

gatnotes

Latestwifi Changes

Bulletin's

TA's

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-8 -8

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changes/suggestions gatlin@aol.com

last changed on 05/13/2025 09:29

[legend](#)

—changes (gold, accent4, lighter 60%)

—changes(orange, accent 2, lighter 60%)~2023-2024

—older changes (green, accent 6, lighter 60%, ~2021-2022)

—passengers (standard colors – light blue)

—need an answer (pink 2)

—different items for similar lists (darker 15%)

—FO or PM items (blue 10)

—titles and charts (204/204/255)(1/3)

—not verified???

—italicized is either stolen from somebody or off of the slides
i.e. not straight out of the book

LCF **-8** **400** **P&W** °↔→ **pass** **GE** **GENX** **NG FMC**

Latest changes

HKG use NADP 2, and not auth to fly sids ending with "T"
Domestic CPDLC

OB 24-11.1 HKG 3 runway ops

OB 24-6 read bac what you're supposed to read back

gatlin.essary.org

Rev 17 OAC new abbreviation for Oceanic Area Control Center, new GPS jamming bulletin 86 (only took 2 years), relief pilots to remain seated till TOC and prior to TOD, turn off taxi lights before facing marshaller(really), changed limitation to "severe" turb speeds, flash landing/turnoff lights or thumbs up to ack ground all clear signal(not taxi light), -8 verify time/date correct on status page, cockpit door access test moved to SP1.5 (once a day), removed requirement to check hatch except Passenger & 429, added TAT as reason for large N1 diff??, guidance not to use higher climb thrust than needed to promote engine life, added verify date/time for 400 clock, captain sets autobrakes if on left front panel, deleted need to record altimeter??, new procedure to use ACARS loadsheet printout to prepare before receiving hardcopy... verbally compare paper LS to ACARS LS/ FDP/ FMC performance numbers, new caution for asymmetric thrust and stabilization prior to takeoff, added TOGA warning, PM callout "Thrust Set after verifying thrust sufficient for go-around, revised warning for reverse thrust below 80 knots, finally changed wording on light forward pressure on control column on takeoff, release to neutral above 80 knots, added note that capt hand must remain on throttles after thrust is set on manual takeoff, position report page 1 auto populates on ACARS position report???.....page 2(wx) not required, added enroute delay and diversion pages, added crew change prompt for duty CA change, Approach briefing must include a reminder that go-arounds on or near the ground require go-around thrust to be set manually and that a flap configuration warning can sound, changed out of reverse to with more than idle reverse and stopping is assured, idle by 80 (for FOD and engine wear)normal procedure states if stopping is assured, by 80 knots start movement to be idle by 60, after engines at reverse idle move thrust levers down, for reject idle reverse detent by taxi speed...field length permitting, revised & simplified setting baro mins for approach...add +50' for localizers now, added to INIT DATA SOB to page 1, added check capt, page 3 extra fuel uplift cause, new causes for dep delay, new oceanic RCL flight crew procedures and ref to Atlantic theater guide, allowed to disable GPS at any time if needed, be sure to enable DME (off by default on -8).... inhibiting doesn't inhibit GPWS look-ahead... use TERR OVRD if necessary, deleted need to circle MFP cruise, added log entry for LCF fluids application, TLR alt range changed to .15", use "new flight" function on EFB in order to clear chart sets instead of just changing airports, runway change..PM reprograms and reaccomplish FMC/MCP briefing...runway change checklist,

changes to checklist

Preflight...Oxygen.....Tested, 100% CF

Before Start CDU preflight.....completed CF verify pre-flt complete on takeoff ref page

Flight Instruments.....Heading xxx, Altimeter xxxx CF

capt states mag heading on PFD, ND, ISFD, Stby Mag

FO states mag heading on PFD, ND, CDU

preflight.....completed CF

verify pre-flt complete on takeoff ref page

Before Takeoff.....Flaps.....xx CF 400 *verify flaps on cdu and EICAS agree*

Descent.....*don't say speed on landing data....* Vref 25, Miniums 201 baro

FOM changes, changes to Min Fuel and Mayday Fuel...*still contradictory and confusing*

New NAT clearance procedures "OCEAN CLX RQ" ... use CPDLC

to request and enter MAX FLxxx in free text (even if same as requested)

FCOM Rev. 16 crosswind guidelines only in FCTM, FMA callouts are 'good CRM' ...not mandatory, check date in preflight (*disappears from nav to aligned*), no longer required to write **altitude on OFF** on ground... just before oceanic record altitudes and time....brief summary of a/c state then "I/You have control" x3 for transfer now, new callouts **"Transition altitude, set standard", "Transition level, altimeters set ____"** (in. or mb), in **climb** above 10,000 Cycle the SEATBELTS selector to **AUTO then ON** when it is safe for the cabin crew or supernumeraries to leave their seats, in **descent** callout **"10,000 feet" or "Flight Level 100" and seatbelt selector to Auto then On for all flights now**, , # Maximum speed operating in RVSM airspace is 0.90 Mach n/a for **LCF** **-8**, **-8** engine inspection required is now **120 minutes** in icing conditions on ground, outstation overnight cold wx secure procedures SP16.16, **engine failure** initial heading (VIA) (max 15 deg) is now at **end of runway** & added ½ wingspan minimum height for subsequent turns (*doesn't make sense*)

OB24-07 Block Times, only one flight when deicing, captain must verbally tell dispatch

OB24-06 GPS signal interference, follow checklist, advise ATC, write up in logbook, file FCIR (*remember -8 you have to manually turn on DME updating*)

OB24-03 Altitude deviation

New randomly located checklist **FIRE ENG on ground**, back cover pg 2 of QRH

OB23-17 new cold wx procedures, de-ice flaps up ([see last page icing restrictions for new checks](#))

OB23-15 electronic devices official use only at flight duty station

OB23-11 5G tolerant a/c no restrictions???? **Contradicts bulletin 84**

OB23-10 pEFB Preflight, 67% charged, updated, can use comply up to 7 days, jepps if checked vs. updated or call dispatch and/or get paper

OB23-08 for the 4th time, put in and check correct callsign

OB23-07 do better security checks

OB23-06 Any time that the Aircraft Log has different times than those reported by ACARS (including ACARS inoperative or not installed), the **Captain must contact Dispatch and verbally report** the arrival message.

OB23-033 no more loadsheet trial

stuff I just noticed from 14/15... supposed to **obtain start clearance** before pressurizing hydraulics *in order to prevent beacons before clearance... ie AMS (gonna be worse elsewhere delaying the push... use judgement)* no more waiting 30 seconds to turn off **AUX hyd**.... Now says to turn off after releasing brakes, removed steering check after releasing brakes, changed flight instrument checks in preflight and removed from taxi procedure, **turn off HF data when using CPDLC**

FCOM Rev 15a confirm checklist date on **-8** after Oct 15 (on resets page), many items removed but "remain procedural" such as wx rdr, departure review, transponder; flt controls moved to before taxi, must redo before takeoff checklist if runway change, allows checking main deck for fire warning, waypoint checking +/-2deg, airplane moving on ground or in flight PF/PM, stopped on ground Captain does thrust levers and fuel controls for shutdown/fire/aborted start, A/T armed at all times, 5G interference limitations and procedures now

in limitations section when no AMOC (attachment to OFP)
Preflight: FO reads, C answers, except both answer to oxygen, flight instruments, altimeters
Before start: FO reads and answers, except C answers trim
Before taxi: FO reads, FO answers except C answers flight controls, both answer "clear"
Runway change, PM reads, PF answers all
Before takeoff: PM reads and answers, both answer flaps
After takeoff: PM reads and answers, (gear lever OFF and checklist after flap retraction is complete)
Descent: PM reads and answers except both answer landing data, PF answers approach briefing
Approach: PM reads and both answer altimeters PF/PM
Landing: PM reads and PF answers all
Shutdown: FO reads and answers, C answers flaps and parking brake, fuel control switches, both answer wx radar
Secure: f/o answers all
FCOM Rev 15... changed all AOR's to Boeing, preflight changed to reflect new AOR's, Preflight
capt flow is now across MCP, O2 PFD, ND, backups, CDU, across to flaps, VHF L, FO flow is now overhead, F/D over on MCP, O2, PFD/ND, gear, eicas, pedestal, seatbelt selector ON moved to preflight, one person does O2 pressure drop test, nobody required to test O2 mic; select totalizer on prog pg 2, , all a/c have NG FMC, relief pilots can sit in back due to observers and/or DDG restrictions, packs step moved to before start, capt sets trim in before start, capt has fuel control switches, call V1 at V1 (no early call), after flaps up....landing gear OFF and After Takeoff Checklist, deleted autobrake guidance, PM recall review read alert and memo messages, both verify ILS tuned and ident, LOC and G/S pointers are shown, loc captured and course, landing rollout call is now 60 knots, after TOGA on go around verify thrust increases is first step after pushing TOGA switch, go around callout is flaps as needed instead of just 20, each pilot gets own WX/TERR switch, aft cargo heat moved to secure procedure

FOM Bulletin's (relevant ones only)

Ver 26 Campinas, captain only approaches and landings, no autoland, **autoland**, sat and unsat, must be written in discrepancy item block, ballast verbiage, redispach verbiage, "IN" time changed to door open??, must review takeoff message under "MISC" page after it is sent at 10,000', GNE is 10nm, ASAP doesn't work for emergency authority notification...use FCIR, added deicing irregularities and fuel jettison to FCIR required reporting, essential personnel definition in relation to DOD exemption hazmat procedures 16.1.7, men in NOTAM
bul30 changed **min fuel** to committed to one airport and can't accept delay, notify dispatch for any block turn back, Exemption to operate at ops spec unlisted **airport** 119.49(a)(4)(ii) with alternate and other requirements

FCOM Bulletin's (Boeing)

59 if aft low, aft high, or both low on lower lobe, turn AFT CARGO HT off prior to descending into warm humid environ. **400**
78/-8 55 don't use ATC datalink EMERGENCY REPORT, revert to voice for emergency contact

79/-8 56 R1 erroneous flight director on ILS with interference, While on an ILS approach, monitor localizer and glideslope raw data and call out any significant deviations. Perform an immediate go-around if not within the criteria to continue the approach.

80/-8 57 R11 NG FMC BP 4.0

To avoid 2 issues don't load approach until needed

Dual FMC Reset of Unknown Origin

If a Dual FMC reset occurs, do the following (it takes up to 90 seconds for the <FMC prompt to appear on the MENU page):

1. Verify route data on the LEGS page
2. Activate and execute the route, *(if caused by executing erroneous offset → activate... delete approach on RTE pg... execute)*
3. Enter valid performance data
4. Execute the modification (reenter offset if needed)
5. Resume normal operations *(reenter approach)*

400 erroneous high min V2 at low gross weight, if it won't accept V2...take out assumed temp, new data with NO ASSUMED thrust

erroneous stab trim value → rejects due to CONFIG STAB, FMC recalculates higher stab trim switching to mid range green band

400 At a gross weight of 240,000 kilograms (530,000 pounds) or less, do not enter an assumed temperature when using the TO or TO 1 takeoff thrust limit. An assumed temperature may be used with the TO 2 thrust limit. (if it will accept V2...see erroneous high min V2 above)

All aircraft, before entering the departure runway, verify that the stabilizer trim is correct and is in the greenband. If the stabilizer trim value on the TAKEOFF REF page is blank, has changed or does not agree with the value from a load sheet or other company source, delete the takeoff CG value, then re-enter the correct takeoff CG value. Verify stab trim is correct and in the green band.

After approach entered → Low speeds, when entering approach or hold, check speeds on legs pgs before executing, if bad → note and delete all hold speeds/speed constraints in missed approach, reenter missed approach speed constraints, then execute, speed intervene on any inbound hold... speed intervene as necessary if slowing.

After approach entered → offsetting check for diverging route before executing, if needed, erase offset, delete approach, reenter offset, reenter approach after offset canceled,... *if executed see dual FMC reset above*

ALTN Pg fails to update... manually enter altn in 4L field, wait several minutes, check for reasonableness...then delete manually entered airport

Uncommanded level off and thrust reduction on VNAV departure, only on data link uploaded flight plans, **prior to each flight...cycle the nav database by selecting wrong date and then back**

Workarounds for unresponsive ATC LOGON/STATUS page, depends on missing data...see bulletin (fmc selector/change route/reenter data....reengage AT)

Loss of V-speeds Prior to Takeoff Roll

1. As normal.... Review takeoff ref page and check V2 on MCP
2. PF displays takeoff ref page
3. PM calls V1 and VR, V2 on MCP and PFD airspeed

use the **ATC UPLINK** page to adhere to **speed clearances** from ATC; they should not rely on the **ATC LOG or printed**

TLS-83/-8 60 NG FMC, VNAV lateral path, when <10nm

between points and/or 120 heading change... insert lower speed and speed intervene during flaps retraction

TLS-84r2 For radio altimeter tolerant airplanes (no placard displayed), comply with operational procedures in bulletin at non-CMAs in contiguous US.

86 GPS jam disable GPS updating at any time to mitigate jamming, use discretion for erroneous GPWS alerts, also new unannounced NNC GPS Data Unreliable for unexpected jam, **-8** *don't forget to enable DME updating*

Technical Advisory's (Atlas)

A/C differences **see new book in Comply365**

N480MC pacs with **P&W** no autostart, gasper switch - ON, humidifier switch - ON

N471MC voice recorder switch to ON for preflight

N475 dome light switch overrides flight deck access light switch??

N472/473 differences

no doors synoptic, check no doors open on EICAS with placard alternate MTOW 356K

MN DK ALERT - AUTO

range arcs with WX or Terrain

SP 2.6 false fire warnings When operating **N472/3MC** in tropical areas under extreme conditions of high temperature and humidity....

during taxi-out/in, takeoff, climb, descent, approach, landing:

1. AFT CARGO HEAT switch - OFF
2. LLCCARF selector - **LOW BOTH**
3. All cargo compartment temp selectors - AUTO (Warm, 3 o'clock position)

At cruise:

1. AFT CARGO HEAT switch - ON
2. LLCCARF selector - As required
3. All cargo compartment temp selectors - As required

Preflight...

—MDCD HORN TEST switch.....NORM

—MN DK ALERT - AUTO

N445/446 Differences ERF's with specific QRH, demand pumps all air driven...engine starts with all packs off and one at a time, auto ign is 1 or 2 (instead of single), SP7 for start without APU for ERF

P&W

preflight.....ENGINE AUTOSTART switches (if installed..ON (guards closed)(may be on overhead above capt head)

for start all packs off and start one at a time *any issues starting → turn off hyd 2 & 3 (pneumatic)*

5 minute cool down before shutdown

NG FMC & -8

Memory Items

- # **400** The turbulent air penetration speed is **290 to 310 KIAS** / **0.82 to 0.85** Mach, whichever is lower.
- # **-8** Severe turbulent air penetration speed is approximately **310 KIAS/.83M**, whichever is lower.
- # Maximum Takeoff and Landing Tailwind Component **15 knots** (**LCF** - 10 knots)
- # Maximum speed operating in RVSM airspace is **0.90** Mach n/a for **LCF -8**
- # Use of aileron trim with the autopilot engaged is prohibited.
- # The autopilot must not be engaged below **250** feet after takeoff.
- # Without LAND 2 or LAND 3 annunciated, the autopilot must not remain engaged below 100 feet RA.
- # Do not use FLCH on final approach below 1,000 feet AFE.

AUTOLAND

- # Automatic landings may be made with flaps 25 or 30 only.
- # The maximum glideslope angle is 3.25 degrees.
- # The minimum glideslope angle is 2.5 degrees. (2½ to 3¼)

Maximum Wind Component

(when landing weather minima are predicated on autoland operations)

- # Headwind 25 knots
- # Tailwind 15 knots (**LCF**-10 knots)
- # Crosswind 25 knots
- # Crosswind CAT II/III 15 knots

Reverse Thrust

- # Intentional selection of reverse thrust in flight is prohibited.
- # Backing the airplane with use of reverse thrust is prohibited.

Flight Controls # Avoid rapid and large alternating control inputs, especially in combination with large changes in pitch, roll, or yaw (e.g., large side slip angles) as they may result in structural failure at any speed, including below VA.

Flaps # The maximum altitude with flaps extended is 20,000' **VNAV Selection** # If leveling off within 2000 feet after changing altimeter setting from QNE to QNH, or QNH to QNE, do not use VNAV to execute the level-off if QNH is less than 29.70 IN/1006 hPa. After the level-off is complete, VNAV may be re-engaged.

- # Avoid **weather radar** operation in a hangar

LCF

2-29 LCF oil overservice N249BA oil quantity should decrease by ≥ 3 quarts after start

2-18r1 LCF loss of multiple hyd sys, >HYD QTY LOW 4 and >HYD QTY LOW 1 are included in the QRH for the caretred messages and flight crews are required to do the appropriate checklist steps when needed.

Auto Ignition Selector should be 1 or 2

Be sure to be mindful of hydraulics when pushing etc, no apu, hyd aux can only be powered by ext pwr, and having auto/on demand pumps will interfere with start on pratts

CWT electric scavenge pump into Main tank 2 pump has low

pressure and M2 or M3 is below 40,200lbs (2 hours or low) guide in comply, training suppliments

LCF Engine Start:

- packs off start one at a time
- Ensure that the #1 and #4 demand pumps are not in the AUTO or ON position during engine start and duct pressure is a minimum of 30 PSI

#4 to AUX, #1 to OFF

- Start engine 4 (and 3 as requested) then remove air and electrical carts - start engines 1 and 2 as appropriate
- If pushback is needed and engine 1 is not running, select #1 demand pump to AUTO for the push, then OFF for the crossbleed start

MTOW 800,000# MLW 575,000#

Read station guides, Read Intams, numerous pertinent information

all bags must be stored on flight deck

doors with slides should disarm if opened from outside

PW have hydraulically activated thrust reversers

N747BC doesn't have predictive windshear or ice detectors

Now uses sable, SME will show as cargo

WBM Vol I, 4.9.3, 13 → minimum 90,000lbs takeoff fuel with 20,000lbs unusable ballast fuel carried in the mains (**not in CWT**)**subtract the ballast fuel from w&b zfw before putting in FMC**

may not need ballast if carrying SME's

Will have drag factor of 2.9 and FF factor of 5, will not match flight plan, don't change it

LRC is approx .83m

3000# or more for start/taxi fuel

Swing Tail: • 30 knots while opening or closing

Reserve tank 2 and 3 maximum fuel tank quantity is 2,065 kgs (4,553 lbs) per side. Main tank 1 and 4 maximum fuel tank quantity is 9,933 kgs (21,900 lbs) per side. These maximum fuel tank quantity limits are necessary to prevent unacceptable airframe vibration characteristics in flight.

1 & 4 aux can only be powered by EXT(no APU), so they should be in AUTO for push (if no EXT power is avail on tug - apparently some do have it)

SP.7.1 for ground pneumatic and cross bleed starts

good habit to shut R1 door every time (in case of movement)

Use of **speedbrakes** in flight with flaps extended past **10** is not recommended.

The Cargo Camera System must be operational to enable cargo(not SME's) to be carried. *(may have to cycle CB's on overhead panel to get cameras and lights working SP10)*

postflight shut off LED lights... EFB bezel >Menu >Video

>select >camera LTS >OFF

then use pwr button on EFB bezel,

don't select "shutdown" on menu, keep pwr on a/c for 2 minutes

only use the EFB camera function (others may cause fault) QFE operations are prohibited.

PAE near Kilo North? "IDLE THURST ONLY DURING TURNS???"

PAE arrivals: use constant descent profile esp. on 34L expect FLAAK to USDAW for a visual approach when landing to the north. USDAW FAF minimum 2200 ft MSL

Keep cargo temp at 2 o'clock to keep hyd warm

temp selector on upper deck aft bulkhead 9 to 10 o'clock for galley area?

overhead escape hatch is not included in the EICAS door display and opening or closing it will not cause a warning or block you in or out

4 crewmembers max
less than full rudder travel on guage??
154' for a 180 turn (1' more than 400)
flight deck fan on in flight when windshield air is on
Do not apply **deicing** fluid directly at the swing tail gap. Use hot air to deice the swing tail gap. The temperature of the hot air must not be more than 150F (66C). An entry must be recorded in the Aircraft Log either at the departure station or at the next arrival station unless a non-MEL currently exists to inspect and flush/rinse the swing-tail gap.

N718 has ice detection system **<ICING**

Caution ! If accomplishing check from L-1 door on LCF or passenger aircraft, ensure door mode selector is placed to MANUAL or DISARM (as installed) to prevent slide deployment. After check is completed ensure door mode selector is placed back to AUTOMATIC or ARM (as installed).

autostart switches are above EEC's

PW start

EGT w/in 20 seconds of RUN

N1 by 40%N2

EGT quickly nears or exceeds start limit

Idle N2 w/in 2 minutes of RUN

icing conditons on ground

50% N1 for 1 sec every 15 minutes

oil temp. before takeoff ??

ZONE TEMP is nuisance message according to supplement/boeing reset with pack reset button no need to write up

ACARS issues see training supp handout in comply

Passenger

Introduce yourself to purser

Should lockdown for medical for security purposes

guide in content locker /drawers Icon/ repositories(really?)/
flight operations/general pax,lcr -8 ops guides

All flight segments on passenger configured aircraft are conducted using flight and duty rest rules of part 117, whether they are empty ferry flights, ferry flights with Cabin Crew only, or live flights with passengers.

For engine start Use Pack 3 if needed and available; do not move Pack 3 Control selector to OFF unless Pack 1 and Pack 2 selectors are OFF.

After **Abort**,

–advise cabin crew evacuation is not required: **“THIS IS THE CAPTAIN, REMAIN SEATED”**(FA's will probably start evacuating in 15 seconds with no indications from cockpit)

–or complete evac checklist which will direct cabin crew to evacuate: **“THIS IS THE CAPTAIN, EVACUATE, EVACUATE, EVACUATE”** (and evac horn)(remain on runway for more room)

call for stairs in case of precautionary deplaning

Cabin crew initiating an evacuation: evacuation horn sounds –
> **stop the aircraft immediately.**

Put fire on downwind side if able to assist evac.

Rest area in cockpit is only certified for one person

117 duty day is 1:30 prior to push until block in

If lots of status msg about recirc fans...reset button in F/A rest area

APU gen 2 must be online to run recirc fans????

put packs in high flow at cruise if it's still hot or smells
top bunk...far right side..underneath(behind curtain) is a black knob to release top bunk so it folds up out of way

N??? overhead hatch doesn't show up on EICAS

Delay announcements will be made no later than five minutes following the scheduled departure time, and updated no later than every 15 minutes as the delay continues.

Fueling with Guests on Board If fueling is to take place, the following procedures must be adhered to:

- The Captain will inform the Purser and the Purser will inform the rest of the crew.
- All main cabin doors must be disarmed.
- At least one main cabin door must be open and must have a ramp, jetway, stairs, or stand positioned for rapid deplaning of Guests. This area should remain clear of any exterior or interior obstructions that might block the route in case rapid deplaning becomes necessary.
- A FA must be positioned at each open door.
- The minimum safety crew must be distributed throughout the cabin to provide the most effective egress at the main cabin doors.
- Smoking is prohibited near the aircraft.
- An announcement must be made regarding smoking, keeping the aisles clear, and remaining in seats with seat belts unfastened.
- Seat belts must be unfastened for rapid deplaning if necessary. FAs will ensure compliance as per their duty assignment.
- The **seat belt signs must be selected OFF.**
- Fuel vapors in the cabin must be reported to the flight deck immediately

N464/5

–microwave in galley, carts act as ovens, warming ovens don't work well

–no auto fire ext on apu

Moderate turb – FA's take seats and discontinue service

one minute/30 sec brace

15 seconds after warning before evac/e/e

When passengers occupy the upper deck cabin, a cabin crew member must be on duty in this compartment during taxi, takeoff, and landing.

cabin crew flight deck checks at least every 60 min

cameras have brightness control on center console and off switch above FO... guarded off and on

evac switch should be off

doors with slides should disarm if opened from outside

push lav avail switch to arm available light (N-SG)

FA's can control cabin temp with 2 eng. Running, if we change it after that..all passenger zones move respectively

concurrent loading.... military allows pacs while fueling if 2 sets of stairs and fire dept. is notified???

Don't stop on a bridge.. tough for evacuation

in very high winds big problems evacuating

if you run out of fire fighting capability..ie fire last bottle, then evac.

Microwave... must close door to get display

ETOPS applies to 4 engine passenger flights when outside 180 of an adequate airport... company policy is to remain w/in 180 minutes (3 hrs) of an adequate airport, doesn't have to be open or have weather but must have winds to comply w/ landing and stop w/in 60% effective length FOM 9.1.1 door

- red guarded switch on side wall to power door lock
- Door codes FCOM Vol 1, NP.15.5
- code in door causes loud buzzer, 60 seconds to deny/unlock, push hard on door when light turns green
- always have 2 people on flight deck
- person opening door should hear codeword over phone and visually (peep hole or camera) check door is safe
- normally shouldn't use electric unlock or deadbolt
- locked key operable position is not authorized
- under lockdown flight deck door should not be opened
- threat condition 1 → lockdown (can't be rescinded under 3&4)
- Warning ! When the deadbolt is used, there is no emergency access to the cockpit. Use of the deadbolt is prohibited, unless directed by a specific MEL placard or when the electrical door locking system fails after dispatch. When using the deadbolt, pilots must use the LOCKED KEY INOPERABLE position. The LOCKED KEY OPERABLE position is not authorized.
- Warning ! If the emergency tone is heard, immediately select DENY on the FLT DK DOOR selector and attempt to establish communication with the cabin crew. Warning !
Using the UNLKD function of the FLT DK DOOR selector for routine access is prohibited.

PA

- for jettison
- for deicing
- all PED's off for cat II/III approaches
- addresses on back of phone, just pick it up and dial
- can use CAB on interphone
- PA guidance FOM 14.1.14-15
- if inop, cycle seat belt 3 times (6 chimes)
- make sure PA isn't in use before talking
- nonessential withing 1.5 hours takeoff or landing
- Alert occupants to prepare for takeoff, landing, and in matters related to safety including turbulence and non-normal situations. Turn on the SEATBELT sign and announce via the PA system "Please take your seats".

Notification of an Emergency

In the event of a non-normal requiring a briefing of the cabin crew, the captain will instruct the purser by PA or interphone to report to the flight deck using the phrase "**FLIGHT DECK REPORT**". The purser must report immediately to the captain with the TEST checklist. Other FAs should discontinue their normal cabin duties, go to their assigned station, retrieve the Emergency Cabin Preparation pages from the FAM, and await instructions by the purser. The captain will brief the purser on the non-normal situation using the TEST acronym.

- T - Type of problem. Concisely describe the problem
- E - Emergency Classification. Red, yellow, medical, or merely a non-normal?
- S - Special instructions. Does the situation require any special procedures?
- T - Time remaining. The cabin crew will prepare the cabin to a different level based on the time remaining. They will always prepare the cabin for an emergency landing and evacuation whenever a red emergency is declared.

Cabin preparations are divided into two time frames, long or short. A short cabin preparation is defined as any preparation under 15 minutes.

Red Emergency

A red emergency exists any time the flight crew believes that circumstances may lead to **injury or aircraft damage**. A red emergency always requires:

- Special handling by ATC, including airport rescue and fire-fighting equipment.
- Preparation of the cabin for an emergency landing/ditching and evacuation.

Yellow Emergency A yellow emergency exists if a non-normal event exists that necessitates an emergency be declared with ATC BUT the safety of the aircraft or guests is NOT deemed to be imperiled AND the flight crew expects a successful landing. Airport rescue and fire-fighting equipment may or may not be required, depending on the nature of the emergency. The captain will inform the purser of the emergency, but the cabin crew will not prepare the cabin for an emergency landing; however, they must remain prepared for an unplanned evacuation.

Briefing to Purser – All flight deck crewmembers should attend. If duties require any flight deck crewmember(s) to be absent, the captain must brief them when conditions permit.

- Introduce flight crew
- Confirm # of FAs
- Possible delays
- A/C & cabin MX items
- WX & turbulence
- Security issues
- Disruptive guests
- Flight deck access (state code word and when at door look up at camera)
- Additional information as desired (i.e. Evacuation)
- Questions

A preflight of the cabin emergency systems and equipment on passenger aircraft must be conducted by the flight crew on ferry flights in the absence of cabin crew. In particular, ensure all galleys (cabinets and carts) are secure.

Pilots should not deplane until all Guests have departed the aircraft, unless early deplaning is necessary for operational reasons or Guest assistance.

-8

*Get some trays off nearby 400's.... always running short RCMD alt may be high during climb out, check MAX ALT
New hot pots don't work with distilled/RO water... use water with minerals or add a little salt*

ISFD In the event of loss of primary air data, standby system corrections must be applied by the flight crew. (limitation)
On jepps app, gear at top right, select -8 fleet to show red on AMM (doesn't work at all airports) must select Wgspn Restr(on AMM) to show red highlights for taxi (unable to highlight if unavailable)

-8 29 nuisance FUEL TANK/ENG when 2/3 qty ind. blank

-8 58 erroneous EFIS/EICAS..... If unusual display system behavior occurs, selecting a different EIU for the affected displays may restore normal operation, but erroneous EICAS messages may remain shown.

-8 61 GLIDESLOPE caution message and aural voice when flying other than ILS/GLS, below 1000' due to incorrect alt. or warm temps, at high temps the FMC generated glide path can

be higher than VGSI, can silence and continue on VGSI, transition to visual, or discontinue approach

-8 63r2 see TLS-84 5G

guide in content locker /Drawers

Icon/repositories(really?)/flight operations/general pax, lcr -8 ops guides

very susceptible to power glitches when changing from ground power to APU, highly recommend turning off all packs before changing power

Max 43,100' PA

Stage 4 noise certified

Center air data switch is on overhead panel above yaw/damper

45% N1 max covers all crosswind limits

Idle for wind >55 knots

Shutdown if crosswind component >55 knots

Dusty 30%

CLB thrust is picked based on TO thrust derate

10 to <20% → **CLB 1** → 10%

>20% → **CLB 2** → 20%

Derate removed from 10,000' to 30,000'

82% N2 for crossbleed starts

45% N1 for takeoff

flt deck access lights on cabin panel

white box in front of EICAS msg → ECL

technique... to prevent FMC recycle....turn off 2nd and 3rd pacs before changeover to APU gens

additional 40 seconds of motoring on start when 30-360 minutes and EGT >30deg C

after 4 inflight start attempts will increase EGT by 25 deg C on each attempt till start or EGT limit is reached

hot brakes...QRH PI check **quick turnaroud** weight limits

If you see **LARGE ATC UPLINK** on upper EICAS in ATC

message...look at the CDU log page to confirm message

if FMC enters descent mode early, enter direct to point and recruise(don't put alt. Constraints = cruise alt.)

leave one **ALTN** in small font will constantly update to closest airport, can't delete small font airports

ECL no need to read aloud or visually confirm items that are complete (green). Closed loop (sensed) checklist items change from white to green when the action is taken. The PM is responsible to check off any open loop (not sensed) item and to verify that all closed loop items are green.

There are no dashed lines to stop for immediate action items

Before Takeoff, Landing checklist PM announces "Checklist Complete" and PF visually confirms checklist complete indication and announces "Checklist complete"

in chocks use right inbd mfd for checklists

*PM reads and responds ** both respond

PF visually confirms all checklist done and verbally responds to landing checklist

FIRE ENG X in checklist will turn white when fire is out

ignore cyan(blue) items

if runway changes, re send for aerodata and reset before takeoff ECL

flight elapsed time at bottom of EICAS stat page

don't have to add 1000' for autoland... uses 7 sec flare??

can intercept course outbound

p/p360 will fly heading and will draw intercept point for heading to course, just bring up next active waypoint descent power setting is 'off idle' more thrust than idle moving map with ARPT selected and range < 5 NM

Cargo Aft or Cargo Forward or Main Deck – After the fire suppression system is armed, turning any pack switch off is

prohibited.

LACFT minimums DL type aircraft apply to -8 on Jepps (FRA) on ground, if relatively cool using just pack 3 gives fresh air with less noise than 1, with 2 you only get recirc air

VSD (turn on with CTR button on EIFIS panel)

all data inside the cyan "swath"(inhibits w/in 6nm below 3,000'AFE on takeoff and approach)

swath inhibited on t.o. and w/in 6 miles/3000' of rwy

GREEN: terrain 500 feet or more below (250' gear down)

AMBER: terrain from -250or-500 below to 2,000 feet above

RED: terrain more than 2,000 feet above

-----MDA

-----3deg(10NM to 1000' past threshold when no GP in FMS)

-----V/S and MCP selected altitude

-----G/P (10NM to MAP from FMC)

Δ Altitude constraint

Range to Target Speed Indicator is green dot on VSD

1 Airplane General

N409MC is base aircraft

	400	LCF	-8
Length	231' 10" 70.7m	243' 11" 74.3m	250'-2" 76.3 m
Width	213' 64.9m		224'-5" 68.4 m
Height	62' 6.5" 19.06m	70' 8" 21.54m	63'-6" 19.4 m
180 deg turn	153' w/bgs	154' w/bgs'	172' w/bgs (52.4 m)
Do not attempt turn w/in	15'(4.6m) wing tip 56'(16.9m) nose		59'(18m) nose

With the Landing Gear lever UP or OFF the wing landing lights are dimmed.

If normal electrical power is lost, the flood lights operate from standby electrical power. If normal power is lost to aisle stand integral panel lights, the aisle stand flood light illuminates at a reduced intensity

Pitot and aoa heated, first engine

FASTEN SEAT BELTS (or) (Auto)

—gear not up and locked

—cabin altitude >10,000'

—altitude <10,300'

—flap lever not up

NO SMOKING (or)(auto)[passenger always on]

—gear not up and locked

—cabin altitude >10,000'

—supernumerary oxygen on

Note: Anytime supernumerary oxygen deploys, NO SMOKING signs illuminate and RETURN TO SEAT signs extinguish, regardless of selector position.

The emergency lighting system is powered by remote batteries. Battery charge is maintained by DC bus 4. A fully charged

battery provides at least 15 minutes of operation.

Main Deck Alert Selector (472/3) (use oxy with aural alert)

- AUTO** lights and sound for decompression, every third light flashes, aural alert, & green led on panel for 30 seconds
- RTS**..just lights
- Use OXY** lights and sound

Accessing main deck, N408MC-N412MC, N418MC-N429MC, N472MC-N477MC, N492MC-N496MC, 747-8, carry o2 at cruise, other a/c prohibited when moving

Horns sound in the crew rest, supernumerary areas, and the main deck, and the main deck ceiling lights flash when:

- cabin altitude reaches 10,000 ft
- smoke is detected in the main deck
- supernumerary oxygen switch is selected on
- MAIN DECK SIGNALING** switch is selected ON
- The main deck ceiling lights also flash when the seat belts signs are selected on.

