

## 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 not controllable:**  
Passenger signs . . . . . ON  
**If the cabin altitude exceeds or is expected to exceed 14,000 feet:**  
PASS OXYGEN switch . . . . . ON

▶▶ Go to the Emergency Descent checklist on page 0.1



## [ ] CABIN ALTITUDE

Condition: Cabin altitude is excessive.

- 1 Don the oxygen masks.
- 2 Establish crew communications.
- 3 Check the cabin altitude and rate.
- 4 **If the cabin altitude is uncontrollable:**  
PASS OXYGEN switch . . . . . Push to ON and hold for 1 second

**Without delay,** descend to the lowest safe altitude or 10,000 feet, whichever is higher.

To descend:

- Move the thrust levers to idle
- Extend the speedbrakes
- If structural integrity is in doubt, limit airspeed and avoid high maneuvering loads
- Descend at Vmo/Mmo

787 NNC includes Emergency Descent

FCOM

### Operation With Loss of Cabin Pressurization

If a depressurization event occurs, the outflow valves close to preserve cabin pressure. While the airplane is descending and cabin altitude is increasing, the outflow valves remain closed until the airplane reaches 15,000 feet or descends below the cabin altitude. At this point the outflow valves drive full open for the remainder of the flight.

It is important that the flight crew not attempt to manually close the outflow valves during the descent.

## 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

2 Choose one:

◆ ENGINE START switch is in **GRD**:

Motor the engine for **60 seconds**.

ENGINE START switch  
(affected engine) . . . . . OFF



◆ ENGINE START switch is in **OFF**:

▶▶ Go to step 3

3 **After** N2 decreases below 20%:

ENGINE START switch  
(affected engine) . . . . . GRD

Motor the engine for **60 seconds**.

ENGINE START switch  
(affected engine) . . . . . OFF



## Aborted Engine Start L, R

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

1 FUEL CONTROL switch  
(affected side) . . . . . CUTOFF

2 START selector (affected side) . . . . . START

3 Motor the engine for **30 seconds**.

4 START selector (affected side) . . . . . NORM



NNC memory items are the same,  
motoring is 30 seconds only

FCOM

During **ground starts**, the autostart system monitors engine parameters and attempts to correct the start for any of the following:

- compressor stall
- high residual EGT
- hot start
- hung start
- loss of one starter
- no EGT rise
- start time exceeds the starter duty cycle timer

## 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 indications stay within limits or the thrust lever is closed

Switch on the Thrust Lever

## [ ] ENG LIMIT EXCEED L, R

Condition: An engine limit exceedance occurs.

- 1 A/T ARM switch (affected side) . . . . .Confirm . . . . . OFF
- 2 Thrust lever (affected side) . . . . .Confirm . . . . .Retard until ENG LIMIT EXCEED message blanks or the thrust lever is at idle

## [ ] ENG SURGE L, R

Condition: An engine surge or stall that requires crew action is detected.

- 1 A/T ARM switch (affected side) . . . . . Confirm. . . . . OFF
- 2 Thrust lever (affected side) . . . . .Confirm . . . . .Retard until the ENG SURGE message blanks or the thrust lever is at idle

Switch on the MCP

2 separate NNC on the 787, however same actions

## 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.**
- 
- 5 At or above **FL270**, set airspeed to **275 knots**.  
Below FL270, set airspeed to **300 knots**.

You better take these as a memory item too... !

Mnemonic for both aircraft :

- above **FL270** = **270**
- below = **300** for **737**

## Dual Eng Fail/Stall

Condition: Engine speed for both engines is below idle.

- 1 FUEL CONTROL switches (both) . . . . . CUTOFF, then RUN
  - 2 RAM AIR TURBINE switch . . . . . Push and hold for 1 second
- 
- 3 Set airspeed above **270 knots**.

You better take this as a memory item too... !

270 knots for GENx engines  
250 knots for RR Trent engines, which is outside X-start envelope

- start switches do not have FLT position
- actions are not repeated by pilot
- a single speed for all levels
- re-engage A/T Left or Right after engine recovery

Expect [ ] **STABILIZER** warning during descent :

- accomplish memory items
- switches are reset to NORM in step 7 of the DUAL Eng Fail / Stall NNC

## 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

Only APU on 737 has memory items

## CARGO FIRE

**FWD**   **AFT**

Condition: Fire is detected in the related cargo compartment.

