1. Set safe OEL.
2. Throttle (affected engine) ----- IDLE
3. Land as soon as practical.

If engine oil pressure is decreasing and engine oil temperature rising:

4. Accomplish \_\_\_\_\_ and \_\_\_\_\_ procedures.

If dual engine power is required for landing, consider restarting the engine and/or returning the throttle to the FLY position prior to final approach.

5. Throttle (affected engine) ----- FLY, on final, if dual engine power is required for landing.
6. Shutdown the affected engine after landing.

OR

"ENGINE ONE/TWO FUEL PRESSURE" aural alert

**CONFIRMING:**

Erratic fuel flow and /or fluctuating  $N_G$ , ITT, and TQ.

**ACTION:**

1. Fuel switch (affected engine) ----- XFD

If the warning light goes out:

2. Land as soon as practical.

If the warning light remains on:

3. Set safe OEL.

4. Throttle (affected engine) ----- IDLE

5. Fuel switch (affected engine) ----- DIRECT

If the warning light continues to remain on:

6. Throttle (affected engine) ----- STOP

7. Refer to \_\_\_\_\_ procedure.

8. Land as soon as practical using the  
procedure.

An ENG 1 FUEL PRESS or ENG 2 FUEL PRESS warning indicates reduced fuel pressure at the high pressure pump inlet. This could be an indication of an air leak in the fuel supply lines.

OR

**ACTION:**

1. Fuel switch (affected engine) ----- XFD
2. Land as soon as practical.

If both fuel impending blockage cautions illuminate:

3. ENG 1 and ENG 2 Fuel Selector switches ----- DIRECT
4. Land as soon as possible.

Illumination of an ENG FUEL IMP BLKG caution message followed by an ENG FUEL PRESS warning message indicates a severely blocked fuel filter which could result in an engine failure.

OR

**CONFIRMING:**

Corresponding fuel tank quantity indicating between 85 to 100 pounds.

**ACTION:**

1. Affected FUEL switch ----- XFD (as desired)
2. Land as soon as practical.

Avoid sustained pitch attitudes in excess of 12 degrees nose up or 5 degrees nose down when either FUEL LOW caution message is displayed or if the usable fuel in either tank indicates 80 lbs or less.

OR

**ACTION:**

1. Affected FUEL switch ----- Return to the previous position
2. Land as soon as practical.

A FUEL SELECTOR 1 FAIL or FUEL SELECTOR 2 FAIL caution indicates that the position of the fuel selector valve is not in agreement with its associated switch position.

## **ACTION:**

If indication of fuel leakage:

1. Close AUX fuel valve.
2. Over water ----- Land as soon as possible
3. Over land ----- Land as soon as practical

If no indication of fuel leakage:

1. Land as soon as practical
  - a. Range may be restricted by main tank fuel only.
  - b. Consider troubleshooting instructions below:

Symptom: Valve position indicator reads SHUT when switch is in OPEN position.

Action: Cycle valve switch. If indicator fails to show diagonal hatching followed by OPEN, valve actuator has failed. Aux fuel will not transfer. Continue flight on main fuel only.

Symptom: Valve position indicator shows diagonal hatching that does not change to OPEN after five seconds.

Action: Valve will be stuck in transit between shut and open positions. Transfer of fuel may occur at reduced rate. Watch main and aux fuel gauges for indication of fuel transfer. Select SHUT prior to landing. Rectify fault in valve prior to next flight.

## **CONFIRMING:**

CHECK ENGINE PAGE caution message illuminated.

Main Gear Box oil pressure less than 50 psi.

## **ACTION:**

1. Monitor main gear box parameters for further failure conditions.
2. Land as soon as practical.

Oil pressure decreasing to 40 to 45 psi and remaining steady is indicative of an oil pump failure. The remaining pump will normally provide adequate lubrication for the main gear box. An oil leak should be suspected if the oil pressure continues to decrease. If an oil leak is suspected refer to the procedure.

"MAIN GEAR BOX OIL PRESSURE" aural alert

**CONFIRMING:**

Main gear box oil pressure is less than 20 psi.

**ACTION:**

1. Descend to VMC and land as soon possible.

If indications of impending MGB failure:

2.

If an impending failure is suspected, the primary consideration is to land the aircraft before the failure progresses to gear box seizure or loss of drive to the main or tail rotor. The descent shall be made at a reduced power setting but with at least 15% torque to ensure that the engines continue to drive the main gear box. Avoid rapid or frequent power changes. A no hover landing shall be performed if a roll on landing is not available.

OR

AND

"MAIN GEAR BOX OIL HOT" aural alert

**CONFIRMING:**

Main Gear box oil temperature is greater than 120°C (amber MGB OIL HOT) or 135°C (red MGB OIL HOT).

**ACTION:**

1. Reduce power.

If main gear box oil temperature is between 120°C and 135°C:

2. Land as soon as practical.

If main gear box oil temperature is greater than 135°C or if oil pressure drops:

3. Descend to VMC and land as soon as possible.

If indications of impending MGB failure:

4.

Oil temperature greater than 120°C indicates main gear box oil cooler malfunction. Transmission oil temperature should be controlled by avoiding high power settings and/or prolonged hovering.

The descent shall be made at a reduced power setting but with at least 15% torque to ensure that the engines continue to drive the main gear box. Avoid rapid or frequent power changes. A no hover landing shall be performed if a roll on landing is not available.

## **ACTION:**

1. Land as soon as practical.

If oil temperature rises or oil pressure falls:

2. Descend to VMC and land as soon as possible.

If indications of impending MGB failure:

**LAND OR DITCH IMMEDIATELY**

If an impending failure is suspected, the primary consideration is to land the aircraft before the failure progresses to gear box seizure or loss of drive to the main or tail rotor. The descent shall be made at a reduced power setting but with at least 15% torque to ensure that the engines continue to drive the main gear box. Avoid rapid or frequent power changes. A no hover landing shall be performed if a roll on landing is not available.