Emergency equip

main deck: big halon & wand (400), h2o extinguisher, crash axe, pbe (check date)

defibrillator.... sealed & flashing hourglass or flashing green light

PED Fire Containment Bag

Li-Ion Extinguishing Agent

Switches (alternate & momentary) both types can have guards or indicator lights

- Alternate action switches off or on, mechanical out and in with mechanical window
- Momentary action switches – reset switch

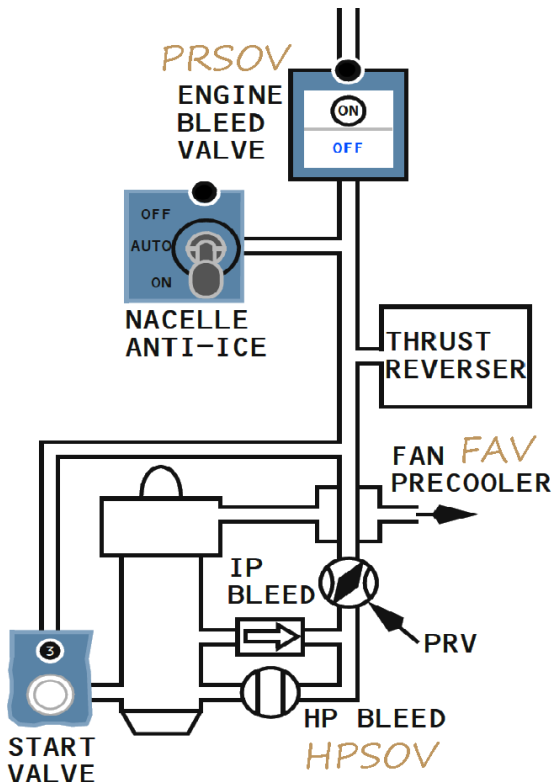
Oxygen mask

take headset off and then put on mask, then headset (or speakers on)

if no smoke/fire -> pull up 100% lever for normal O2

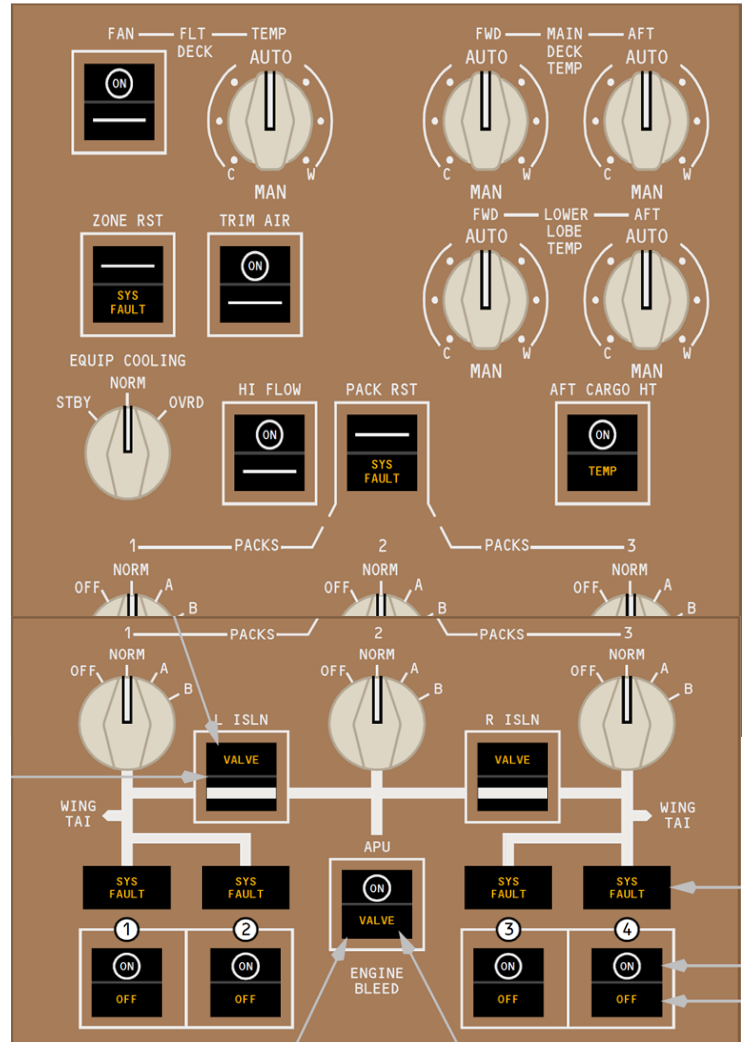
push test/reset button to restore normal mike

flight deck access lights switch/botton locations→ top left of rear overhead panel, lower hatch to e&e, upper deck service



door, upper deck cabin services module

Brown font names are DDG names



2 Air Systems

18°-29°C passengers

4°-29°C boxes

24°C is default (upper deck when power applied)

≥ 12 psi bleed duct pressure (white)

≤ 11 psi bleed duct pressure (amber)

11 psi duct pressure pops up on pri EICAS(or ENG selected)

7 temperature zones

+/- 6°C upper deck and crew rest may be modified

-8 4°C/10°C (40/50 deg F) low/high aft cargo heat

-8 center duct pressure and recirc fans are shown on ECS

synoptic -8 if main deck temperature selectors are left off

temp is set to 20 C, all 4 off results in economy flow

the temperature zone requiring the coolest temp. controls pack outlet temperature (LLCAFR is OFF)

manual position of temperature selectors controls trim air

valve for that zone

sp.2.3 carriage of animals and perishables

packs 1 & 3 supply the flight deck, if inop 2 + recirc air

Pack temperature controllers PTC's two controllers w/3

channels each, switch between a and b on touchdown regardless of switch position, failure of one channel auto changes to other PTC channel, failure of controller changes all 3 channels, regardless of switch positions..see synoptic pack valves electrically controlled and opened by bleed air X (criss-cross) between packs 2/3 and aft/fwd lower lobe trim air to lower lobe is controlled by Lucifer, independent of trim air switch,

-8 just has on/off switch, no a or b settings, has IASC integrated air system controller to control respective pack and some bleed air functions

-8 pack 1 and pack 3 supply air directly to flight/upper deck/rest areas with 2 as backup

LCF pack 1 provides air to flight deck and pack 2 & 3 provide air to cargo zones, if 1 fails, pack switching valves configure to provide air from 3 to flight deck, check valves on pack 1 and cross from 3 to 1

trim air switch – OFF

- master trim air valve closed
- pack temps go to backup mode (temp selected by flight deck) (different for LCF & passenger??)
- selects pack controller A (B not available unless A fails)

-8 left trim air switch– flight/upper/crew and aft main

-8 right trim air – fwd and aft lower lobe and fwd main

-8 trim air isolation valve – may open when left or right fail if switches are on and no overheat

Engine Bleed Air System

SYS FAULT

2 overs 2 opens

- bleed air overheat, or
- bleed air overpressure, or
- HP bleed valve open when commanded closed, or
- PRV open when commanded closed

If a bleed air overheat is detected, the PRV and HP bleed valves close. Pushing an Engine Bleed Air switch from off to ON resets the engine bleed fault detection system.

PRV pressure regulating valve – regulates pressure

FAV is fan air valve, part of precooler that regulates temp.

PRSOV pressure regulating and shutoff valve is DDG name for engine bleed valve (pylon valve)

HPSOV high pressure shut off valve is DDG name for HP bleed

-8 no fault lights

ENGINE BLEED Air Switches

ON

- engine bleed air valve opens for engine start
- engine bleed air valve, PRV, and HP bleed valve open by system logic when bleed air pressure available

Off -

- engine bleed air valve, PRV, and HP bleed valve closed, off light may momentarily flash due to system logic opening and closing valves, will not get EICAS msg.
- PRV opens when nacelle anti-ice on, unless
 - PRV closed by prior or present bleed air overheat, or
 - start valve not closed, or
 - *HP bleed valve failed open
- HP bleed valve and PRV open for thrust reverse, unless
 - PRV closed by prior or present bleed air overheat, or
 - start valve not closed

ZONE RST (Reset) Switch

- resets zone **temperature controller** if fault no longer exists
- reopens master trim air valve if duct overheat no longer exists
- reopens forward or aft lower lobe cargo trim air shut off valve if duct overheat no longer exists

Zone System

SYS FAULT

overheat, controller fault, failed, switch off

- temperature zone duct overheat
- zone temperature controller fault has occurred
- master trim air valve failed closed
- Trim Air switch off
- master trim air valve failed closed and pack air flows

Pack System

SYS FAULT

- pack overheat or other system fault has occurred
- may illuminate briefly when automatically or manually switching from pack temperature controller A to B or B to A

PACK Reset (RST) Switch Push –

- resets pack fault protection system
- restarts pack after automatic shutdown if fault no longer exist

Pack flow rate is configured by:

- the position of the Lower Lobe Cargo Conditioned Air Flow Rate selector,
- the phase of flight, and
- the number of operating air conditioning packs.

Trim air is not available to the flight deck, upper deck, crew rest , and main deck conditioned air distribution system if:

- the EICAS advisory message TEMP ZONE is displayed (may be available to lower lobe if applicable)
- the center section of the bleed duct is isolated,
- the EICAS advisory message TRIM AIR OFF is displayed
- the Master Trim Air switch is OFF

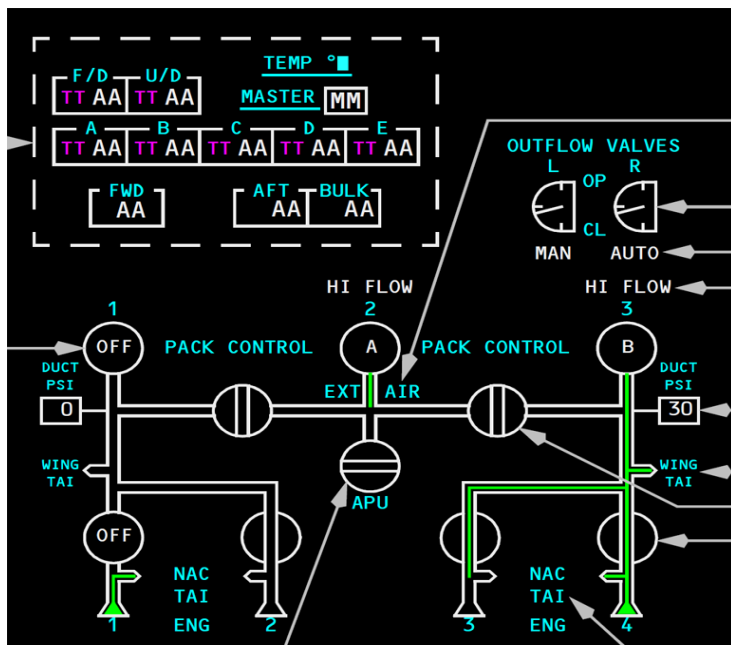
Upper zone's PTC set's temp by→respective zone→ flight deck(backup mode) →last flight deck temp.→24 dec C lower lobe →last selected respective temp→outlet temp sensed when backup initiated

-8 if both lower lobe temperatures are selected, all 3 packs go to high flow

LOWER LOBE CARGO Conditioned (COND) AIR FLOW RATE Selector

- OFF –resets duct overheats (blank target temps on ECS synoptic)
- FWD LOW – 2/3 of 3 to forward (only pack 3 in high flow) and outflow is overboard
- AFT LOW – 2/3 of 2 to aft (only pack 2 in high flow)
- BOTH LOW – two-thirds to forward and aft *
- FWD HIGH – all pack 3 conditioned air to forward *
- AFT HIGH – all pack 2 conditioned air to aft *
- *all packs high flow in cruise
- trim air is provided by bleed air duct..not controlled by master trim air valve
- in high respective pack temp is set to target temp. for zone in low, temp of 2 and/or 3 is limited to lowest of non-lower lobe zones—main deck should be equal/lower than lower??

-8 ECS left and right trim air	
Left	Right
Aft main deck	Fwd main deck
Flight deck	Fwd lwr lobe
Upper deck	Aft lwr lobe
Crew rest	index



- airflow inadequate
- overheat or smoke is detected
- ground exhaust valve not in commanded position (If exhaust or supply fan fails while in normal or standby, the supply valve and exhaust valves will close and bypass valve will open -> closed loop)(no EICAS... just status msg)
- in OVRD and diff. Pressure for reverse flow inadequate in **flight** likely a dual fan failure..go override iaw checklist (no heat in lower fwd cargo)(If both fans fail, OVRD would be closed, diff. Pressure creates reverse airflow and exhaust is vented overboard)

8 TEMP DEV CGO HI/LO

- HI 5 deg C (9deg F) higher than selected
- LO 5 deg C (9deg F) lower than selected

8 Alternate (ALTN) Ventilation (VENT) SwitchON -

with airplane depressurized, opens alternate ventilation valve outside air is supplied to flight deck when switch is pushed ON, valve moves to open position, 20 seconds after switch is pushed ON, valve can be repositioned with the Alternate Ventilation selector

AFT CARGO Heat (HT) Switch

controls overheat shutoff valve

see Bulletin 59

ON -

- overheat shutoff valve opens to provide center bleed air heat to aft and bulk cargo compartments
- temperature control valve closes and opens to maintain temperature
- overheat shutoff valve closes and opens for overheat protection

Off -

- shuts off aft cargo heat bleed air to compartment.

Aft cargo heat is normally selected ON when aft lower lobe cargo conditioned air is selected. This configuration ensures the compartment floor temperature is maintained above freezing

Aft Cargo Temperature (TEMP) Light (amber)

- compartment temperature excessive
- overheat shutoff valve closes
- inhibited on the ground and during climb

If a system fault or overheat occurs in the **lower cargo air conditioning air zone**, a cargo zone trim air shutoff valve closes and a backup mode controls temperature.

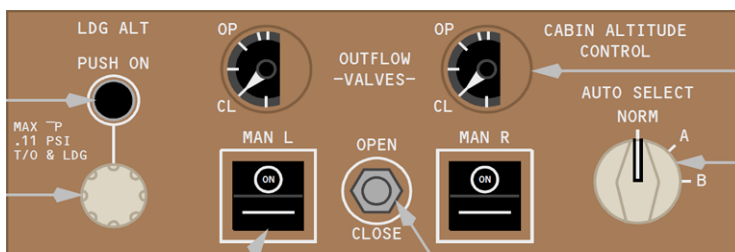
Reset cargo zone air conditioning - allows the cargo zone trim air shutoff valve to reopen, and clears the backup mode

- Cargo Temp selector AUTO to MAN or AUTO to MAN
- LLCCA FR selector to OFF

Equipment cooling		
NORM (ground)	>7° C (45°F)	Exhaust outside (ground valve)
	< 7°C (45°F)	Exhaust fwd lower (~flight mode)
	-8 based on ambient and FLL set temp	Exhaust outside or forward cargo
	-8 *FLL >10° C (50°F)(≥ 2 eng. running)	Exhaust forward cargo
	-8 *FLL < 10° C (50°F)(≥ 2 eng. running)	Closed loop
STBY	Forces to flt. mde.	Exhaust fwd lower (except)*
Flight mode	Automatic	
OVRD	-8 pass NGS shutdown	Exhaust outside (opens smoke override valve & closes all others)
Lower FWD or AFT cargo fire (still pressurized)		
Single fan fail, fault		Closed loop (bypass valves open)
* In flight, FLL set <10° C & LLCCA FR FWD(low,both,high)		
Main deck cargo fire (depressurized)		
System configures for flight with 1 or more engines operating on each wing, *2 or more engines running		
This is an oversimplification, lots more going on		

EQUIP COOLING

- see QRH
- on **ground**--> go to standby...still shown then,



Pressurization

39,000' assumed cruise alt. With no info from Fmc

14,000' SUPRNMRY/PASS OXY ON

passenger/supernumeraries o2 automatically activates, no

smoking signs, fasten seatbelt sign
11,000' cabin alt. Limiter closes both outflow valves *if in auto mode*
↓12,000' cabin alt. supernumeraries O2 can be electrically reset with switch

10,000' CABIN ALTITUDE Warning Siren

–horn in upper deck, no smoking sign, fasten seatbelt sign, return to seat extinguishes
 –cabin alt. changes to red
↓9,500' CABIN ALT EICAS changes to amber and resets warning
↑8,500' cabin alt. changes to amber, CABIN ALT AUTO???
>8,000' field elevation, after takeoff cabin descends in climb
8,000' maximum cabin alt. In cruise mode
<8,000' fully auto operation of cabin altitude
2,000' assumed landing alt. If no info from FMC
-1,000' to **14,000'** landing elevation limits
195 minutes of supernumerary O2 at 25,000'
65 knots during takeoff cabin outflow valves close slightly
11 psi amber duct pressure numbers
9.4 max cabin diff. (from slides)(relief valves open???)
8.9 psi target pressure at cruise
2 controllers A/B control both outflow valves, alternate flights and auto switch

ground mode outflow valves open

For **takeoff**, the system provides a small positive pressurization prior to rotation to cause a smooth transition to the cabin altitude climb schedule *takeoff mode— engines running, >65 knots outflows slightly close*

climb mode—planned leveloffs in FMC are included and cabin continues to climb

cruise mode within 200' of cruise alt. or <100'/min for 1 min

descent mode at T/D or at initial descent of approximately 1,000 feet from cruise altitude, regardless of T/D. *descent descends to 100' below field elev.*

At **touchdown**, the outflow valves open to depressurize the cabin. The captain's altimeter setting provides landing altitude barometric pressure correction.

Two mechanical **positive pressure relief valves** prevent over pressurization of the airplane. One or both valves open if cabin pressure becomes excessive, and close when cabin pressure is no longer excessive. Pack two shuts down to assist in relieving excess cabin pressure. Pack two resets when both cabin pressure relief valves close. *Exterior cover doors can only be reset on ground*

Negative pressure relief valves open when pressure inside is slightly less and when respective door is unlatched, 3 cargo doors main/forward/aft

Aux heaters (foot and shoulder) inop on ground

Supernumerary Oxygen (SUPRNMRY OXY) Switch

- RESET (spring-loaded) – flow control unit closed electrically when cabin altitude below 12,000 feet.
- NORM – system activates if cabin altitude reaches approximately 14,000 feet.
- ON (spring-loaded) – cabin oxygen masks drop.

CABIN ALT AUTO Caution Beeper

–both controllers failed or both outflows in manual

BLD DUCT LEAK L, C, R Caution Beeper

Bleed air leak or overheat along left, center, or right duct section.

C duct isolated.....will loose

- trim air (backup temp control mode)
- cargo smoke detection

- potable water
- aft cargo heat off – electrically closes valves to prevent reverse flow

–**-8** nitrogen generation

L or R duct isolated.....will loose

- LE flaps revert to secondary (electric)
- demand pumps 1 or 4 (selected off to avoid message)
- don't us WAI
- hydraulic reservoir unpressurized on that wing
- max one pack on to assure sufficient thrust available
- check non-normal landing data**

EQUIP COOLING Caution Beeper

- in NORM or STBY, airflow inadequate, or overheat or smoke detected in OVRD, differential pressure for reverse flow cooling inadequate; or ground exhaust valve not in commanded position

3 Anti-Ice,Rain

[see Anti-icing table](#)

4 pitot static and **2** AOA probes **heated** when any eng oper
2 **tat's heated** in flight

2 ice detection probes on forward fuselage

-8 EAI instead of NAI on EICAS

Windshields have Anti-ice(electric resistance on exterior) and anti-fog (electric resistance on interior) w/ overhead switches
side windows only have anti-fog (no control), thermostatically controlled whenever AC power is available
 window heat off for 10 seconds resets

auto NAI– if on at touchdown, stays on till shutdown
 wing anti-ice valves auto close on ground *and is only effective in flight if LE flaps are retracted*

Bleed air is not available for nacelle anti-icing if the engine bleed PRV is closed because of:

- a prior or present bleed air overheat, or
- the start valve is not closed, or
- the engine bleed HP valve is failed open

NAI valve on → continuous ignition (PRV opens)

Wing Anti-Ice VALVE light if

- valves are in transit
- disagreement between switch and valves

-8 BLD LOW TEMP

engine bleed is too low for wing anti icing

>ANTI-ICE WING

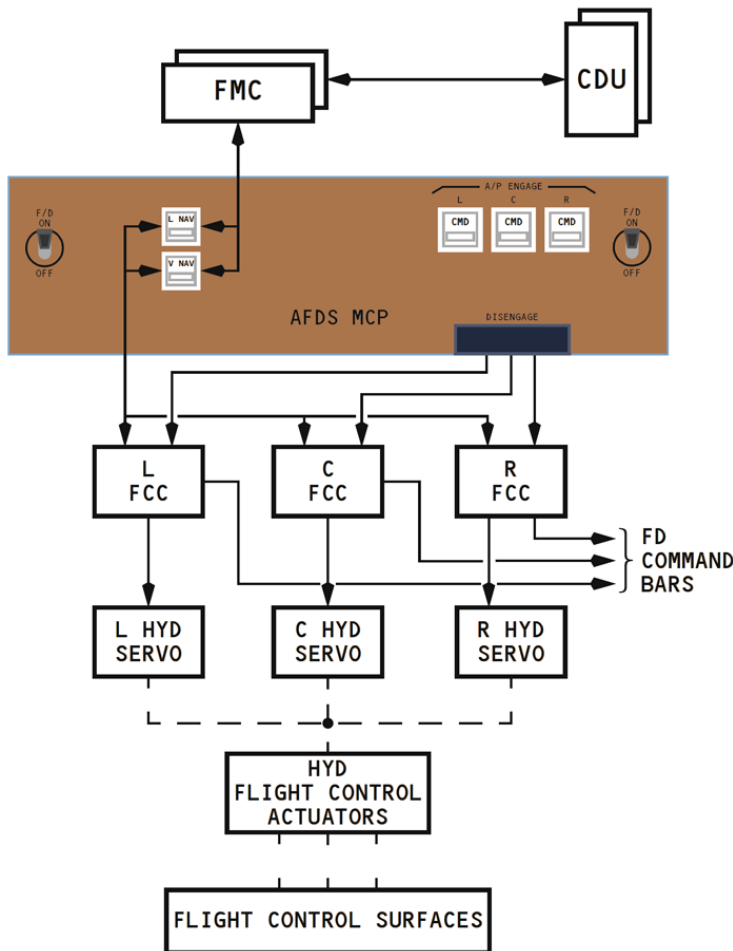
switch on and TAT >12 deg C

>ANTI-ICE NAC

switch on and TAT > 12 deg C and no ice detected

No ice detection	Advisory Ice det. (no auto)
N419MC N747BC	N718BA

4 Automatic Flight



200, 000, 10000 on MCP at startup
automatic flight control system consists of

- AFDS autopilot flight director system
- 3 FCC (flight control computers) and MCP
- A/T autothrottles

MCP and FMC control AFDS and A/T

FCC's control separate hydraulically powered A/P control servos

rudders only commanded during multi A/P approaches
nosewheel steering added during rollout from autoland

LAND 3 fail operational, 1 fault can't prevent autoland
LAND 2 fail passive, 1 fault can't cause significant deviation autoland

>10° of crab, runway alignment occurs at 500' and 5° of side slip is established resulting in upwind wing slightly low
5° to 10° of crab, two alignments, at 500' crab angle is reduced to 5° at 200' increases sideslip to further reduce touchdown crab angle

<5° deg crab, alignment at 200' initiates a sideslip to align aircraft with runway

at 1300' with engine loss, aircraft is commanded to wings level with sideslip unless opposing crosswind

below 200' will not change from LAND 3 to Land 2

NO AUTOLAND no LAND 2/3 by 600', flare and rollout not armed

All modes deactivate by disengaging the autopilot and turning

both flight directors off. After localizer **and** glideslope capture, the localizer and glideslope modes can only be deactivated by **disengaging the autopilot and turning both flight directors off or by selecting TO/GA mode**. VNAV, LNAV, LOC, and APP modes can be disarmed by pushing the mode switch a second time.

on ground, no A/P engaged, first F/D switch arms the F/D IN TO/GA mode

in flight, no A/P engaged, first F/D switch activates

–V/S in pitch mode

–HDG HOLD as roll mode, if bank >5, ATT

F/D off, display with TO/GA switch >80 knts and flaps out of up in climb changes to mach at approx .84

in descent changes to ias at approx 310

if FMC data is invalid, VNAV will not activate and FCC data will be used for FLCH SPD and TO/GA

Autothrottle Modes

can't be engaged >50knts, till 400'

at 65knts goes to HLD till pitch out of TOGA

if it fails, need to leave switch on to get RPM matching from EEC's... *if you want it.... May make it harder to hold speed*
rev thrust causes to disconnect

THR from >400' to landing, thrust to maintain clim/descent rate required by pitch mode up to limit

THR REF thrust set to the reference thrust limit on EICAS.

IDLE

HOLD thrust lever autothrottle servos are inhibited. The pilot can set the thrust levers manually.

SPD holds speed set by MCP or FMC up to thrust limit, inactive in VNAV XXX, FLCH SPD, OR TO/GA

Autothrottles off by

- any engine in idle reverse
- any EEC goes to Alt.
- switching FMC's
- Dual FMC failure (can't be reengaged)
- 2 engine failure (can't be reengaged)

Autothrottle engagement → Cycle AT switch for

- FLCH
- VNAV
- TOGA

Select SPD if in (rule of 3's)

- ALT
- V/S
- G/S

THR switch (push) (light remains off)

–after takeoff with VNAV or FLCH goes to armed climb thrust limit or CON if engine out

–after go-around goes to CLB or CON if engine out or selected (stays GA if landing flaps or G/S pitch mode)

A/T disconnects with > one eng inoperative

A/T activates with VNAV, FLCH, OR TO/GA

A/T activates when SPD with ALT, V/S, or G/S (3 characters)

A/T blank and VNAVXXX OR FLCH SPD, cycling A/T arm with activate A/T

after touchdown A/T are active after reversers are stowed for 10 seconds or until flaps are up

speed protection not provided for V/S mode and engine failure above engine out alt.

Roll Modes (*modes that can be armed)

* **LNAV** activates when above 50 feet and in position to turn onto the active route leg. In flight, selection causes immediate activation if within 2 1/2 NM of the active leg

armed if on intercept heading

HDG SEL airplane turns to or maintains the heading set in the MCP heading window

HDG HOLD AFDS holds present heading. When turning, AFDS holds the heading reached after rolling wings level

ATT when the autopilot is first engaged or the flight director is first turned on in flight, AFDS holds a bank angle between 5 and 30 degrees and will not roll to wings level. When the bank angle is less than 5 degrees, AFDS rolls to wings level (HDG HOLD).

When the bank angle is greater than 30 degrees, AFDS rolls to 30 degrees of bank.

***LOC** AFDS captures the localizer when within range and within 120 degrees of the localizer course

–disarmed before capture by

–push a second time

–select another roll mode

–deactivated after capture by

–roll mode other than LNAV

–TO/GA

–disengaging A/P and F/D's off

TO/GA On the **ground**, TO/GA annunciates by positioning either flight director switch ON when both flight directors are OFF.

TO/GA roll guidance becomes active at lift-off and provides guidance to maintain ground track

In **flight**, TO/GA is armed(not annunciated) when flaps are out of up or glideslope is captured. There is no flight mode annunciation for TO/GA armed. TO/GA is activated in flight by pushing a TO/GA switch. The roll steering indication provides guidance to maintain the ground track present at mode engagement

8 LNAV auto engagement on a go-around w/ leg or rwy after MAP, will engage at at 200' w/ A/P (hdg hld and sel avail), and 400' w/o A/P (hdg hld and sel avail), with roll mode other than LNAV before TOGA, hdg hld and sel avail at 400'

***ROLLOUT**

displays below 1,500 feet radio altitude and activates below 5 feet, after touchdown, AFDS uses rudder and nosewheel steering to steer the airplane on the localizer centerline

Pitch Modes (*modes that can be armed)

TO/GA – On the ground, TO/GA annunciates by positioning either flight director switch ON when both flight directors are OFF. The flight director pitch bar indicates an initial pitch of eight degrees up. TO/GA pitch guidance becomes active at lift-off

At liftoff V2 + 10 or current speed (after 5 sec) (V2+25max)

Engine failure

–V2 if below

–existing if between V2 & +10

–V2+10 if above

(AFDS uses the speed set in the IAS/MACH window for V2.)

In flight, TO/GA is armed when flaps are out of up or glideslope is captured (indicated by GA as THR ref.)

When a go-around is initiated, the command speed is the MCP IAS/Mach window or current airspeed, whichever is higher. If the airspeed increases and remains above the initial target airspeed for five seconds, target airspeed resets to current airspeed to a maximum of the IAS/MACH window speed plus 25 knots. If airspeed at initiation of go-around is greater than IAS/Mach window plus 25 knots, that speed is maintained. GA displays as the reference thrust limit on the primary EICAS engine display

popup feature activates FD with TO/GA switch above 80 knots, flaps not up, and FD switches off

***VNAV** activates at **400 feet** and provides pitch commands to maintain the FMC computed airspeed/path:

–**VNAV SPD** AFDS maintains the FMC speed displayed on the PFD and/or the CDU CLIMB or DESCENT pages. During speed intervention, use the MCP IAS/MACH selector to manually set the speed

–when a VNAV descent is initiated before the top of descent (T/D) and the airplane subsequently intercepts the VNAV descent path, the pitch annunciation may change from VNAV SPD to VNAV PTH

–**VNAV PTH** – AFDS maintains FMC altitude or descent path with pitch commands. For a non-entered headwind, thrust may increase to maintain the VNAV descent path. If the MCP altitude window remains set to the current cruise altitude and the airplane is within two minutes of the top of descent, the CDU scratchpad message RESET MCP ALT displays

–**VNAV ALT** – If a conflict occurs between the VNAV profile and the MCP altitude, the airplane levels and the pitch flight mode annunciation becomes VNAV ALT. The airplane maintains altitude. To continue the climb or descent, change the MCP altitude and push the altitude selector or change the pitch mode. If below the VNAV path, resetting the MCP altitude window and intercepting the VNAV path will also continue the descent

V/S Pushing the V/S switch opens the vertical speed window and displays the current vertical speed. It also opens the IAS/MACH window (if blanked). Pitch commands maintain the rate of climb or descent selected in the V/S window. A/T operates in SPD mode, if armed, **Speed protection is not provided**

FLCH SPD Pushing the FLCH switch opens the IAS/MACH window (if blanked). Pitch commands maintain IAS/MACH window airspeed or Mach. A/T operates in THR followed by HOLD in descent, changes to SPD when level

ALT –Altitude hold mode is activated by:

–pushing the MCP altitude HOLD switch (returns to alt where pushed)

–capturing the selected altitude from a V/S or FLCH climb or descent

***G/S** –AFDS follows the ILS glideslope.

***FLARE** – (armed) - during autoland, FLARE displays below 1,500 feet RA, during autoland, flare activates between 60 and 40 feet RA, *autopilots start flare at 50' RA, a/t retard to idle at 25' RA* FLARE deactivates at touchdown and the nosewheel smoothly lowers to the runway

APP

loc captures w/in 120 deg

gs capture inhibited till loc capture and intercept w/in 80 deg disarmed before capture by

–push a second time

–selecting LOC, LNAV, or VNAV

deactivated after loc capture, g/s armed by

–selecting another roll mode other than LNAV

deactivated after loc and g/s capture by

–selecting TO/GA

–disengaging A/P and F/D's switches off

elevator speed protection in VNAV SPD, FLCH SPD, and TO/GA.... not for V/S, ALT and VNAV ALT

TO/GA switch

–<50knots, flaps out of up, activates A/T in THR REF

→50 knots, inhibited until 400'

→65 knots HOLD

→updates FMC to runway threshold if no GPS

push after liftoff with THR REF displayed

→removes derates

→A/T in HOLD, activates THR REF

→50 to 400' activates TO/GA roll mode

→>400' activates TO/GA roll and pitch modes(might need to reselect VNAV??)

push on approach with flaps out of up or g/s captured

→activates A/T in THR mode with GA ref thrust **2000fpm**

→selects TO/GA roll and pitch

→second push, THR REF

no A/P or F/D and TO/GA armed

→displays FD, THR, TO/GA, TO/GA on both PFD's and adjust thrust for 2000 fpm climb

100 knots FMC records altitude, activates LNAV & VNAV, enable A/T activation(if not already), command accel for flap retraction, set climb thrust

wind shear recovery guidance below 1500' with autothrottle armed, must push TOGA

pushing **altitude selector** (knob)

→each push deletes next (waypoint) constraints

→during climb, if higher than cruise level, resets it

→during cruise

→resets FMC cruise altitude

→in VNAV PTH or VNAV ALT, initiates climb or descent towards altitude in window

→w/in 50 miles of t/d, reduced rate descent

5 Communications

can't turn off guard if 121.5 selected..... just the volume down

RADIO TRANSMIT

radio keyed for >=30 sec,on ground disabled after 35 sec and warning beep

FAIL on radio head... turn off and back on..... resets it(on some a/c... resets control head only)

Monitor 121.5 on VHF R.

LCF, N419MC, N429MC, N464MC, N471MC

With an operational ACARS system, [except for FIR boundary reports] the use of **center VHF** radio is not approved for ATC voice communications.

N409MC, N476MC, N480MC, N496MC-N499MC Do not use the **center VHF** radio on 120.000 MHz or 120.005 MHz as the required means of communication. If frequencies 120.000 MHz or 120.005 MHz are required, left VHF radio and right VHF radio communication systems must be operational for dispatch.

HF L is primary, HF R is secondary

N408MC - N412MC, N475MC - N477MC, N492MC - N499MC

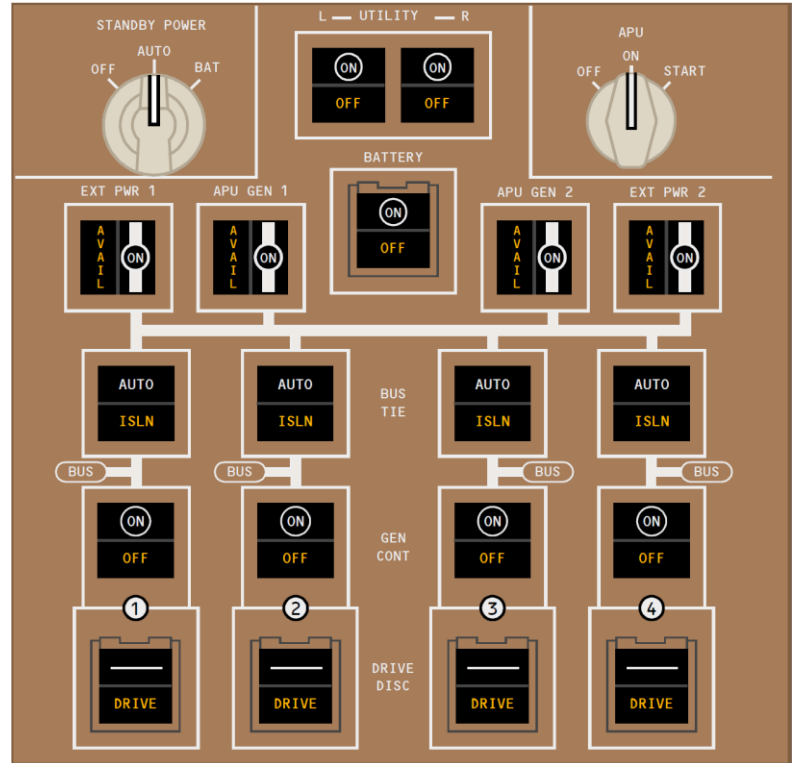
If one HF radio is selected for transmission, deselect the other HF radio on all audio control panels to prevent audio interference.

HF tuning no more than 7 seconds

ensure HF data off when logging on to ATC w/CPDLC

Can't DMI VHF L

Emergency HF freqs SP.17.1



6 Electrical

protection on hot batt busses

detection on batt busses (switch on)

no indications for dc problems

irs/iru's can operate on AC or DC (C for only 5 min)

All six EFIS/EICAS screens blank. QRH 10.10

aft receptacle is EXT PWR 1

3 phase 400 cycle 115 VAC

AVAIL related power source is plugged in and quality is acceptable

Main cargo deck handling bus powered when either APU2 or EXT 2 switches shows AVAIL

Ground handling bus powered when EXT 1 or APU 1 is ON or AVAIL

Also see [Electrical Busses](#).

STANDBY POWER Selector (Push to turn.)

