

737

Quick Reference Handbook

MEMORY ITEMS

Aborted Engine Start

Condition: On the ground, an aborted engine start is needed.

Objective: To shut down the engine and motor it.

- 1 Engine start lever (affected engine) CUTOFF

- Look at the timer when switching the start lever to CUTOFF

Airspeed Unreliable

Condition: Airspeed or Mach indications are suspected to be unreliable. (Items which might indicate unreliable airspeed are listed in the Additional Information section.)

Objective: To identify a reliable airspeed indication, if possible, or to continue the flight using the Flight With Unreliable Airspeed table in the Performance Inflight chapter.

- 1 Autopilot (if engaged) Disengage

- 2 Autothrottle (if engaged) Disengage

- 3 F/D switches (both) OFF

- 4 Set the following gear up pitch attitude and thrust:

Flaps extended 10° and 80% N1

Flaps up 4° and 75% N1

- “PAN PAN x3 - RYR xxx Flight instruments problems unable to maintain XXX, standby”

APU FIRE

Condition: Fire is detected in the APU.

1 APU fire switch . . . Confirm Pull, rotate to the stop, and hold for 1 second

2 APU switch OFF

- Make MAYDAY call

CABIN ALTITUDE WARNING () or Rapid Depressurization ()

CABIN ALTITUDE (If installed and operative)

Condition: One or more of these occur:

- A cabin altitude exceedance
- In flight, the intermittent cabin altitude/configuration warning horn sounds or a CABIN ALTITUDE light (if installed and operative) illuminates.

1 Don oxygen masks and set regulators to 100%.

2 Establish crew communications.

3 Pressurization mode selector MAN

4 Outflow VALVE switch Hold in CLOSE until the outflow VALVE indication shows fully closed

5 **If** cabin altitude is **uncontrollable**:

Passenger signs ON

PASS OXYGEN switch ON

►► Go to the Emergency Descent () checklist on page 0.1



Emergency Descent ()

Condition: One or more of these occur:

- Cabin altitude cannot be controlled
- A rapid descent is needed.

- 1 Announce the emergency descent. The pilot flying will advise the cabin crew, on the PA system, of impending rapid descent. The pilot monitoring will advise ATC and obtain the area altimeter setting.
- 2 Passenger signs ON
- 3 **Without delay**, descend to the lowest safe altitude or 10,000 feet, whichever is higher.
- 4 ENGINE START switches (both) CONT
- 5 Thrust levers (both) Reduce thrust to minimum or as needed for anti-ice
- 6 Speedbrake FLIGHT DETENT
- 7  Set target speed to Mmo/Vmo.

If structural integrity is in doubt, limit speed as much as possible and avoid high maneuvering loads.

- Set the intercom switch to OFF and use PPT to communicate
- Silence the HORN
- If a loud BANG was heard suspect structural damage and limit speed during descent
- If able initiate descent below 10000ft to make sure cabin altitude reads below 10000ft (At Low QNH cabin altitude will read higher)
- Call N1 to Flight Deck when both pilot have taken masks off

ENGINE FIRE ()
or
Engine Severe Damage or
Separation ()

Condition: One or more of these occur:

- Engine fire warning
- Airframe vibrations with abnormal engine indications
- Engine separation.

1 Autothrottle (if engaged) Disengage

2 Thrust lever
(affected engine) Confirm Close

3 Engine start lever
(affected engine) Confirm CUTOFF

4 Engine fire switch
(affected engine) Confirm Pull

To manually unlock the engine fire switch, press
the override and pull.

5 **If** the engine fire switch or ENG OVERHEAT light is
illuminated:

Engine fire switch Rotate to the stop and
hold for 1 second

If after 30 seconds the engine fire switch or ENG
OVERHEAT light stays illuminated:

Engine fire switch Rotate to the
other stop and
hold for 1 second

- Switch the autopilot to the operative engine side before moving
the start lever to cutoff

Engine Limit or Surge or Stall

Condition: One or more of these occur:

- Engine indications are abnormal
- Engine indications are rapidly approaching or exceeding limits
- Abnormal engine noises are heard, possibly with airframe vibration
- There is no response to thrust lever movement or the response is abnormal
- Flames in the engine inlet or exhaust are reported.

Objective: To attempt to recover normal engine operation or shut down the engine if recovery is not possible.

- 1 Autothrottle (if engaged) Disengage
- 2 Thrust lever
(affected engine) Confirm Retard until
engine indications
stay within limits or
the thrust lever is closed

ENGINE OVERHEAT

ENG 1
OVERHEAT

ENG 2
OVERHEAT

Condition: An overheat is detected in the engine.

- 1 Autothrottle (if engaged) Disengage
- 2 Thrust lever
(affected engine) Confirm Close
- 3 **If the ENG OVERHEAT light stays illuminated:**

►► Go to the ENGINE FIRE or Engine Severe Damage or Separation <> checklist on page 8.2



LANDING CONFIGURATION

Condition: In flight, the steady warning horn sounds.