OR

**ACTION:**

1. Descend to VMC and land as soon as possible.

If indications of impending IGB or TGB failure:

- 2.

Intermediate and tail gear boxes have combination high temperature and fuzz burn chip detectors.

OR

**CONFIRMING:**

Check that the affected DC generator load is 0 amps.

**ACTION:**

1. Associated DC GEN switch ----- OFF, RESET, then ON

If the generator comes back on:

2. Continue flight.

If the generator remains off or returns after one reset:

3. Associated DC GEN switch ----- OFF

4. If IMC, transition to VMC.

5. Land as soon as practical.

AND

Loss of copilot displays (PFD, MFD, and MCDU)

**CONFIRMING:**

Check both DC generator load indications at 0 amps.

**ACTION:**

1. DC GEN 1 and DC GEN 2 switches ----- OFF, RESET, then ON

If both generators come back on:

2. Continue flight.

If one generator remains off:

3. Complete procedure.

If both generators remain off:

4. If IMC, transition to VMC.
5. Land as soon as practical.

A Dual DC Generator Failure will result in loss of power to AP1. Any coupled flight director modes will de-couple. Pilots should be attentive to flight controls while operating with only a single autopilot engaged.

An emergency battery is provided to power the Intergrated Electronic Standby Instrument (IESI) in the event of a total DC power loss.

With loss of both DC generators, the only DC power source available is the battery, which powers the DC essential buses. The installed battery capacity is sufficient to maintain the functionality of those items required for continued safe night flight and operation in IMC for a minimum of 30 minutes.

OR

**ACTION:**

1. Associated DC GEN switch ----- OFF, RESET, then ON

If the caution goes out:

2. Continue flight.

If caution remains on or returns:

3. Associated DC GEN switch ----- OFF

4. Land as soon as practical.

A DC GCU FAIL caution without a corresponding DC GEN caution could be caused by a partial system failure. Confirm all required systems are operating prior to continuing the flight.

OR

**ACTION:**

1. Bus Tie switch ----- RESET 1 or RESET 2

If the caution goes out:

2. Continue flight.

If the caution remains or returns after one reset:

3. If in IMC, transition to VMC and land as soon as practical.
4. If unable to transition to VMC and /or maintain VMC, land as soon as possible.

OR

**ACTION:**

1. DC electrical system ----- Determine status
2. DC Generators and Bus Tie switches (as required) ----- RESET
3. Land as soon as practical.

**CONFIRMING:**

BATT switch is in the OFF position while the aircraft is powered by another DC power source.

**ACTION:**

1. BATT Switch ----- ON

It is normal for a BATT OFF caution to illuminate during a FADEC Controlled Load Shed (FCLS) event.

## **ACTION:**

1. Check status of DC electrical system.
2. Reset DC generators and Bus Tie switches as required.

If caution remains or returns after one reset:

3. If in IMC, transition to VMC as soon as practical.
4. If unable to transition and/or maintain VMC, land as soon as possible.

A BATT PWR ONLY caution indicates that the battery is discharging.

With loss of both DC generators, the only DC power source available is the battery, which powers the DC essential buses. The installed battery capacity is sufficient to maintain the functionality of those items required for continued safe night flight and operations in IMC for a minimum of 30 minutes.

A Dual DC Generator Failure will result in a loss of power to AP1. Any coupled flight director modes will de-couple. Pilots should be attentive to flight controls while operating with only a single autopilot engaged.

## **CONFIRMING:**

Battery voltage less than 24 vDC.

## **ACTION:**

1. DC electrical system ----- Check status
2. DC Generators and Bus Tie switches (as required) ----- RESET

If caution remains or returns after one reset:

3. Land soon as practical.

## **ACTION:**

1. BATT switch ----- OFF, RESET, then ON

If caution remains or returns after one reset:

2. BATT switch ----- OFF
3. If IMC, transition to VMC and land as soon as practical.
4. If unable to transition and/or maintain VMC, land as soon as possible.

A BATT FAULT caution indicates that the battery is unable to supply emergency backup power to the aircraft.

Prior to engine shutdown, consider turning battery switch ON to avoid possible abnormal engine shutdown. If battery is unable to provide power, consider using external power for shutdown, or advise maintenance.

**CONFIRMING:**

Battery current greater than 200 Amps on the ground or greater than 85 Amps in flight.

**ACTION:**

1. Land as soon as practical.

A BATT CURRENT HIGH caution may illuminate following an engine start. If this occurs, ensure that the battery current is decreasing.

## **SYMPTOM:**

Loss of all electrical components except for the IESI and emergency lights.

## **ACTION:**

1. BATT switch ----- OFF, RESET, then ON
2. DC GEN 1 and DC GEN 2 switches ----- OFF, RESET, then ON

If generator and battery power are restored:

3. Continue flight.

If generators and battery power are not restored:

4. Land as soon as possible.

If both generators are restored, but battery power is not:

5. Complete procedure.

If battery power is restored, but generator power is not:

6. Complete procedure.

If one generator remains off:

7. Complete procedure.

The IESI and emergency lights have backup batteries that will power them in the event of a total DC electrical failure.

In the event of a total DC electrical failure do not reset the BUS TIE switches.

Prior to engine shutdown, consider turning the battery switch ON to avoid possible abnormal engine shutdown. If battery is unable to provide power, consider using external power for shutdown, or advise maintenance.

## **CONFIRMING:**

Main AC generator load indication is 0 KVA

## **ACTION:**

1. MAIN AC GEN switch ----- OFF, then ON

If the caution remains illuminated:

2. MAIN AC GEN switch ----- OFF
3. Continue flight.

Certain AC system failures will cause a MAIN AC GEN caution to be illuminated even though the generator is producing power. These failures shall be treated the same as if the generator has failed.