OFF -

→standby power not available

→main and APU standby buses disconnected from all power sources

AUTO -

→allows main and APU standby buses to be powered from available sources.

BAT -(Note: BAT position for ground maintenance use only.)

→disables main and APU battery chargers

→powers Main and APU (hot battery, battery, & standby)

busses from their related batteries through their hot battery busses and standby inverters with Battery switch ON

Stby power only → see sim notes

BATTERY Switch

ON -

- main battery available as backup power source for main battery bus and main standby bus
- APU battery available as backup power source for APU battery bus and APU standby bus

OFF - disconnects main and APU batteries from related battery busses.

SSB Split System Breaker

allows 2 separate power sources (APU gen/EXT pwr)
if SSB open (2 gnd powers), engine start 1st gen powers only
it's side of the bus, 1st gen on other side disconnects it's ext/apu and closes SSB

BUS TIE - Bus Tie Switches

ON arms AC circitry and closes DC isolation relays (DCIR)

OFF opens BTB and DCIR and resets fault logic

ISLN BTB open and AC bus isolated from sync bus with fault, switch position AUTO is still visible with ISLN illum. automatic isol. of AC bus doesn't trip DC isolation relays

GEN CONT - Generator Control Switches

ON - arms GCB to close when generator power quality acceptable

OFF -

- opens generator field and GCB
- resets fault control logic circuitry
- isolates generator from its related AC bus

if both "switch ON" indication and **OFF** light==> it has automatically tripped

IDG

DRIVE DISC - generator drive disconnect switches

- Disconnects IDG from engine when above idle speed
- Opens related GCB

Mx must reconnect on ground

low high fault

- IDG oil pressure low
- IDG oil temperature high (automatically disconnects)
- GCB open due to uncorrectable generator frequency fault

→ **ELEC DRIVE** EICAS message and **DRIVE** light in switch
high oil temp auto disconnects IDG, opens GCB → **ELEC GEN OFF** and **OFF** light...pushing drive disconnect switch after auto disconnect changes **ELEC DRIVE** to **DRIVE DISC**

>DRIVE DISC 1, ELEC GEN OFF

Utility bus switch

ELCU (electrical load control unit) bus faults and load shedding, *galley buses then utility buses*(fwd main 2&3,overrides, jettison) each switch controls 2 ELCU's (and 2 galley ELCU's on passenger)

OFF - removes power and resets fault logic, on passenger with both off removes power from IFE and turns on cabin night lighting, not illuminated during load shedding, illuminates with galley emergency power off switches

EICAS alert messages during **load shedding**

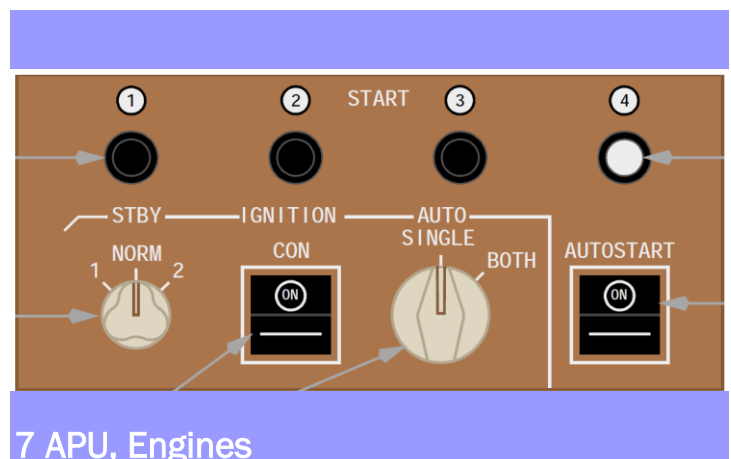
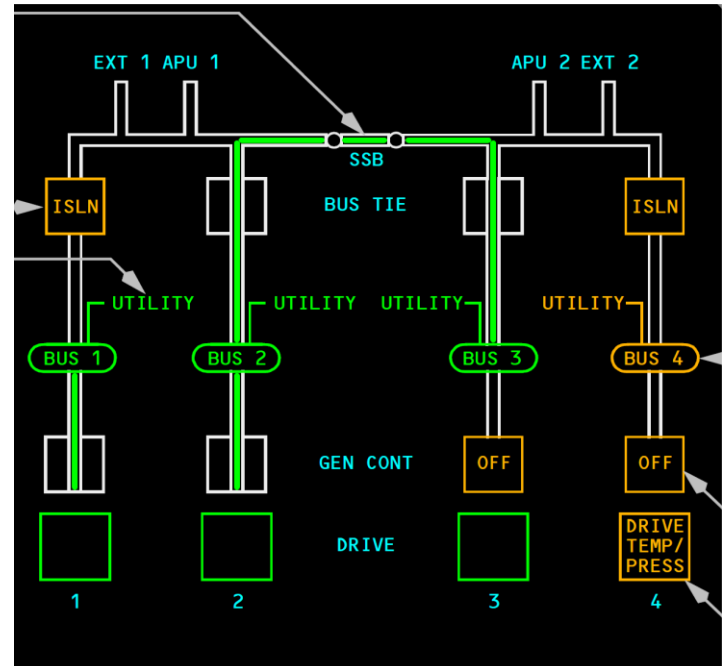
FUEL PUMP 3 FWD
FUEL PUMP 2 FWD
FUEL OVRD 3 FWD
FUEL OVD CTR L
FUEL OVRD 2 FWD

autoland - AC & DC busses 1, 2, & 3 are isolated, 4 powers sync bus, ISLN lights & assoc EICAS messages are inhibited, electrical synoptic is not available

ELEC AC BUS 1, 2, 3, 4 Caution Beeper

AC bus unpowered, get ISLN and OFF lights

Checklist will reset generator, re-parallel, reset EEC's



APU

1 min to start

2 min before battery off after APU switch OFF

>95% and APU selector ON → **APU RUNNING**

300 Kgs./hour

if autoshut down for bleed duct overheat, can't be restarted
apu fault - immediate shutdown?

Inflight (in supplemental procedures)

- 1 pack on for TO up to 15,000'
- can be operated up to 20,000'
- no inflight start
- no generators inflight

TR overheats on start, continues on APU batt only once
 any other TR failures doesn't auto switch to batt
 before 2nd start wait 1 min
 before 3rd start wait 1 min on Batt (10 min on TR)
 before 4th start 75 min
 further starts see FCOM V I Limitations
 stby pwr start, capt inbd to EICAS

During a **battery start** sequence, the APU starter is powered by the APU battery and all APU components except the starter are powered by the main battery while the APU starter is engaged.

Limit exceeded or fire detected auto shutdown

APU battery	main battery
<ul style="list-style-type: none"> -inlet door, -APU controller -APU DC fuel pump -APU fire detect sys 	<ul style="list-style-type: none"> -Stby pwr for the APU cont. -APU fuel valve -APU fire extinguisher

APU Selector

OFF -

- closes APU bleed air isolation valve
- initiates normal shutdown(1 minute unloaded cooldown)

(allow 1 more minute (2 total) for fire detection before battery off) sheds electrical loads

- resets auto shutdown fault logic except when shutdown due to APU bleed duct leak
- APU RUNNING no longer displayed

ON (APU operating position) -

- opens APU fuel valve and inlet door

arms APU bleed air isolation valve

- AC # 2&3 aft Fuel pumps run cont. (regardless of switch position) or DC #2 fuel pump (tank 2 provides fuel and 3 pump runs to prevent tank to tank transfer and as a backup)(429,464,465 only one AC pump, 2 aft)

START (momentary position, spring-loaded to ON) - initiates automatic start sequence.

APU

fault shutdown w/selector ON or >95% with selector in OFF

APU DOOR

air inlet door position disagrees with commanded position

APU FUEL

fuel pressure low or fuel shutoff valve disagrees

FIRE APU (MC warning) (bell)

shutdown without cooldown, APU fire light

Engines

oil magenta <4 quarts or >6 quarts differential

no mechanical connection to thrust levers

takeoff

- maximum thrust reduction authorized is 25 percent below any certified rating
- can't increase power on takeoff using a derate, can using an assumed temp
- EGT indications white for 5 minutes when cont. limits reached

EEC electronic engine control

- sets thrust using N1 as controlling parameter
- thrust lever angle
- FMC
- engine sensors

-n1 & n2 overspeed protections

-keeps thrust constant independent of temp and pressure

-thrust limiting(N1 max at full forward position)

powered by alternator on accessory gearbox

normal to alt, autothrottle disconnects, can be reconnected

when all are placed in alt mode

alt mode does not provide thrust limiting at max N1(overboost)

thrust lever should be moved aft prior to manually selecting alt mode/

P&W switch to alt mode in reverse

in alt thrust should be adjusted for changing conditions

amber N1 for max thrust for P&T, thrust levers full forward

red max N1 RPM limit (overspeed)

green ref. N1(numbers are ref. from FMC)

magenta target N1 commanded by FMC

white N1 commanded by thrust lever position

Standby (STBY) IGNITION Selector

NORM -

-AC power system supplies power to selected igniters

-standby power system supplies power continuously to all igniters if AC power system is not powered *EICAS STBY*

IGNITION ON

1 or 2 - standby power system supplies power continuously to selected igniters (regardless of auto ignition selector position).

Approach Idle (decreases acceleration time for go around)

- nacelle anti-ice is ON
- flaps are in landing position
- Continuous Ignition switch is ON
- thrust reverser operation
- maintained till 5 seconds after touchdown

Selected **ignition** occurs:

- nacelle anti-ice ON
- trailing edge flaps out of up position
- during start when N2 RPM less than 50%
- engine flameout

Continuous (CON) IGNITION Switch ON -

- selected igniters (single or both)operate continuously
- commands approach idle minimum

AUTO IGNITION Selector

-SINGLE -

-EEC alternates igniter 1 and igniter 2 after every second ground start (alternate after each start according to slides)

-EEC selects both igniters for in-flight start or flameout

-BOTH - selects all igniters.

Autostart switch ON arms autostart

Start switch out

- arms start valve
- opens engine bleed air valve

Fuel control switch to **RUN** initiates the autostart sequence

- start valve ==> start light
- opens fuel metering valve,
- energizes igniter (one on ground, 2 inflight)
- 50% N2 starter cutout, start switch releases, start and bleed valves close, start light extinguishes, stops ignition
- start line appears until idle
- autostart switch off, opens fuel valves and energizes ign.

fuel control switch to **cutoff**

-secondary engine displays

- in flight start envelope displayed (fire switch in)
- max or current alt limits (whichever is lower)
- xbleed shows if needed

During in-flight **flameout** and/or start, the EEC reacts to a hung start or to EGT reaching the takeoff limit. If the EEC detects the EGT reaching the takeoff limit or a hung start(or *compressor stall*), it cuts off and then reapplies fuel. The EEC continues making start attempts until the engine stabilizes at idle or the Fuel Control switch is moved to CUTOFF.

auto-relight uses 2 igniters after rapid decrease in N2 or less than N2 idle

Autostart monitors for

- 400 GE & PW (*hot, hung, & wet*)

- hot start
- hung start
- no egt rise

400 3 attempts before motoring for 30 seconds, impending hot start or a hung start after starter cutout, the autostart sequence is aborted immediately. The engine does not motor.

- -8 compressor stall, no light-off, starter shaft shear, low/no starter pressure, no N1 rotation, starter duty cycle exceedance, EGT exceedance, no oil pressure rise

Thrust levers

with auto throttles off and VNAV engaged, throttles should be moved to match magenta line

FUEL

tank → spar valve → fuel pump(2 stage)→fuel/oil exchanger→fuel filter/bypass →servo fuel heater
?→metering unit(hydro mechanical unit HMU)→fuel flow trans→engine fuel valve HPSOV (fuel control switch)→fuel/oil heat exchanger for IDG→fuel manifold/tubes/nozzles

OIL

Low oil quantity has no EICAS, just turns on secondary and turns magenta

oil magenta <4 quarts or >6 quarts differential

oil reservoir(quantity sensor) → pressure pump →oil pressure sensor →bearings (lube and cool) → scavenge pump → temp sensor → fuel/oil heat exchanger → oil filter/bypass→

EICAS

upper EICAS always displays primary engine indications N1 & EGT

Secondary engine indications displayed on lower EICAS

- when power is applied
- in flight when fuel control is cutoff, secondary engine indications are displayed
- exceedence displays partial indications

with exceedence and another secondary/lower EICAS selected(or it's inop), secondary engine displays in compacted mode on upper EICAS

in flight start envelope is displayed when fuel control switched to cutoff and fire switch is in

red limit boxes can be cancelled and recalled

FL 250 150-365KTS (in flight start, also if needed, xbleed start & fuel on line)

VVVVV (secondary engine exceedance cue)

highest **vibration** source is shown, FAN LPT N2 or BB for

broadband (with failure) (0 to 5 range)(always white)
egt color changes are inhibited for 5 minutes after TOGA

-8 differences

- no manual starts
- vibration ind turn black with white background above high band mark
- EEC will shut down engine on ground if lever is at idle and thrust is not decelerating to idle
- igniters alternate for each start
- 30 seconds of motoring between all restart attempts
- abort and no motoring for no oil pressure, no n1 rotation, egt limitations, sheared starter shaft, low starter air pressure, impending starter duty cycle limit
- inflight restarts on fifth attempt egt limit is incr. by 25 deg C

hydraulically actuated thrust reverse

P&W hydraulic reversers

8 Fire Protection

fire detection systems tested upon power up eng/apu/cargo manual test

- hold test switch in until test complete
- only time gear and wing bleed leak are tested
- tests engines, APU, wheel wells, cargo, wing bleed duct leak
- master warning, warning bell and all fire lights

engine and apu are continuously monitored

(differences between the engine/APU switches highlighted in grey below)

Engine

dual loop fire detectors with 'and' loops
separate(from fire) dual overheat detectors 'and' loops
with fault in a single loop, automatically reconfigures allowing warning from a single operating loop

2 bottles each wing

turning 2 switches same direction on same wing will use different bottles

can be mechanically unlocked by pushing override switch

Fire Switch (5)(unlocks with fire warning, cutoff, or override)

- closes engine fuel and spar fuel valves
- closes bleed air valve
- trips off generator
- arms both related engine fire extinguishers
- shuts off hydraulic fluid and depressurizes EDP

FIRE ENG X (MC Warning) {bell} fire switch light, fuel control switch light

displayed as long as condition exists

BTL B DISCH →

>BTL LOW ENG B

>DET FIRE/OHT X

fault in both loops

OVHT ENG X NAC (MC Caution) {beeper}

APU

1 bottle

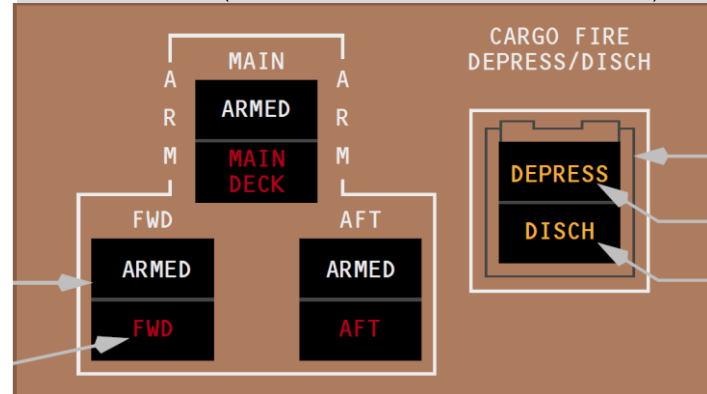
dual fire detection 'or' loops (no overheat detectors)

FIRE APU (MC Warning) {bell}

APU fire handle light, horn in right body gear wheel well
fire warning on ground, auto shuts down apu, fire's bottle (most airplanes except passenger/BCF), unlocks switch
fire warning bell is one second on, 10 off
right body gear pull handle then push extinguisher button
fire in flight must be manually shut down????

APU Fire Switch unlocks with fire warning or override switch

- closes APU fuel valve
- closes APU bleed air valve
- trips APU generator field and generator breaker
- arms APU fire extinguisher bottle
- closes APU air inlet door
- shuts down APU (if automatic shutdown does not occur)



Cargo

400 use center bleed air duct to draw in air and loops

tested every 60 min once fault is detected
main deck

- sixteen dual loop (-8 62 detectors, 2 for fire warning)
- extinguish by depressurizing

forward and aft lower cargo compartments

- four dual loop (-8 fwd 18 detectors, aft 19 detectors, 2 for fire warning)
- 4 bottles (6 diff.) for either compartment

FIRE CARGO (MC warning) {bell} light in associated ARM switch remains until no longer smoke condition

FIRE CARGO FWD/AFT
FIRE MN DK FWD/MID/AFT
FIRE MAIN DECK (multiple)

ARMED MAIN DECK

- turns off two packs
- closes master trim air valve
- turns off all airflow to main deck and airflow and heat into lower cargo compartments
- (SATCOM shuts down)
- configures equipment cooling to closed loop (depress.)
- enables main deck fire suppression (depressurization)
- EICAS will indicate FWD, Middle, or AFT or just FIRE MAIN DECK for more than one zone
- 8** closes all zone trim air valves, chiller is shutdown, turns off recirc fans, turns off nitrogen generation system

ARMED

FWD/AFT

- turns off two packs (#3 and fans on passenger)
- closes master trim air valve
- turns off all airflow and heat into lower cargo compartments
- (SATCOM shuts down)

-configures equipment cooling to smoke override mode(press)

-arms lower cargo compartment fire extinguishers

-**-8** closes main deck and lower lobe zone trim air valves, turns off recirc fans, turns off nitrogen generation system

CARGO FIRE Depressurization/Discharge (DEPRESS/DISCH) Switch

-**MAIN - DEPRESS** - initiates airplane depressurization (at a controlled rate) to slightly below airplane altitude.

-**FWD or AFT - DISCH** - initiates extinguisher discharge sequence to provide effective agent concentration for 210 minutes. (400C-334 min)

Pushing the Cargo Fire Discharge switch discharges two bottles immediately. The others discharge after a brief delay(*metered*), or upon touchdown.

main gear wheel wells single loop fire detector

FIRE WHEEL WELL until condition no longer exists

smoke detectors in lav & crew rest

auto fire extinguisher in waste compartment in lav

associated EICAS with any of above

9 Flight Controls

Spoilers												
	1	2	3	4	5	6	7	8	9	10	11	12
Indicate				i								i
Speed			s	s	s*	s*	s*	s*	s	s		
Flight	f	f	f	f	f			f	f	f	f	f
Ground	g	g	g	g	g	g	g	g	g	g	g	g
-8 wing Id	w	w									w	w
-8 Flr ast				f	f			f	f			
Hyd sys	3	2	2	3	4	4	4	4	3	2	2	3

*partial

Primary flight controls (no manual reversion)

4 elevators

- 1 hyd sys each respective outboard, 2 each inboard
- Column → mechanically connected to inbd elev control units → inbd elevators → position transmitted to outboard elevator(slave)
- artificial feel by hyd 2 & 3
- EICAS position provided by outboard elevators
- 8** automatic tail strike prevention decreases elevator deflection

4 ailerons (2 hyd sys each)(all indicated on EICAS)

- wheels → interconnected lateral control packages → power control units on each aileron & spoilers
- aileron lockout system locks the outboard ailerons in the neutral position at high airspeeds (240 KIAS (2 eng. Maneuvers section))

-8 outboard ailerons

- fly by wire control, hyd pwr
- droop for takeoff when flaps are 10 or 20, doesn't limit aileron travel, raised if AOA above stick shaker
- neutral at flaps 25 or 30
- above 258/.53m outboard ailerons are neutral

-8 inboard ailerons

- are mechanically controlled, hydraulic pwr
- droop for flaps 10 or greater

2 rudders (2 hyd sys each)(both on EICAS)

- pedals & trim → art feel → ratio changer → rudders
- 8 double hinged lower rudder & rudder trim centering switch

shearouts

- between control wheels (and jam override(allows one wing))
- inboard and outboard elevators
- rudders

Secondary flight controls

Spoilers (4 and 12 indicated on EICAS)

- 5 outboard operate w/aileron on each wing
- 4 inboard operate as speed brakes inflight on each wing (2 inbd are partial)
- all on ground
- 8 LCE lateral control electronics/fly by wire

with hyd. Failure, still symmetric

- 8 Load shift LCE extends outboard spoilers for undesirable loads, elevators deflected down to compensate, retracts speedbrakes(handle doesn't move)

- 8 flare assist, spoilers extend slightly when flaps to 30, and move with control column below 260' RA

- 8 with engine failure and above 100 knots, inboard spoiler pair will extend to assist in yaw control with large rudder

Speedbrake Lever

On ground

- armed to out
- main gear touchdown
- 1&3 near closed (retarded)
- DN to out (auto gnd spoilers for RTO, backup for landing)
- main gear touchdown
- 1&3 near closed
- 2 or 4 pulled to reverse idle detent (1&3 retarded)
- OUT to DN
- 1 or 3 advanced

Horizontal stabilizer (2 separate hyd sys)

Flaps LE(pneumatic) & TE(hyd) flaps both w/electric backup

- flaps 1, inboard and midspan leading edge flaps, -8 all leading edges extend
- flaps 5, outboard leading edge, trailing edge 5
- flaps 10 - 30 trailing edge flaps

opposite TE mechanically connected for symmetry protection gate at flaps 1(prevent raising remaining LE) and 20(for go-around)

handle →FCU's (no mechanical connection) → flap actuators logic based on flaps comes from handle...not gauge??

Logic

- trailing edge flaps out of up -- continuous ignition all eng.
- when trailing edge flaps are in transit, or in flight when flaps are extended past 1 demand pumps 1 and 4 also operate
- flaps are extended, in flight, demand pumps 2 and 3 also operate
- flaps in landing position -- approach idle

FCU(3) Flap control units (3 basic functions) any can provide all 3 functions

L primary control(LE pneumatic, TE hydraulic)

- trailing edge asymmetry protection
- flap load relief, 30 to 25, 25 to 20, -8 20 to 10 (retract-236 knts/extnd-231 knots)

R secondary control (electric)

- trailing edge asymmetry protection
- TE
- reverts to primary mode when hydraulic pressure returns
- if pressure was already available, remains in secondary mode until fully **retracted**

-LE flaps remain in secondary till commanded position

-If a primary control failure occurs in either the inboard or midspan leading edge flap group (flaps 1), both groups switch to **secondary mode**. For all other flap groups, only the failed (symetric) group operates in secondary mode

-If a failure occurs in a leading edge flap group on one wing, the flap groups on both wings change to secondary mode after a time delay of between 20 to 45 seconds. Non affected side has already completed movement

-If any groups are driven in secondary mode, the groups remain in secondary mode until fully retracted

C indication and annunciation

ALTN flaps (after **FLAPS CONTROL**)

bypasses FCU's and flap lever and only uses electric motors max flaps 25

not spring-loaded

index marks displayed on expanded EICAS (no green line)

load relief not available

asymmetry protection not available

ALTN Flaps Arm Switch

- arms flap alternate control mode
- arms Alternate Flaps selector
- shuts off primary and secondary mode operation
- Flap lever inoperative

ALTN Flaps Select

- EXT all electrically **extend** immediately
- RET electrically **retract** LE after inboard TE

If flap control is in secondary or alternate mode, or if any non-normal flap position is detected, an expanded flap indication is displayed

During engine reverse thrust operation, automatic retraction of inboard and midspan leading edge flaps (-8 and one panel on each outboard) changes the flap position indicator to reflect flaps in transit.

Between 1 and 30 - actual position of slowest trailing edge flap group.

Box Outline – Retracted

□ retracted.(white)

◻ unit stuck up (amber)

Crosshatch – in transit

/// in transit.(white)

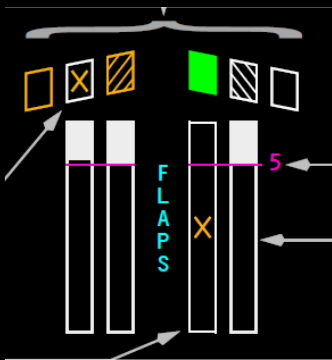
/// still in transit after normal time (amber)

Solid Box – extended

■ extended (green)

■ unit stuck down (amber)

X position sensor failed



Green – flaps in selected position.

Magenta – flaps in transit to position selected by Flap lever.

Amber – disagrees with flap lever handle position

Leading Edge Flap Indication

With only standby power, loose left TE indications

Indication is no longer displayed 10 seconds after flap retraction.

Two independent **yaw damper** systems operate continuously in flight to improve airplane directional stability and provide turn coordination.

yaw dampers (hyd sys 2 & 3) uses IRS

elevator feel provided for changes in speed by hyd sys 2 & 3, backup by springs which do not change with speed

Stab trim cutout switches

- AUTO – unscheduled or uncommanded trim causes cutout
- CUTOUT - removes hydraulic power to STCM (stab trim control module)(cutout to auto, short delay)
- ON - overrides automatic cutout

A/P's electrical signals L-#3, R-#2, C - #3 or #2(if 3 failed)???
control column cutoff will temp cutoff trim signals from A/P's or trims switches

one stabilizer trim actuator fails → half rate movement
trim rate automatically reduced at high speeds
no trim commanded if

- capt and fo switches opposite
- control column opposite thumb switches
- thumb switches opposite alt switches

w/ single AP engaged, control wheel manual trim will disconnect AP and move stabilizer

w/ multiple AP engaged, control wheel manual trim is inhibited

Alternate Stabilizer Trim

- switches override autopilot trim commands with any number of autopilots engaged and do not cause disengagement.
 - Provide increased trim range over stabilizer trim switches
 - does not disengage autopilots and bypasses cutouts
- Activating the Stabilizer Trim switches or engaging an autopilot inhibits mach stability trim.

speed stability trim (low speed) & mach stability trim(high speed) inhibited with stabilizer trim switches or A/P engaged

STAB TRIM UNSCHED Caution Beeper

uncommanded stab trim and did not auto cutout or alt trim switches used with a/p engaged

STAB TRIM 2/3 Caution Beeper

stab trim switch in cutout or auto cutout has occurred or trim has been commanded and actuator fails to responded

>STAB GREENBAND

indicates nose gear oleo switch disagrees with green band (only if nose up or down band???)

FMC's use cg, gw, thrust setting -8 flap entry(actual flaps overrides) to calculate green band,

>CONFIG STAB

trim not in green band

AILERON LOCKOUT

fault in lockout system

- avoid large or abrupt movements at high speeds
- 20 knot crosswind limit for landing

FLAPS PRIMARY Caution Beeper

One or more flap groups operating in secondary control mode. Uses electric motors...allow additional time for movement

FLAPS DRIVE Caution Beeper

One or more flap groups have failed to drive in secondary mode, or an asymmetry condition detected.

TE Asymmetry, primary is shutdown and FCU's don't go to secondary for that group, don't use alt flaps

FLAPS CONTROL Caution Beeper

displays when alt. Mode selected or all 3 FCU's have failed
Maintain flaps UP maneuvering speed. Slow to flaps 5 maneuvering speed after 3 minutes and 45 seconds with the alternate flap selector in EXT. Slow to flaps 25 approach speed after 5 minutes total.

alt mode, no flap lever, maybe no guage

Uses electric motors...allow additional time for movement

>FLAPS RELIEF

primary mode only, flap handle doesn't move

>SPEEDBRAKES EXT Caution Beeper

aft of ARMED detent and

- radio altitude is between 800 feet and 15 feet
- flaps are in a landing position
- two or more Thrust levers are forward of closed position.

>SPEEDBRAKE AUTO

fault in automatic ground spoiler system, may extend in flight when armed or not auto extend on ground

RUD RATIO SNGL/DUAL

avoid large or abrupt rudder inputs at high speeds
less rudder may be available at low speeds
ratio changer fails in the current limiting condition

10 Flight Instruments, Displays

EFIS electronic flight instrument system → PFD & ND
EICAS

EIU EFIS/EICAS interface unit, supplies PFD, ND, & EICAS
IDS integrated display system → 3 IRU's to 6 CRT/LCD's
ADC's (2 on most planes, 3 on BCF, passenger, polar & LCF)
enables EIU's to display alt., airspeed, mach, and air temp.

-8 center ADC is not a complete system and uses inputs from failed adc (switch on overhead panel, FO side)

-8 3 ADIRU air data reference units, ADC integrated with IRU
SAT on prog page 2

high latitude alignment 70° 12.0' to 78° 15.0'. ALIGN for a minimum of 17 minutes.

bank limit selector in heading select only, otherwise auto center irs cuts off after 5 min in standby power
does not autotune adf's

Altitude box is highlighted in white between 900 feet and 300 feet when approaching selected altitude.

Altitude box changes to amber when deviating from selected altitude between 300 feet and 900 feet.

Pitch limit indicator appears flaps not up, windshear

-8 POS/REF Pg 2 can update the FMC computed position to match either the IRS, GPS, or RADIO position.

if PFD CRT/LCD fails, inbd(nd) automatically changes to pfd
if lwr EICAS CRT fails, upper switches to compacted mode, or if uppr fails, compacted mode on lower

iru failure, need to select operable iru for capt/autobrakes, fo/rmi referencee(uses c if other than r)

localizer/glideslope deviation diamonds fill w/in 2 1/3 dots

vertical speed appears >400'/min

trend arrow is speed in 10 seconds

loc/gs diamonds fill in w/in 2 1/3 dot

expanded loc, rectangle is 1/2 dot deviation

if EFIS fails, no more traffic info, TCAS turns to off on ND
PFD

if both EFIS control panels fail, EICAS control panel fails
high and low vor's below 40nm selected, high only 80 and greater

green arc uses vertical speed and ground speed to compute trend vector 30seconds per segment

30/3, 20nm/2, 10nm/1 segment displayed

vertical path indicator and deviation scale, dig. >400'

Maximum Speed (bottom of red ants)

maximum airspeed limited by lowest of the following:

- Vmo/Mmo
- landing gear placard speed, or
- flap placard speed

Maximum Maneuvering Speed (bottom of yellow bar)

maximum maneuvering speed. This airspeed provides 1.3g maneuver capability to high speed buffet. May be displayed when operating at high altitude at relatively high gross weights.

Minimum Maneuvering Speed (Top of amber bar)

minimum maneuvering speed.

- 1.2 on **NG FMC** ???
- 1.3g maneuver capability to stick shaker with flaps down
- 1.3g maneuver capability to stick shaker or VREF+80, whichever is less, with flaps up below 20,200 FT

-1.3g maneuver capability to low speed buffet (or an alternative approved maneuver capability as preset by maintenance) above 20,200 FT

Displayed with first flap retraction after takeoff.

Note: 1.3g maneuver capability occurs at 40 degrees of bank in level flight.

During non-normal conditions the target speed may be below the minimum maneuvering speed.

Minimum Speed (top of red ants) Indicates airspeed where stick shaker or low speed buffet occurs.

ILS approach tuning inhibit is active when:

- the autopilot is engaged and either the localizer or glideslope is captured
- the flight director is engaged, and either the localizer or the glideslope is captured, and the airplane is below 500 feet radio altitude, or
- on the ground, the localizer is alive, airplane heading is within 45 degrees of the localizer front course, and ground speed is greater than 40 knots

IAS DISAGREE

>5 knots difference more than 5 seconds

ALT DISAGREE

>200' difference more than 5 seconds

EFIS/EICAS C/P

both EFIS have failed and EICAS display select panel fails

ROLL or PITCH (disagree) on lower portion of att. Ind.

11 Flight Management, Navigation

IRS is 3 IRU's and mode selector panel

DC for hot apu bus is backup to AC power for IRS

IRS AC

-C IRU shuts down after 5 min on DC power

1 FMS includes 2 FMC's and 3 CDU's

LNAV activates at 50'

VNAV activates at 400'

3 ILS radios, 2 of everything else

2 5 channel DME's

2 sets of 3 glideslope antennas, gear doors used when gear down

VOR antennas (tail) used for sensing, LOC antenna in nose for capture

ADF's must be manually tuned

ILS autotuned w/in 200 nm of TOD or 1/2 way if less

-8 ILS autotuned w/in 150 nm of destination, 50nm of t/d, or in descent mode

-8 backcourse localizer approaches are not authorized

-8 approach name is displayed on PFD top left for IAN approaches, minimums don't need to be set in MCP alt.

automatic/procedure/route tuning

GPS, DD, VD, & LOC updating indicated on ND

-see pos ref pgs 2 & 3 for more info

approach logic

-**NG FMC**

-descent phase active and flaps out of up

-sequenced first wpt. (or FAXXX) of active nav. DB approach

- 12nm from dest. apt. direct to or intercept course to active wpt. and manually entered EOD alt. <500' AFE
- runway or MAP is active wpt. and w/in 25nm of rwy

NG FMC 250 max wpts.
NG FMC Off idle descent

ILS ANTENNA beeper

- 2 or more ils antennas failed to switch, reduced TCH

fast realign, go to align, may enter ppos, back to NAV
ATT mode, hold straight and level for 30 seconds, must periodically enter heading on POS INIT, loose accel functions, vertical speed & speed trend??? loose navigation
max rate = max angle + 25 knots on VNAV CLB page
 when off active route, waypoints may not sequence, must use direct to or intercept course to make correct leg active
 -> LNAV will not capture inactive leg
 multiple waypoints of same name, direct to and hold use first instance
 hidden discontinuity, - - - on inbd course to first waypoint on legs page
 if engines aren't shut down between flights, enter a new cruise altitude to rebuild vertical profile
 if changing destination during descent, enter a new cruise altitude to rebuild vertical profile

CLB thrust is picked based on TO thrust derate

- 5 to <15% → **CLB 1** → 10%
- ≥ 15% → **CLB 2** → 20%
- Derate removed from 10,000' to 15,000'
- 8**
- 10 to <20% → **CLB 1** → 10%
- ≥ 20% → **CLB 2** → 20%
- Derate removed from 10,000' to 30,000'

Conditional waypoints (displayed in parenthesis)

- passing an alt
- flying a heading to a radial
- flying a heading to a DME distance
- intercepting a course
- heading vectors

Under normal conditions, the left FMC is designated the master for CDU operations. The left FMC determines which key pushes should be executed and in what order. It then transmits the **key-push** messages to the right FMC. Each FMC processes the key-push message and updates its own CDU. If a climb to cruise altitude is necessary after completing a descent, a **new cruise altitude** entry must be made. Cruise altitude can be entered on the CLB page.

Thirty seconds after engine shutdown, flight complete phase **clears** the active flight plan and load data.

The FMC will not **sequence the active** waypoint when: more than **21 nm off the active route** and not on an offset route. DIRECT TO courses are segments of a great circle route. When entering a DIRECT TO waypoint on the Legs page, the **course** above the waypoint before execution is the arrival course at the waypoint. However, after execution, the course is the current course to fly to the waypoint.

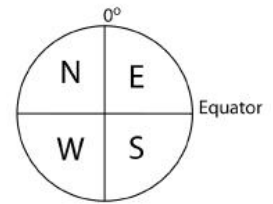
Maximum range cruise or the minimum fuel speed schedule may be obtained by entering a cost index of zero.

FMC selected stations display on the POS REF page 2. **Position error** can be detected by selecting the EFIS POS switch and observing calculated VOR (Chapter 10, VOR navigation display symbology) positions relative to VOR/DME RAW DATA radial

and distance information.

- N50° W040° becomes 5040N
- N75° W170° becomes 75N70

- >100° - put letter in middle, leave off the 1



(there's only one way to put each letter in the correct hemisphere)

N47° W008° is entered as N47W008

N47° 15.4' W008° 3.4' is entered as N4715.4W00803.4
 both display the same as N47W008

must use leading zeros

The first letter identifies the type of fix and the second letter identifies the type approach: Examples: C132R, PV15, FN24L.