- 1 CARGO FIRE ARM switch (affected compartment) . . . Confirm . . . . Push, Verify ARMED
- 2 CARGO FIRE DISCH switch . . . . . Push and hold for 1 second

**Note:** DISCH light may need up to 30 seconds to illuminate.

## [ ] FIRE APU

Condition: Fire is detected in the APU.

- 1 APU fire switch . . . . . Confirm . . . . . Pull, rotate to the stop and hold for 1 second
- 2 Choose one:
  - ◆ FIRE APU message **stays shown**:  
Plan to land at the nearest suitable airport.  
▶▶ Go to step 3
  - ◆ FIRE APU message **blanks**:  
▶▶ Go to step 3

- 3 Do **not** accomplish the following checklist:  
APU SHUTDOWN

■ ■ ■ ■

## [ ] FIRE CARGO AFT

Condition: Smoke is detected in the aft cargo compartment.

- 1 AFT CARGO FIRE ARM switch . . . . . Confirm . . . . ARMED
- 2 CARGO FIRE DISCH switch . . . . . Push and hold for 1 second



## 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

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## [ ] FIRE ENG L, R

Condition: Fire is detected in the engine.

- 1 A/T ARM switch (affected side) . . . . . Confirm . . . . . OFF
- 2 Thrust lever (affected side) . . . . . Confirm . . . . . Idle
- 3 FUEL CONTROL switch (affected side) . . . . . Confirm . . . . . CUTOFF
- 4 Engine fire switch (affected side) . . . . . Confirm . . . . . Pull
- 5 **If** the FIRE ENG message stays shown:

Engine fire switch (affected side) . . . . . Rotate to the stop and hold for 1 second

**If** after 30 seconds, the FIRE ENG message stays shown:

Engine fire switch (affected side) . . . . . Rotate to the other stop and hold for 1 second

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Switch on the MCP

## 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



## [ ] OVERHEAT ENG L, R

Condition: An overheat is detected in the engine.

- 1 ENGINE ANTI-ICE selector (affected side) . . . . . OFF
- 2 A/T ARM switch (affected side) . . . . . Confirm . . . . . OFF
- 3 Thrust lever (affected side) . . . Confirm . . . Retard slowly until the OVERHEAT ENG message blanks or the thrust lever is at idle

4 Do **not** accomplish the following checklist:  
AUTOTHROTTLE

5 Choose one:

◆ OVERHEAT ENG message **blanks**:

**Note:** Run the affected engine at a thrust setting that keeps the OVERHEAT ENG message blank.

Avoid icing conditions.



◆ OVERHEAT ENG message **stays shown**:

▶▶ Go to step 6

No memory items on the 787

## Engine Tailpipe Fire

Condition: An engine tailpipe fire occurs on the ground with no engine fire warning.

## Smoke, Fire or Fumes

Condition: Smoke, fire or fumes occur.

## Volcanic Ash

Condition: Volcanic ash is suspected when one or more of these occur:

- A static discharge around the windshield
- A bright glow in the engine inlets
- Smoke or dust on the flight deck
- An acrid odor.

Objective: To exit the ash cloud and restart engines if needed.

## Fire Eng Tailpipe L, R

Condition: An engine tailpipe fire occurs on the ground with no engine fire warning.

## Smoke, Fire or Fumes

Condition: Smoke, fire, or fumes occur.

Objective: To remove power from the ignition source.  
To land the airplane as soon as possible, if needed.

## Volcanic Ash

Condition: Volcanic ash is suspected when one or more of these occur:

- A static discharge around the windshield
- A bright glow in the engine inlets
- Smoke or dust on the flight deck
- An acrid odor

Objective: To exit the ash cloud and restart engines if needed.

None of these NNC have memory items



## 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

## [ ] STABILIZER

Condition: One of these occurs:

- Stabilizer movement without a signal to trim
- The stabilizer is failed

- 1 STAB cutout switches (**both**) . . . . . CUTOUT
- 2 Do not exceed the current airspeed.