OR

## **ACTION:**

1. MAIN AC GEN switch ----- OFF, then ON

If the caution remains illuminated or returns:

2. Main AC GEN switch ----- OFF
3. Continue flight.

A MAIN AC GCU FAIL or MAIN AC GCU BIT caution without a corresponding MAIN AC GEN caution could be caused by a partial system failure. Confirm all required systems are operating prior to continuing the flight.

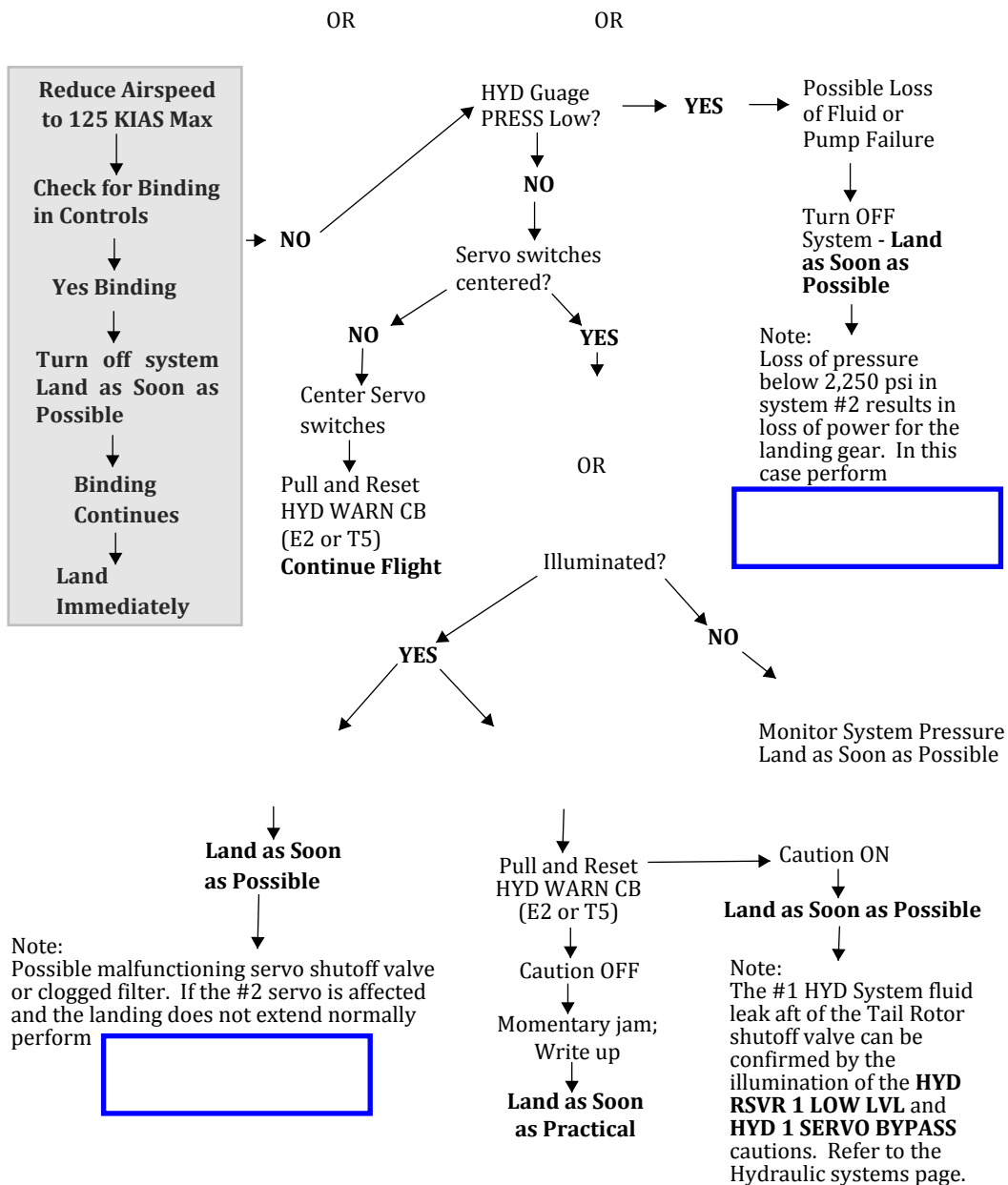
AVC and Weather RADAR will be inoperative with AC GEN OFF.

**ACTION:**

1. Continue flight.
2. Limit flight time to 5 hours with caution illuminated.

**ACTION:**

1. Check electrical indications for any abnormalities.



AND

AND

AND

**CONFIRMING:**

HYD 1 system pressure normal.

HYD 2 system pressure is less than 1600 psi.

**ACTION:**

If the failure occurs in cruise flight:

1. Airspeed ----- Reduce to 125 KIAS or less
2. Proceed to location where a run-on landing can be made.
3. Landing Gear ----- BLOWDOWN using  
procedure
4. Initiate a long shallow approach.
5. Airspeed ----- Gradually reduce to 45 KIAS
6. Over runway ----- Level helicopter as  
heading aligns with the runway
7. Perform run-on-landing
8. After touchdown ----- Use differential  
braking to maintain heading

Do not allow airspeed to decrease below 45 KIAS during the approach.  
If below 45 KIAS, do not attempt a go around.

As the helicopter slows to 45 KIAS, it may be desirable to accept some  
left yaw instead of trying to overcome collective load.

**Continued on the Next Page**

Extremely high pedal forces required, but pedal application will result in some yaw control. Collective-to-yaw coupling may be evident. Pedal motion is indicative of mixer unit interaction and not tail rotor pitch control. Priority should be given to collective input as conditions require. Consider turning off YAW TRIM.