Last letter is dme, 5 across, right is 5, 10, 15

unnamed fixes along dme arc start with D then radial and dme/character

fix/approach

Fix(x)	(x)Approach	Runway(xx)
C final approach course fix	I ILS	RX runway extension
F final approach fix	L localizer only	FA VFR FAF
P missed approach point	B backcomb ILS	CF fnl apch course fix
I initial approach fix	D VOR/DME	FF FAF
D minimum descent altitude	V VOR only	IF IAF
T touch down point	S VOR with DME points	OM
R runway centerline intercept.	N NDB	MM
	Q NDB with DME points	IM
	M MLS	BM back course marker
	T Tacan	MD MDA
	R RNAV	A + a letter, step down fix
		RW threshold
		MA MAP
		TD touchdown pt inboard of threshold

Latitude or longitude reporting waypoints

- W060-10 adds waypoints starting at W060 in ten degree increments from that point to the destination
- the entry must be made on a LEGS page on any line before the first reporting point
- usually, this entry is made on the active waypoint line and proper sequencing is performed by the FMC

Along-track waypoints.

- VAMPS/25 is 25 miles after VAMPS on the present route, and displays as VAM01
- ELN/-30 is 30 miles before ELN on the present route, and displays as ELN01
- Latitude and longitude waypoints cannot be used to create along-track waypoints.

-Distance must be less than distance to the next/previous respective wpt.

Place/ bearing /distance

crossing Lat or Long waypoints

W140 creates a waypoint where active route crosses w140

Constant radius to a fix **NG FMC**

1.9 ARC R - arc to the right with a radius of 1.9 nm.

Hidden discontinuity - - -
 an inactive route - - - - -
 an activated, but not yet executed route, _ _ _ _ _
 the active route _____
 modifications _ _ _ _ _

modified waypoints white

executed route offsets _ _ _ _ _

NAV RAD

Procedure autotune, Route autotune, Autotune for best position orientation, Manual tuning
Park displayed >200NM from t/d or less than halfway to dest.

FMS FUEL

PERF INIT page as CALC, MANUAL OR SENSED
PROG PG2 as TOTALIZEER AND CALCULATED
FMC normally uses CALCULATED values, reset prior to eng.
Start and during jettison, MANUAL will be updated by fuel flow, SENSED when fuel flow data invalid
fuel used reset on ground after shutdown and at next engine start fuel flow

FUEL DISAGREE-PROG 2

difference between total and calculated values, select one

INSUFFICIENT FUEL

fuel at dest. Less than entered reserve value

Single (master) FMC Failure FMC LEFT or FMC RIGHT

controlling FMC fails, AP wings level and holds pitch

QRH 11.1

- MENU page and the scratchpad message TIMEOUT – RESELECT display, the FMC is no longer connected to the CDU.
- select ALT HOLD, HDG SEL/HOLD, manual throttles (temp)
- select operable FMC – FMC switch to L or R (gives command guidance to AP/AT)
- select NAV source selector to operable FMC (fixes ND)
- cycle autothrottle switch??, SPD
- LNAV, VNAV
- 1L on inop FMC CDU to select other FMC
- After loss of a single FMC, a resynchronization may occur. The active route may become inactive, the performance data may be lost, and LNAV and VNAV modes may fail. To regain FMC operation, activate and execute the flight plan, enter the necessary performance data, and select LNAV and VNAV.

Standby/Alternate Navigation

No < FMC prompt on menu page → Alternate navigation
3 separate standby navigation systems CDU & IRU

Dual FMC failure FMC LEFT & FMC RIGHT QRH 11.1

- select ALT HOLD, HDG SEL/HOLD,
- manual throttles (all day)(→ no cat III)
- navigation source selector to corresponding CDU
- HDG SEL to follow ND (use most accurate ND/CDU)

Available CDU pages L-P-N

- LEGS
- PROG 5L indicates controlling IRU, L/C/R
- NAV/RAD

manually tune ILS/VOR on each(3) CDU's using freq, no performance or navigation data, must enter new waypoints as lat/long in each individual CDU, existing waypoint names remain, you'll loose all conditional waypoints, offsets, and holding patterns, Mag heading for active waypoint only, rest True, still great circle between waypoints, totalizer fuel avail. on EICAS

Dual FMC Failure		Target N1	PI.21.2?
		Go Around N1	PI.20.4
Flaps Maneuver Speeds			
UP		Vref 30 + 80	
1		Vref 30 + 60	
5		Vref 30 + 40	
10		Vref 30 + 20	
20		Vref 30 + 10	
Vref 25			PI.20.1
Vref 30			PI.20.1

performance inflight section of QRH

Polar Operations

may have map shift on ND (non-selected FMC) when no longer updating due to split IRS operations
If the ND is referenced to true north and the airplane descends 2,000 feet at more than 800 feet per minute, the heading reference box changes color to amber and flashes for 10 seconds.

The compass display references true north when the airplane is north of 82° N latitude (or north of 70° N between 80° W and 130° W) or south of 82° S latitude (or south of 60° S between 120° E and 160° E).

SPLIT IRS OPERATIONS

passing 84° till 83.5° loose radio updating,
GPS inhibited form 88.5° till passing 88° decreasing, may result in position offset/different ND's
keyhole determines if in TRUE

PURGE UPDATES POS 2

radio updates rejected due to reasonableness checks

Weather Radar

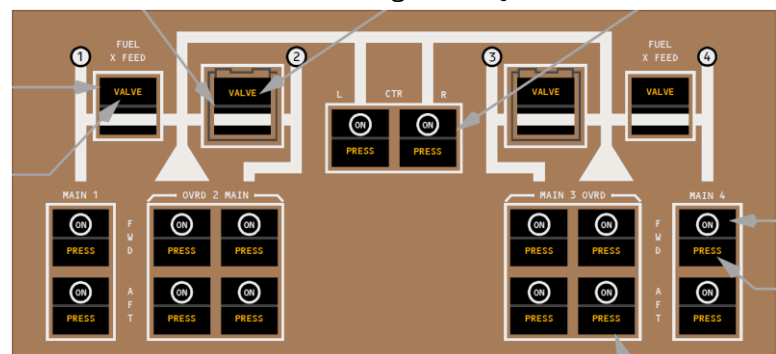
- weather is only shown at current position, will move with winds before you get there
- if you have two different ranges on nd's or one is in terrain, you will only update radar every other sweep
- turbulence w/range<40nm, twice as long to sweep
- 2 r/t's and one antenna
- FOM 3.7.3 weak echos by FL200/5nm, FL250/10nm, >FL300/20nm, 5,000' vertically, 10nm lateral separation when between cells-not over

>FMC RUNWAY DIS Caution Beeper

- Airplane position or heading not within specified limits of active FMC departure runway and takeoff thrust applied

>TRANSPONDER L, R

- may have just lost GPS signal therefore lost ADS-B....no TCAS OFF or TCAS SYSTEM message... see QRH



12 Fuel

light blue highlights = jettison operations

<66,600 kgs fuel load → reserve tanks are empty

~36,500 kgs in CWT & flaps out of 10/20 → stabilizer fuel transfer

36,000 min takeoff fuel for BCF aircraft

27,200 kgs in 2 or 3 – CWT scavenge begins (-8 and CWT <=1,600kgs)

-8 21,600 kgs in 2 or 3, opens 1&4 transfer valves during jettison

18,200 kgs (40,200 lbs) in 2 or 3 – reserve tank 2&3 transfer valves open (also during jettison)

12,800 Kgs total standpipe w/reserve valve

9,072 kgs (20,000 lbs) in 2 or 3, opens 1&4 transfer valves during jettison

-8 6,100 kgs in 1 or 4, reserve tanks transfer

4,080 kgs FUEL DISAGREE-PROG 2

-8 3,450 Kgs. Standpipe, 2&3 ovrp pump, 1&4 trans. valve
3,200 Kgs. (7,000 lbs) Standpipe, 2&3 ovrp pump, 1&4 transfer valve

2,720 kgs FUEL IMBAL 2-3

2,720 kgs FUEL IMBAL between 1&4 and 2&3

share flow <2,300 in CWT and >6,800 kgs/hr consumption

1,360 kgs FUEL IMBAL 1-4

900 kgs FUEL QTY LOW (MC caution) {beeper}

450 imbalance messages clear

300 kgs/hour APU burn

90 seconds for jettison to update based on actual rate

-8 ~83 total tons → tank to engine??

~53 total tons → tank to engine

45 kgs (100 lbs)/min 4 eng taxi burn (=2,700 an hour)

-37 C or below, temp turns amber (for jet A)

4 jet pumps scavenge center into 2/3 except 429, 464, 465 elec pump into 2 (120 minutes or no pressure)

maintain at least 3 °C above fuel freezing point

#1 tank has fuel temp probe

see FOM section for fuel requirement

A single pump supplies sufficient fuel to operate one engine at takeoff thrust conditions or two engines at cruise thrust.

Each override/jettison pump supplies sufficient fuel to operate two engines during takeoff and cruise conditions.

one CWT pump does not override 2 and 3 override/jettison pumps or the outboard main pumps.

Generally descend for **fuel temp**, more effective than increasing speed, above tropopause temp increases with climb (approx FL360 at poles)

2/3 ovrp/jett switches arm tanks and system logic controls

Surge tanks drain back into 2/3

refueling at 7500 liters/minute

fuel quantities on lower EICAS become amber if low, unbalanced or suction feed

crossfeed manifold cannot be used to transfer between mains hyd return lines heat fuel tanks

Prefuel selected on wing panel shows on fuel EICAS page

2 FSMC Fuel System Management Cards

FQIS fuel quantity indicating system

Warning ! Do not cycle CWT and HST pump switches from ON to OFF to ON with any continuous low pressure indication

present.

Warning ! Do not reset a tripped fuel pump circuit breaker.

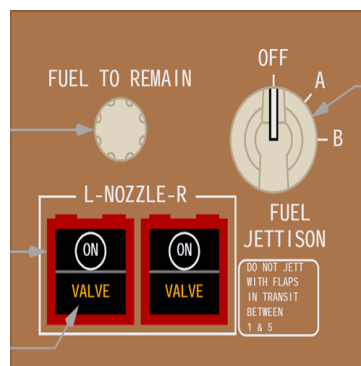
Balancing or engine out fuel issues

1&4 have 1 transfer valve with standpipe

only 2 & 3 OVRD pumps have standpipe

OVRD pumps go directly into x-feed manifold, so you have to have a x-feed open to burn from them

except for 1 to 2 and 4 to 3 with transfer valves, and reserve tanks to their respective main tanks – you can only transfer fuel from tanks to engines, not other tanks, you have to use either OVRD pressure or turn off main pumps (low tank) to burn off fuel from higher tank using x-feeds



Fuel Jettison

–a and b don't automatically change with failure

Fuel Jettison Selector

–arms jettison system

–displays preselected fuel to remain on EICAS

–MLW -

–arms jettison system

–displays fuel on EICAS for maximum landing weight plus

1,000 kgs - N429MC

3,000 kgs - -8 & N-SG

set fuel to remain

Fuel Jettison NOZZLE Valve Switches ON -

–jettison nozzle valve selected open

–when jettison system armed, activates override/jettison pumps in tanks containing fuel (pump switches must be ON)

Begins updating the estimate based on actual fuel quantity rate of change **90 seconds** after jettison begins.

The jettison control system controls fuel **balancing** between main tanks **2 and 3** as fuel is jettisoned.

-8 21,600 kgs in 2 or 3 → 1&4 transfer valves

18,140 in 2 or 3 → reserve transfer valves open

9,072 in 2 or 3 → 1 & 4 transfer valves open

-8 6,100 in 1 or 4 → reserve transfer valves open

Jettison terminates when total fuel quantity decreases to the fuel to remain quantity. The fuel to remain quantity indication changes color from magenta to **white** and flashes for **5 seconds**. The jettison control system deactivates all operating override/jettison pumps. The related **FUEL OVRD** pump EICAS messages display until the Fuel Jettison selector is OFF.

-8 **Nitrogen Generation System (NGS)** The NGS converts bleed air to nitrogen-enriched air to reduce flammability of center wing tank fuel during all phases of flight and for a brief period after landing. shut down for
–engine out operation.

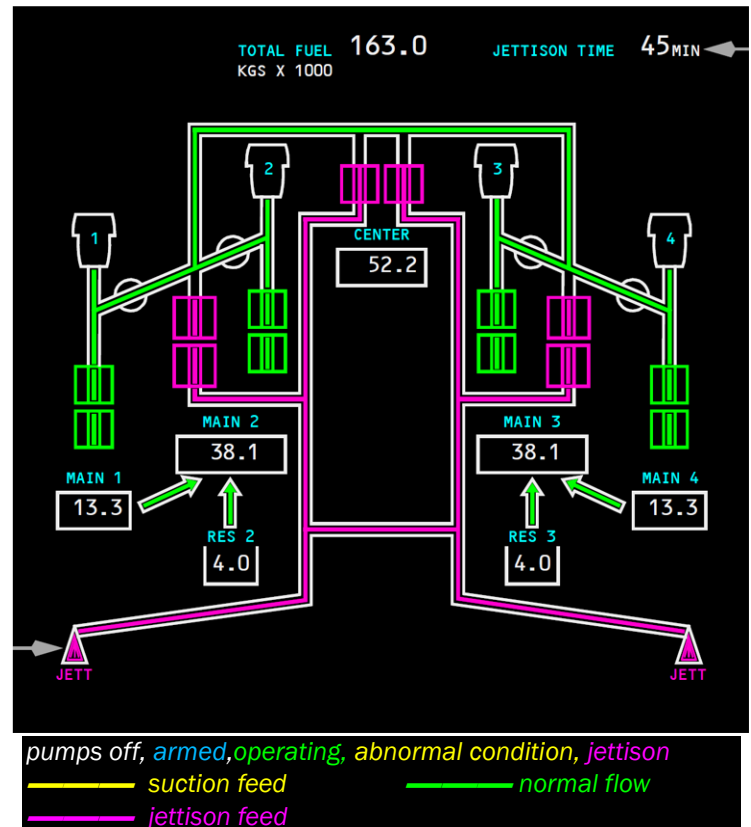
Normal Fuel Sequence		
Start		All mains ON Xfeed 1&4 OPEN X feed 2&3 auto open
	See NP.20.4 FUEL TANK/ENG	OVRD 2&3 OFF then Xfeed 1&4 OFF 1-1,2-2,3-3,4-4
	CWT ≥ 7,700 including -8 now	CTR pumps ON OVRD 2&3 auto OFF CW to all
	CWT < 7,700	CTR pumps OFF Ovr2-1&2, Ovr3-3&4
Takeoff	Flaps to 10 or 20	X feeds 2&3 auto close CW - 1&4, 2-2, 3-3 Ovr2-1,2-2,3-3, Ovr3-4
Climb	Flaps out of takeoff	X feeds 2&3 auto open CW to all Ovr2-1&2, Ovr3-3&4
	CWT < 3,200 (pitch > 5°) FUEL LOW CTR	CTR pumps OFF OVRD 2&3 auto ON Ovr2-1&2, Ovr3-3&4
Pass	CWT ≤ 36,500 kgs & flaps out of 10/20	stabilizer fuel transfer enabled
	FUEL PMP STB L or R ≥ 500	Stabilizer Tank L&R Pump switches ON
	FUEL LO STAB L or R ≤ 900	Stabilizer Tank L&R Pump switches OFF*
Cruise	CWT ≥ 1,800 (pitch < 5°) FUEL OVRD CTR	CTR pumps ON CW to all
	CWT < 1,300 FUEL LOW CTR	CTR pumps OFF OVRD 2&3 auto ON Ovr2-1&2, Ovr3-3&4
	2 or 3 approx 27,200	CWT auto scavenge
	2 or 3 = 18,140	2&3 reserve tank auto open
	400 2 ≤ 1 or 3 ≤ 4 -8 2 ≤ 1 + res1 or 3 ≤ 4 + res4 or 2 or 3 < ~20.7 & xfeed 1 or 4 open FUEL TANK/ENG	OVRD 2&3 OFF then Xfeed 1&4 OFF 1-1,2-2,3-3,4-4
	900 kgs in any main	FUEL QUAN LOW

*NP40.2 after 5 minutes may turn on to empty tanks

- Equipment Cooling selector is in OVRD
- right bleed air duct is isolated
- Cargo Fire Arm switch is ARMED.

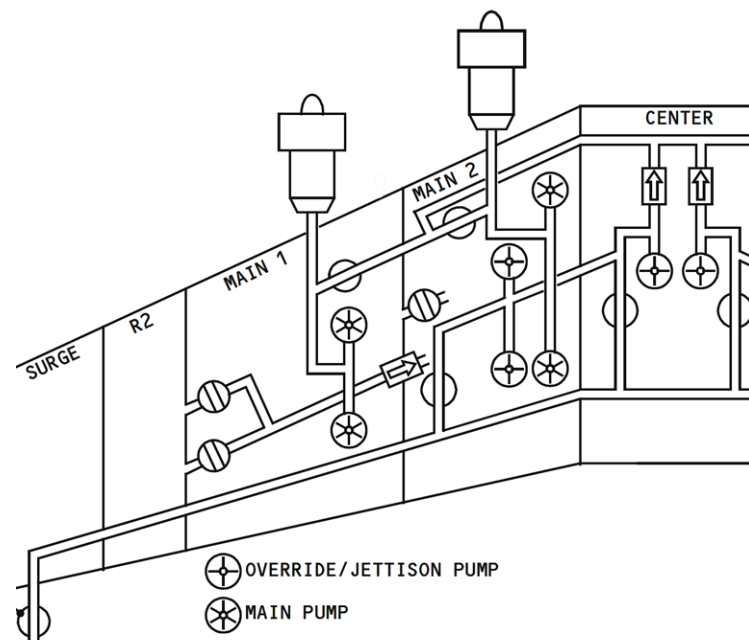
Lower Fuel EICAS

valves are amber in transit or if valve disagrees with commanded position

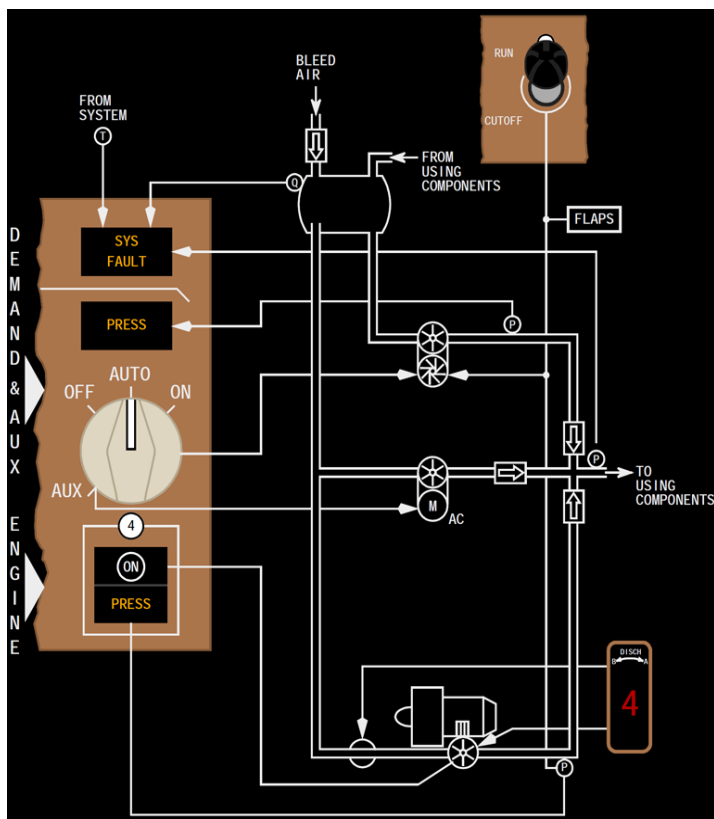


FUEL DISAGREE scratchpad

ROG 2 if a difference of 4,080



Fuel Tank Capacities		
7 Tanks	Tank	Total
1&4	13.3	26.6
2&3	38.1	76.3
Reserves	4.0	8.0
Center wing	52.2	52.2
Stabilizer*	10*	
Freighter Total		163,042
*Passenger Total		173072



13 Hydraulics

312 LCR for hydraulics and autopilots (also electric)
 System 4 has electric aux pump(grnd hand bus)with aux will have demand press light, System 1 on Passenger and **-8** has elec aux pump

Systems **1 and 4** have air driven demand pumps
 Systems **2 and 3** have electric motor driven demand pumps.
 N445&6 and 480 have all pneumatic demand pumps
 The letters **RF** display next to the reservoir quantity indication when refill is required. **RF** is inhibited in flight. The letters **LO** replace **RF** when a system low quantity exists.

hydraulic fluid Shutoff Valve closes with fire switch(not EDP switch)

Hydraulic DEMAND Pump Selector

AUTO -

- demand pump operates when related engine pump output pressure is low or
- related fuel control switch is in CUTOFF
- 400** demand pumps 1 & 4 also operate when flaps are in transit (ground), or flaps out of up in flight
- 8** demand pump 1& 4 also operates when TE flaps are in transit, or in flight when flaps are > 1
- 8** in flight, demand pumps 2 & 3 also operate when flaps are extended past 20

-8 RAT ram air turbine,

- automatically deployed with loss of 3 engines, manually by pushing switch
- when deployed left inboard and outboard elevators transferred to sys 3

-PRESS SYS 3 primary flight control, >~1500psi,

-UNLKD not in stowed position

Auxiliary (AUX) -

- auxiliary pump operates on ground until related engine pump pressurizes
- related demand pump off

Hydraulic System (SYS) Light (two lows and a high)

- low system pressure
- low reservoir quantity
- high fluid temperature

Demand Pump Low PRESS Light

- demand pump selector positioned to OFF or AUX
- demand pump operates and output pressure is low

ENGINE Hydraulic Pump Low PRESS Light

Illuminated (amber) - low engine hydraulic pump pressure.

HYD PRESS SYS 1, 2, 3, 4 Caution Beeper

Loss of hydraulic system pressure.

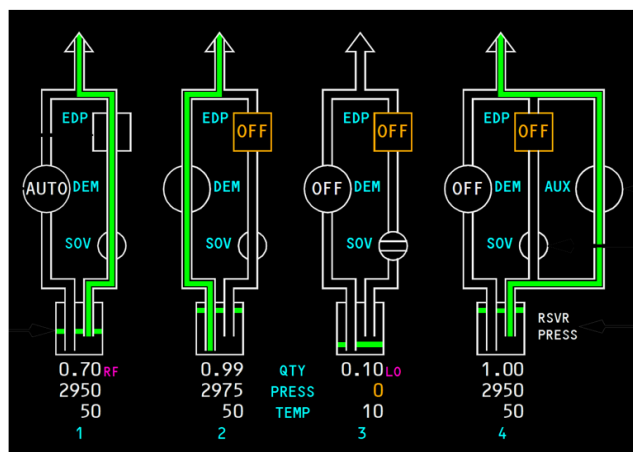
A single Hydraulic Quantity Interface Module (HYQUIM) processes quantity inputs from each reservoir transmitter. Should the HYQUIM fail because of an overvoltage condition, the following false indications may be experienced for all four hydraulic systems:

- hydraulic SYS FAULT lights flashing on and off
- >HYD QTY LOW X advisory messages appearing and disappearing
- EICAS hydraulic quantity indications decreasing and increasing

power flow (green lines) are generated by logic, may not display actual power flow or sys operation

line on reservoir indicates quantity

low reservoir bleed air pres. doesn't illuminate sys fault light



Hydraulic Systems			
I (inboard)	2	3	4(outboard)
C autopilot	R autopilot	L autopilot	
Nose gear			
Body gear			Wing gear
ALT brakes	ALT brakes (backup)		Primary brakes (autobrakes)
Inboard TE flaps			Outboard TE flaps
L outboard aileron		R outboard aileron	
L inboard aileron	R inboard aileron	L inboard aileron	R inboard aileron
	Spoilers	Spoilers	spoilers
L inboard elevator*		R inboard elevator	
L outboard elevator*			R outboard elevator
	Elevator feel		
	Stabilizer trim		
Upper rudder	Lower rudder	Upper rudder	Lower rudder
	lower yaw damper	upper yaw damper	
<div>Non logical side</div> <div>* -8 when ram deployed, powered by system 3</div>			

14 Landing Gear

Tiller turns nose wheels up to 70 degrees in either direction overrides rudder pedal steering

Rudder/Brake Pedals turns nose wheel up to 7 degrees in either direction, does not activate body gear steering
nose gear retracts forward

normal metering valve is controlled by brake pedals

shuttle valve allows either brake pedals or autobrakes to apply?

Gear Position Indication

DOWN (green) – all landing gear down and locked.
 crosshatched – one or more landing gear in transit.
UP (white) – all landing gear up and locked (blanks after 10 seconds).

Empty box (white) – all landing gear position indicators inoperative.

X (amber) – landing gear position indicators inoperative.

Nose gear extension sensing provides a signal to relays controlling functions in the stall warning and nose gear steering systems.

In flight, the **lever lock** is released when the main gear are tilted and the body gear is centered.

Brakes are applied automatically during retraction

Landing Gear Alternate Extension

Alternate gear extension is activated by pushing the Alternate Gear Extend switches. The gear uplocks and gear door latches are electrically released, allowing the gear to free fall. Gravity and airloads extend the gear and springs pull the downlocks into the locked position. Alt hyd actuated gear doors remain open after alternate extension.

The EICAS landing gear position indication displays the expanded gear position indication when the alternate extension system is used

Body gear steering -

- nose wheel steering angle exceeds 20 degrees.
- Deactivated – increasing thru 20 knots
- activated – decreasing thru 15 knots

Brakes

brake temp range 0-9

amber at 5 -> **BRAKE TEMP**

hot brakes see FOM section

Autobrakes/RTO with all 4 idle (memory aide)

When the parking brake is set, the first hydraulic system pressurized may supply a small amount of fluid to the brake lines. When brakes are released, that small amount of fluid returns to system 4. Pressurizing system 4 before pressurizing the other systems precludes the transfer of hydraulic fluid from system 1 or 2 into system 4.

BRAKE SOURCE Light Illuminated (amber) – active brake hydraulic sources (4, 1, and 2) have low pressure.

Pressure-operated selector valves provide automatic brake source selection.

Antiskid

each wheel with normal brakes

lateral wheel pairs with alt. Brakes

Touchdown and hydroplaning protection is provided using airplane inertial ground speed. Locked wheel protection is provided using a comparison with other wheel speeds.

Brake Torque Limiter A brake torque sensor is provided at each wheel. The sensors detect excessive torque during braking to prevent damage to landing gear. When excessive torque is detected, a signal is sent to the antiskid valve to release brake pressure to that wheel. If the alternate brake system is used, brake torque is sensed on an individual wheel basis, however the signal is sent to the alternate antiskid valve and brake pressure is released on a laterally paired wheel basis.

RTO autobrake setting commands maximum braking pressure (equal to full manual braking) if:

- the airplane is on the ground
- groundspeed is above 85 knots, and
- all thrust levers are closed

snaps to off after takeoff

autobrakes inop with alt brakes

autobrakes selector

OFF - deactivates and resets system.

DISARM -

- disengages autobrake
- releases brake pressure
- 1, 2, 3, 4, MAX AUTO -(max less than full manual application on dry runways)

- increasing autobrake deceleration rates
- brakes apply at touchdown

After landing, **autobrake application** begins when:

- all thrust levers are closed,
- ground mode is sensed, and
- the wheels have spun up

Autobrake – Disarm The system disarms immediately if any of autobrakes disarm :

- pedal braking applied
- any Thrust lever advanced after landing
- Speedbrake lever moved to DOWN detent after speedbrakes have deployed on the ground
- DISARM or OFF position selected on Autobrakes selector
- autobrake fault
- normal antiskid system fault
- loss of normal brake hydraulic pressure

spoilers and TR's modify the braking
autobrakes continue until disarmed or full stop

AUTOBRAKES Advisory

- autobrakes disarmed or inop
- selector is off but sys is armed
- RTO above 85kts but no brakes applied
- may indicate loss of hyd sys 4, manual braking required

BRAKE TEMP Advisory

- Temperature of one or more brakes excessive.
- (see FOM notes) (5 or higher)
- in flight, extend gear for 8 minutes IAW QRH

GEAR DISAGREE Caution

- Gear position disagrees with Landing Gear lever position after normal transit time.

GEAR DOOR Advisory

- One or more gear doors not closed after normal gear transit time.
- Inhibited if alternate gear extension selected.
- Look at gear synoptic to see which door is open

ANTISKID OFF

parking brake lever released and parking brake valve not fully open

or brake sys control unit power loss

or antiskid power off on all wheels

BRAKE LIMITER

brake torque limiter failure on more than one wheel per truck

or parking brake lever released and valve not fully open

or brake unit control sys power loss

ANTISKID

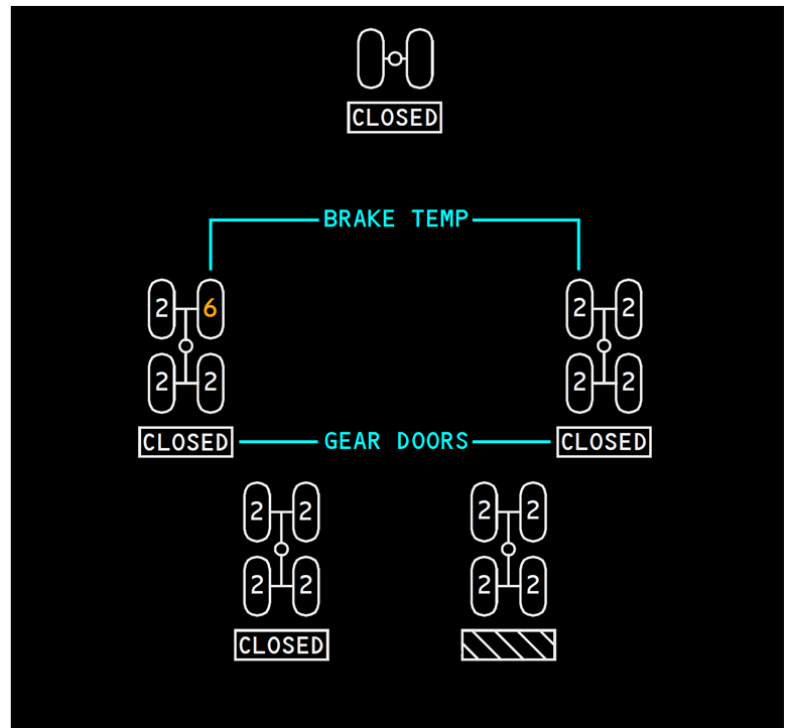
fault in antiskid system, may result in loss of antiskid to one or more wheels

15 Warning Systems

WARNING MESSAGES (cannot be canceled)

CAUTION MESSAGES

>CAUTION MESSAGES



ADVISORY MESSAGES >ADVISORY MESSAGES

11 lines

MEMO MESSAGES (bottom up)

RECALL STATUS or VVVVV PG1
(secondary engine cue)

status cue inhibited from after eng. Start to 30 min after liftoff
ENGINE INDICATION AND CREW ALERTING SYSTEM (EICAS)





- EICAS alert messages are the primary method to alert the crew to non-normal conditions
- EICAS memo messages are crew reminders of certain flight crew selected normal conditions
- EICAS status messages indicate equipment faults requiring MEL reference for dispatch

caret symbol (>) prefaces an alert message that has no procedural steps.


-8 Medium level comm. Messages have high/low chime

-8 low level messages are indented one space w/no chime
Compact mode, ENG/FUEL/GEAR (Seattle to MIA)

Traffic Display Indicates relative position of traffic.

-  Resolution Advisory RA aural (20-30 sec)
-  Traffic Advisory TA aural (25-45 sec according to alt.)
-  proximate traffic (6 miles / 1200')
-  other traffic

number is relative altitude of traffic in hundreds of feet

 vertical motion arrow indicates traffic climbing or" descending at 500 feet per minute or greater

To ensure vertical separation, the center of the airplane symbol must be outside the red outlined RA pitch regions to avoid traffic.

TCAS messages and symbols cannot be displayed on ND in PLN, APP centered, or VOR centered

TFC, TA Only and TEST can be displayed in all modes

will get **TRAFFIC** or **TRAFFIC** even if not in TFC mode

"now" for corrective modified action--> they changed vert. Spd

"monitor vertical speed" = don't climb/descend
normal reaction within 5 seconds
"increase" and "now" within 2.5 seconds

Terrain Display

dotted green – terrain from 2,000 feet below to 500 feet (250 feet with gear down) below airplane altitude
dotted amber – terrain 500 feet (250 feet with gear down) below to 2,000 feet above airplane altitude
dotted red – terrain more than 2,000 feet above airplane altitude
dotted magenta – no terrain data available

message	Alert inhibited	From	to
New caution	MC lights beeper	80 knots	400' or 20 sec from V _R
PWS cautions	Messages		400' RA
PWS warning	Messages	100 knots	50' RA
New warning FIRE	MW lights bell	V ₁	400' or 25 sec from V ₁
New warning except CONFIG GEAR FIRE	MW lights siren		
New warning CONFIG GEAR		Liftoff	800' or 140 sec after nose gear lift off
FUEL TANK/ENG	Message		Ten minutes after lift off
PWS alerts	Messages	1200' RA	Approach
Various other less important ones VII 15.20.29			

solid amber – look-ahead terrain caution is occurring

solid red – look-ahead terrain warning is occurring

Displayed automatically when:

- a look-ahead terrain alert occurs, and
- TERR not selected on either ND, and
- respective ND is in MAP, MAP CTR, VOR, or APP mode

look ahead terrain warnings and predictive windshear will pop up if respective TERR or WX is not selected on either ND will get display on respective side when displayed and also red warning on other ND

terrain >2000' beneath a/c or w/in 400' of airport not displayed

Takeoff Configuration Warnings

CONFIG FLAPS/GEAR CTR/PARK BRK/SPILERS/STAB master warn & siren

airplane is on the ground, and FUEL CONTROL switches are in RUN position, and engine two or three thrust is in takeoff range, and airspeed is less than V₁, and any of the following configurations exist;

- flaps not in a takeoff position, or
- body gear not **centered**, or
- parking brake set, or
- Speedbrake** lever not in DN detent (spoilers), or
- stabilizer **trim** not in takeoff range

Takeoff configuration warnings are inhibited at V₁.

Siren and MC off after throttles reduced, EICAS for 10 sec

Landing configuration warning

CONFIG GEAR master warn (siren)

the airplane is in flight, and any landing gear is not down and locked, and any of the following configurations exist;

- any Thrust lever is closed and radio altitude <800 ft., or
- flaps in a landing position (flaps 25 or more)(cannot be silenced)

GPWS alerts are provided for the following:

- altitude loss after takeoff or go-around
- excessive and severe descent rate
- excessive terrain closing rate
- unsafe terrain clearance when not in the landing configuration
- excessive deviation below an ILS glide slope
- windshear

GPWS terrain warnings do not account for man made obstr.

"Terrain, **Terrain**, PULL UP" 20 to 30 seconds from impact

"Caution **Terrain**" 40 to 60 seconds from impact

"TOO Low Terrain" descent below unsafe altitude while too far from airport in terrain database

pws is enabled 12 seconds after turning on radar

PWS alert area is 25 deg either side and from .5 to 3nm

(warning area(on centerline) in flight only goes out to 1.5NM)

Only 400 panels with CAL selection have PWS

WINDSHEAR AHEAD, WINDSHEAR AHEAD WS predicted close to and directly ahead during takeoff below 1,200' RA

GO AROUND, **WINDSHEAR** AHEAD WS predicted w/in 1.5 miles and directly ahead during approach below 1,200' RA

MONITOR RADAR DISPLAY **WINDSHEAR**(amber or red)

predicted w/in 3 miles and ahead of a/c during takeoff and approach below 1,200' RA

must push TOGA to get PWS FD commands (normal go around pitch mode)... 15 deg nose up or pitch limit till climb rate 600 to 1200 fpm (0 to 600 eng. out) then transitions to airspeed control

voice alert BANK ANGLE 35°, 40°, and 45°.