1 Assure correct airplane landing configuration.



Loss Of Thrust On Both Engines

Condition: Both of these occur:

- Both engines have a loss of thrust
- Both ENG FAIL alerts show.

Objective: To restart at least one engine.

- 1 ENGINE START switches (both) FLT
- 2 Engine start levers (both) CUTOFF
- 3 **When** EGT decreases:
Engine start levers (both) IDLE detent
- 4 **If** EGT reaches 950°C or there is no increase in EGT within 30 seconds:
Engine start lever
(affected engine) Confirm CUTOFF,
then IDLE detent
If EGT again reaches 950°C or there is no increase in EGT within 30 seconds, repeat as needed.

Runaway Stabilizer ()

Condition: Uncommanded stabilizer trim movement occurs continuously.

- 1 Control column. Hold firmly
- 2 Autopilot (if engaged) Disengage

Do **not** re-engage the autopilot.

Control airplane pitch attitude manually with control column and main electric trim as needed.

- 3 Autothrottle (if engaged) Disengage

Do **not** re-engage the autothrottle.

- 4 **If** the runaway **stops** after the autopilot is disengaged:



- 5 **If** the runaway **continues** after the autopilot is disengaged:

STAB TRIM CUTOUT
switches (both) CUTOUT

If the runaway **continues**:

Stabilizer
trim wheel Grasp and hold

- “PAN PAN x3 - RYR xxx Flight controls problems unable to maintain XXX, standby”

TAKEOFF CONFIGURATION

TAKEOFF CONFIG (If installed and operative)

Condition: On the ground, the intermittent cabin altitude/configuration warning horn sounds or a TAKEOFF CONFIG light (if installed and operative) illuminates when advancing the thrust levers to takeoff thrust.

1 Assure correct airplane takeoff configuration.



PIOSEE - RECAP

PROBLEM ("What do you think the problem is?")

Think about future problems, ask yourself "how will the malfunction affect us?"

- The need to land at the nearest suitable airport?
- Higher fuel consumption?
- Higher Landing Distance Required?
- Loss of navigation performance?

INFORMATION

- FUEL (Especially when QRH indicates: Note do not use FMC fuel predictions)
- Airports within our fuel range
- Weather for those airports
- Landing Distance Required vs Landing distance available
- Cabin : Any passengers injuries, damage to the aircraft...

OPTIONS / SELECT

Discuss the options with the information gathered and make a crew decision on the future course of action. Common options:

- Return to departure airport
- Continue to destination
- Divert to an alternate

EXECUTE

- Tell ATC (you can follow a NITS structure)
- Tell the CABIN -> NITS -> PA
- (complete any remaining checklist ex: One engine inop landing checklist)
- DALTA setup

EVALUATE

- Monitor / evaluate fuel, weather, situation... be open to new options

MANEUVERS

APPROACH TO STALL OR STALL RECOVERY

Pilot Flying	Pilot Monitoring
<ul style="list-style-type: none"> • Initiate the recovery: <ul style="list-style-type: none"> • Hold the control column firmly. • Disconnect autopilot and autothrottle. • Smoothly apply nose down elevator to reduce the angle of attack until buffet or stick shaker stops. Nose down stabilizer trim may be needed.* 	<ul style="list-style-type: none"> • Monitor altitude and airspeed. • Verify all required actions have been done and call out any omissions. • Call out any trend toward terrain contact.
<ul style="list-style-type: none"> • Continue the recovery: <ul style="list-style-type: none"> • Roll in the shortest direction to wings level if needed.** • Advance thrust levers as needed. • Retract the speedbrakes. • Do not change gear or flap configuration, except <ul style="list-style-type: none"> • During liftoff, if flaps are up, call for flaps 1. 	<ul style="list-style-type: none"> • Monitor altitude and airspeed. • Verify all required actions have been done and call out any omissions. • Call out any trend toward terrain contact. • Set the FLAP lever as directed.
<ul style="list-style-type: none"> • Complete the recovery: <ul style="list-style-type: none"> • Check airspeed and adjust thrust as needed. • Establish pitch attitude. • Return to the desired flight path. • Re-engage the autopilot and autothrottle if desired. 	<ul style="list-style-type: none"> • Monitor altitude and airspeed. • Verify all required actions have been done and call out any omissions. • Call out any trend toward terrain contact.