If failure occurs below 45 KIAS:

1. Airspeed ----- Increase to 45 KIAS if able

Varying amounts of right yaw will be experienced, depending on airspeed and gross weight. It will require pilot's judgement as to whether pedal and collective loads are manageable enough to gradually continue to 45 KIAS.

2. If unable to continue to 45 KIAS ----- Level aircraft,

If failure occurs in a hover:

1. Level aircraft with cyclic.
2. Collective ----- Lower, land immediately

Aircraft will immediately yaw right. Left pedal force required to arrest this yaw would result in collective being driven down. Priority should be given to collective and not to pedals.

**SYMPTOM:**

Cyclic or collective control of pitch, roll, or collective will not move with normal hand-control pressure. Typically, only one axis is involved, and remaining axes are normal.

**ACTION:**

If the jam occurs while on the ground:

1. Shut down and investigate.

If the jam occurs while in flight:

1. Turn off the affected trim system to see if it alleviates the jam.
2. Check that a foreign object has not impeded any cockpit control travel.
3. Apply increased force to the affected flight control axis to actuate a shear device within the jammed flight control damper.

A shear device is incorporated within each of the pitch, roll and collective flight control dampers. The typical amount of force required to actuate the shear device is:

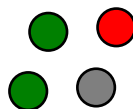
Collective	55 - 62 pounds
Pitch	17 - 20 pounds
Roll	35 - 40 pounds

With asymmetrical landing gear extension, the aircraft could roll over. Consideration should be given to evacuating all non essential crew and passengers in a "light on wheels hover" before putting the full weight on the aircraft.

### **SYMPTOM:**

After lowering the LDG GEAR handle to the DN position, one or two of the green indicator lights do not illuminate and / or red UNLKD light remains illuminated.

### **LANDING GEAR**



### **CONFIRMING:**

The box displayed around the landing gear text on the HYD page is displayed in white with the landing gear handle in the DN position.

### **ACTION:**

1. Airspeed ----- 80 KIAS or less
2. LDG GR CTRL 1 and LDG GR CTRL 2  
circuit breakers (A5 and M2) ----- CHECK / RESET
3. LDG GEAR handle ----- Cycle up then down

If an indication of a jammed gear is present, leave LDG GEAR handle in the DN position.

If landing gear remains unsafe:

4. Hover and have someone outside examine landing gear.

Consider having ground crew make a careful attempt to pull gear into place.

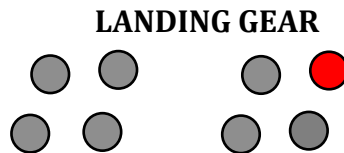
**Continued on the Next Page**

If landing gear appears to be extended and/or a safe gear indication is obtained:

5. Land ----- Touch down lightly on landing gear
6. Landing gear ----- Pin gear prior to putting weight on the gear, taxi or shutdown

Use of the emergency extension system is not recommended for cases with mixed safe and unsafe landing gear indications.

With asymmetrical landing gear extension, the aircraft could roll over. Consideration should be given to evacuating all non essential crew and passengers in a "light on wheels hover" before putting the full weight on the aircraft.



Absence of normal HYD 2 pressure or electrical power on both of the DC essential buses will require the use of the emergency blowdown system to extend the landing gear.

**SYMPTOM:**

After lowering the LDG GEAR handle to the DN position, none of the three green indicator lights illuminate.

**CONFIRMING:**

The box displayed around the landing gear text on the HYD page is displayed in white with the landing gear handle in the DN position. If the box is displayed in green, the landing gear is down and the indicator light(s) has failed.

**Continued on the Next Page**

## **ACTION:**

1. Airspeed ----- 80 KIAS or less
2. LDG GR CTRL 1, LDG GR CTRL 2 and LDG GR POS LTS  
circuit breakers (A5, M2 and M3) ----- CHECK / RESET
3. LDG GEAR handle ----- Cycle up then down

If landing gear remains unsafe:

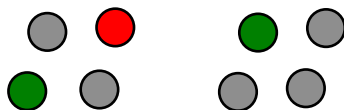
## **PROCEDURE B - EMERGENCY BLOWDOWN:**

Confirm that the landing handle is in the DN position prior to activating the EMER DN handle.

4. EMER DN handle  
(while on final approach) ----- Turn and pull
5. Land ----- Touchdown lightly
6. Landing gear ----- Pin gear prior to taxi or shutdown

Once the landing gear has been blown down, do not raise the landing gear handle until the maintenance personnel have inspected and bleed the landing gear hydraulic lines.

## LANDING GEAR



### SYMPTOM:

After raising the LDG GEAR handle to the UP position, one or more green indicator lights or the red UNLKD light remain illuminated.

### ACTION:

1. Airspeed ----- 80 KIAS or less
2. LDG GEAR handle ----- DN

If a safe down indication is obtained and destination can be reached with landing gear down:

3. Airspeeds ----- Up to 130 KIAS
4. Do not raise landing gear again unless no safe landing area is within range with landing gear extended.

If gear will not extend:

5. Perform

With asymmetrical landing gear extension, the aircraft could roll over. Consideration should be given to evacuating all non essential crew and passengers in a "light on wheels hover" before putting the full weight on the aircraft.

Flight above 130 KIAS is not authorized with the landing gear extended or partially extended.

## **SYMPTOM:**

Uncommanded sharp right yaw of aircraft.

Aircraft yaw unresponsive to pedal inputs.

## **ACTION:**

If impending failure is suspected at high airspeed:

1. Airspeed ----- Immediately slow to between 100 to 110 KIAS
2. Land as soon as possible.

If tail rotor drive failure occurs:

3. Control aircraft yaw with collective.
4. Autorotate if necessary to control aircraft yawing rate.

When landing is to be made:

5. Enter autorotation.
6. Airspeed ----- 75 KIAS
7. LDG GEAR handle ----- DN
8. Engine throttles ----- STOP prior to touchdown
9. Autorotative landing ----- Execute

Groundspeed at touchdown should be held to a minimum to reduce the tendency for aircraft roll over due to yaw.