2500, 1000, 500, 50, 40, 30, 20, 10, feet RA annunciations

100 feet above minimums – PLUS HUNDREDt

At minimums – MINIMUMS

pushing G/S Inhibit switch with inhibit aural "glideslope" if below 1000' RA

EICAS EVENT RCD 5 events, also automatic when paramater exceeded

Altitude alert EICAS is inhibited when departing selected altitude when glide slope is captured or landing flaps and gear down

Horns sound in the crew rest, supernumerary areas, and the main deck, and the main deck ceiling lights flash when:

- cabin altitude reaches 10,000 ft
- smoke is detected in the main deck
- supernumerary oxygen switch is selected on

Pilot Response inhibited

- below 20,000'
- during climb
- flaps not up

Flows

Procedures accomplished in flight, or those that are an alternate means of accomplishing normal procedures (such as manual engine start), are usually accomplished from memory. Infrequently used procedures, not normally accomplished (such as DEICING) are usually accomplished by reference.

Exterior Safety Inspection

Check:

- Chocks in place. (2 on each wing gear)
- Landing gear door position.
- Flight control surfaces clear.
- APU exhaust area clear (unless APU running).

A minimum of 1/2 of each stripe must align. A stripe is on the inboard and outboard side of each strut. n/a -8

Verify gear pins removed

Aircraft Log inspection procedure – captain

Preliminary Flight Deck Procedure

Electrical Power up SP.6.1

freighter-need apu 2 or ext pwr 2 **AVAIL** to pwr main deck cargo handling, LCF needs it for lights
passenger-needs ext./apu pwr on both sides to power galleys, etc.

Power's already on...

Preliminary flight deck procedures

IRS, off then nav

EICAS, cancel, ENG check oil, STATUS check status messages

Verify that only expected alert and memo messages are shown, o2 pressure, Hyd quantity, Engine oil quantity, -8 verify UTC time and date are correct, map database is current

No status messages are allowed, unless dispatched in accordance with the DDG or an Engineering Order (EO).

Windows

Portable EFB verify battery charging?

use "new flight" function on EFB in order to clear chart sets instead of just changing airports

C/B's

SMOKE EVACUATION handle

Overhead maintenance pane.....Guards closed

APU START SOURCE switch..... APU BATTERY

-8 CONDITIONED AIR FLOW RATE low 4 or high 10

LLCCAFR as required

Towing power switch.OFF

FLT DECK WIFI Switch.....On

Cockpit Voice Recorder Test (several planes have a switch that must be moved to on instead of auto to test)

Flight Deck Emergency Equipment (check date on PBE)

Set the parking brake to check the brake wear indicators during the exterior inspection.

1 turn per second when adjusting rudder with no force on pedals

Test Passenger Door

Don't have to check hatch except on passenger and 429 (but you're an idiot if you don't secure it on every plane)

CDU Preflight Procedure

if no VHF ACARS or pacs/BCF, you'll have to wait for IRS for SATCOM

either may enter data into FMC's, both must independently verify

FMC Initial Data

-ident, verify model, engines, date range, drag/fuel flow (sp.11.13.... INIT REF/INDEX/IDENT.... ARM into 5R, update drag/FF)

-POS INIT verify time, enter present position

Navigation Data (before checking PFD's and ND's)

-5-digit CO ROUTE/UPLINK code from the OFP into the CO ROUTE field of the RTE 1 page (ignore msg) send

-activate & execute

-don't enter CRZ CG

-enter callsign exactly from OFP, ie don't use 5Y or PO (standards email)(should be auto entered with route)

-DEPARR execute (from LEGs page)

-PROG compare DEST DTG w/ OFP, pg 2/2 select TOTALIZER

-RTE verification

-both pilots verify w/ OFP/ATC clearance

-LEGS page to verify SID/DP speed, altitude constraints

-FIX or NAV RAD for engine out

-NAV/RAD verify radios for dep

-LEGS load winds (default is 240/300/340/390, dispatcher can push winds also)

-RTE copy

Initial Performance data

PERF INIT reserves, cost, cruise, step 2000 or "R" or 0 if entering manual steps

Initialize ACARS

ORIG, DEST and FLT NUM will copy to FMS & ACARS from uplink... If the flight number includes an alpha character (e.g., 123A), leave the FLT NUM in small font (the alpha character will not show). This forces the flight number on the RTE page be included in AeroData

New entry for SOB, check captain(enter only if PIC), extra fuel cause

FDP requests .

On some a/c must biggie size **FLT DATE** (scheduled date next to callsign on top left of flight plan)

The pilot is not required to make small font (FMC computed data) large when directed to verify or modify in accordance with FCOM procedures. CAM slides 2017

New procedure to prepare FDP early using ACARS Loadsheet, not required for flight but paper copy is required and controlling, Capt and FO will **verbally** compare paper LS to ACARS LS/FDP/FMC performance numbers

After receiving loadsheet send for FDP

When FDP takeoff data is received, both pilots review/verify the following:

-WIND, OAT, QNH

-CG, GRWT, FUEL, ZFW (enter ZFW minus ballast)

-REMARKS / CAUTIONS

-Runway / intersection

-MTOW

-Thrust (THR, ATM, and Pack configuration)

-Engine Failure Procedure

If using TLR see SP.20.40 must have

-QNH ≥ PQNH -- .15" (5hPa)

-OAT ≤ MT and > POAT - 10 C

-TOW < MFPTW and PTOW+(value)

-ZFW > OFP ZFW + 10,000 kg (22,000lb)

-Applicable DDG must be shown in RMKS section

Final Performance Data...PF set

PERF INIT Pg. PF enter ZFW (enter ZFW minus ballast) and

check for reasonableness and limits.

THRUST LIM Pg

Select TO/TO 1/TO 2 and enter assumed temp, FMC w/in 1% N1 or .02 EPR of FDP/TLR, (4% or .08 EPR at 10 °C below POAT on TLR)

large differences may be because of displayed TAT (TAT is inaccurate without bleed air...LCF)

TAKEOFF REF Pg

–NG FMC Pg1 enter Flaps/CG/V speeds no other fields, don't enter TOGW, Pg 2 E/O/Accel HT/Thr red, no other fields

–NG FMC quiet climb not yet available

–Trim → Compare FMS to FDP or table in QRM, normally +/- 1.0 units, if needed delete takeoff CG and reenter

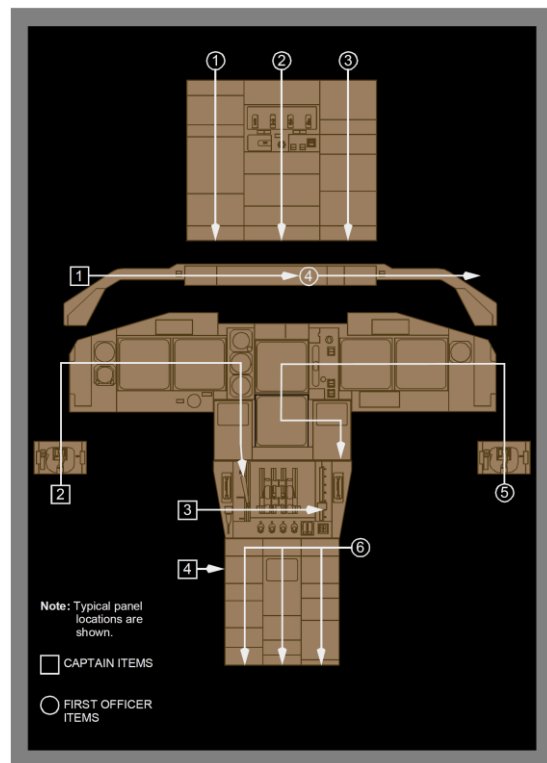
–Verify that the stabilizer trim is in the greenband.

–Use max CLB for dusty conditions.

MCP (PF) set V2, LNAV(if applicable)/VNAV (and verify FMA)(don't select VNAV for QFE), set runway heading or may be preselected for turn

Xcheck fuel at fix will tell you if you've missed winds, wrong ZFW, bad route etc.... also, just good to know.

Preflight and Postflight Scan Flow



Flight deck procedure, Capt FMC initial data finished

Preflight

capt flow is now across mcp, o2 PFD, ND, backups, CDU, across to flaps, VHF L

Target Oxygen Pressures (psi)(Land/Ocean)

–Crew System 950/1,200 Pass System 1,200/1,200

after preflight MCP set up by PF

parking brake set, check memo displayed, accumulator pressure may be insufficient to prevent movement.

Autothrottles (CA) ARM during preflight

set v2 from from TLR or Vref 30 from FMC approach page →

update and check vs. FDP when available

Oxygen preflight mask

–left red down – 100%

–press to test ==> yellow balloon

–and push emer button on bottom, hear mie

–10 seconds (one station only) STATUS pg. no more than 100psi drop

Clock, Verify UTC date and time are correct

Initial data/navigation data (route) entered and IRS's aligned Flight Instruments

–verify flight instruments are correct

–only flags shown are TCAS OFF, NO VSPD (until selected)

–blank/TOGA/TOGA & FD

–display map mode

RVSM Altimeters (limitations)		
Field elevation	Capt & FO	Capt. Or FO & field
SL to 5,000'	35'	75'
9,500'	40'	75'

flight deck procedures, FO

FO flow is now overhead, F/D to right on mcp, o2, PFD/ND, gear, eicas, pedestal

400 AUTO IGNITION selector - SINGLE; P&W - 1 or 2

fuel xfeeds on, pumps off, check lights (override 2/3, center, main 2/3 aft (400C aft 2 ony), 400P stabilizer pumps PRESS.... lights extinguished

Gasper ON, Humidifier On

–8 inbd panel to MFD

–8 ECL reset all (not required to check date)

–8 check radar is in auto/gain 12o'clock [tfr will select other radar switch settings(twice the sweep rate when both in same range), gc will deactivate ground clutter when pushed and held, L is up]

Oxygen preflight mask, Flight Instruments...see Capt. above should have lights in switches on elec. panel below the busses, 6 fuels(switches off), 4 bleeds(switches on & off lighted)

Seatbelt selector[F] on after fueling complete

security inspection procedure FO

upper deck/cockpit procedure FO

main deck procedure FO

final upper deck procedure FO supernumerary briefing

(supernumerary or cockpit jumpseat briefing card and life vest video on comply365, understanding of o2/interphone/sterile cockpit), secure galley, smoke barrier door closed and locked. If needed arm doors

Fuel Verification Procedure - Captain or First Officer

Calculate new Min Fuel and Block fuel if ZFW is > planned Verify total fuel (> block) and proper distribution

Retain receipts

~~liters or gal. from fuel receipts to KG's + prefuel = final fuel~~
uplift (fuel added) in gallons goes into logbook (with density) and ACARS on preflight page

Capt docs (when available/ready)

–all operating crew signify fit for duty by signing next to their name on master and station OFF

–check tail vs OFF and circle (FOM)

–verify identity & initial to left of names on master OFF for observers /jumpseaters

–confirm oceanic track agrees with ATC, OFF, track messages

–wx at all airports

–requested fuel >= block

–logbook (as soon as possible) see FOM notes

Final Documents procedures FO

Departure Clearance SP 5.19 get clearance by CPDLC:DLC (US only) → ACARS:PDC (if GTI or PAC callsign) → voice PDC (ACARS)

- D-PDC N. America, Airinc relays
- DCL (elsewhere) direct to tower
- w/in 25 minutes of filed departure time
- type B744 or B748, next page 'Atlas Air colors' if necessary
- ATC CLEARANCE: indicates a change to filed flight plan or departure routing.
- REVIEW ATC INSTRUCTIONS: indicates the cleared routing is the same as the filed flight plan routing unless amended in the ATC INSTRUCTIONS
- END OF CLEARANCE must be included.
- Monitor NEXT FREQ (except AUH where it is departure freq.???)

CPDLC/DCL in US

- login to KUSA,
- if fails, check data, try once more
- don't use free text,
- won't get ATC COMM ESTABLISHED or clearance until w/in 30 min filed ETD
- may get revisions up until Takeoff
 - "then as filed" no changes
 - "cleared to xxxx via route clearance" is partial reroute
 - "cleared route clearance" is full reroute
- LOAD prompt indicates a revised route
 - reinsert RWY/SID/Trans, check for disco's
 - review RTE/LEGS
 - resend for winds

Final flight deck procedure

- Fuel verification and final documents procedures
- CDU preflight procedure complete
- PF – MCP set, brief a/c status, differences...now in comply, fuel plan, wx, rwy cond, terrain/obstacles, NOTAMS, taxi plan/hot spots, RTO "We will reject prior to V1 for a Master Caution, Master Warning, engine failure, or the aircraft is unsafe or unable to fly.", EFP, Return, t/o alt, highest threat/mitigation, brief from glass/MCP
- RTE RUNWAY xx, FLT NO GTI xx
- NEXT PAGE VIA sid.trans, TO xxxxx
- LEGS (PM ref Jepps SID) brief sid and constraints,
- VNAV CRZ ALT FL xx, xxx/10000, SPD TRANS first constraint, TRANS ALT xxx
- INIT REF (PM ref FDP/TLR) N1 xx.x%, FLAP xx, CG RWY/intersection, GR WT xxx.x V1, Vr, V2,
- NEXT PAGE E/O ACCEL HT, CLB x, NADP x
- MCP V2, LNAV, VNAV (as appropriate), HDG, ALT
- finally standardized SP.11.7

====>preflight checklist

APU RUNNING
PACKS 2+3 OFF
AUTOBRAKES RTO
PARKING BRAKE SET
PASS SIGNS ON

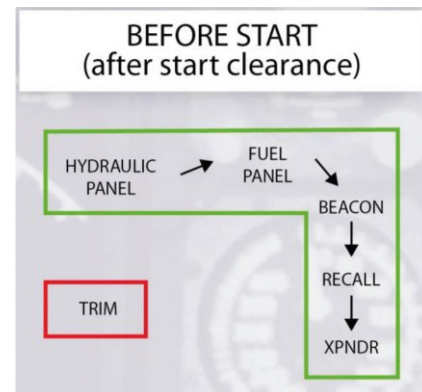
If ATC or maintenance issues occur which will delay pushback, notify FAs & guests. If refueling while guest are onboard, the purser MUST be notified immediately.

Purser will call for

- permission to close door (check pax count vs. wt. And bal.)
- "cabin secure"** for push (verbally on interphone)(doors go to A, takes 5-7 mins)

Guest Announcement (after most or all guests are boarded):

- "This is CA/FO _____ Welcome aboard Atlas Air flight _____ to _____, enroute time _____, arrive local _____ cruising level _____ enroute wx _____ when safe, we'll switch off seatbelt sign, however always keep it fastened when seated – enjoy your flight"



Before start procedure

relief pilots in seat from prior to before start to TOC except for required observations/DDG restrictions.

flight deck door closed [F]

verify cabin secure [C]

EICAS

- DOORs closed(synoptic & EICAS msg's, armed(if req'd),
- FUEL

C "Requesting clearance to pressurize hydraulics"

Apparently, they now want us to get permission for push/start before checklist due to trouble with beacon on before push clearance... use judgement

APU 1 & 2 generators ON (allow several seconds and check for nuisance EICAS or FMC messages)

remove ext power (8 ensure before hyd aux 1 & 4 are pressurized)

aux, sys out, press illuminated, source out, green band

1-3 auto, sys and press out

fuel pumps on, center tanks on with >=7,700kgs (17,000lbs)

check on EICAS, line of x-feeds (8 load sheds some pumps beacon both

FO packs max one pack on (1 Norm, 2 & 3 Off)

LCF P&W (8 all off

pass Use Pack 3 if needed and available; do not move Pack 3

Control selector to OFF unless Pack 1 and Pack 2 selectors are OFF.

C trim

FO trans verify TCAS OFF, If not in conflict with local procedures, select an active altitude reporting transponder setting, but not a TCAS mode

Recall [F], "4,3,2,1 Engine Shutdown", cancel and select ENG When procedure flows contain an EICAS recall, read aloud all EICAS messages and cancel once verified by the other crewmember.

NO TRIM AIR & PACK fault light → APU bleed is off

X-FEED CONFIG → #1&4 crossfeeds not on

====>call before start checklist

FUEL TANK/ENG

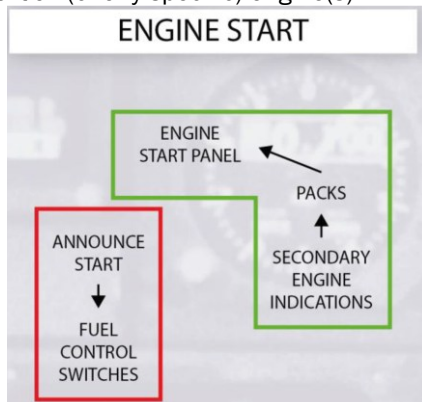
–verify OVD 2&3 OFF, X feed 1&4 off

C “Ready for pushback” G “Roger, release brakes” C “Brakes released”

if ACARS doesn't show block out time, check misc menu/sensors for open fuel door (won't show on EICAS)

if set fuel is shown on fuel EICAS, fuel door is still open

“Ready to start all (or any specific) engine(s)”



engine start is defined as moment you select start switch

Engine start procedures

Normal sequence is 4&1, then 2&3 (symmetric)

Verify N1 rotation and oil pressure indication by: [C,F]

–idle N2 62-67% (GE)

–40% N2 (PW)

LCF

–all packs off

–Ensure that the #1 and #4 ADPs are not in the AUTO or ON position during engine start.

–Plan on starting all engines in the blocks, (for pushback #1 ADP AUTO then off for start)

Preferred engine start sequence for safety considerations:

start 4 and 3; then remove air cart, then start 1 and 2

–N249BA, N780BA, oil quantity should decrease by >= 3 quarts after start

P&W

–all packs off

–start one at a time

-8

–FUEL PUMP 2(3) messages should clear after engine start...should cycle 2(3) FWD Override Pumps switches once to clear FUEL OVRD 2/3 FWD messages

Abort start checklist for:

–GE

–no N1 rotation by idle N2

–non normal oil pressure indication by idle N2

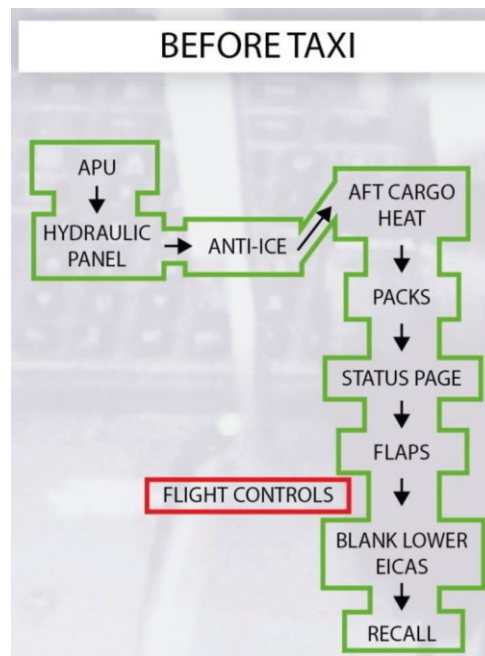
–**P&W**

–no oil pressure indicated by idle N2

–fuel control switch is in RUN, the engine RPM is low, and the Autostart switch is off

–oil pressure indication is not normal by the time the engine is stabilized at idle

–according to ground school slides – idle N2 not achieved w/in 2 minutes of fuel control switch to run



After start procedure

“Cleared to disconnect, standing by for hand signals”

all clear from ground, flash landing/turnoff (not taxi) once or thumbs up, flash 3 times to call them back

apu off

demands auto

anti ice auto/on (after all engines started)

-8 cycle fuel pump switches if required for FUEL OVRD 2 or 3 FWD or FUEL PRESS CTR L

status pg **-8** FLT CNTRL page (**-8** 8 up, 2 down)

Recall [F], “No Items” cancel (if not delayed starts)

CDU

–PF V-speeds selected and displayed on Takeoff Ref page

–PM Legs page 1/x displayed

FO aft cargo heat on

FO packs

PARKING BRAKES SET
AUTOBRAKES RTO
PASS SIGNS ON

-8 FO putt away ECL and bring up moving map

FO records Fuel on OFP

Ground equip.... clear L & R

The Captain will call “Flaps_____”.

On the Captain’s command, the First Officer will respond

“Flaps_____” and move the flap handle to the takeoff setting.

Captain control column and control wheel control check, may be accomplished while flaps in transit

After ground crew is clear captain holds tiller and checks rudders

FO blank status pg

====>Before Taxi checklist

Taxi Out Procedure

obtain clearance

release parking brakes(C/PF) *apparently removed steering check and flight instrument checks a few years back*

PACKS AUTOBRAKES RTO PASS SIGNS ON

Delayed engine start

- hydraulics normal, all buses powered, 2 gens or apu
- no 3 eng taxi on contaminated
- <330,000 start 3
- <300,000 start 2
- 30 psi (-1 per 1000)
- recommend 3 min at idle power before takeoff (5 for P&W)
- min oil temp. –bottom of temp scale (lower amber for P&W)
- recall [PM], cancel
- review before taxi checklist** PM reads & responds

taxi notes

flash 3 times to return ground crew
all ext lights on crossing any runway **now PM**
taxi lights off when stopped **now PM**
max recommended breakaway thrust is 45% N1
sandy/dusty 40% N1
normal taxi speed 20 knots, long and straight 30
dry, use 10 knots for angles > high speed turnoffs
reverse thrust on slippery...vspeeds are removed and full TO
thrust is selected
firm steady application of brakes
153' for 180
170' no body gear 180
Crews shall clear right and left prior to entering or crossing a
taxiway or runway.

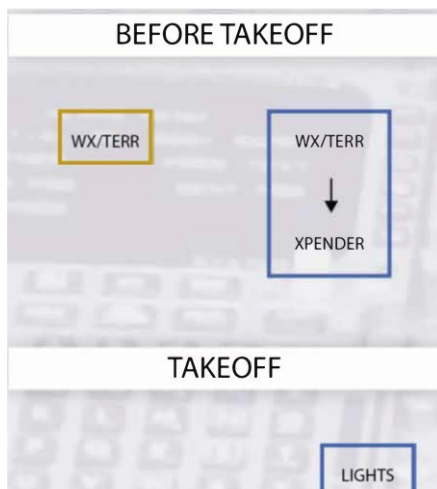
For all **return to block** situations, Dispatch must be notified
before subsequent block out and departure.

runway change....FMC/MCP briefing will be completed again
followed by the Runway Change checklist.

- During Taxi – use discretion and PM should program the
CDU silently so as not to create a distraction.
- The PF will verify the changes prior to takeoff and brief the
applicable changes using the FMC/MCP briefing procedure.
The PM will reference the SID and FDP/TLR.
- runway change checklist**

Prior to crossing a runway, or taxiing into position for takeoff,
the Pilot Flying will confirm with all other crewmembers that
clearance has in fact been received.

Before takeoff Procedure



notify cabin (2 min prior, should respond w/in 1 min)

"Cabin crew be seated for departure." will normally respond
with "**Cabin Ready**" text on interphone panel

PF updates changes to brief

Set WX and terrain display as needed

PM verify trim, if the stabilizer trim value on the TAKEOFF REF
page is blank or has changed, delete the takeoff CG value, then
re-enter the correct takeoff CG value.

Verify that the stabilizer trim is correct and is in the greenband.

====>Before Takeoff Checklist

8 PM announces "Checklist Complete" and PF visually
confirms checklist complete indication and announces
"Checklist complete"

Before entering runway, verify runway, runway entry point, and
first fix

Complete Before Takeoff procedures and checklist prior to
crossing the hold line.

8 one VSD on recommended

TA/RA (switch, both ND's, final clear)(PM)

exterior lights (PM)

On the runway, on map display verify a/c position symbol to
assigned & selected runway (10 miles or less, then as desired
to view first waypoint if able)

contaminated runways

–static takeoff, (set throttles to stabilized value, release
brakes, push TO/GA)

–fixed derate or rated thrust only

After the aircraft is aligned with the runway, verify airplane
heading agrees with assigned runway heading

Captain smoothly advance thrust levers to approximately 70%
N1, **8** 45% N1 or **P&W** 1.1 EPR and allow engines to stabilize.
(then release brakes for standing takeoff) Allowing the
engines to stabilize longer than approximately two seconds
before advancing to takeoff thrust may adversely affect
takeoff distance.

*Not allowing them to stabilize will cause asymmetric thrust and
reject Boeing wing tips WT747-1*

New Caution **8** ensure each engine stabilized to at least 45%
N1 (*don't use asymmetric thrust turning on runway*)

Push TO/GA switch to advance the thrust levers to takeoff
thrust, or manually advance the thrust levers to takeoff thrust.
Keep hand on the thrust levers until V1.

Light forward pressure is held on the control column. Keep the
airplane on centerline with rudder pedal steering and rudder.

The rudder becomes effective between 40 and 60 knots.

Above **80 knots**, relax the forward control column pressure to
the **neutral** position. (*yay... tired of people trashing the
nosewheel*)

Prior to 80 knots, the takeoff should be rejected for any of the
following:

- activation of the master caution system
- system failure
- unusual noise or vibration
- tire failure
- abnormally slow acceleration
- takeoff configuration warning
- fire or fire warning
- engine failure
- predictive windshear
- if the airplane is unsafe or unable to fly

Above 80 knots and prior to V1, the takeoff should be rejected

for any of the following:

- fire or fire warning
- engine failure
- predictive windshear warning
- if the airplane is unsafe or unable to fly

PM Call "80 knots, thrust set" "checked"

PM Call out "V1" at V1 speed, -8 if autocallout fails

PM Call "Rotate"

Verify a positive rate of climb on the altimeter. Call "Positive rate"

desired rotation pitch attitude @ 35' of 15 deg -8 11.5 deg
With the main gear on the runway, tail contact occurs at approximately 12.5 degrees.

400 Above 309,000 kgs, limit bank angle to 15° with flaps up until reaching UP + 20 knots.

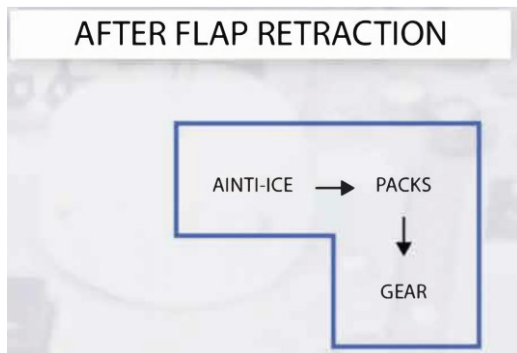
The maximum rate climb speed is max climb angle +25 knots

At or above 250 feet AGL:

Call "___ autopilot CMD."

A/P use required for RNAV departures.

Can go to HDG SEL before 400' if you need to (ie Skor3/JFK)
[standards ref. Pg 4\)](#)



After flap retraction is complete:

- AI to Auto if required
- verify packs operating
- 400 after gear retraction is complete: Position landing gear lever OFF.

PF call "After Takeoff Checklist"

====>After Takeoff Checklist

Comply with sterile cockpit procedures below 10,000 feet MSL.

"Transition altitude, set standard"

Above 10,000 feet MSL, and when work load permits:

- Cycle the SEATBELTS selector to AUTO (pause) then ON when it is safe for the cabin crew or supernumeraries to leave their seats.
- Delete any unnecessary manual tuning on the NAV RAD page, Make VHF and/or OFF report

-Above 18,000 feet MSL [now PM]:

- Exterior lights - set
- Turn LANDING, LOGO, and WING lights off.
- NO SMOKING selector - as desired
- SEATBELTS selector - AUTO (when conditions permit)

Minimum Use of Aircraft Lights	
Conditions	Light
Engines running or Pushback	Nav / Beacon

Ground movement during taxi	Taxi ^{1,2}
Crossing Runways	All ³
Cleared onto departure runway	All except Landing ³
Cleared for takeoff	All ³
Above 18,000 feet	Wing as needed
Below 18,000 feet	At least one set of Landing lights / Wing / Logo ³
Cleared to land	All ³
¹ off prior to facing or approaching a marshaller.	
² a landing light or runway turnoff lights if no taxi light	
³ Wing and Logo only at night	

Off report use ACARS Dispatch Report Free Text

OFF xx.x

SOB x

Cruise

Relief pilot is designated by captain on OFP to right of their name ie PIC/0730z-1000z, ACARS ENROUTE menu CREW CHANGE/DUTY CA empl. #, change time???

Check weather enroute, primary ACARS FOM 8.1.1

don't have to do times or fuel trend on flights ≤2 hours, still have to record hourly rvsm alt checks and check planned arrival fuel every hour

allowed to disable GPS at any time if needed, be sure to enable DME (off by default on -8) inhibiting doesn't inhibit GPWS look-ahead... use TERR OVRD if necessary with NG FMC BP4.1 will be able to request specific flight level winds, for now requests entered cruise alt plus step size value, before entering cruise it requests 240,300, 340, 390, valid update times at 0,6,12,18z... (available 1 hour prior)

RVSM at least once an hour and oceanic reporting points

crosscheck primary altimeters w/in 200', don't circle

- Two primary altimeters (no standby mode or using the alternate static source do not qualify).
- Autopilot altitude hold.
- Altitude alerting system (aural or visual).
- Transponder with Altitude Reporting.

At cruise write down time and 3 altimeters on flight plan

Limit overshoots to 150', limit rate to 1000 fpm when w/in 1000' and near other aircraft

CPDLC LOGON should be initiated as follows:

- prior to takeoff, w/in 45 min ETD for current FIR
- departing Alaska, after departure but before FL180 PAZA
- in flight, >10,000'
 - 15 min or more prior to boundary, select current ATSU
 - less than 15 min prior next boundary, select next ATSU
- When instructed by ATC for situations such as an unsuccessful data link transfer.

If more than 21nm off course and not in LNAV...will not seq. ensure HF data off when logging on to ATC w/CPDLC

Oceanic and Remote Continental Airspace

Prior to entry read theater guide

- update winds, if necessary,
- Log on to CPDLC,
- send RCL (NAT airspace except NY Oceanic E)

- Waypoint verification, independently verify expanded FMS lat/long vs OFP, also +/-2° and +/-2 NM, circle is checked, check mark is cross-checked
- Alt checks, at cruise write down time and 3 altimeters on OFP
- Verify RNP value
 - Item 18 PBN/ Codes: A1 (RNP 10 or RNAV10) L1 (RNP 4)
 - Item 18 NAV/ Codes: M2 (RNP 2)
- Navigation accuracy check
- Verify ANP is less than RNP
- If no GPS...Record IRS positions
- Select POS REF page 3/3 and select BRG/DIST.
- Record the nautical mile error for each IRS on the MFP.
- LRCS checks, SELCAL check HF prim., sec. HF if SATCOM inop

Entry

- Squawk
 - in NAT Squawk 2000 after 10 minutes (except Reykjavik)
 - all others upon entry or as directed by ATC
- Assigned mach... ECON unless notified, use ECON if receive RESUME NORMAL SPEED (notify if change $\geq .02$ M)
- 123.45/121.5
- SLOP

Approaching waypoint ("few" minutes prior)

- verify **expanded FMS lat/long vs OFP for next and subsequent wpt.** check +/-2° and +/-2 NM to **next wpt.** Put **diagonal over next wpt.**
- Verify autopilot is in desired steering ..normally LNAV

Over Waypoint

- confirm transition to next wpt, note MC and dist to next wpt compared to OFP, confirm a/c turns to correct heading
- draw diag line(X)over waypoint on OFP
- record time, fuel, SAT and wind from POS RPT pg
- RVSM alt check
- confirm time to next waypoint (report if ≥ 3 min change)
- ATC and company position report(as required)

10 minutes after waypoint

- Confirm symbol on track on ND 5/10 scale
- Confirm XTK is 0
- Verify active waypoint
- Verify autopilot is in desired steering ..normally LNAV

Coast in

- Remove SLOP prior to exiting oceanic airspace
- Confirm routing and speed
- If GPS inop, nav accuracy check

Contingencies SP 11.16 FOM 12.1.6

- in all oceanic 30 degree turns 5 miles offsets, 500' vertical offset(>410...1000') best to descend <FL290
- WX if unable to get clearance, offset 5nm, north of track descend 300', south of track climb 300'

Pilot making CDU change states "CONFIRM"

- Other pilot confirms change by stating "EXECUTE"
- Pilot making CDU change verifies magenta course and states "LNAV AVAILABLE" (if applicable) The CDU should only be executed from either the LEGS or ROUTE page once the change/routing is verified.

Light Turbulence

cycle the seat belt sign to the ON position. The Purser will make an announcement

Moderate or Greater Turbulence anticipated, ensure the seat

belt sign is ON and make a PA from the flight deck stating:

"Please return to your seats immediately and fasten your seat belts. Cabin Crew be seated." The PA will be heard in the crew rest areas and will alert resting crew members to fasten their seat belts, but more importantly, it will alert them not to get up. When it is safe for the Cabin Crew to get up, "Cabin Crew may resume their duties." If the seat belt sign is to remain ON, "Guests should remain seated until the seat belt sign is turned OFF."

allowed to disable GPS at any time if needed, be sure to enable DME (off by default on -8).... inhibiting doesn't inhibit GPWS look-ahead... use TERR OVRD if necessary
In range call, if required in station guide or -0 page.... ETA, est. block fuel, mx, request for gpu etc.

Continuous ignition must be ON encountering:

- heavy rain
- severe turbulence
- volcanic ash
- icing conditions
- standing water or slush on runway

Note: Continuous ignition is automatically provided when nacelle anti-ice is on.

relief pilots in seat from prior to approach briefing thru shutdown checklist except for required observations/DDG restrictions.

Descent

In order to select appropriate approaches/transitions (especially AMS, FRA) select from database Approach, approach transition, arrival, arrival transition, helps to have one ND in Plan mode on last page of legs

set Vref

Flaps 25 is preferred due to noise and maintenance. Flaps 30 may offer operational advantages in some situations. Flaps 30 is the preferred CAT II/III landing flap setting.

For normal landing conditions, **autobrake 2** used with idle reverse thrust optimizes brake wear. When selecting autobrakes, consider landing distance, runway length and condition, exit plan, actual and expected brake temperatures, and weather. With the exception of operational considerations (i.e., quick turns, environmental issues), use of the autobrake system is recommended for all landings.

Hot brakes and blown tires can be a problem during the summer months at high-density altitude airports. Use additional runway length for deceleration and avoid heavy braking to make high speed turnoffs. Consider using flaps 30, autobrakes OFF, minimize brake applications, and maximum reverse thrust.

set mins **-8** check notes on Jepp approach min's for large heavy miniums (FRA)

if both are able set exact mins, if one is not set nearest 10' above

PF "recall review" PM reads all, PF "cancel"

-8 review operational notes

Brief

Brief EICAS messages affecting the approach and landing as threats

Approach briefing must include a reminder that go-arounds on or near the ground require go-around thrust to be set manually and that a flap configuration warning can sound.

TOD → will get **EMER LIGHTS** eicas when FA's test

Before top of descent or no later than 18,000 ft

Ladies & gentlemen. This is CA/FO _____ with an update.