## 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**
- 

Mnemonic for both aircraft :

- near ground 10 x 8
- in flight 4 x 7

## AIRSPEED UNRELIABLE

Condition: The airspeed or Mach indications disagree with AOA calculated airspeed.

Objective: To identify a reliable airspeed indication.

- 1 Autopilot disconnect switch . . . . . Push
  - 2 A/T ARM switches (both) . . . . . OFF
  - 3 F/D switches (both) . . . . . OFF
  - 4 Set the following gear up pitch attitude and thrust:  
Flaps extended . . . . . 10° and **85% N1**  
Flaps up . . . . . 4° and **70% N1**
- 

Other EICAS indications can be :

- HEAT L+C+R
- NAV AIR DATA SYS
- NAV AIRSPEED DATA

→ in all cases, do the

AIRSPEED UNRELIABLE

Switch Captain AIR DATA / ATT to ALTN by memory in order to compare and investigate

## Overspeed

Condition: Airspeed is more than Vmo/Mmo.

- 1 Reduce thrust and, if needed, adjust attitude to reduce airspeed to less than Vmo/Mmo.



## LANDING CONFIGURATION

Condition: In flight, the steady warning horn sounds.

- 1 Assure correct airplane landing configuration.



## 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.



## OVERSPEED

Condition: Airspeed is more than Vmo/Mmo.



## CONFIG FLAPS

Condition: The flaps are not in a takeoff position during takeoff.



## CONFIG GEAR

Condition: A landing gear is not down and locked and one of these occurs:

- Below 800 feet radio altitude and a thrust lever is at idle
- The flaps are in a landing position



On the 787 these NNC are not by memory

## Severe Turbulence

Yaw Damper ..... ON

Autothrottle ..... Disengage

AUTOPILOT ..... CWS

A/P status annunciators display CWS for pitch and roll.

Note: If sustained trimming occurs, disengage the autopilot.

ENGINE START switches ..... FLT

Thrust ..... Set

Set thrust as needed for the phase of flight. Change thrust setting only if needed to modify an unacceptable speed trend.

## Severe Turbulence

The recommended procedures for flight in severe turbulence are summarized below:

Passenger signs ..... ON

Advise passengers to fasten seatbelts prior to entering areas of reported or anticipated turbulence. Instruct flight attendants to check all passengers' seat belts are fastened.

## Climb, Cruise, and Descent Considerations

After takeoff, and when established in a clean climb configuration, use of the autoflight system is recommended for flight through turbulence.

[Option – GE engines]

In severe turbulence during cruise, it may be necessary to disconnect the autothrottles to prevent excessive thrust changes. Thrust setting guidance is available on EICAS when VNAV is engaged. Set N1 at or slightly above the magenta VNAV target N1 indication. Change thrust setting only if required to modify an unacceptable speed trend.

## Turbulent Air Penetration Speed :

Climb / Descent      280 knots  
                                 .76 Mach

Cruise      FMC Turbulence N1%  
(take N1% from Unreliable  
Airspeed table with FMC INOP)

## Turbulent Air Penetration Speed :

Climb / Descent      290 knots

Above 25,000 feet      310 knots  
                                 .84 Mach

## Tailwind :

10 knots (older NG) – 15 knots (recent NG)

## Crosswind :

	<u>Takeoff</u>	<u>Landing</u>
Dry :	33	33 knots
Wet :	25	33 knots
3 mm standing water :	15	20 knots

## Dimensions :

	<u>Length</u>	<u>Width</u>
B737-700W :	34 m	36 m
B737-800W :	40 m	36 m

During a ground turn, the **wing tip** passes **in front** of the nose :

B737-700W :	5 m
B737-800W :	3 m

## Tailwind :

15 knots

## Crosswind :

(valid for CG ≤ 25% / **more aft is more limiting !**)

	<u>Takeoff</u>	<u>Landing</u>
Dry :	37	40 knots
Wet :	37	40 knots
3 mm standing water :	15	knots

## Dimensions :

	<u>Length</u>	<u>Width</u>
B787-8 :	57 m	60 m
B787-9 :	60 m	60 m

During a ground turn, the **wing tip** passes **in front** of the nose :

B787-8 :	m
B787-9 :	11 m