Adverse collective-to-yaw coupling may occur with Fixed Pitch, Cable Break, or Tail Rotor Drive Failures. Consider turning off YAW TRIM.

### **SYMPTOM:**

Uncommanded sharp right yaw of aircraft.

Aircraft yaw unresponsive to pedal inputs.

### **ACTION:**

1. Maintain helicopter attitude and attempt to achieve zero ground speed and drift.

2. Engine throttles ----- STOP (at about 10 feet)

3. Collective ----- Increase to cushion landing

After ground contact:

4. Collective ----- Lower to minimum

5. Wheel brakes ----- As required

**SYMPTOM:**

Binding or restriction in tail rotor pedals, or  
Little to no response to tail rotor pedal movement.

Allow the pedals to move during the approach and landing to permit unrestricted collective movement.

Adverse collective-to-yaw coupling may occur with Fixed Pitch, Cable Break, or Tail Rotor Drive Failures. Consider turning off YAW TRIM. Do not apply right pedal after touchdown.

**ACTION:**

If fixed pitch at high power:

1. Lowering the collective will cause the aircraft to yaw left.
2. Fly an airspeed that results in the lateral deviation cue being out 1/2 deflection to the right (left yaw).
3. Fly a shallow approach accepting some left yaw to a roll-on landing.
4. Left yaw will reduce as collective is raised to cushion landing.
5. After touchdown, lower collective slowly.
6. Use differential braking to control heading.

**Continued on the next page**

If fixed pitch at cruise power:

1. Aircraft will yaw left or right as collective is lowered or raised.
2. Make approach and landing at airspeed less than 50 KIAS which corresponds to the cruise power setting.
3. After touchdown, lower collective slowly.
4. Use differential braking to control heading.

If fixed pitch at low power:

1. Raising the collective will cause the aircraft to yaw right.
2. Fly a shallow approach to a roll-on landing at an airspeed at or below 40 KIAS which results in a minimum yaw on touchdown.
3. Right yaw will increase as collective is raised to cushion landing.
4. After touchdown, lower collective slowly.
5. Use differential braking to control heading.

Consideration should be given to selecting a runway with a left crosswind, which will reduce some of the adverse yaw on touchdown.

## **SYMPTOM:**

Limited to no aircraft response to pedal inputs in one or both directions.

## **ACTION:**

1. Airspeed ----- Adjust to minimize yaw
2. Land as soon as possible.

When landing is to be made:

3. Airspeed ----- Slow to approximately 80 KIAS
4. Make a long shallow approach to be established on short final at 60 KIAS.
5. Cyclic ----- Gradual flare to execute a level deceleration to 40 KIAS
6. Collective and Cyclic ----- Small inputs to continue deceleration to 10 feet AGL or less
7. Perform a roll-on landing when aircraft heading becomes aligned with the runway.
8. Collective ----- Reduce slowly
9. Use differential braking to control heading.

Large control inputs at moderate to rapid rates are to be avoided. Collective applications should be slow and deliberate, not exceeding that required to gradually transition from one flight regime to the next (approach to balked landing, descent to level off, and touchdown to rollout are examples).

Proceed to a landing area offering at least 2000 feet of surface. Crosswind landings with winds greater than 10 knots are not recommended.

**SYMPTOM:**

Sharp increase in tail rotor vibration.

**ACTION:**

1. Airspeed ----- Slow to approximately 90 KIAS
2. Land as soon as possible. Plan for a run-on landing at or above 45 knots if possible.

OR

**ACTION:**

1. Fly manually ----- Airspeed 100 KIAS or less
2. If IMC, transition to VMC.
3. Continue flight.

Pilots should be attentive to the flight controls while operating with only a single autopilot engaged.

Any coupled flight director modes will de-couple with failure of an autopilot. Consider resetting AP1 or AP2 on the APCP and checking circuit breakers E3 / F8 / U9 / U10.

AND

**ACTION:**

1. Fly manually ----- Airspeed 100 KIAS or less
2. If IMC, transition to VMC.
3. Land as soon as practical.

Consider resetting AP1 or AP2 on the APCP and checking circuit breakers E3 / F8 / U9 / U10.

**ACTION:**

1. Fly manually ----- Airspeed 100 KIAS or less
2. Crosscheck both AHRS and ADC's with the IESI to determine which autopilot is receiving incorrect sensor information.
3. Affected AP switch ----- Deselect
4. ATT switch ----- As desired
5. If IMC, transition to VMC.
6. Land as soon as practical.

Autopilot miscompare occurs when there is a difference between the two autopilots and the autopilot monitoring cannot determine which one is incorrect.

Amber box displayed in the FMA around the degraded mode.

**ACTION:**

1. Fly attentively.
2. If IMC, transition to VMC.
3. If able to determine which autopilot is affected, deselect associated AP and fly manually.
4. Land as soon as practical.

An AFCS DEGRADED caution illuminates when a discrepancy between two sensors used by the AFCS for inputs and the AFCS cannot determine which sensor is correct.

## **CONFIRMING:**

One or more series actuators operating at or beyond its amber limit line on the AFCS page.

## **ACTION:**

1. Fly manually
2. Cyclic trim release and pedal trim switches ----- Actuate
3. Decrease severity of flight maneuver.

If caution remains on:

4. Land as soon as practical.

An AFCS mistrim condition is generated when one or more series actuators are operating near their limit and are not recentered by the flight control auto trim. The AFCS page can be displayed to determine which axis is affected.

ACFS MISTRIM caution is inhibited when the flight controls are out of the trim detents.

Ground taxiing the aircraft with the pilot's feet off the pedals may cause an AFCS MISTRIM caution to illuminate.