Expect to land in _____ minutes at _____ local, we'll start

descent in a few minutes, we hope you enjoyed the flight, thanks for flying with Atlas Air
SEATBELTS selector – ON (at initial descent (aprox. 30 minutes out for passenger ops))

Landing Data

landing distances don't tell you how hot the brakes will get
Certified data – for dispatch

- max manual braking
- no reverse
- stop within 60% of available runway
- + 15% for wet

Advisory Data –

TLR, FDP (ACARS data)

- no reverse (may be selected for FDP (ACARS data))
- 15% SAFO margin (factored)
- ~1500' flare included
- 400** 1500' flare (manufacturer + 500')
- 8** 7 second flare (1400-1900')
- Autoland
 - FDP select autoland will add ~1000'
 - TLR add 1000' if not provided

Dispatched with inop items will show up in landing data remarks (don't have to select it again), reverser credit will use 2 or 0 if selected in non-normal,

Non-normal configuration landing distance values do not include the additional 15% safety margin.

QRH PI normal landing distance (unfactored)

- full reverse thrust
- 400** actual distances, 4.22 second flare (900-1200')
- 8** 15% margin, 7 second flare (1400-1900')
- autoland flare not included, add additional ~1000'

====>Descent Checklist

PM programs and sets, PF verifies

- Arrival and approach procedures
- Speed and altitude constraints
- NAV RAD page
- LAPS / VREF sFspeed

PF call for “recall review” and PM read all alert and memo messages and **-8** operational notes

PM call ““Transition level, altimeters set ____” (in. or mb)

PF call “Approach Checklist”

Landing data verbiage is "VREF 25 ", "MINIMUMS 210 BARO"

At 18,000 feet MSL [now PM]:

- Exterior lights - set
 - Turn on at least one set of LANDING lights
- Turn LOGO lights on only at night
- SEATBELTS selector - ON

====>Approach Checklist

At 10,000 feet: PM

Cycle SEATBELTS selector to AUTO then ON
Descent “10,000 feet” or “Flight Level 100”

Landing imminent (approx. 5 min)“CABIN CREW BE SEATED FOR LANDING” (flaps 1) should get CABIN READY text back from purser

set exact minimums *if both sides are capable*, otherwise round up SP4.15

ILS When on heading to intercept the final approach course with the LOC and G/S pointers correctly displayed and cleared for the approach: Arm APP mode & verify LOC and GS armed

RNAV & RNP ops, go around if UNABLE RNP in IMC, procedure must be retrievable from database, don't delete/add (*change*) waypoints, **FAA RNAV(RNP) or ICAO RNP(AR) approaches not authorized**, RNAV(RNP) radius to fix departures for **-8** only current and interim with (RNP) are not authorized current RNAV(GPS/GNSS) RWY XX and interim RNAV(GNSS)RWY XX and final RNP RWY XX are ok

final RNP RWY xx (**AR**) with authorization required is **not** authorized

If no autothrottles for landing add one half of the tower reported steady headwind component plus the full gust increment, not to exceed 20 knots (minimum 5)

Bleed off headwind additive but keep gust till touchdown.

Do not apply wind corrections for tailwinds.

emphasis item that LOC/APP is primary means to intercept unless LNAV is warranted CAM slides 2017

-8 LACFT minimums DL type aircraft apply to -8 on Jepps (FRA)
ILS/IAN at glideslope alive “gear down, flaps 20, *set speed”
Capt arm the speed brake

At glideslope capture “Flaps 25/30” *set missed app alt.* (beginning final approach descent VNAV)

“Landing Checklist”

Call FAF name and crossing altitude,

VNAV at FAF [PF/PM] verify crossing alt. & crosscheck altimeters w/in 100'

ILS at 500'AGL [PF/PM] verify Autoland status

All approaches have a **stabilized approach** gate of **1000 ft AGL**.

The PF shall execute an immediate go-around for any approach that is not stabilized by 1000 ft AGL, or becomes unstable below 1000 ft AGL. “**Unstable – Go Around**” (any operating crew member is required to make call)

-On flight path

- Correct airport and runway is programmed
- Only small changes in heading/pitch are required to maintain the correct flight path
- Sink rate <= 1000 fpm (unless required and briefed)
- specific approach requirements
 - ILS/IAN → within 1 dot vert. or horizontal
 - Other→ On VNAV glide Path (VTK +/- 75 feet), and RNAV ½ RNP lateral or LNAV course is touching the a/c symbol in 10 mile scale
 - LOC/VOR 1 dot lateral
 - Visual: on VNAV glide path or visual approach path indicator(all four red/white is unstable), and on centerline with wings level <300°

-Configured for landing as planned and checklist complete

-On speed,

- on target speed with normal bracketing and momentary deviations, (Normal bracketing corrections occasionally involve momentary deviations made necessary by atmospheric conditions. Momentary deviations are acceptable. Sustained deviations are not normal bracketing corrections.)

–Thrust is stabilized to maintain target speed.

–If airspeed is below Vref when crossing the runway threshold - go-around.

–Maintain Target speed until approaching the flare. If airspeed is excessive when approaching the flare - go around.

–Do not touch down beyond the touch down zone (TDZ). If not touched down within the TDZ - go around.

Do not use FLCH on final approach below 1,000' AFE

Landing checklist

Landing checklist PM announces "Checklist Complete" and PF visually confirms checklist complete indication and announces "Checklist complete"

Warning! After reverse thrust is initiated, a full stop landing must be made. If an engine stays in reverse, safe flight is not possible.

PM-as required.. "speedbrakes up/not up"

PM-when all rev indications are green "Reversers normal" or "No reverse engine number X"

PM-as required 'autobrakes off' for EICAS, selector DISARM/OFF

When more than IDLE reverse thrust is used and stopping is assured, reducing reverse thrust to IDLE by 80 knots provides FOD mitigation in addition to significant engine wear improvement.

If stopping is assured, by 80 knots, start movement of the reverse thrust levers to be at the reverse idle detent by 60 knots. NP55.1

Warning! If reverse thrust credit is needed to meet landing performance, full reverse thrust should be used until stopping is assured.

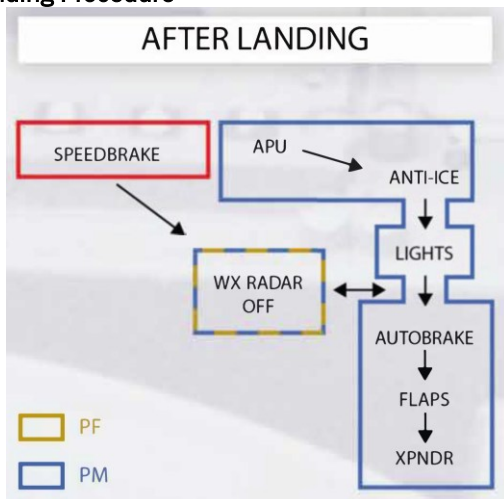
After the engines are at reverse idle, move the reverse thrust levers full down.

Before taxi speed, disarm the autobrakes. Use manual braking as needed.

PM-If AUTOBRAKES advisory message displays, selector moves to DISARM, or selector is OFF call "Autobrakes Off"

Before turning off the runway, disconnect the autopilot.

After Landing Procedure



clear of active runway

C- Speedbrake down

PM- APU start

PM- anti ice on if needed

PM-lights [PM]

C/F- WX radar off

PM-autobrakes to off

PM-flaps (don't retract flaps after hard landing or contamination)

PM-transponder

Taxi-in procedure

Conditions permitting, symmetrical engine pairs or a single inboard engine may be shut down and the following conditions are met:

-The engine(s) have operated at idle a minimum of 3 minutes. (P&W 5 minutes)

-All other engines are operating normally.

-All hydraulic systems are operating normally.

-All electrical busses are powered.

-Minimum of 2 generators, or APU, operating normally.

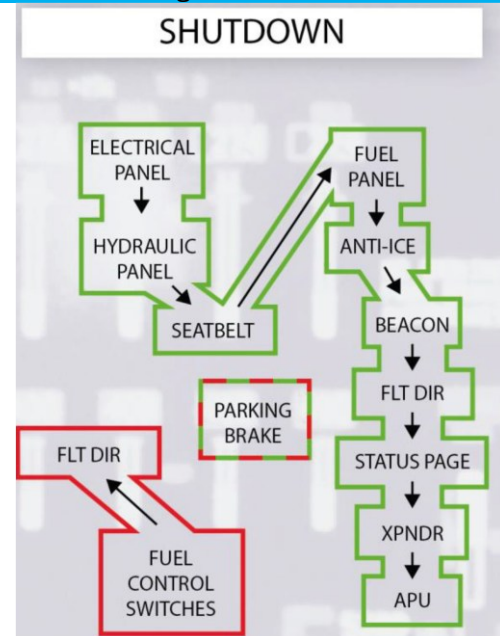
-No difficulty is anticipated maneuvering to the parking spot.

-Taxiways or ramps are not contaminated

-guidance only...<330,000 kgs (730,000 lbs) shut down one

-<300,000 kgs (660,000 lbs) shut down two symmetrical

If stopping short of the gate, make the following PA announcement: "Ladies & gentlemen, please remain in your seats with your seatbelts fastened. There will be a slight delay before we arrive at the gate."



shutdown procedure

parking brake set

seatbelts off

F- establish electrical (-8 very important) LCF don't turn on EXT 2... won't be able to get cargo lights

F- hyd off, aux 123-off, 4-aux

C- fuel control switches off (shutdown-- cool down at least 3 minutes, PW 5 minutes)

F- seatbelt selector off

F- fuel pump switches off

F- anti ice auto

F- beacon

C/F- flight director switches off

F- status messages

F- transponder

hyd 4 to off

irs off (wait for arrival message if no VHF ACARS)

LCF cargo camera lights off

shutdown checklist

purser will announce doors to manual as stairs approach

postflight procedure

L CDU → ACARS flight log MENU ACARS

R CDU → INIT REF MAINT IRS

C CDU → ACARS flight summary, IRU L, C and R errors, to's and landings, autoland on pg 2, → send

secure procedure (prior to leaving a/c)

irs's off

emergency lights off

Aft Cargo heat switch off

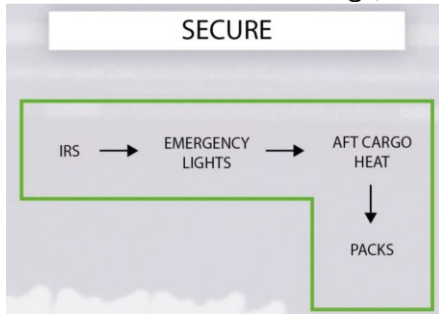
packs off (non longer mandatory for -8 per -8 guide)

remove pEFB accessories and store

if depowering, electrical power down checklist in SP

trip envelope, retain ACARs dep. Clearance and all amendments

postflight exterior inspection..... a crewmember will conduct abbreviated exterior walkaround... damage, missing panels,



tail strike FOM 10.1.69

Sim Notes

engine failure initial heading (VIA listed on special) (max 15 deg from runway hdg) is now at **end of runway** & added ½ wingspan minimum height for subsequent turns SP20.5
New randomly located checklist **FIRE ENG on ground**, back cover pg 2 of QRH, (eng. fire/severe checklist sends you there after one turn of handle)

Comply collections/Training 747/recurrent training/PCWU has setup sheet for sim

Comply collections/training/recurrent/pcwu/spots for nice guide/slides

Comply check airman and instructor slides (in standards folder) talk about the latest emphasis items... but are a bit cryptic without explanation

FMA's !!!!

Oral question bank in Comply365: Training/recurrent training/oral/pc oral question bank...click on circle i and export into keynote, click on play (triangle) and will get questions separate from answers or use microsoft copilot

When procedure flows contain an **EICAS recall**, read aloud all EICAS messages and cancel once verified by the other crewmember

Upon activation and crew recognition of the **master caution/warning**, either Crewmember will verbally announce the message(s) and then immediately reset the master caution/warning so as to allow recognition of a subsequent caution/warning alert message.

At the completion of any NNC which has an associated EICAS message: PF will state "**Recall review**" after the PM states "___ checklist complete" or "___ checklist complete except deferred items"

I was told not to hit recall button... just read...that's ridiculous
PM will read aloud all EICAS messages

The crew will determine if additional NNC should be accomplished. If no further NNC should be accomplished, the PF will state "Cancel" PM will cancel the EICAS messages

Also review Vol 1 Maneuvers section, immediate action items

(back of checklist) and memory items in here

PCWU/PC is now at SFO

SFO has the 90 deg missed approach off of 19, be aware of terrain, don't try to level off at 2K, several different EFP's no longer required to fully clean up on the first engine loss if you know you're going to land immediately, leave flaps at 5, don't forget to go to ENG OUT on VNAV page and if needed, press THR to get CON

SIM red box around EGT... overtemp is considered severe damage ...there is a sim mode that has low n1 and n2 which starts to vibrate later

Pan Pan x3 for first engine loss call

mayday when you lose the second engine

Mayday x3 = distress, Pan x3 = urgency, both declare an emergency, Mayday for fuel, CAM slides 2017

Minimum Fuel any additional delay may cause an emergency situation, only declare once you have committed to an airport that is the only viable option due to fuel limitations, Aircraft can safely arrive at their destination having used a portion of the fuel designated as reserve fuel. Company policy is to declare "minimum fuel" when, in your best judgment, any additional delay will cause you to burn into your reserve fuel????

Mayday, Mayday, **Mayday, Fuel** 30 minutes or less fuel upon landing 5000kgs = 30 minutes (tech tips nov 23)

Fuel is reported to atc in minutes

-20.0 Kgs~2 hours~120 minutes

-15.0 Kgs~1.5 hours~90 minutes

start problems

- "Immediate action items" **Aborted Start** from QRC "Fuel Control switch - Cutoff" then QRH

- No oil pressure by N2 idle (62% - 67%)

- No N1 by N2 idle

- "Immediate action items" **ENG X AUTOSTART** from QRC "Fuel Control switch - Cutoff" then QRH,

- Tailpipe fire (if no fire warning) → Fuel Control switch - Cutoff, then call for Fire Engine Tailpipe checklist from QRH (listed on front cover), standards ref. pg. 5

- mx, ddg, manual start SP7.x (limits now listed in SP)

General profile is takeoff, FMS exercises, steep turns, stalls, something breaks, return,

Lower than standard takeoff mins 500/500/500.. 2 required, all controlling, need CL and HIRL (10-9A)

Light spacing 50' in middle and 200' on edge

V1 cut, 3 engine missed, lose another, land generally, use anti ice on first circuit, A/I on after start when 10°C or below and icing conditions exist

temp **3°C** or below & anti ice required,

- GE 60% for 30 sec every 30 minutes also SP16.4

- static runup prior to takeoff (60% for 30 sec)

Briefing Flow

PF asks PM to set up approach

"line select ILS 4L"

"line select ILS 04L course fix intercept" or

"line select ILS 04L, deer park transition"

(It also really helps if the PM selects the approach on CDU as you are given it from instructor... although not realistic.)

Setup and Briefing (**little Y** on CDU)

- **DEP ARR** select arrival & runway (should reset crz alt)

- **LEGS** check

- **NAV RAD** check vor/ils

– **INIT REF** (APPROACH REF) Vref (may do this first in order to set Vref so you can configure)

Big Y

– **minimums** (also, personally for VNAV, what to set in MCP, and when to set Missed Alt.)

– “check landing assessment” - **autobrakes** (3 wet/4 if broken/fire) (PI add 1000' for autoland)

– “recall review”/cancel then

– briefing

PF “**you have control**”, brief - review briefing checklist (also PRM, CAT II/III) don't forget wind additive

additional briefing items

– Idle/Symmetric reverse (2 eng idle)

– Autobrakes 3/4 (wet/broken or fire)

– Trim out

When the “non-flying” pilot gets the airplane... put on the autopilot, trim, and slow down/configure if appropriate
Bare minimum brief...Vref, Approach, Mins, Autobrakes, trim, reversers.

“I have control, descent check, approach check” [standards ref. pg. 7](#)

V1 Cut

PM call “**Engine failure**” (**don't say a number**)

SIM...apply almost full rudder and then back off from there to get ahead, they say to parallel centerline, personally seems to be a better mindset to fight for the centerline

most people don't do it but, assumed temperature reduced thrust (TO) you may manually push throttles up on runway to full takeoff thrust or use TOGA when airborne, when using fixed derate takeoff (TO1/TO2) (including double derate/assumed temp with derate), you can't increase thrust

SIM in some sims you will lose some directional control approx 10 knots before V_R , seriously helps to keep slight forward pressure till rotation (normally should be removed before V_1), don't rotate unless you're pointing straight down the runway don't be in a hurry to lift off until 2000' remaining (red & white lights down middle at 3,000', yellow on side 2,000')

target pitch attitude is approx. 2° to 3° below the normal pitch attitude at slightly lower rotation rate

TOGA roll mode will hold ground track, if you're “askew” at liftoff go to HDG SEL on runway heading,

If airborne when engine is lost, lots of rudder

End of Runway → HDG SEL if VIA is listed in special EFP, $\frac{1}{2}$ wingspan minimum height for subsequent turns SP20.5 rudder trim

>250 RA → L autopilot to CMD, with correct rudder and/or trim (somewhat stabilized)

400 (“beep, beep, beep”...inhibit lifted) → **HDG SEL** (if required, avoids wrong LNAV lateral path) “Pan pan, Pan pan, Pan pan, Giant 400 engine failure” & intentions

E/O ACCEL HT, (1000' standard), **HDG XXX**, fly EFP if not already (very common to get distracted and not turn to heading), start to accel/clean up, PF calls “**Status**” (check EICAS to see if **FIRE ENG X** or severe damage (airframe vibrations with abnormal indications), or separation.... otherwise engine failure NNC after flaps up and conditions permit), PM states condition and engine “Engine severe damage # 1”, PF states “confirm” PF calls for “**Immediate action items**” → PM reads from QRC “**Thrust lever # 1 confirm, idle**” → PF place hand on #1 and repeats “Thrust lever number 1, confirm?” → PM “Confirmed” → PF slowly pulls the

thrust lever to idle, states “idle” → PM gets the rest after PF confirms, (PF/PM place hand on lever/switch before reading step) (Standards QRC protocol pg.6, E/O pg. 4)

If you're not getting the pitch over/accel at E/O ACCEL HT you either accidentally hit speed intervene (instead of hdg sel) → just close speed window, or forgot VNAV → select VNAV, if no VNAV → FLCH, flaps up man spd +20, when there → THR
PM “Immediate action items complete”

At planned flap setting → **verify/select CON** (push THR) **select ENG OUT** on VNAV page (also brings up CON after short delay), PF calls for **QRH/ECL** (reference checklist items), PM reads title and condition and objective as needed, ensures immediate items were done and reads checklist starting at dashed line, (don't re-read immediate action items.)

Severe damage is same checklist as fire... in fire section (8.2) new checklist step to check non normal landing data PL22.13 or approved source (**FDP??**) (PI add 1000' for autoland)

PM “**checklist complete**”

PF “**recall review**” PM read aloud all alert messages **after takeoff checklist**

get wx

consider jettison over 302k (Vref over 158), or overweight landing (if on fire)

~3.5 deg of rudder trim in level flight (300k)

min drag is control wheel centered

400 There is only one combination **FIRE ENG** or engine severe damage or separation checklist in Chapter 8 (fire chapter)

8 has separate checklist for fire eng and severe

8 ECL for severe damage is non-normal/eng./damage fail/eng sev damage

8 ECL will not have -----dashed line to signify end of immediate action items.... Look at QRC

match throttles after cutoff

approx 78% N1 after flaps 10 (300k)

start slowing and getting flaps out

If not more than one engine of an airplane that has three or more engines fails or is shut down to prevent possible damage, the pilot-in-command may proceed to an airport that the pilot selects if, after considering the following, the pilot makes a reasonable decision that proceeding to that airport is as safe as landing at the nearest suitable airport:

- a. The nature of the malfunction and the possible mechanical difficulties that may occur if flight is continued.
- b. The altitude, weight, and useable fuel at the time that the engine is shutdown.
- c. The weather conditions en route and at possible landing points.
- d. The air traffic congestion.
- e. The kind of terrain.
- f. His familiarity with the airport to be used. FOM 19.1.16

DEP ARR **index** and select correct route and airport to get approaches

New destination → if not departure airport → **RTE** **PREV PAGE** (pg 1/x), change destination, (insert RWxx here if you prefer to remove old one)

can do cat II/III (3 engine)

LAND 2/3 use rudder and trim till below 1500', then trim may be centered or may be left in, on multiple autopilot go-around, be ready to apply rudder when returning to single autopilot with new roll or pitch or approx 1000', may require more rudder than rudder trim can apply
personally I take out rudder trim at G/S intercept

Engine Failure Procedure	FRA (E/O ACCEL HT)	Lateral EFP	
		VMC	IMC
Standard	1,000' AFE	Climb straight ahead to 1,000' AFE. Return to land visually or complete IMC procedure.	Climb straight ahead to 1,000' AFE, then Hxxx or navaid ¹
Simple Special (SPECIAL on FDP) (turn required below 1000')	1,000' AFE or as listed TLR in MSL² FDP in AFE	VIA turn at end of runway	
		Mandatory until 1000'	mandatory
Complex Special³ (In Jepps -7)	1,000' AFE or as listed	Mandatory	

¹ At navaid hold on the inbound radial using a direct entry and standard holding procedures. If Hxxx, fly heading until a minimum safe altitude is attained. Radar vectors may be accepted when available after reaching 1,000'.

² in TLR EO ACCEL HT (AFE) = (MSL – Apt Elev)

³ Complex special only valid for specified departure (if listed)

CLB is climb speed if listed???, LT left turn, RT right turn, DT direct (shortest direction), H heading

After engine failure initial heading , ½ wingspan minimum height for turns

Correcting for winds is not required... but encouraged.

Descent & Approach checklists

- configure normally
- some say to wait for flaps 10 till on dogleg to make handling easier
- flaps 25 makes for an easier go around
- all to idle reverse, then symmetric reverse
- PM “Speedbrakes up, No reverse(s), Engine Number X”
- PM “autobrakes off”
- If you have to keep an engine at idle, it's a real pain with auto throttles...it will maintain relative position
- SIM** normally you won't get ENG FIRE on V1 cut because it doesn't give you the yaw
- SIM** on 3 engine manually flown approach, look outside...see runway and make call, back on instruments (in sim) to avoid wild maneuvers at low altitude

2 Engine

Mayday x3 call

E/O ACCEL HT (typically 1000') PF “Status”, immediate action items, QRC, QRH, NNC

if it's producing thrust and you need it, wait to shut it down...

wait till flaps 5, usually only clean up to flaps 5,

no A/T

continue up to missed approach altitude to avoid terrain

after takeoff checklist

call for **2 engine checklists** QRH 7.33 (2 prior to chapter 8)

get wx (no cat II/III)

new destination (see 3 eng.)

pick best approach and use course fix intercept (quicker/easier and cleans out LEGs page)

personally I always do a box pattern and turn back abeam Cxx

fix to avoid rushing and helps with VNAV for guidance

if only RW available,

- select VFR APPR, gives fix 8 miles out at 2000' with FPA of 3deg or

- select RWY EXT and input 6nm, input 1800' at fix and threshold elevation + 50' at runway

MCP altitude 500' AGL, watch out for ALT capture...set missed or minimum safe altitude

Don't set baro minimums

don't use FLCH below 1000'

approx 89% level

FLCH SPD or VNAV SPD → A/P on w/AT off (2 eng.) **control descent rate** (not speed) with thrust

g/s alive – flaps 10

confirm clearance to land before committed (gear down)

g/s intercept – gear down, flaps 20

approaching 1000' flaps 25, zero rudder trim, leave time for...

landing checklists (aural warning at 800' if no gear)

idle reverse thrust (if not symmetric) FDP will give reverser credit for 2 engines if selected in non-normal.... If appropriate... ie symmetric???

PM “Speedbrakes up, No reverse, Engine Number x & x”

for 2 engine go around, nlt approx 1,000' keep descent going, go around flaps 20, gear up, max on inboard, play outboard, clean up to flaps 1

new checklist step to check non normal landing data PI.22.39 or approved source(FDP??)

Normal go around

PF call “Go-around” push TOGA (*push up throttles*)

–Both Verify thrust increases.

THR / TOGA / TOGA

PF call “Flaps 20” or “flaps XX”

–verify rotation to go-around attitude. (PF/PM)

PM Verify that the thrust is sufficient for the go-around or adjust as needed.... Call “Thrust Set”

PM Verify a positive rate of climb on the altimeter “Positive Rate”.

“positive rate, thrust set” appears to work to get the excessive verbal calls required at the worst possible time

PF Verify a positive rate of climb on the altimeter “Gear Up”.

PM gear UP.

>250' L A/P to CMD

400' PF call for LNAV or HDG SEL **8** verify/select

PM Verify that the missed approach altitude is set.

Verify missed approach route being tracked. (PF/PM)

1000' VNAV or FLCH (above 400' RA if needed)

–Set **speed**

raise flaps on schedule

flaps up/set, if FLCH was selected, push THR, Both verify climb thrust set

Verify missed approach **altitude** captured. (PF/PM)

PM gear lever to OFF after landing gear retraction

After takeoff checklist

Some use LVSA on go around also

Approach briefing must include a reminder that go-arounds on or near the ground require go-around thrust to be set manually and that a flap configuration warning can sound

Reject

C - "Reject, I have control"

Without delay.... simultaneously

- close thrust levers
- disconnect A/T
- max manual brakes or verify RTO(>85KTS)

C - raise speedbrake lever

max symmetric reverse thrust (idle reverse - disconnects A/T, speedbrakes up))

max braking until certain to stop on runway

speedbrakes and reverser callouts

if evac, set parking brake

FO call tower and 60 knots

idle reverse detent by taxi speed... field length permitting

Warning ! If reverse thrust credit is needed to meet landing performance, full reverse thrust should be used until stopping is assured.

NNC as needed

Don't do immediate action items for engine fire... go directly to engine fire on ground checklist (2 pages from back of QRH)

Change to 3 step RTO instead of 2 step.... According to google....too much untested stress on engines when going from high power settings to reverse, speed brakes gives slight delay, also -8 supposedly has it programed in.... but 3 steps is for type commonality

After Abort,

- advise cabin crew evacuation is not required: **"THIS IS THE CAPTAIN, REMAIN SEATED"** (FA's will probably start evacuating in 15 seconds with no indications from cockpit)
- or complete evac checklist which will direct cabin crew to evacuate: **"EVACUATE, EVACUATE, EVACUATE"** (and evac horn)(remain on runway for more room)

call for stairs in case of precautionary deplaning

Evac responsibilities are on QRH

BRAKE TEMP (>5) (70 minute wait) QRH 14.7 • VOL I

PI.12.8 • FPPM 1.1.5 & 1.4.6

brake cooling PI.12.7-8, see FOM 19.1.15 for requirements w/reject and brakes

SIM PM don't just stare at the a/s on takeoff roll, crosscheck the engines, flameout of inboard with gusty winds is hard to detect with no noise or master caution

FMS Exercises

When intercepting airway... must delete all before leg you will actually cross and 6R Inbd course (legs page)

Sim Legacy Intercepting course outbound must create course/distance fix and 6R inbd course

NG just have to use fixcourse

ILS/IAN

check for -8 heavy mins on plate

for IAN localizer have to select G/S off on arrival page???

When on localizer intercept heading:

- verify that the ILS is tuned and identified

- verify that the LOC and G/S pointers are shown

When cleared for approach:

- Arm APP mode
- Verify LOC and GS armed

Verify that the localizer is captured. (PF/PM)

Verify the final approach course heading. (PF/PM)

At glide path alive call "Gear Down, Flaps 20"

Capt. Arm speedbrake

At glide slope capture call "Flaps XX"

Set missed approach altitude on MCP

Call "Landing Checklist"

At FAF, call FAF and crossing altitude, verify the crossing alt (PF/PM) (IAN xcheck alt. w/in 100')

When cleared to land turn on remaining ext. lights (PM)

(ILS) Verify Autoland status at 500' AGL

(IAN) disengage autopilot no later than 50 feet below

minimums and disconnect the autothrottle at the same time.

(IAN) Maintain the glide path to landing.

CAT II/III

captain confirms with "landing" at AH condition

- LAND 2/3

position

- raw data

- 1/2 dot glide slope

- 1/3 dot Localizer (not touching sides in expanded)

- or visual (cat II)

go around is not mandatory for no flare by 50'

alternating green and yellow taxi lights denote ILS critical area

no poor or nil braking action reports

autobrakes >= 3 (till <10 knots)

<1200RVR SMC GS in effect???

min TCH of 44'

cat I only TDZ required and controlling

cat II/III all RO mins are 300'(75m)

asiest sim failure for CAT II/III is to fail rollout

Cat II/III at foreign airports now listed on OFP and is primary reference (c60)

Cat II all us airports (include international Mil if TERPS is indicated on plate {not listed in C-060}) and international in OP SPEC C-060

RH OI.AWO.2 approach review, .4-.6 lights and equip. req.

QRH OI.AWO.5 for RVR mins and required lighting (use approach mins from chart to select correct row to get RVR mins for TDZ/mid/RO)

Cat II set published RA, if RA NA set baro mins as backup to marker (round up if needed) SP 4.5

may use manual throttles on cat II SP 4.4

Special Aircrew and Aircraft Authorization (SA). less than normally required lights so requires autoland OP SPEC C-059-7 (ie ANC)

Cat III we always set 100' in RA as AH. (even if mins are 50')

QRH OI.AWO.2 / FCOM SP4.5 C060

LCF not approved for cat III

SFL may be inop for cat III

IIla no DH or DH<100' & controlling RVR >= 700'(200m)

IIlb no DH or Dh<50' & contr. RVR <700'(200m)>=150'(50m)

IIlc no DH & no visibility limitations

cat III if approach lights go out on approach → continue ref??

shouldn't enter critical area with weather <800/2 ref???

Approach Notes

Callout is PM "Minimums, No Runway" PF "Go Around, Flaps XX"

If RVR goes below minimums when established on Final Approach Segment (< 1000' HAA in UAE & UK), the approach may be continued. QRH 01.AWO.5

AFDS change prior to DH/AH, adjust minimums accordingly below DH/AH for any EICAS continue the approach unless **NO AUTOLAND** is displayed

Below 500 feet, a **missed approach** is mandatory for

- Deviations of 1/2 dot on the glideslope or 1/3 dot* on the localizer. Note: *1/3 dot on the localizer is represented by the pointer remaining within (and not touching) the expanded localizer rectangles.
- Any failure indication on the ND or PFD.
- Any auto throttle malfunction (Cat III).
- Any failure indication on required flight instruments.
- Any deviation in excess of the stabilized approach criteria.
- Inadequate visual conditions for landing (Cat II).
- Failure of any required airport equipment.
- Any conditions which in the judgement of the Captain, jeopardizes the safe continuation of the approach.

Overlay method sp 4.13

- selected approach and NDB course <= 5 deg difference
- RWxxx is available

try to match missed with approach procedures

may have to use HDG SEL, speed intervention, FLCH SPD

if using VNAV, do not insert waypoints inside FAF

PRM Breakout Maneuver

may get descending instructions as last resort... should be no lower than MVA (1000' clearance)

Captain

- Disengage autopilot, auto throttles and simultaneously:
- Establish a 25-30 degree bank turn, as directed, within 8 seconds
- Climb / Descend as directed by the controller
- (max V/S, 1000 fpm)
- Note: The Captain may need to look through the flight directors, until they are selected off, to ensure immediate response to controller's instructions.

First Officer

- Set MCP heading and altitude
- Select both flight director switches OFF, then select both ON Note: If the LOC and GS have been captured prior to an ATC directed "breakout," both F/D switches must be selected OFF, after the A/P is disengaged to re-enable selection of a roll and pitch mode, then selected ON.
- Press HDG SEL and FLCH
- Confirm FMAs correct for roll and pitch (HDG SEL and FLCH SPD or ALT)

Captain

- After heading change and altitude level off completed (descending), or established on heading and climbing:
- Confirm FMAs and F/D steering and pitch indications.
- "___ autopilot CMD"
- Set flaps 20 speed, call "Flaps 20, gear up"

Non precision

book no longer specifies to configure early.... in sim be configured well before FAF to avoid problems

check MCP altitude set to mins

disconnect AP nlt 50' below DA(H)

disconnect AT before touchdown

IAN should be used only for approaches that have one of

- a published GP angle on the LEGS page for the final approach segment
- an RWxx waypoint at the approach end of the runway
- a missed approach waypoint before the approach end of the runway, (for example, MXxx).

Use of IAN is not recommended when an approach has a visual maneuver segment that is not in the FMC database.

This procedure is not authorized using QFE.

May have to turn off glideslope on CDU arrivals page and execute

VNAV / IAN approaches

Can use DA(H)... RNAV (GPS), RNAV (GNSS) or RNP using LNAV/VNAV. Not authorized... RNAV (RNP) and RNP (AR)

- pitch mode must be VNAV PTH or G/P,
- the procedure must be selected from the FMC database
- VNAV path must be shown on both the Jeppesen profile view and on the CDU LEGS page.

If pitch mode VNAV PTH or G/P and LNAV/VNAV charted minimums... set DA(H)... All others set +50' (We no longer use the exception for localizer... use +50')

VNAV/IAN should be used only for approaches that have **one** of the following features:

- a published GP angle on the LEGS page for the final approach segment
- an RWxx waypoint at the approach end of the runway
- a missed approach waypoint before the approach end of the runway, (for example, MXxx).

8 IAN is not recommended when an approach has a visual maneuver not in the FMC database

400 Select procedure from arrivals page, do not manually build or add waypoints

VNAV/IAN to a DA(H) are **not authorized** if

- **400** if the path angle is less than 2.75 or more than 3.50 degrees.
- using QFE.

do not insert waypoints inside the FAF, use the FIX page

When cleared for the approach:

- select or verify LNAV or LOC
- select or verify VNAV
- select or verify speed intervention
- set DA(H) or MDA(H) on the MCP

call "Gear Down, Flaps 20"

Capt. Arm speedbrake

Beginning the final approach descent call "Flaps XX"

Call "Landing Checklist"

At FAF, verify the crossing alt., xcheck altimeters w/in 100') (PF/PM)

At least 300' below missed approach altitude, Set missed approach altitude on MCP

When cleared to land turn on remaining ext. lights (PM)

disengage autopilot no later than 50 feet below minimums and disconnect the autothrottle at the same time.

Maintain the glide path to landing.

if you notice no descent quickly (doesn't go to path), confirm alt sel set to DH and push button

check notes for temp limits

SIM **Legacy FMC** If you "extend" from the Fxxx fix... you will not sequence the Cxxx fix and will not go in to approach mode

until crossing the Fxxx fix, you'll see VNAV ALT and it will not start a descent on path at Fxxx.....push the button once to release from "ALT" and to go VNAV SPD or PTH (if you hit it again, you'll delete the next constraint)

–You can do this before passing the FAF

–You may have to wait till past the T/D if applicable

–You may want to wait till "established on the approach" in order to comply with ATC instructions

–see approach logic Vol. II 11.31.30

If you're manually hand flying, when in VNAV SPD you have to reduce power to start descent (elevator controls speed)

In VNAV SPD prior to approach logic, with speed window open, A/T should go to Idle and A/P will not fly path ????

LVSA (instead of LAVs)(...or just fly the plane without a crutch)

–LNAV/LOC (lateral)

–VNAV (vertical)

–Speed intervene

–Set MCP Altitude to minimums

if you forgot to set missed and ALT captures on VNAV approach at DH, just push the button to release VNAV ALT to get FD back, or just fly through the bars and use the raw data

V/S approaches SP 4.16

Set published minimums + 50' (although v/s duties table states MDA???)