- Disengage automatics -> Make smooth control inputs

- IMMEDIATELY TRIM NOSE DOWN to compensate for the increase in pitch when advancing the thrust levers

- Use the PLI and fly the aircraft just below them

TERRAIN ESCAPE

Pilot Flying	Pilot Monitoring
<p>Disconnect autopilot.</p> <p>Disconnect autothrottle.</p> <p>Aggressively apply maximum thrust.</p> <p>Simultaneously roll wings level and rotate to an initial pitch attitude of 20°.</p> <p>Retract speedbrakes.</p> <p>If terrain remains a threat, continue rotation up to the pitch limit indicator (if available) or stick shaker or initial buffet.</p>	<p>Assure maximum* thrust.</p> <p>Verify all required actions have been completed and call out any omissions.</p>
<p>Do not change gear or flap configuration until terrain separation is assured.</p> <p>Monitor radio altimeter for sustained or increasing terrain separation.</p> <p>When clear of terrain, slowly decrease pitch attitude and accelerate.</p>	<p>Monitor vertical speed and altitude (radio altitude for terrain clearance and barometric altitude for a minimum safe altitude.)</p> <p>Call out any trend toward terrain contact.</p>

- **Warning before impact “TERRAIN” (40-60 s) “PULL UP” (20-30 s)**
- **Disengage automatics -> Make smooth control inputs**
- **Use the PLI and fly the aircraft just below them**

TCAS RA

Pilot Flying	Pilot Monitoring
<p>If maneuvering is required, disengage the autopilot and autothrottle.</p> <p>Smoothly adjust pitch and thrust to satisfy the RA command. Follow the planned lateral flight path unless visual contact with the conflicting traffic requires other action.</p>	
<p>Attempt to establish visual contact. Call out any conflicting traffic.</p>	

- **Disengage automatics -> Make smooth control inputs**
- **Stay just slightly above/below the red trapezoid**
- **Do not follow a descent RA below 1000ft AGL**
- **If in landing configuration call for Flaps 15, then Gear Up with a positive rate of climb**

WINDSHEAR ESCAPE

Pilot Flying	Pilot Monitoring
<p style="text-align: center;">MANUAL FLIGHT</p> <ul style="list-style-type: none"> • Disconnect autopilot. • Press either TO/GA switch. • Aggressively apply maximum* thrust. • Disconnect autothrottle. • Simultaneously roll wings level and rotate toward an initial pitch attitude of 15 °. • Retract speedbrakes. • Follow flight director TO/GA guidance (if available). <p style="text-align: center;">AUTOMATIC FLIGHT</p> <ul style="list-style-type: none"> • Press either TO/GA switch**. • Verify TO/GA mode annunciation. • Verify thrust advances to GA power. • Retract speedbrakes. • Monitor system performance***. 	<ul style="list-style-type: none"> • Assure maximum* thrust. • Verify all required actions have been completed and call out any omissions.
<ul style="list-style-type: none"> • Do not change flap or gear configuration until windshear is no longer a factor. • Monitor vertical speed and altitude. • Do not attempt to regain lost airspeed until windshear is no longer a factor. 	<ul style="list-style-type: none"> • Monitor vertical speed and altitude. • Call out any trend toward terrain contact, descending flight path, or significant airspeed changes.

- Disengage automatics -> Make smooth control inputs
- When out of windshear, advise ATC of encountered windshear

CABIN ALTITUDE WARNING / EMERGENCY DESCENT

- Set the intercom switch to OFF and use PPT to communicate
- Silence the Horn
- If a loud BANG was heard suspect structural damage and limit speed during descent
- If able initiate descent below 10000ft to make sure cabin altitude reads below 10000ft (At Low QNH cabin altitude will read higher)
- Call N1 to Flight Deck when both pilot have taken masks off

Captain	First Officer
Oxygen Mask - On	Oxygen Mask - On
Crew communications - Establish	Crew communications - Establish
Assumes PF role	Assumes PNF role
Pressurization mode selector - MAN Outflow valve switch - CLOSE If pressurization is restored, continue manual operation to maintain proper cabin altitude.	
If cabin altitude is uncontrollable:	
	Passenger oxygen switch (if required) - ON
	Passenger signs - ON
Emergency descent - Initiate	

Captain (PF)	Co-Pilot (PM)
1. Announce Emergency Descent.	1. Select Engine Start switches to CONT.
2. Select lower ALT on MCP ALT selector.	2. Set 7700 and select TA on the transponder mode selector.
3. Select LVL CHG.	3. Contact ATC - Mayday Call State new HDG - Request QNH - Request descent to 10,000 MSA.
4. Select HDG SEL and turn approximately 45 degrees off existing HDG or track, terrain considerations permitting.	4. Turn ON Turnoff and Inboard Landing lights.
5. Close thrust levers manually.	5. Set QNH.
6. Select speed brake to Flight Detent.	6. Monitor TCAS and Descent.
7. Select MCP SPD to VMO/MMO or limit speed as required.	7. Read Depressurization and Emergency Descent checklists.
8. Tidy up MCP - ALT: Select QNH and 10,000' MSA - HDG - Note new HDG - Speed - Ensure MMO/VMO set.	8. Anticipate turbulence and icing requirements.
9. Respond to altitude calls.	9. Call every 10,000' during descent.
10. Reduce rate of descent at "TWO TO GO."	10. Call "TWO TO GO."
11. Retract speed brake at "ONE TO GO."	11. Call "ONE TO GO."
WHEN LEVEL	
12. When level, set speed appropriate to situation.	12. Verify pressurization system and advise the captain when the cabin altitude is below 10,000'.