OR

**ACTION:**

1. Fly manually.
2. Associated AP circuit breakers  
(F8 and U10 or E3 and U9) ----- PULL
3. If IMC, transition to VMC.
4. Land as soon as practical.

An autopilot hot caution is generated when the temperature sensor in the affected Flight Control Module (FCM) reaches 85°C.

**ACTION:**

1. Fly attentively.
2. Continue flight without using any coupled collective modes.

An AFCS CLTV MODE FAIL will cause collective decouple.

OR

**ACTION:**

1. Reduce the severity of the flight maneuver.
2. Continue flight.

Amber box displayed in the FMA around the collective mode annuciation.

SAS displayed in the FMA pitch and roll mode annunciations.

**ACTION:**

1. Fly manually.
2. ATT switch ----- Reset

If caution remains:

3. If IMC, transition to VMC.
4. Land as soon as practical.

Loss of cyclic trim, or cyclic trim selected OFF, will result in ATT OFF caution and SAS mode active.

"Autopilot" aural alert

**ACTION:**

1. Fly manually
  2. ATT or SAS switch ----- Reset
- If Caution remains:
3. Airspeed ----- 100 KIAS or less
  4. If IMC, transition to VMC.
  5. Land as soon as practical.

Consider resetting AP1 / AP2

Some APCP lights and / or button inoperative.

**ACTION:**

1. Fly attentively.
2. FMA ----- Monitor mode engagement status.
3. Land as soon as practical.

Following an APCP failure, an autopilot may be deselected by pulling its associated circuit breakers (F8 and U10 or E3 and U9).

OR

ENG 1 or ENG 2 FIRE / ARMED button illuminated .  
"ENGINE ONE FIRE" or "ENGINE TWO FIRE" aural alert.

**CONFIRMING:**

Trailing smoke, burning odor, or warnings from other aircraft  
or ground crew.

**ACTION:**

In Flight:

1. Confirm fire.
  2. Set Safe OEI.
  3. Throttle (affected engine) ----- Identify, IDLE, STOP
  4. FIRE/ARM switch (affected engine) ----- ARM
  5. Fire extinguisher switch ----- MAIN/RESERVE (as required)
  6. Land as soon as possible.
- If fire is not extinguished:
- 7.

On the ground:

1. Throttle (affected engine) ----- STOP
  2. FIRE/ARM switch (affected engine) ----- ARM
  3. Fire extinguisher switch ----- MAIN/RESERVE (as required)
- If fire is not extinguished:
4. Both engine throttles ----- STOP
  5. Rotor brake ----- Apply
  6. BATT switch ----- OFF
  7. Evacuate aircraft.

**Continued on the next page**

Pressing the FIRE/ARM switch and selecting the MAIN fire extinguisher should extinguish most engine fires. If the engine fire warning remains illuminated for several seconds after the MAIN extinguisher has been selected, the pilot should then select the RESERVE fire extinguisher.

Once the fire has been extinguished, the ARM switch should be disarmed. This will prevent inadvertent use of the remaining fire bottle into the failed engine compartment in the event of a fire in the operating engine compartment.

Pilots can confirm L or R FIRE EXT PRESS LOW on the WCA after use of FIRE Extinguisher switch.

**SYMPTOM:**

Smoke, flames from engine exhaust, and / or rapid rise in ITT.

**ACTION:**

1. Throttle (affected engine) ----- STOP
  2. Fuel switch (affected engine) ----- OFF
  3. Affected engine START/IDLE button ----- Press and hold

If smoke or flames persist, continue motoring engine:

  4. Fire guard (if available) ----- Discharge fire extinguisher  
into engine intake

**SYMPTOM:**

Smoke or flames in the cabin or cockpit.

**ACTION:**

1. Notify ATC and begin immediate descent
  2. ECU and heater switches ----- OFF
  3. Close all cabin ventilation
  4. Fight fire with fire extinguisher
  5. Land as soon as possible

If fire persists:

  - 6.

If smoke accumulation becomes excessive, execute  
and continue to fight fire.

"SMOKE IN BAGGAGE" aural alert

**CONFIRMING:**

Unusual smell or smoke.

**ACTION:**

1. Land as soon as possible.
2. Inspect baggage compartment and fight fire with fire extinguisher if required.

The baggage compartment is sealed so that harmful quantities of smoke will not enter the cockpit and cabin. Large quantities of smoke in the baggage compartment will probably be smelled in the cockpit/cabin area.

**SYMPTOM:**

Smoke or flames in the cabin or cockpit.

**ACTION:**

1. Pilot's windows ----- OPEN

2. ECU switches ----- ON

Turn OFF if smoke or fumes are noted coming from cabin or cockpit air outlets.

3. Door vents and cabin exhaust ducts (if equipped) ----- OPEN

## **SYMPTOM:**

Smell of burning insulation, acrid smoke.

Prior to shutting off electrical power the pilot must consider what equipment is essential for continued safe flight.

## **ACTION:**

1. If IMC, transition to VMC.
2. Turn off all non-essential electrical systems.
3. Land as soon as possible.

If fire persists:

4. Main AC GEN switch ----- OFF
5. Set the Bus Tie Test switch to the TEST 2 position. Hold until the BUS TIE 2 FAULT caution message is displayed.

6. DC GEN 2 switch ----- OFF

If fire persists:

7. DC GEN 1 switch ----- OFF

If fire persists:

8. DC GEN 2 switch ----- ON

9. BATT switch ----- OFF

If fire persists:

10. DC GEN 2 switch ----- OFF

Absence of electrical power on both of the DC Essential Buses will require the use of the emergency blowdown system to extend the landing gear.

Shutting off all generators and the battery will result in the loss of all PFD's, MFD's, MCDU's AP's and Trim Systems. The IESI should be available for at least 30 minutes.

OR

**ACTION:**

1. Land as soon as practical.

Check MISC page to confirm.