.2 prior to fix roll V/S knob down

can cheat and watch displacement on Prog Pg 2 ??

approaching glide path, set MDA(H)/next constraint

at descent point push V/S button SP 4.16

CDU exercises

Must be quick, but helps awareness to put VOR into NAV/RAD page and input course to get reciprocal

don't forget to unselect LNAV if on vectors after CDU exercises

Windshear

manual, max thrust, 15 deg nose up, push and follow TOGA (if avail)

AP on – press TOGA (should only be once)

follow TOGA guidance (if available) with **WINDSHEAR** on PFD

verify TO or GA power for THR REF (hit TOGA again)

PWS Vol 1 MAN 1.16

windshear during takeoff roll

–at VR rotate at normal rate and perform escape man. Once airborne

–near VR with speed loss, rotate normally 2000' before end at normal rate even if slow

–ensure max thrust is set by pushing thrust levers full forward

WINDSHEAR caution

"monitor radar display" (inhibited >80), maneuver as required to avoid wx

WINDSHEAR warning

"windshear ahead" (inhibited >100), abort prior to V1, after V1 perform windshear escape maneuver

RA

disconnect AP disconnect AT

fly away from red box (leave a little daylight between airplane and red box)

on approach, go around procedures

"xxx center, GTI 400, TCAS RA" or if issued contradictory clearance "Unable, TCAS RA"

Terrain

disconnect AP/AT

max thrust

wings level, 20 deg nose up

retract speed brakes

continue to PLI or shaker or buffet if terrain remains a threat

approach may be continued and alert regarded as cautionary if positive visual verification that no obstacle or terrain contact is imminent

look ahead terrain warning may be considered unreliable if it can be immediately verified as above the min safe alt.

steep turns

try not to vary bank angle

personally I trim, some say don't

inside top corner of 'wing' on level horizon line, or

diamond between 2.5 and 5 deg, touching 5 in level turn

upset recovery

>25deg nose up, >10 deg nose down, bank > 45 deg, inappropriate airspeed

Stalls

PF recover at buffet or stick shaker

–ignore the **AIRSPD LOW** EICAS ?????????

hold column firmly

disc. AP and AT (trick on departure stall is instructor to leave AT engaged to see if you click it off)

smoothly nose down to reduce AOA until buffet or stick shaker stops, trim may be needed

roll in shortest direction to wings level **if needed**

thrust levers as needed

retract speed brakes

don't change config (except for flaps up takoff → go to Flaps 1)

check a/s adjust thrust

establish pitch attitude

configured, recover to Bug Speed

It is important to note that pitch should be lowered until the stall indication ceases, once the indication stops the pitch should be stabilized at or around the pitch when the stall indication ceased. 2017 CAM slides

Don't hit TOGA unless you are actually going around... hard to continue departure procedure

PM

monitor alt. and a/s

verify and call out omissions

set flaps as nec.

call out trend toward terrain contact

SIM high altitude stall, gouge is 1deg nose up till you get your speed, but it's more realistic to flail through a few burbles

Re-automating on departure stall usually is just recycle A/T trim, then turn on A/P

Re-automating

–Flight directors on

–Roll mode

–Pitch mode

–A/T mode - Recycle switch or SPD

–A/P L/R to CMD (better for PF to do this... forces you to trim)

Deicing after before start checklist, packs off, apu bleed off SP16.16

Holding

if holding at FAF, be sure to **exit hold** before flying approach, may loose VNAV and/or missed approach

be careful to use next hold w/missed approach already loaded

be sure to input radial on correct line.... Different than where you enter course
time added due to etc time recalculates fuel from estimated time at fix

Exit Holding

- exit hold
- enter Direct to
- course intercept

SIM reset after landing

- training checklist—it's in the sim training guide, most instructors prefer to do it for you and not use it
- double check they've reset cruise alt and you have something in L1 on LEGS
- to remove the direct to leg to something in L1.. just hit delete on L1
- select >ALL ENG on VNAV page

cruise, dep, rwy, RTO, flaps, t/o data, F/D cycle, trim

Miscellaneous

Gusty winds might want to brief "sinkrate" callout... if stable on approaches with high additives, continue

Immediate action checklist IAC, don't say step number to avoid confusion on engine #'s, say applicable condition only ie fire or severe damage

Don't call for >carreted checklist

Don't re-read immediate action items in QRH... start at dashed line

call for "Recall Review" before briefing and after QRH complete starter cutout DDG... don't go with broken starter

QRH PI.22.1 for manual Flaps 30 landing data

coordinating for easier climb out/missed is more trouble than

it's worth in sim because of reprogramming the FMS

"course fix intercept" is the verbiage they want....careful it will delete your current holding fix while in holding... hence only execute from the legs page

if the light in the fire handle is red, generally you're going to need to turn it..but read checklist

mostly use autobrakes 4 (somethings broke/weathers bad)

inop RVR for takeoff, see 10-9 back and QRH

after first start switch, complete non-normal checklist then

consult DDG for relief, and call dispatch & MX control

flaps 30 is better for visibility if wx is at mins, not just cat II/III

silence aural alerts after recognizing the cause

cancel EICAS messages after all checklists are complete or on hold- so that future messages are more noticeable.

Do not reset fuel pump or refuel CB's, others may be reset once after 2 minutes cooling, on ground only by direction of mx

with passengers, stop on runway..more room for egress

confirm-> execute on LEG page

get/keep flaps to 5 so turns are tighter in pattern

manual throttles, must use wind additive, ½ steady headwind component, full gust, Do not apply wind corrections for tailwinds.

Flight control check – only sim failure mode is to make a triangle disappear

radios, numbers but no letters ==> check manual tuning

fsmc (we have a and b)status message, ==> ddg

EICAS BRT has 2 knobs in case ND is moved

"Autobrakes off" call if AUTOBRAKES advisory message displays, selector moves to DISARM, or selector is OFF

CAT II/III equipment and minimums OI.AWO.5

> (carrot) no checklist

on styby power, left eiu fails, all go blank

pc w&b 9000 greater, do min fuel required and fuel burn adj
common problems

not setting MCP alt before FAF on non-ils approaches

use autobrakes 4 if in doubt

2 engine approach, fly a square pattern (don't let them rush you).....but read quick

don't brief till everything is set, have clearance, CDU's & MCP

use 8 knots max for taxi turns in sim

proc hold will exit itself after one turn

RTFC, read the checklist, traps are

- second item may not continue in order,
- checklist may resume on another page or in middle of page
- don't stop till you see ■ ■ ■ ■ and even then keep going as there may be additional information at the end of the rest of the checklist

FMS

-if you use DES NOW to get rid of T/D you may delete altitude restriction on first point of approach, very bad

-when all else fails, HDG SEL, FLCH till you get FMC set

-If you're returning, see new destination under 3 eng.

-normally change runway on DEP ARR page

-Double pump/execute on destination airport will delete approaches

-make sure correct waypoint is active when vectored to final ie when vectored inside of a point on approach

-make sure waypoints are sequencing on final when in loc/app so you will have missed, if not, move next point to L1 and biggie the inbd course

-runway extension (white dashes) are 14.2 miles long

-when setting up always reselect RWY to open up all transitions

NNC overviews and traps

The pilot flying may direct checklists to be done by memory if no hazard is created by such action, or if the situation does not allow reference to the checklist. QRH CI.NNC.5

after nnc. "recall review" "cancel"

"immediately" cancel master caution/warning so you can recognize a new one

land at the nearest suitable airport:

-“Plan to land at the nearest suitable airport.” written in checklist

-fire or smoke continues

-only one main power source remains

-any other situation determined by the flight crew to have a significant adverse effect on safety if the flight is continued.

It must be stressed that for smoke that continues or a fire that cannot be positively confirmed to be completely extinguished, the earliest possible descent, landing, and evacuation must be done.

If a smoke, fire or fumes situation becomes uncontrollable, the flight crew should consider an immediate landing. Immediate landing implies immediate diversion to a runway. However, in a severe situation, the flight crew should consider an overweight landing, a tailwind landing, an off-airport landing, or a ditching.

There are no non-normal checklists for the loss of an engine indication or automatic display of the secondary engine

indications. Continue normal engine operation unless an EICAS alert message shows or a limit is exceeded.

verbal confirmation is required inflight for:

- an engine thrust lever
- a fuel control switch
- an engine or APU fire switch, or a cargo fire arm switch
- a generator drive disconnect switch
- an IRS mode selector

dual FMC failure

- LEGS, PROG, NAV
- must input freq's on nav page, no idents
- put ILS freq in each CDU
- no autothrottles (no cat III)
- see section 11, ~pg 19 of this guide

Standby power only (6 busses)

- L PFD, ND, CDU, FMC, EIU, primary EICAS?
- TE flaps only (Vref +25, right side indications only)
- no reversers, manual speedbrakes, no antiskid
- manual pressurization
- no FD, raw data ILS available
- alternate trim only

Hydraulics

312 A/P

HYD PRESS SYS (→ no cat III)

- 3.17 with 1 or 4, go to **C other**
- after noting inop systems, checklist continues on another page below sys 4, not on next page

4 – manual brakes, speedbrakes DN, (pitch up w/reversers) and

1 or 4 – secondary flaps **4 minutes from 1 to 5**, alt gear ext
2 & 3 – stab trim & elev feel inop, all A/P inop

with more than one sys inop, land with flaps 25, Vref + 20
alt gear extension, you will get gear disagree, cause they do,
follow checklist and push buttons before handle, *you can't bring inoperable gear up... so committed to land or must have gas to fly gear down to alternate*

secondary flap ext, you'll get **FLAPS PRIMARY**, cause they aren't

Fire Cargo FWD or AFT (lower) confirm before arming

shuts off 2 packs, see correct checklist to see which one needs to be off/on for Fwd/aft & freighter/passenger(just 3)

loose SATCOM

DISCH fire extinguishers(don't have to confirm)

cabin manual to 8,000'

before descent, cabin auto

land

warning to ground personnel not to open door until everybody is off plane

fire main deck confirm before arming

O2 masks

loose SATCOM

DEPRESS depressurize with depress switch(don't have to confirm)

climb or descend to 25,000'

land (T/D 75NM, SB Vmo till 15NM config)???untested

Fire wheel well

below 270/.82 lower gear immediately (not at cruise alt)

land

Door open

follow checklist, non-plug/not pressurized...depressurize, descend to 8000'

plug type doors you can continue with good pressurization

MC and beeper for non-plug door w/engines started

Gear handle will not go up (GEAR TILT EICAS)

do GEAR TILT checklist first????

best checklist is "Gear lever will not move up"

if you don't do checklist fast enough, you'll get GEAR

DISAGREE, either checklist will do the same thing

if you do GEAR TILT QRH, confusing and you'll soon get GEAR

DISAGREE... do Gear Disagree checklist and go to "landing gear lever will not move to UP option"

Flaps Drive probably asymmetric flaps, watch speed

speed intervene 200 knots protects everything except flaps 30

unlisted objective is to put working flaps down to 25, asymmetric

ones stay put

don't use alt flaps

fly faster

if flaps return to normal indication and green, don't need to keep additive

Flaps Primary slower than normal using electric

don't go below current flap speed on tape until flaps reach position

Flaps control controllers broken, use alt.

you may or may not have expanded flap indications, have to time if you don't

tailstrike

level off

depressurize

land

Smoke, Fire, or Fumes

O2 masks and goggles

establish comms with crew (and cabin)

bring extra PBE's into cockpit in case O2 is compromised and for evac

anytime the smoke or fumes becomes the greatest threat, do the smoke or fumes removal checklist

attempts to find source of smoke

freighter → utility power, flt deck fan, apu off

passenger → IFE, PC power, utility power off

if located turn it off/put it out

divert

consider immediate landing if uncontrollable

don't delay landing to complete following steps

isolate different packs

EVAS do QRH first, don't pull tab till installed and needed,

backup master switch in storage container

Most lithium battery fires can be extinguished with less than

25% of one application bottle of **Firebane**

AvSax PED containment bag, open by pulling yellow tab, 1 liter of water, turn over, another liter of water, put in device, add up to 13 liters of water as required

Smoke or fumes removal

done when directed by smoke, fire or fumes checklist

don't delay landing to do checklist

equip cooling ovrd

if on flt deck, pull smoke evac

persist or sever or determined to be in cabin

–manual cabin to 8000'

equip cooling norm

descend to 8500' or safe

depressurize

Passenger→ slow to 200KIAS, open doors as directed

go to smoke, fire, or fumes checklist

Bleeds

if you have a choice leave pack 1 or 3 running to cool cockpit
Bld duct leak C, apu selector is for APU start **selector**... not apu bleed **switch** like I tried (twice now)(center duct leak is easier to run in sim.... No flap issues)

Landing distance leak L or R PI.22.11

Overweigh landing use flaps 25 if Vref **400** >167, **-8** >175, use all available runway for stopping to minimize brake temps

Unreliable airspeed, IAS DISAGREE is immediate action item, use flight path vector, flaps 10° & 90%, clean 4° & 80% (FCTM 8.20)

FMC rules and tips

no auto tune for ndb's

●**FMC** load winds etc.

never bring anything down from above to fix a discontinuity
vnav doesn't work while mod is displayed?

if execute is lit, 6 left will get you out of it — erase

vnav path scale is +/- 400' high/low

altitude constraints for VNAV must be below cruise altitude to be valid

max range cruise is cost index of 0

The E/D is located 50 feet above the runway threshold (RW waypoint) for all approaches except VOR approaches.

Intercept final selected on the "INTC CRS TO" line on the LEGS page or by selecting the "XXXXX INTC>" prompt on the ARRIVALS page.

XXXXX INTC will delete all waypoints from flight plan except L1
TO/GA selects highest altitude in missed as new cruise level
if waypoint is in flightplan more than once, bringing to L1 will always take you direct to first instance, be careful bringing next point on approach up, may loose constraints
VNAV cruise altitude will be reset with TOGA switch, or selection of approach, uses highest constraint altitude on apprch/missed

FL390s for **step climb**

change airways only on RTE pages

Route offsets rte pg1

three dashes before L1 is an anchor point (from point)(w/ intercept airway)

to create fix abeam, **FIX**, **abeam**

to create **disco** in L1, AAA, **DELETE** x 2

max angle VNAV pg 2

max rate = best angle +25 knots (spd below 10?)

if cleared direct to the field, you can use an ILS ident to fly direct to instead of 4 letter code which would delete approaches

number of flight plans on A/C 7 – Rt 1&2 x 2 FMC's, 3 x CDU's
Uncareted, small font, or default values are not required to be line-selected to be valid.

Approach Logic Vol. II 11.31.30-

put in the transition to the runway/approach before putting in star, also watch there can be multiple pages of transitions
descent path is built whenever on altitude constraint below cruise is put into legs page FCTM 4.19

FOM & other notes

AMU FOM 10.7

ACARS

problems with flight plan,

–tech menu/password/overrides/.NxxxMC(with period)

if atis on auto, have to exit page or it won't pop up

wx request/notams will give hourly and forecast

recycle VHF C by going to voice will fix some issues

ACARS/TECH/ACARS TEST???

Reset everything.....

400 L&R FMC, LC&R CDU, LC&R Flt Cntrl Cmptr

-8 CMU A/C, Satcom, Satcom HGA

Aerodata SP 20.17 TLR SP20.53, [See chart in SIM section](#)

engine failure initial heading (VIA)(max 15 deg) is now at **end of runway** & added ½ wingspan minimum height for subsequent turns

To **remove landing runway** on CDU, select that runway, then **1L** will remove runway

Select **WET** for Frost or any of the following surface conditions reported as **1/8 inch or less**: standing water, slush, dry snow, wet snow. For all others, select the reported condition and depth if prompted.

uses ramp wt for t/o data, if over MTOW will show ENSURE T/O
FOB <XXXX

TLR check date on top line matches OFP, check planned weights and all conditions, TLR is primary w/out ACARS
can request FDP for 8 hours after last TLR calculated
TLR and OFP revision #'s don't have to match

TLF invalid if A/I on when planned off
number under runway length on FDP is amount runway has been shortened

PMRTW only considers takeoff limits

PMRLW is max for dispatch (60% rule)

MFPTW includes landing and climb performance

REQUEST INDIVIDUALLY means E/O accel height is different for diff. Runways, must select individually

shortened runway 26L/AAA-E2000F = rwy 26L east 2000 ft
“-” indicates additional info below(now changed to *)

A - AFM limit where the data physically can't calculate any higher		
B - brake energy limit	C - climb limit	F - field limit
O - obstacle limit	S - structural(landing)	T - tire speed limit
I - Dispatch		

FRA in TLR – MSL

EO ACCEL HT = (FRA – Apt Elev)

FDP in AFE

D-TO - MT (maximum temperature) is programmed as the assumed temperature (i.e. 25L D-TO, assumed temperature 41C).

TO, TO-1, TO-2, - MT is simply the maximum allowable OAT for that runway, and NO temperature is programmed as the assumed temperature

Contamination levels SP 20.52

planned landing data is for wet (not annotated), exception FOM 7.1.28, alternates are planned dry

Aerodata does not account for and the TLR does not indicate use of thrust reversers for landing performance, but does take into account their use for takeoff accelerate-stop

performance. FOM 7.1.28
 copy of TLR is not required on aircraft
 LOW GROSS WT/AFT CG should be in remarks of TLR
 (manually input by dispatch) or FDP (automatically generated)
 New TLR for (see last page in SP)
 –OAT colder than POAT by more than 10°C or >MT
 –QNH more than 0.10" (3 hPa) below PQNH
 –ZFW greater than flight plan ZFW by 10,000kgs(22,000lbs)
 –Performance related DDG item not included on the TLR

Airport not in database SP4.14

manually load flight plan, not legal for RNAV

SIDS/STARS/APPROACHES???

LANDING ALT in manual

departures lat/long first point on legs

destination lat/long last point on legs w/speed & altitude,
 can't put altitude in for missed...have to use FLCH on
 missed??? have to use raw data (VOR mode) for non ILS
 approaches, very hard to revert to....consider PM for
 monitoring raw data

ETA and fuel information is based on the last point in the legs
 page... could be end of the missed approach

may have to recycle dest. to clear manual alt.???

Alcohol Crewmembers may possess alcoholic beverages on
 Company aircraft, provided they remain enclosed in personal
 luggage at all times. Further, no personal luggage containing
 alcoholic beverages may be brought into the cockpit operating
 area of the aircraft.

Crewmembers may not consume alcoholic beverages:

- At any time when in uniform.
- Within 8 hours of reporting for duty (operating, deadhead
 to duty, reserve, or training).
- When on duty (operating, reserve, or training) or
 conducting Company business.
- When deadheading within a pattern of flying, except:
 -- When deadheading into a rest period or scheduled day
 off to conclude a pattern of flying.
- Within 8 hours following an accident unless a post-
 accident test under part 121, appendix J has been given, or
 it has been determined that the crewmember's performance
 could not have contributed to the accident.

Animals SP 2.4

Dark except for birds

Confirm fuel adj. +1%, (-8 +.63%)

High flow all day

Temp. turn off lowers to cool main deck

Early descent

Apps zztrop tripcase

APU inop

turn off #1 demand pump if air cart is weak

400 new DDG procedures to turn off utility busses

-8 leave off fuel tanks till after start SP 7.1

arresting cables (raised) no restrictions but avoid, also avoid
 braking while crossing

ASAP 24 hours domestic // 48 hours international

Autoland 30 day limitation, put "AL" in left seat landing box, sat
 and unsat must be written in discrepancy item block, for cat I
 advise ATC "coupled approach and autoland"

Bad elf reset by hold top 2 buttons w/restart... forget BT bad elf

Ballast Fuel Subtract ballast fuel weight from ZFW prior to entry
 in ACARS for performance and PERF INIT on FMS, include
 ballast in FMS reserves

B/C back course localizers not authorized for 747

Bogota, Colombia SKBO The Captain will make all approaches,
 landings, and takeoffs, except First Officers(w/min 100 in
 company type) may make VMC landings from 1 hour prior to
 sunrise to 1 hour after sunset. The PIC must be
 accompanied by a Line Check Airman on their initial flight into
 Bogota, unless the PIC has previously operated to Bogota as a
 required crewmember

Going south they may restrict you airborne to 12,000 '...
 happens quick (3,000' AGL)

These points not confirmed.....

RWY 14R BOG139/16.4 RWY 32L BOG 142/4.8

RWY 14L BOG136/16.4

Blockout if blockout doesn't show on ACARS, check flight log,
 misc menu / SENSORS for fuel door open, will probably have
 fuel set on fuel page still

BRAKE TEMP (>5) (70 minute wait) QRH 14.7 • VOL I

PI.12.8 • FPPM 1.1.5 & 1.4.6

brake cooling PI.12.7-8, see FOM 19.1.15 for requirements
 w/reject and brakes

Brakes

normal landing performance charts good = wet

Observe maximum quick turnaround limit. QRH After landing
 at weights exceeding those shown above, adjusted for slope
 and wind, wait at least 70 minutes (-8 49 minutes)and check
 that wheel thermal plugs have not melted before executing a
 takeoff.

No sooner than 10 minutes and no later than 15 minutes after
 parking, check the BRAKE TEMP advisory message on EICAS.
 If the message is not displayed no waiting period is required.
 If the message is displayed, do not dispatch until at least 70
 minutes after landing, or until the BTMS readings on the
 EICAS Gear Synoptic Display are all 2 or lower. Before making
 a subsequent takeoff, check that the wheel thermal plugs
 have not melted.

any indicators inop – lookup brake energy QRH (PA > 8000 use
 FPPM 1.4.7)

Recommended brake cooling schedule PI.12.8 to get time

If any brake temperature display digit is blank or the BRAKE
 TEMP SYS status message is displayed, the Maximum Quick
 Turnaround Weight table must be used.

When in caution zone (5-6), wheel fuse plugs may melt. Delay
 takeoff and inspect after one hour. If overheat occurs after
 takeoff, extend gear soon for at least 8 minutes.

When in fuse plug melt zone(7 and above), clear runway
 immediately. Unless required, do not set parking brake. Do
 not attempt to taxi for one hour. Tire, wheel, and brake
 replacement may be required. If overheat occurs after takeoff,
 extend gear soon for at least 12 minutes.

Campinas SBKP, Captain only approach and landing, no
 autolands, immediate call to Sao Paulo on departure....
 Callsign only, 170-150 5nm final, clearance 15 min prior

Captain Only

low gross weight, aft cg takeoff FCOM Vol I SP 1.4

The Captain must make all approaches and landings:

- PRM operations
- Category II or III operations
- see FOM for Bogota, Campinas, Eldoret, Kathmandu,
 Guantanamo, Guatemala City, Quito
- with High Minimums first officers <100 hours in type (no
 LCA) captain must make all takeoffs and landings in the
 following situations:
 –At all special airports.

- Prevailing visibility in the latest weather report for the airport is $\frac{3}{4}$ mile or less.
- RVR for the runway to be used is 4,000 feet or less.
- Runway is contaminated with water, snow, slush, or similar conditions that may adversely affect airplane performance.
- Braking action on the runway reported to be less than good.
- Crosswind component is greater than 15 knots.
- Windshear is reported in the vicinity of the airport.
- Any other condition in which the Captain determines it to be prudent to exercise the Captain's prerogative.

Charges... see flight crew travel policy on globalnet

Chocks flight crew not responsible FOM

China RVSM use feet from table to set altitude, assures 1000' separation, ftools installed from company hub app allows to select/show on ipad simultaneously with jepps

CI 600 make sure climb speed ≤ 350 , slow in turbulence, use IAS only for descent speed(already above transition from mach)

Circle-to-land maneuver....published MDA ($\geq 1000'$ HAA) & vis ≥ 3 miles

Climb/Descend clearances (altitude) FOM 13.1.3 [FAA FAQ pdf](#)

Don't give top/bottom altitude...just passing altitude and "via" clearance when checking in

"maintain" deletes altitude constraints (not speed)

Contaminated.... see runway

Coordinates

Pyramids of Giza, Al Haram, Giza, Egypt (29.97, 31.13)

The Karnak Temple Complex, Luxor, Egypt (25.71, 32.65)

The Valley of the Kings, Luxor, Egypt. (25.74, 32.60)

Siwa Oasis, Matrouh, Egypt. (29.20, 25.51)

titanic n41-44, W49-57

Inca Nazca lines, astronaut S14-45 W075-05, hummingbird S14-41 W75-09

Chile large telescope S24-37 W70-24

China CPDLC on L1 & L888

CPDLC

min equip. see limitations

ensure HF data off when logging on to ATC w/CPDLC

don't select a reason when requesting climb now....ref?

ensure HF data off when logging on the ATC w/CPDLC, *although satcom may not work north of 82deg and have to use HFData*

identifier may be different for center vs cpdlc, in jepps

software CPDLC shows in brown on route notes

reply to messages within 60 seconds... use stby if needed

if having problems recycle VHF data may also help

latency monitor function SP.5.34

ADS automatic dependent surveillance (auto sends

position/speed/alt to center – passing position, 300' vert, any lateral, others)(periodic, event, demand)

ADS-Addressed (ADS-A), also known as ADS-Contract (ADS-C) plane to ground only

ADS-B(broadcast) *ground uses mode S info(position, alt, etc.)*

from transponder instead of radar, no logon/pilot action, used in remote areas, radio (line of site)

CDA current data authority – active center, R3, Only center you can exchange cpdlc messages with

CPDLC Controller pilot data link communications – comm link/contract to center

NDA next data authority, automatically1 GPS required, DDG 34-58-1

some centers require manual position report crossing

boundary (GOLD 5-15?) see list on cover

If an **OFFSET** (excluding SLOP) is executed for wake turbulence or weather, the start and termination of the offset must be reported. (The oceanic controller must reconcile any differences between a position report and the cleared route.)

Two different logons

–CPDLC only - still have to do position reports, communicate via CDU (still have to monitor HF's)

–ADS only - constantly sends position reports (shows "ACT"), still have to communicate with radios, acts like radar so usually no position reports in remote areas

check passing FIR boundaries if it doesn't swap – switch both off and connect to correct station

manually override points that aren't compulsory

NAT's

Shanwick CONFIRM ASSIGNED ROUTE may show as old...treat as new report/confirm/send.. may have to send twice....plain text if unable to respond (includes slop in message (from cp email)

A-D-S : Participating in ADS Waypoint Position Reporting (WPR) only

C-P-D-L-C : Participating in DLC (including DLC and ADS)

"Gander Radio, Giant 123, CPDLC, Shanwick next (omit if domestic), request cell call abcd" Gold E-11

PAN urgency needed

MAYDAY threat to life/ac - sends position report

inadvertent mayday they will query with speed request –

"confirm ADS" → respond with "reset ADS"

equipment restrictions in limitations FCOM L.10.7

Route change over CPDLC... see SP & notes on back cover

Coordinate uplink and downlink messages using the appropriate flight deck displays. Do not use printer-based information to verify CPDLC messages.

Couriers can continue back to original departure airport, including resting along the way, must have FAA form 8430

Customs

–one open liter of alcoholic beverage and 300 cigarettes, or 50 cigars, or 2 kilograms of smoking tobacco, or a proportionate amount of each;

–merchandise not exceeding \$200 in value, which may include gifts the crew member has purchased for persons in the United States, free of duty.

CVR CB P6-3 top right??

Dangerous goods big red book, ICAO inflight emergency response guide updated every 2 years, required on aircraft small orange book, DOT, ground emergency response guide has first aid, listed in library but not required

RBM/3090 and RBI/3480 not in bulk

SP 7573 is for AMC waivers

mag aft of c, not in t, company not in a2,a2, b, c, or t

radioactive aft of f or separated

dry ice not next to animals, 2000kg main deck 500 each lwr diamond Y is for limited quantities??

Use the NOTOC form to confirm the main deck pallet position of any dangerous goods. Cargo aircraft only (CAO) dangerous goods must be accessible (Class 3 PG III, 6, 7, and 9 are not required to be accessible).It is not required to physically verify/access the pallet tag information once the ULD is loaded and secured into position.

3090 lithium metal, 3480 lithium ion are forbidden on passenger and in bulk cargo section on freighter

For reference...3091 lithium ion in equipment, 3481 lithium ion in equip. AMC flights do not require pallet tags

Database out of date

check all enroute coordinates w/OFP, pEFB or paper charts(can't change for US Q or T routes), can only use SID/STAR/Approach if chart date is older than database. SP.11.6

DDG (see discrepancies)

time starts at midnight z of the calendar day written up on orange stickers must be written up each flight (should only be used for write ups requiring inspections before each flight)

can't expire in flight

Sections

- P preface
- 0 introduction
- 1 EICAS messages (alphabetical order & condition)
- 2 **DDG** in ATA chapters, MEL

2-00-00-1.2 categories list and timeframes

- 3 CDL items (missing external stuff and penalties)
- 4 Nonessential equipment and furnishings program
- 5 Nonessential equipment and furnishings list (where to look to see if it's nonessential) don't have to be on MFP

Category A. time interval specified

Category B. three (3) consecutive calendar days (72 hours),

Category C. ten (10) consecutive calendar days (240 hours),

Category D. one hundred and twenty (120) consecutive calendar days (2880 hours) (*NEF items unless specified*)

An operator who has the authorization to use an MEL also has the authority to approve extensions to the maximum repair interval for category B and C items provided the responsible Flight Standards District Office (FSDO) is notified within 24 hours of the MEL extension. The operator is not authorized to extend A and D items in the MEL.

Indented effectivities all apply to that a/c, non indented only next line applies

Where performance penalties are listed as negligible, no more than three negligible items may be missing without taking further penalty. For each missing item more than three, reduce the takeoff, landing and enroute climb limits by 100 pounds (45 kilograms).

May be more than one applicable deferral, ie valve secured open or closed(may even have a/c specific for one vs. the other but can still use either) [ref. 2015 CA notes](#) below dashed line is airline tailored, must comply with M's and O's [ref. 2015 CA notes](#)

De-icing

HOTs App Use Standard

go tip to root, front to back

failure on leading and trailing first

Type I orange or pink and heated, others clear, green or yellow frost – see anti ice section on last page

Takeoff With De-icing/Anti-icing Fluids – Do not use reduced thrust (assumed temperatures) for takeoff. Takeoffs predicated on TO1 or TO2 are permitted.

Wait approximately one minute after de-icing is completed to turn pack selectors/switches on to ensure all de-icing fluid has been cleared from the engines.

When To De-ice

Deicing/Anti-icing may be required under the following conditions: • Any time the outside air temperature (OAT) is below 10°C and visible moisture (rain, drizzle, sleet, snow, fog, etc.) is present. • Whenever taxiways are slush, snow, sleet, or water covered and the ambient temperatures are near freezing. • When local forecast indicates the above conditions

will exist at or near scheduled departure time.

Takeoffs in light freezing rain or drizzle should only be attempted after either an outside the aircraft tactile check of the aircraft's wings or the aircraft is anti-iced using a Type II, III, or IV fluid and the takeoff is accomplished within the HOT. Do not use APU bleed air for the packs until 15 minutes after deicing is complete. Air conditioning smoke/fumes may result. Conditions permitting, use the APU-to-Pack Takeoff or Packs Off Takeoff procedure.

HOT range is for light to moderate precip conditions

See Nose/Wing checks on last page anti-ice

Deicing changes

De-icing done with flaps up

Note: opening of doors not authorized

Nose Check (Pre-Takeoff Check)

Wing Check (Pre-Takeoff Contamination)

Post De/Anti-icing or External Check (qualified ground crew)

Discrepancies OB18-4 see laminated card

DDG effectivities not indented only applies to next step.. see "O" in DDG

Engine start is defined as engagement of first start switch.

Status messages

- before start or block out... return to blocks, write up
- after start or block out...continue, messages that remain after block in must be written up

EICAS messages (advisory, caution, warning) or inop instruments or equipment,

- Not in DDG, return to blocks and write up...must be fixed

- before start or block out→ return to blocks, write up

- After start or block out→ QRH, works/clears...continue,

- still inop→ DDG allowed and dispatch & mx concur

- no "M" items and can continue (log entry not required till block in) comply with "O" procedures

- "M" item, no FC deferral →return and write up

- "M" item, FC deferral →Write up w/ MEL#, DMI #, MC initials, signature & employee #, sticker on tin and a/c, comply with "O" procedures

DOD flights, must have >250 hours on type combined crew start apu w/ bleed off for 1 minute

Dust / Sandstorms

Use a filtered ground cart for pneumatic air for engine start, if available.

start apu w/ bleed off for 1 minute

Allow maximum motoring for 2 minutes when starting engines to help remove contaminants.

apu to packs takeoff

close outflows if securing

max CLB rating

Duty

Domestic 121.471

8 hours between required rest periods

30/7 consecutive days

100/calendar month

1000/calendar year

during 24 hours ending at last landing		May be reduced to	Must be given x hours w/in 24
Rest	Sched Flt. Time		
9	<8	8	10
10	>=8<9	8	11
11	>=9	9	12

“(g) A flight crewmember is not considered to be scheduled for flight time in excess of flight time limitations if the flights to

which he is assigned are scheduled and normally terminate within the limitations, but due to circumstances beyond the control of the certificate holder (such as adverse weather conditions), are not at the time of departure expected to reach their destination within the scheduled time.”

no duty for 24 hours in any 7 consecutive days

Non-local trans to or from work cannot be considered rest

EFIS failure, On CDU use S or STD for 2992

Engine runs for mx are voluntary OB19-01

Faa inspectors should have form 10a in order to ride, read them the entire briefing card (different cards for cockpit and back????)

FIX ETA no distance if wrong time i.e. arrive after landing

Flag 2 person crew 121.481

scheduled ≤ 8 flight hours, double flight time of rest, min 8 hours

>8 w/in 24 must be given 18 rest

32 in 7 days & 1 in 7

100 in calendar month

100 in 30 days if not regularly assigned under .483 & .485

1000 in 12 calendar months

Flag 3 person crew 121.483

scheduled ≤ 12 flight hours in 24

18 off if flown >20 in 48 or 24 in 72

1 in 7

120 in 30 consecutive days

300 in 90 consecutive days

1000 hours in 12 calendar months

Flag 4 person crew 121.485

350 in any 90 consecutive days

1000 in any 12 calendar month period

rest upon return to base, twice total hours flown since last rest period at base (according to FOM only if sched >12 hours)

adequate sleeping quarters on airplane when scheduled more than 12 hours during any 24 consecutive hours

if landing in USA, if cargo is unloaded, revert to domestic rules ???

121.487????

Sec. 121.491 Flight time limitations: Deadhead transportation. Time spent in deadhead transportation to or from duty assignment is not considered to be a part of a rest period.

