

ENGINE FAILURE IN CRUISE

©2007 www.a330jam.com
Not an official document

The FIXED SPEED STRATEGY is for ETOPS planning purposes and is not used in practice. (M0.82 / 310 kts) CPE is based on this descent speed.

DESCENT PROCEDURES

ENGINE FAILURE IN A CLIMB - INITIALLY SELECT "ALT" on the FCU

IN CRUISE - "ENGINE FAILURE" OR ENGINE SHUTDOWN

- SET THRUST MCT & A/THR OFF
- SELECT A HEADING AWAY FROM THE AIRWAY (consider location of Alternate Airport)
- FMGEC PROG PAGE > SEE "REC MAX"
- SET NEXT LOWEST WHOLE ALTITUDE HERE & on FCU
- OP DES (speed on elevator)
- SELECT M0.82/300 (consider engine/airframe damage and limit speed if appropriate)
- SPEED PULL (SELECTED)
- INFORM ATC (PAN CALL)
- WHEN R.O.D IS BELOW 500'/MIN:
 - SELECT V/S -500
 - ENGAGE A/THR

FMGEC PROG PAGE "REC MAX E/O"
CRUISE ALTITUDE is the recommended max altitude is for LONG RANGE E/O CRUISE with anti-ice OFF.

QRH DATA

- Pg 4.05 Graph showing
- GROSS CEILING
 - LRC CEILING (1.1% CLIMB GRADIENT BUILT IN)
 - based on ANTI-ICE OFF, PACK FLOW HIGH (is the case with 1 engine failed)
 - lines for ISA through to ISA+20
 - adjustment for green dot speed or LRC speed
 - adjustment for engine anti-ice on or total anti-ice on

- Pg 4.06 Table showing
- DIST, TIME, INITIAL SPEED, FUEL and LEVEL OFF ALT for green dot speed
 - remember corrections for engine/total anti-ice ON

- Pg 4.07 Table showing LRC cruise data
- WEIGHT, FLIGHT LEVEL, N1, MACH, IAS, FUEL FLOW
 - remember corrections for engine/total anti-ice ON

- Pg 4.08 Table showing cruise and descent data
- FUEL CONSUMED AND TIME >> to landing from any point in E/O cruise (descent included)
 - remember corrections for engine/total anti-ice ON

Do not delay these actions at high altitudes and high weights as rate of speed decay will be significant and loss of control may occur.

- SET THRUST MCT & A/THR OFF
- SELECT A HEADING AWAY FROM THE AIRWAY (consider location of Alternate Airport)
- FMGEC PROG PAGE > SEE "REC MAX"
- SET NEXT LOWEST WHOLE ALTITUDE HERE & on FCU
- OP DES (speed on elevator)
- SELECT GREEN DOT SPEED - SPEED PULL
- INFORM ATC (PAN CALL)

FMGEC PERF CRZ PAGE "DRIFT DOWN TO FL____" appears with E/O condition and shows the DRIFT DOWN ALTITUDE. The LRC driftdown speed is also on the page - this can be modified.

Established in the descent the FMGEC CRZ page shows time and distance to descend

OBSTACLE STRATEGY - DRIFTDOWN PROCEDURE

GREEN DOT SPEED
BEST ANGLE OF DESCENT

STANDARD STRATEGY

M0.82 / 300 KTS

(BEST WINDMILL SPEED FOR RESTART & BEST FUEL BURN IN DESCENT)

This strategy is normally used (not used when mountainous terrain necessitates the driftdown procedure)

ESTABLISHED IN DESCENT

PF: "I HAVE CONTROL, MY RADIOS, ECAM ACTIONS"
PNF: PERFORM ECAM ACTIONS

INFLIGHT RESTART ATTEMPT (not for damaged engine or fire)

- VOL 3 checklist directs restart attempt at the time ECAM says "ENG RELIGHT CONSIDER"

DECISION MAKING MATTERS

- * Airports in Range
- * Fuel available
- * Weather enroute and at destinations
- * Terrain - especially for E/O approach and go around
- * Traffic
- * Emergency services (commercial matters secondary)
- * Familiarity
- * Availability of failed engine for (re)use
- * ETOPS distance limitation (can go past an adequate but not the nearest suitable Main/Alternate)
- * Seek Company input as to latest NOTAMS, weather, commercial preferences (they will also call the destination and get support under way)

ENGINE FAILED CUES

- RAPID DECREASE IN EGT, FF AND N2 FOLLOWED BY DECREASE IN N1
- VISUALLY INSPECTED CATASTROPHIC DAMAGE (EG. PAXING CREW REPORT)

If there is engine damage the ECAM directs pushing the FIRE SWITCH and discharging one fire agent bottle.

If R.O.D becomes less than 500'/min (and terrain not an issue);

- Select V/S -500
- Engage the A/THR

AT LEVEL OFF:

- SET LRC CEILING ON FCU
- SET LRC CRUISE SPEED
- ENGAGE A/THR

If terrain continues to be a problem, the driftdown ceiling increases as fuel is burnt off - so a gradual climb may be achieved.

ENGINE DAMAGE INDICATIONS

N1 & N2 are proportional to TAS. N2 may be zero at low speeds and low altitudes without engine damage. N2 takes time to wind down - should not stop immediately (engine damage if it does) N1 should not be zero. If it is, the engine is damaged (seized main rotor) N1 and N2 may still be spinning with engine damage present. High EGT and/or vibration may indicate engine damage. A visual nacelle check is also a valuable assessment. Loss of oil indicates likely damage. Presume damage if there is explosion (not a surge). A physical inspection from the cabin is of great value.

ECAM procedure for damaged engine / engine fire: the 10 sec delay allows the engine to wind down so that the fire agent is not quickly propelled through the engine, thereby reducing its efficiency. The INNER TANK SPLIT buttons divide the inner tank (not collector cell) into two separate parts (closing a valve between them) in case tank damage is suspected (a possible cause of the engine failure). It separates a good tank possibly from a leaky / damaged one.