OR

**ACTION:**

1. AVC switch ----- OFF
2. Continue flight.

Abnormal vibrations not affected by AVC switch position or not associated with an AVC failure may require more immediate action.

Reducing airspeed may reduce vibrations.

OR

**ACTION:**

1. Land as soon as practical.

1. Land as soon as practical.

## **ACTION:**

In flight:

1. Rotor brake handle ----- Check in detent

If caution light goes out:

2. Continue flight.

If caution light remains on:

3. Investigate for fire, vibrations, or unusual noise.

4. Land as soon as possible.

If fire is suspected:

5.

On the ground:

1. Rotor brake handle ----- Check in detent

If caution light remains on:

2. Shut down and investigate.

### **CONFIRMING:**

One or more doors indicate open on the MISC page.

### **ACTION:**

#### **Hinged Door:**

1. Door panel LOCK switch ----- PRESS
2. Door all upper pins ----- Ensure seated

If caution extinguishes:

3. Continue flight.

If caution remains:

4. Land as soon as practical.

#### **Sliding Cabin Door (If Installed):**

1. Airspeed ----- Reduce below 125 KIAS
2. Sliding cabin door(s) ----- Ensure closed

### **CONFIRMING:**

EXT PWR door indicates open on the MISC page.

### **ACTION:**

1. Land as soon as practical.

## **SYMPTOM:**

If VMM 1 fails:

(on pilot's display)

(on copilot's display)

Copilot's displays lose the following data:

COM and NAV radio information

Warning, caution and advisory messages

Fuel flows and quantities

MGB oil pressure and temperature

Hydraulic pressure

System page information

If VMM 2 fails:

(on copilot's display)

(on pilot's display)

Pilot's displays lose the following data:

COM and NAV radio information

Warning, caution and advisory messages

Fuel flows and quantities

MGB oil pressure and temperature

Hydraulic pressure

System page information

## **ACTION:**

1. RCP VMM switch ----- Select operable VMM
2. Land as soon as practical.

The pilot will lose all audio alerts with the VMM 2 failure. The audio alerts will be restored when VMM 1 is selected on the RCP.

The copilot will lose all audio alerts with the VMM 1 failure. The audio alerts will be restored when VMM 2 is selected on the RCP.

A VMM alert will be displayed on both pilot's PFD's when the RCP is selected to a single VMM source.

**SYMPTOM:**

If VMM 1 fails:

(on copilot's display)

(on pilot's display)

Pilot's and copilot's displays lose the following data:

COM and NAV radio information

Warning, caution and advisory messages

Fuel flows and quantities

MGB oil pressure and temperature

Hydraulic pressure

System page information

**ACTION:**

1. Land as soon as possible.

Both pilots will lose all warning, caution, advisory messages and audio alerts with a dual VMM failure.

OR

**ACTION:**

1. Land as soon as practical.

**ACTION:**

1. Do not takeoff until fault is corrected.

A VMM check calibration caution indicates that there is an inconsistency between the fuel calibrations loaded into each VMM.

**ACTION:**

1. Do not takeoff until fault is corrected.

A check configuration caution is generated on the ground when there is an inconsistency in the software and/or data loaded into one or more of the following display units, VMM's or FCM's.

OR

**ACTION:**

1. Do not takeoff until fault is corrected.

A PFD and MFD configuration caution is generated on the ground when there is an inconsistency in the aircraft configuration file or checklist data loaded into the associated display unit.

**ACTION:**

1. COM radios ----- Reconfigure as required
2. Continue flight.

A check communications caution indicates that one or more of the communications radios (COM 1, COM 2, ATC 1 or ATC 2) have failed.

**ACTION:**

1. NAV radios ----- Reconfigure as required
2. Continue flight.

A check navigation caution indicates that one or more of the navigation radios (NAV 1, NAV 2, ADF 1, or ADF 2) have failed.

OR

**ACTION:**

1. Fly attentively.
2. Switch NAV source to operable FMS as required.
3. Continue flight.

IFR dispatch requires two operative FMS's

## **ACTION:**

1. Fly attentively.
2. Command a manual cross talk via the MCDU MSG page to resynchronize the FMS's.
3. Continue flight.

The FMS synchronization caution indicates that a cross talk failure has occurred and the information contained in each FMS might not be the same.

A manual cross talk may also be commanded by pressing DATA/STATUS/FMS BITE/CTK INIT on the MCDU that is opposite from the PFD in-command white triangle.

OR

## **ACTION:**

1. RCP ADC knob ----- Select operable ADC
2. If IMC, transition to VMC.
3. Continue flight.

OR

**ACTION:**

1. Fly manually.
2. RCP AHRS switch ----- Select operable AHRS
3. If IMC, transition to VMC.
4. Continue flight.

If unable to maintain VMC:

5. Land as soon as practical.

The associated autopilot will disengage and the pilot will be unable to couple to any flight director modes.

OR

**ACTION:**

1. Use the operable CCD as required.
2. Continue flight.

A stuck CCD button will cause that CCD to fail. Unsticking the button will restore the CCD's functionality.

OR

**ACTION:**

1. Use the operable MCDU as required.
2. Continue flight.

OR

**ACTION:**

1. RCP PCP switch ----- Select operable PCP
2. Use the operable PCP as required.
3. Continue flight.

**ACTION:**

1. Maintain desired altitude and ground clearance visually.
2. Continue flight.

If valid RADAR altitude information is lost during a coupled ILS approach, the automatic level off will be inoperative and the aircraft will continue to follow the glideslope below 50 feet AGL.

**ACTION:**

1. Maintain obstacle clearance visually.
2. Continue flight.

The landing gear audio alert will not be heard when a warning message is generated following a failure of the TAWS.

**ACTION:**

1. Maintain traffic separation visually.
2. Continue flight.

OR

**ACTION:**

1. Utilize the other GPS for navigation.
2. Continue flight.

LPV instrument procedures will be unavailable.

**CONFIRMING:**

Access the appropriate MCDU RMS ATC page to determine lost functionality.

**ACTION:**

1. Notify air traffic control as necessary.
2. Continue flight.

**ACTION:**

1. AFDS ISOLATE switch ----- ISOLATE
2. Continue flight.

If failure of the AFDS occurs, indicated by the illumination of the caution annunciator on the AFDS control panel, and the dedicated annunciator on the instrument panel in the vicinity of the IESI, the ISOLATE switch should be placed to ISOLATE. Failure to place the ISOLATE switch to ISOLATE may cause the floats to inflate when the emergency flotation system is armed.

While in ISOLATE, the EFS must be manually deployed in accordance with the aircraft RFM.

**ACTION:**

1. Shutdown and check maintenance page for nature of exceedance.
2. Contact maintenance prior to flight.

An EXCEEDANCE caution is an indication that the HUMS has recorded an exceedance on one of the aircraft systems. An EXCEEDANCE caution message will only be displayed when the aircraft is on the ground with the engines OFF.

**ACTION:**

1. Land as soon as practical.

A CHIP SYS FAULT caution indicates that the chip detector system is not able to detect metal particles in the gear boxes being monitored.

**ACTION:**

1. Monitor associated systems (e.g., AFCS, WXR, TCAS, etc.)
2. Continue flight.

## SYMPTOM:

Ground crew cannot see all of the droop stop indicators at idle  $N_R$ .  
One or more main rotor blades are flying lower than normal at idle  $N_R$ .

## ACTION:

1. Shutdown one engine to reduce idle  $N_R$ .
2. Operating engine Start/Idle button ----- Press and  
release to set low idle

If the droop stop(s) remains out:

3. Collective ----- Increase slightly to further reduce  $N_R$

If the droop stop(s) remains out:

4. Collective ----- Full down
5. Operating engine Start/Idle button and throttle ----- Press to select  
high idle, and advance throttle to set  $N_R$  greater than 70%
6. Slightly displace the cyclic in an attempt to dislodge the hung droop  
stop.
7. Operating engine throttle ----- IDLE
8. Operating engine Start/Idle button ----- Press and  
release to set low idle

If after several attempts, the droop stop(s) does not engage:

Ensure all ground personnel are well clear of the main rotor tip path  
while stopping the main rotor with a droop stop not engaged.

9. Cyclic ----- Place in neutral position
10. Operating engine throttle ----- STOP
11. Rotor brake ----- Apply firm pressure to the  
brake handle to quickly slow main rotor

AND/OR

AND/OR

**ACTION:**

1. Affected PITOT HEAT switch(es) ----- OFF
2. Affected PITOT HEAT circuit breakers -----Pull and reset  
(L1 and L2, C9 and C10 or J4 and J5)
3. Affected PITOT HEAT switch(es) ----- ON

If caution goes out:

4. Continue flight.

If caution remains:

5. RCP ADC switch ----- Select the unaffected ADC  
(as required)
6. Exit conditions requiring the use of pitot heat or land as soon as possible.

Illumination of any pitot heat caution indicates a failure of the pitot heat system.

**CONFIRMING:**

OAT is less than 5° C and PITOT HEAT switches are OFF.

**ACTION:**

1. PITOT HEAT switches ----- ON

OR

**ACTION:**

1. Affected WSHLD HT switch ----- OFF

If caution remains:

2. Affected WSHLD HT circuit breakers ----- Pull (D6 OR W4)

## **ACTION:**

1. Landing gear ----- Down
2. MAYDAY ----- Complete
3. Transponder ----- 7700
4. Passengers ----- Brief

If ditching:

5. Floats ----- ARM and deploy below 75 KIAS
6. Final approach ----- Into wind
7. Land on crest or back side of wave with minimal touchdown force.
8. After landing or ditch, complete

## **ACTION:**

1. Rotor disk ----- Level
2. Engines ----- Shutdown
3. On water, avoid use of rotor brake. If necessary, apply when  $N_R$  is below 40%.
4. Doors / emergency exits / windows ----- Jettison
5. Life rafts (on water) ----- Deploy
  - a. Consider wind / wave conditions before deployment.
  - b. Be ready for immediate release from aircraft.
  - c. Prevent raft from damage by aircraft components.
6. Collect cockpit and cabin emergency equipment.
7. Evacuate aircraft.
  - a. On land ----- Up wind if possible
  - b. On water ----- As directed by commander
8. Perform head count and check for injuries.
9. ELT(s) ----- ON

**SYMPTOM:**

Noticeable bang followed by flotation bags appearing outside the pilot and copilot windows.

**ACTION:**

1. Airspeed ----- 75 KIAS or less
2. Land as soon as practical.

Due to decreased airspeed and increased drag, aircraft range will be severely limited with floats deployed.

**SYMPTOM:**

Flash and / or bang.

Possible static noise in the intercom and radios.

Possible failure of avionics equipment.

Possible erratic compass and NDB indications.

Possible increase in vibration levels.

Possible ozone smell.

**ACTION:**

1. Land as soon as possible.

If the aircraft has suffered a lightning strike, it is likely there will be considerable damage to main and / or tail rotor blades, rotor heads and associated components. The majority of this damage may not be visible without strip examination. Once the aircraft has landed after a lightning strike, it should not be flown again until it has been fully inspected by appropriate technical personnel.

## **ACTION:**

1. Radio call ----- Complete
2. Divert to nearest suitable landing site.

On arrival:

3. Aircraft ----- Shutdown at suitable remote location
4. Passengers and crew ----- Evacuate to safe location
5. Security authorities ----- Inform
6. Do not touch or attempt to move any suspicious object.

## **WARNING / CAUTION ANNUNCIATORS**