Passenger FAR 117 duty is from 1.5 prior to block in

Flight time max 117.11

–100 hours flight time in any 672 consecutive hours(28 days)

–1000 hours flight time in any 365 consecutive calendar day

–**Unaugmented flight time limits** Table A

Time of report (acclimated)	Maximum flight time (hours)
0000-0459	8
0500-1959	9
2000-2359	8

– 3 pilots 13 hours

–4 pilots 17 hours

–extensions may exceed cumulative but are reportable(10 days)

Flight Duty Period (FDP) Max 117.13

–**Unaugmented duty time limits** Table B

–not acclimated to departure theater... duty reduced 30 min

–split duty min 3 hours rest 117.15

Scheduled time of start (local time in theater you were last acclimated in)	Maximum flight duty period (hours) for lineholders based on number of flight segments						
	1	2	3	4	5	6	7 +
0000-0359	9	9	9	9	9	9	9
0400-0459	10	10	10	10	9	9	9
0500-0559	12	12	12	12	11.5	11	10.5
0600-0659	13	13	12	12	11.5	11	10.5
0700-1159	14	14	13	13	12.5	12	11.5
1200-1259	13	13	13	13	12.5	12	11.5
1300-1659	12	12	12	12	11.5	11	10.5
1700-2159	12	12	11	11	10	9	9
2200-2259	11	11	10	10	9	9	9
2300-2359	10	10	10	9	9	9	9

– **Augmented Duty Table C** 117.17

–**not acclimated** to departure theater... duty reduced 30 min

–2 consecutive hours rest in 2nd half inflight rest for pilot landing, 90 consecutive minutes rest for PM landing
max 3 leg

Scheduled time of start (local time in theater you were last acclimated in)	Maximum flight duty period (hours) based on rest facility and number of pilots					
	Class 1 rest facility		Class 2 rest facility		Class 3 rest facility	
	3 pilots	4 pilots	3 pilots	4 pilots	3 pilots	4 pilots
0000-0559	15	17	14	15.5	13	13.5
0600-0659	16	18.5	15	16.5	14	14.5
0700-1259	17	19	16.5	18	15	15.5
1300-1659	16	18.5	15	16.5	14	14.5
1700-2359	15	17	14	15.5	13	13.5

extensions 117.19

reserve 117.21

cumulative limits 117.23

–60 duty hours in any 168 consecutive hours(7 days)

–1990 duty hours in any 672 consecutive hours (28 days)

rest period 117.25

–30 hours free in pas 168 consecutive hours (7 days)

–upon reteurning to home base and traveled over 60 deg and gone >168 hours(7 days) must be given 56 hours rest including 3 nights local time

–min 10 hours rest with 8 hours of uninterrupted sleep opportunity

–if dh exceeds table b, must be given equal time rest

early departures Flights will not block-out greater than fifteen (15) minutes before scheduled time (ETD on the OFP)without specific permission from the GCC. 10.1.20

FCR Flight crew report required for: NTSB 830 and other irregularities FOM A.1.1-2, not landing at intended destination, observing volcanic activity(pirep also), PED is suspected of causing interference, bird strike, hard landing FOM A.1.3, laser (online FAA form also), near midair collision(report to ATC also), unconsciousness or illness or injury of occupant or crewmember, TCAS event(each crewmember), W&B omission or error, FAA interference, ipad issues FOM 6.1.23, deficient facilities, delays, overweight landings, safety hazards, gFross nav. Error, loading error,

refusal of dangerous goods, cargo discrepancies??, guest removals, disruptive guests (also drinking personal alcohol) < 4 copies of hazmat paperwork on mil. Flights, bomb threat, RTO, inflight failure or shutdown FOM 19.1.16,
EFB ipad 67% sto start flight/25% T/D, ipad must not be used in place of paper QRH

Email
john.smith@atlasair.com

server: webmail.Atlasair.com

domain: aawh username: jsmith description: atlas use SSL, accept all Ssl : OK??

engine out (Dispatch)

- method 1 reduce payload to maintain 2000' clearance w/in 5 SM of route
- method 2 escape routing to maintain 2000' clearance w/in 5 SM of route and 1500' above alt. Airport
- 4 eng. a/c must remain w/in 90 minutes of apt. or loose 2 and fly to field w/ 15 min fuel at 1500', & 2000' w/in 5 SM of track

ETP must have charted approach mins weather, however use closest suitable airport (instead of listed ETP)

Fatigue call chief pilot will call 24 hrs after, must file fatigue report w/in 72 hours (3 days)

FEDEX MEM mem approach..entry spot, mem grnd..entry spot, doors closed..ramp, beacon w/park & runway restr.

Fuel

Domest	Origin to Dest.		Alt.	45 min reserve at normal cruise
Intern'l	Origin to Dest.	10% dest	Alt.	30 min hold @ 1500' over alt. (or dest.)
Redisp	POR to dest.	10% of POR to dest.	Alt.	30 min hold @ 1500' over alt. (or dest.)
Isolated*	POR(PSR) to isol.			2 hrs at normal cruise
Normal cruise is t/d fuel flow				
*Min fuel for isolated is greater of req. fuel from ORIG to initial DEST(w/ standard reserves + alt if req.) or ORIG to final DEST w/ 2 hours				

FMC RESERVES ==> Planned Diversion Fuel to alternate and 45 minutes holding at 1,500 feet AGL. (does not require a "min fuel" call to ATC)

Isolated airports FOM 7.1.19&24 Incheon, Delhi, Almaty
 Min fuels in excess of fars

- ADD.TO min. takeoff fuel of 25,000 kgs(55,200lbs)
- LCF ferry flight min is 90,000 lbs w/20,000 lbs ballast (either fuel or SME)(unusable fuel)
- ADD.E ETOPS min fuel
- ADD.LD min fuel at destination of one hour
- ADD.AL min fuel at the alternate of 45 minutes
- ADD.RC min fuel to RAPT is greater than dest.

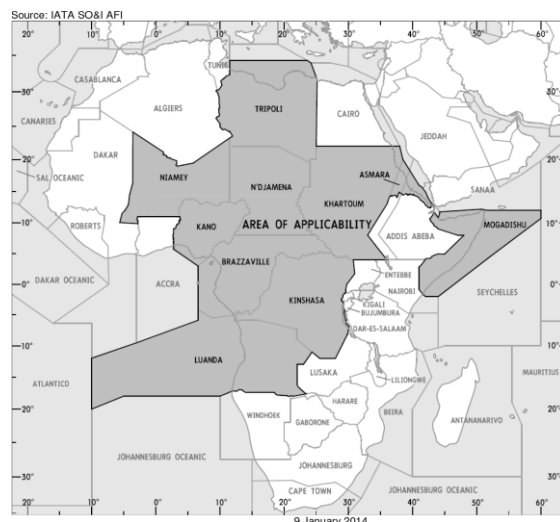
NextGen VNAV ALTITUDES

- OPT (no wind)
- RECMD alt on CRZ 4r
 - constrained by STEP size → (RVSM)
 - may call for descent
- Wind Trade step at 1R and 2R
 - after last manual step climb (step descent turns it off)
 - constrained by STEP size
 - won't call for descent
 - until w/in 500nm dest or 200nm of t/d,

Endurance at 14K clean is approx 6 minutes per ton

Hazardous WX Should not be dispatched through or to

hazardous weather...severe icing, severe turb, low level windshear, volcanic ash, nil braking action FOM 8.1.2
HF freq SP 17.1 South American Freqs...Pubs/back/N. Am/gen
airway/enroute data/airinc
High Minimums FOM 5.1.8
HNL ophi 2 >360k use full CLB, close in for 2400' restriction
Hong Kong VHHH NADP 2 (1000') in order to speed up for restrictions at first point



IATA IFBP (inflight broadcast procedures) 126.9 All Stations, this is GTI XXX in the XXX FIR, FLXXX, Southbound on XXX(airway), Est. XXX @ 0000z, GTI XXX, FL XXX, in the XXX FIR. (some airplane allow ACARS on satcom with C VHF tuned, 408,)

A broadcast should be clearly pronounced in English:

- a) 10 minutes before entering or crossing an FIR within IFBP region;
- b) For a pilot taking off from an aerodrome located within the IFBP region as soon as appropriate;
- c) 10 minutes prior to crossing or joining an ATS route, report crossing airway or waypoint. In the interest of reducing congestion on the IFBP frequency, pilots may exercise discretion to omit closely spaced repetitive IFBP reports;
- d) at not less than 20 minute intervals;
- e) before a change in flight level;
- f) at any other time considered necessary by the pilot

ICAO flight plan FOM 7.1.49

Incheon RKSI (squawk ident) call sign, type, cargo

Incident FOM 19.1.18, appendix A chart

Instrument Approach OpSpecC052 FOM 8.1.1

can now fly CAT III with 1 thrust reverser inop

CAT II check OpSpecC059 for international airports

CAT III check OpSpecC060 for all airports

Circling approaches are not authorized below 1000/3.

Sidestep maneuvers are authorized.

no SMCs, limited to 600 RVR CAT III ie SFO, JFK

3000' remaining - alternating red and white CL lights

2000' remaining - amber runway edge lights

1000' remaining - solid red CL lights

CL lights spaced 50' intervals starting at 75'

min TCH 44'

we can do CAT II/III 3 engine

Precision instrument runway markings or runway centerline

lights are required for initiation of an

instrument approach when the RVR or visibility is less than 3/4 mile, RVR 4000 feet (1200m).

Insufficient Fuel → enter winds/step climb/

Isolated airport see reidispach

–Listed in FOM 7.1.16

–same as redispatch using Point of safe return(PSR) instead of POR with greater of standard reserves (including alt. if req.) or 2 hours fuel required... see fuel

Jeppesen new charts, alt restrictions/blue, speed/magenta, MSA/brown, DME holding to scale

Search function now works on taxi chart...very useful

AMM

–New comm tab on bottom left

–Low vis button

–Push and hold or use Runway button to get info and highlight

–Push and hold on parking spot to highlight

2 finger for zooming, push and hold 2 fingers for ruler

3 finger swipe to go to next plate

Change map font size under settings tab

must select Wgspn Restr(on AMM) to show red highlights for taxi

route notes, under FIR label

–brown color indicates either 4 letter CPDLC identifier or that **call ahead is required**

–clicking on frequencies will bring up more freq, → by selecting individual freq it will place that freq into first spot to enable red screen tint by triple click on home button (physical button) settings / accessibility / accessibility shortcut (at bottom) / color filter→select,

back out by selecting → / accessibility / display and text size/ color filters__> select on / select color tint.... Slide slider almost to far right →triple tap physical button (quickly)

headset symbols show freqs on map

spider web sill show restricted areas for directs

Jumpseaters/flight deck observers, OAL and off-duty-

~~company~~....captain will verify eligibility, identification & CASS, valid passport(not docs.) & briefed

–PSR's and FA's have blue badges but aren't allowed on freighters

–no screening required for domestic operating crew

–MRCO May be denied access to the flight deck jumpseat if, in the Captain's judgment, the individual exhibits specific behavior that could have a negative impact on safety of the flight. MRCO flight deck access may be denied only after consulting with Flight Operations management.

–Air marshals and SS must have ID. and are passenger a/c only

–FAA FAA Form 110A

–NTSB NTSB Form 1660.2, (ID Card) and NTSB Form 7000-5

–DOD evaluator S&A Form 110B, (DoD personnel without a Form 110B must comply with all requirements of priority 6)

–Company Employees, ID and if observing.... letter from sup.

–Non-Company.... Employer Issued photo ID, & FAA Form 8430-6

–ATC FAA Forms 7010-2, 7000-1, and 3120-28

Laundry ANC? 7th – code 3636

Level change

Hit button to update cruise alt.

V/S button

Speed window and mach sel button

When level... VNAV... check path

Landing 2016 CA notes

Lo ERROR on VNAV page, NADP affects it, thrust doesn't

Loading

adjusting hooks, one per side may be inoperable or missing
hooks cannot be attached to area of cut diamonds

no more than 2 cut diamonds per side

no adjoining cut diamonds

one diamond bridge per side to temp repair broken diamond

no cuts in bottom 3 knot rows

one cut on bottom row counts as missing tie-down

2 tie downs per net can be missing but not on same side or adjacentn corners

tie down can be fixed with stud replacemnt strap

ULD damage limits are in WBM Vol. II...may have changed

WBM found on cd's and in ground section on Globalmess

can't attach to aircraft with chains, to paet only

only 1/8 inch cuts on straps, no knots

Logbook

daily check is only good for 48 hours from first block out to last

planned block in..... can't plan to expire in flight

transit check prior to each departure

autoland within 28 days restricted to cat I until autoland w/cat

I wx & atc notified of Autoland

“AL” is entered into log for autoland for left seat crewmember

max thrust required only by mx message (enter thrust code)

only list operating crew

Orange sticker for inspection required before each flight must be written up by captain each flight, reference the DMI number.

NEF items will be deferred and tracked by Maintenance Control using the same procedure as all other deferred items, using a DMI number and DMI stickers and decals.

Non-MEL items are recorded on a Non-MEL Item List (T2002) in the Aircraft Log tin.

Aircraft registration, flight number, date, and From and To

blocks must be filled in on **subsequent pages**.

ensure all (M) specific maintenance procedures have been properly entered in the Aircraft Log.

do not list jumpseaters or supernumeraries

If OFF or ON fuel is not recorded, use taxi fuel consumption rates to determine landing fuel.

can go w/out transient check at unplanned offline stations

GMM pg. 515?? out stations captain can defer w/company concurrence(they should call faa)

LRC = best buffet margin at all cruise alt. **-8** .86 **400** .85
FCTM4.12

LOW GROSS WEIGHT, AFT CG TAKEOFF see SP 1.8

–Captain will perform the takeoff

–A rolling takeoff is preferred. (*i recommend manual throttles*)

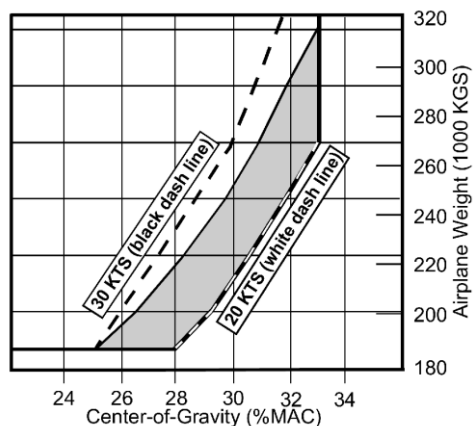
–Apply full forward control column deflection till approximately 80 knots to improve nose wheel steering

–adjust thrust prior to 80 knots as required

–must select TO2 or equivalent assumed temp/thrust reduction for required derate

–LCF requires TO2 and an assumed temp to meet it's 30%

–also applies for **-8** with aft cg and crosswind component
~20-30 knots, SP 1.8,



M2/M3 < 6K or 3K SIG pressurize fuel pumps to clear status message or balance fuel and/or ground test by MX manuals

FCOM trumps FOM 12.1?

If missing a/c manuals or out of date... notify dispatch
manual thrust takoff If VNAV is not engaged, push the THR switch to change reference thrust limit to armed climb thrust limit.

Max Weight Limits are identified by the following prefixes:

- S - Structural (AFM limits)
- P - Performance (AeroData)
- L - Landing (landing limit + trip fuel burn)
- I - Inserted by Dispatcher

MIA alternate missed DHP109/6 DHP109/10.9 Hold 289/L

Military if using CMB callsign.... don't take directs unless you're sure about countries involved... probably have restricted cargo

Miscellaneous stuff nobody will tell you about that will happen on OE

- if you don't set the brakes before closing all the doors, it will **block you out** when the last door is closed
- if it doesn't block you out check Flight Report on ACARS under SENSORS prompt, could be fuel door
- if you block in and are running engines awhile before a door is opened, it will block you in at the last time you set the brakes
- if you screw up any of the above, just send a plain text message to dispatch to give them correct times
- there is an air control knob for the side windows vents just behind your shoulder underneath windows

to install the sun shades, there is a spring loaded section just over your shoulder that pushes in to slide shade on bar

MNPS now called HLA?? equip req. see DDG 2-34-61-1, Ops. Spec., and NAT chart, 15 miles offset for contingencies

MORA (OFFP) - Minimum Off-Route Altitude providing 2,000 ft. terrain clearance 5 NM either side of the route in mountainous areas. Not displayed <10,000 ft. MSL

NAT HLA (North Atlantic Tracks High Level Airspace)

- contingencies Jepps>manuals>europe>pg 860
- 285-420 inclusive
- On OTS (the tracks) CPDLC is required from 350-390 inclusive
- RlatSM reduced lateral separation minima, 25nm min separation, 350-390 inclusive, new route will only be given on CPDLC uplink...no acars/voice (slides), **must verify points using scratchpad as the 30 deg will not show on legs page**

or on ND, TCAS fully operational for PF (diff from DDG...slides)

Noise Abatement Departures Noise abatement departure profile 2 (NADP-2) (B, distant, 1000') is the normal profile used unless otherwise specified by the Jeppesen airport pages or Departure Procedure.

NORPAC

see DDG?? and B-36for equip restrictions

UHPP/PASY diversion airports

PTZGR – radar contact

No cpdlc..Est(next comp)next(comp or not)

Nose door not showing closed on synoptic, downstairs on left wall, top left switch, down then up

Oceanic FOM 12.1.6

- contingencies** in all oceanic 30 degree turns 5 miles offsets, 500' vertical offset(>410...1000') best to descend <FL290
- WX** if unable to get clearance, offset 5nm, north of track descend 300', south of track climb 300'
- New NAT clearance procedures "**OCEAN CLX RQ**" ... use CPDLC to request and enter MAX FLxxx in free text(even if same as requested) TMI required only on voice clearances

ACARS "OCEAN CLX RQ" page

Shanwick and Bodo 90-30 minutes

Gander 90-60 minutes

Santa Maria At least 40 minutes

Reykjavik various ~20-25 min SP5.44

Gander 90 min prior or airborne, <45min call 10 prior start, westbound check in with exit point

New York no clearance required???

Gander..... Flight crews in receipt of an ACARS data link oceanic clearance from Gander OCA while in the New York OCA but subsequently routing through Gander Domestic airspace before re-entering the NAT HLA, should not modify the FMC prior to exiting the New York OCA. Modifications in accordance with the oceanic clearance should be executed while within Gander Domestic airspace.

Reykjavik..... If the flight planned route does not contain a waypoint on the Reykjavik OCA boundary then the Entry Point should be the next flight plan waypoint before the Reykjavik OCA boundary. In such cases the entry point in the Oceanic Clearance (CLX) message will be a system calculated boundary crossing point and this change will be highlighted with the text "ENTRY POINT CHANGE <position>" in the ATC/line. Exceptions to this are the waypoints EPMAN, DARUB, JULET and LT.

Verify route before entry... see flows

Verify RNP value set in the FMS (generally RNP 2 prior to oceanic entry and RNP 4 after oceanic entry)

Navigation accuracy check

–Verify ANP < RNP

–If GPS inop...

–use POS switch and observe raw data radial/DME

–Record IRS error on MFP (POS REF/NXT PGE/ BRG/DIST)

Write down time and all 3 altimeters for RVSM compliance???

SELCAL checks

OFFP Remarks FOM 7.1.37

Operating Certificate... See Ramp Check

Oxygen usage FOM 2.4.8

Used by each crewmember it > 10,000' cabin pressure

Above FL410 if one pilot leaves other must wear

PAR/ASR

Captain only

Minimums 200' ½ mil vis (2400RVR)

Attempt to contact if no contact

- one minute being vectored to final
- 15 seconds on final ASR
- 5 seconds on final PAR

PBCS Performance Based Communication and Surveillance

Auth should be in remarks section of OFP, requires..

RNP 4,

RSP 180 (180 secs to send ADS-C position),

RCP 240 (240 secs for response from crew to ground query)

PCD

crewpad management-same login/pass as training
reset passwords

- mobile ecrew-top right/4 squares/password
- touchdown(email)play button(circle with triangle)(top,second from right)/settings/password
- xabber/manage accounts/password, enable
- zenprise or connect/re-enroll/username/password

pEFB at least one ipad w/67% charged, must use RAM mount
FOM 6.1.26

perishables FF should be listed on first page of OFP

Phone

Pilot Pairing Restrictions

DOD 250 hours in type combined

at least one >=100 hours in type (not seat specific)

no PWP with <100 hours in type (not seat specific)

Plotting charts distance between service volume of nav aids exceeds 725 NM. FOM 12.1.9

Polar Operations may have to do plotting chart??? FOM12.1.18

loose satcom at 84deg

do GNE check before entering AMU

HDG SEL must go manual to HDG TRU first FCTM 4.18

Position Reports every 4 hours (except domestic) use POS
report page CAM slides 2017

400 If ACARS is available, it is not necessary for ATC to forward
oceanic position reports as they may be manually sent. FOM
7.2.5

Printer if not printing in vertical strip, roll off a few feet of paper
and reinsert, make sure paper is not in backwards(writing on
back)

printing a manual snapshot for DMU LSAP (DDG) CMC/EICAS
MAINT PAGES/PG 3/PERF/MANUAL SNAP/REPORT/SELECT
OO/PRINTER

PRM Precision runway monitoring, *captain must fly, Breakout-
A/P off, 25/30 deg turn w/in 8 seconds, climb/descend (max
1000'fpm vs des), set MCP HDG & ALT, both F/D's off, HDG
SEL FLCH if unable notify at least 100NM prior
3,000' to 4,300'*

750' to 2,999' SOIAusing LDA PRM

Pretty Neat Stuff Bags www.luggageworksonline.com

QFE

The use of LNAV or VNAV with QFE selected is prohibited.

select alt ref on CDU approach ref page

Landing Alt. Manual 0'

baro to HAT

Stby Alt. Set QNH

LCF – QFE operations are prohibited.

QNH

don't use vnav if leveling w/in 2000' of transition with qnh <
29.70 or 1006

Quito, Ecuador The Captain will:

- Make all take-offs, approaches, and landings.

–Review pictorial pages within the preceding 12 months.

–Review the Quito (SEQM) Jeppesen 10-0 page.

–Contact Dispatch prior to departure for a briefing.

–Visual maneuvering to RWY 18 not authorized

RWY 36 engine out QSV354/13.8 QNV315/4 QNV 315/30

-8 Exit only at end of runway

See Volcanoes, this section

Ramp check operating certificate

Comply/SAFA Ramp Check/Applicable AOC and Op

Specs/Atlas/Op Spec A999

RAIM FOM7.1.33 Failure... required DME's may be limiting,

can't use RNP approach mins(wx)

may still use if no "passed" if ANP is less than specified RNP

Reanalysis >15 min late, >=4000' off alt, >100 mile deviation

Recency 3 takeoffs and landings w/in 90 days (no autolands)

Redispatch no comm, land at initial dest. unless safer to

continue to final dest.(captains emer. auth. FCIR)

RDA, time(not required for acars), active PIC's initials (must be
retained)

open >= 3000'/5 SM, **oper** <3000'/5, **instruments** <1000'/3

<600/1..... plain text forecast

Planned redispatch flights do not require a planned alternate
for the final destination if the flight time from the POR to final
destination is 6 hours or less and the weather requirements
of this paragraph are met. FOM 7.1.5

Refuel test-select quantity-push set-check total-open-check
lights-connect-2 handles to open valves-///-lights off-close
valves

RTE 2 and in the middle of flight plan, go direct to next point or
you'll have insufficient fuel and not capture track

RLat tracks CPDLC, SATCOM, GPS required, FL350 and above
30 mile separation, must bring wpt to scratchpad to see 30

RNAV Ensure LNAV is armed prior to departure for both RNAV1
and RNAV2 departure procedures. Confirm LNAV active once
airborne. Ensure LNAV is the active roll mode when
established on a RNAV Q-Route or RNAV STAR. On departure,
engage the autopilot as soon as possible after passing
autopilot engagement minimum altitude.

If given RNAV point in takeoff clearance "RNAV to xxxx",
confirm it and read it back. (*mostly in CVG or close rwys*)

Min equip. see limitations, check DDG

RNAV/RNP approaches/arrivals/departures must be retrieved
by name from a/c navigation database.

RNP Min equip. see limitations, check DDG

RNP 1 departures and arrivals approved in OSI C-63

RNP1 RF for -8 only

RTA

–Prog Pg 3, wait 1 minute before relying on info, recommend
speed intervene and just look at arrival time on RTA
page..shows tenths of a minute

use A or B to select after or before ie 2339A

-8 will give wheels up time for dest.

–**400** No OPT or MAX while active

Runway [see also takeoff/landing restrictions table](#)

For landings, short runways (<8,000') must have approved
vertical guidance (VASI/PAPI, GS, or VNAV ability).

Min runway Width..... 747-8 is 148 feet (45 meters), other 747
models is 132 feet (40 meters).

dry runway is neither "wet" nor "contaminated," and includes
those paved surfaces which have been specially prepared
with grooves or porous pavement and maintained to retain
"effectively dry" braking action even when moisture is

present.

wet runway is covered with sufficient moisture to cause it to give a shiny appearance, but is not contaminated.

- Any runway with 4,000 RVR (¾ mile/ 1200m) or less is considered wet performance.
- use autobrakes 3 or 4 (NP.45.2)
- reduced thrust (fixed derate, assumed temperature method, or both) is allowed SP 16.1
- WET - more than 25 percent of the runway surface area is covered by any visible dampness or water that is less than 1/8 inch (3 mm) in depth. Note: A damp runway that meets this definition is considered wet, regardless of whether or not the surface appears reflective. SP 20.5

Contaminated Runway - more than 25 percent of the runway surface area is covered by

- Surface water more than 3 mm (0.125 in) deep, or by slush, or loose snow, equivalent to more than 3 mm (0.125 in) of water;
- Snow which has been compressed into a solid mass which resists further compression and will hold together or break into lumps if picked up (compacted snow); or
- Ice, including wet ice.

- Derates are allowed, **assumed temp is not allowed** SP.16.1 **standing takeoff procedure will be used NP.35.1**

Runway Contaminant Contractions listed on SP.20.9

400 Takeoffs are not recommended when slush, wet snow, or standing water depth is more than 0.5" (13 mm) or dry snow depth is more than 4" (102mm)

- 8** Takeoffs are not recommended when slush or standing water depth is more than 0.5" (13 mm), wet snow depth is more than 1.18" (30 mm), or dry snow depth is more than 5.12" (130mm).

FICON field condition report (in US), up to 2 conditions for each 3rd, RCC runway condition codes for each third... use the worst for assessments FOM 8.1.51

Runway State Group (ICAO) 8 digits at end of METAR

12345678

12 Runway, add 50 for right, 88 all runways, 99 repetition of last message

3 Deposit 0-clear and dry, 1=damp, 2=wet, 3=frost, 4=dry snow, 5=wet snow, 6=slush, 7=ice, 8=compacted snow, 9=frozen ruts or ridges, /=not reported

4 extent of contamination, 1=20% or less, 2=11% to 25%, 5=26% to 50%, 9=51% to 100%

56 Depth of deposit 00=<1mm, 01-90=1mm to 99mm, 92=10cm, 93=15cm, 94=20cm, 95=25cm, 96=30cm, 97=35cm, 98=40cm or more, 99=no operational, /=not reported

78 Friction coef or braking action 28=coef .28, 91=BA poor, 92=BA med/poor, 93=BA med, 94=BA med/good, 95=BA good, 99=unreliable, /=not reported

CLRDR will replace middle 4 digits when cleared

Old Snowtam

- TTAAiiii = data designator for SNOWTAM = SW; AA = geographical designator for States, e.g. LF = FRANCE, EG = United Kingdom (see Location Indicators (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators); iii = SNOWTAM serial number in a four-figure group
- A – Aerodrome location indicator (four-letter location indicator).
- B – Eight-figure date/time group – giving time of observation as month, day, hour and minute in UTC;

–C – Lower runway designator number.

–D – Cleared runway length in metres, if less than published length (see Item T on reporting on part of runway not cleared).

–E – Cleared runway width in metres, if less than published width; if offset left or right of centre line, add “L” or “R”, as viewed from the threshold having the lower runway designation number.

–F – Deposit over total runway length as explained in SNOWTAM Format. Suitable combinations of these numbers may be used to indicate varying conditions over runway segments.

–G – Mean depth in millimetres deposit for each third of total runway length

–H – Friction measurements on each third of the runway and friction measuring device.

–BRD Brakemeter-Dynamometer

–GRT Grip tester

–MUM Mu-meter

–RFT Runway friction tester

–SFH Surface friction tester (high-pressure tire)

–SFL Surface friction tester (low-pressure tire)

–SKH Skiddometer (high-pressure tire)

–SKL Skiddometer (low-pressure tire)

–TAP Tapley meter

–Item J – Critical snowbanks. If present insert height in centimetres and distance from edge of runway in metres, followed by left (“L”) or right (“R”) side or both sides (“LR”), as viewed from the threshold having the lower runway designation number.

–Item K – If runway lights are obscured, insert “YES” followed by “L”, “R” or both “LR”, as viewed from the threshold having the lower runway designation number.

–L – When further clearance will be undertaken, enter length and width of runway or “TOTAL” if runway will be cleared to full dimensions.

–M – Enter the anticipated time of completion in UTC.

–N – The code for Item F may be used to describe taxiway conditions; enter “NO” if no taxiways serving the associated runway are available.

–P – If applicable, enter “YES” followed by the lateral distance in metres.

–R – The code for Item F may be used to describe apron conditions; enter “NO” if the apron is unusable.

–S – Enter the anticipated time of next observation/measurement in UTC.

–T – Describe in plain language any operationally significant information but always report on length of uncleared runway (Item D) and extent of runway contamination (Item F) for each third of the runway

–Runway contamination – 10% – if less than 10%

–Runway contamination – 25% – if 11–25

–Runway contamination – 50% – if 26–50%

–Runway contamination – 100% – if 51–100%

New Snowtam (Nov 2020?)

Aeroplane performance Section

–Item A - Aerodrome location indicator

–Item B - Date and time of assessment

–Item C - Lower runway designator number

–Item D - Runway condition code (each runway third)

- Item E - Per cent coverage (each runway third)
- Item F - Depth of loose contaminant (each runway third)
- Item G - Condition description for each third
- Item H - Width of RWY to which the RWYCCs apply

Situational Awareness Section

- Item I - Reduced runway length
- Item J - Drifting snow on the runway
- Item K - Loose sand on the runway
- Item L - Chemical treatment on RWY
- Item M - Snow banks on the runway
- Item N - Snow banks on the taxiway
- Item O - Snow banks adjacent to the runway
- Item P - Taxiway conditions
- Item R - Apron conditions
- Item S - Measured friction coefficient
- Item T - Plain language remarks

RVSM OpSpec B046 (FL 290 to FL 410 inclusive) FOM 7.1.3

Min equip. see limitations

Limit over/undershoots of cleared flight level to 150 feet.

Limit rate of climb/descent to 1,000 feet per minute when within 1,000 feet of cleared flight level and near other aircraft. SP.11.13

RVR

Visibility Less Than ¾ Mile or RVR 4000 (1200m)

- runway considered wet
 - Precision instrument runway markings or runway centerline lights are required for initiation of an instrument approach
- far end RVR is advisory only and may sub for rollout only*

SATCOM call For US numbers enter 0011 before the area code.

security see jumpseaters

SLOP FOM 7.1.6 /AC No: 91-70A

NAT/Pacific/ANC/NY/OAK/SAN Juan and *illegal technique in Africa non-radar*

[Skyguideonline.com](http://skyguideonline.com)

SeatGuru.com

Seat won't move electrically...check red on/off switch

See and avoid FOM 2.4.8

Shortwave Radio Freq's

[BBC](#) [North American List](#) [NPR](#) [VOA](#) [General worldwide](#)

Initial **taxi** clearances should be written down. Write down non-standard or complex ATC taxi instructions;

Have an airport diagram displayed prior to initiating, and during, taxi. Check the assigned taxi route against the diagram with special emphasis to potential incursion areas or points (HOTSPOTS) FOM 6.1.4

<standard **takeoff minimums** FOM 6.1.11/QRH OI.AWO.8

Initial **Turn After Takeoff in VMC** Climb to 400 feet above the runway elevation, prior to making the initial turn after takeoff.

If an immediate turn is specified on the departure procedure or required by the local ATC authorities, maintain a minimum bank angle commensurate with safety until reaching 400 feet above the runway elevation. FOM 6.1.7

SMGCS

in US must have below RVR 1200

foreign below RVR 400M (may be called LVP)

advanced below 600RVR has charts w/# hold points

ie JFK has mins of 600RVR

Where inadequate fillets and clearances exist at turning points, or other locations, along taxi routes used for operations below 600 RVR, the letters "OS" in a diamond will be depicted on the appropriate chart. This notation will identify specific locations where it may be necessary to

intentionally oversteer the corner to ensure that the inside main gear remains on the paved surface.

special airport

"Q" on OFP

in the previous 12 months

- any operating crewmember made entry w/ takeoff and landing (sim also) ?????? even more confusing now
- review airport pictorial pages
- view video
- or forecast 1000' above MEA,MOCA, initial apprch alt. and vis >= 3 miles at ETA

fo's must have >=100 hrs. in type for takeoff or landing (or LCA)

UHPP, first entry day vfr

CIS, & PRC, all airports special except those listed in

Speed [FAA FAQ pdf](#) On a STAR, the last published speed is the same as a controller assigning you the speed. You should not decelerate until the controller has cleared you for an approach or authorized you to slow. You should always request a slower speed, if operating conditions dictate. Note: Be cognizant of the 200 KT maximum speed permissible when operating below the floor of Class B Airspace - 14 CFR 91.117.

domestic min safe is approved below 10,000'/ int'l 250 at(maybe) & below 10,000/ actual speed if noted on chart FOM 13.1.9

supplemental flights (FLIGHT RELEASE on OFP)

threat levels

- 11 disruptive behavior
 - 2 physically abusive behavior
 - 3 life threatening
 - 4 flight deck breach or attempt
- location 5R

TLR see -8 section

Thrust Reversers one may be inop for CAT II/III

Transfer of Control pertinent information concerning automation, navigation, and configuration

TWIP severe wx at apts w/terminal doppler radar, under ATS menu on ACARS, text every 1min, graphics 5min(may be 15 - 20 min old) M is microburst(>30knts) G is gustfront ATL, BNA,BWI,CVG,DFW,EWR,FLL,HOU,IAH,ICT,MEM,MIA,ORD,PBI, SDF,STL,TPA

Trim see bulletin 80, may be incorrect for anomaly, FMC calculated gross weight, derate thrust setting, c/g, -8 flap

Uniform shirt and tie are required at all times in public areas.

On cargo flights, the uniform tie may be removed on the airport ramp and in the aircraft. On passenger flights, the uniform shirt and tie must be worn on the ground when in the view of the customers. On all flights, casual attire may be worn during cruise except when out of the flight deck on live passenger flights. In this case the uniform slacks and shirt must be worn.

Volcanoes FOM 8.1.46

General information [Links to different graphics and warning sites](#) [Ash warning messages and graphics for north and central America](#)

<http://www.ssd.noaa.gov/VAAC/washington.html>

<http://www.nnvl.noaa.gov/>

new volcanic ash procedures <20NM contact dispatch one hour prior to terminal area ops, takeoff and landing alt. required

on ipad, in map view, symbols on right bottom... click < and then other to enable volcanoes, also enable volcanic ash advisories at bottom of weather layers

Weather

RAMTAF preceding the TAF instead of WSITAF is a EWINS forecast

Use worst case scenario for BECMG forecasts i.e. earliest for decreasing wx and latest for increasing wx
Takeoffs, approaches, and landings are not authorized when runway-specific wind shear or microburst alerts are in effect for the intended runway of use. FOM 8.1.34

Flights will not be dispatched through or near **thunderstorms**.

In the terminal area, takeoffs, approaches and landings should not be attempted when thunderstorms are near the airport unless the runway and flight path are clear of thunderstorm and its associated gust front. FOM 8.1.28 separation between individual thunderstorm cells are the following minimum distances:

- 5 miles below 10,000 feet
- 10 miles between 10,000 and 25,000 feet
- 20 miles at or above 25,000 feet

Takeoff limits see 10-9 page, **QRH 01.AWO.1**, FOM 10.1.46 standard ½ mile(800m) / 2400 RVR (750m) touchdown lower than standard takeoff mins

if using displaced th for to and no cl lights, min 1000RVR??

Takoff Alternate required when field below Cat 1 mins or can't return or volcano, FOM 7.1.14 (*I'm guessing they meant Cat 1 or airport minimums...whichever higher...which is what I'll be using*)

- withing 2 hours normal crz, still air, 1 eng inop i9
- **-8 400** 900nm (**LCF** 800nm)
- dispatcher should provide name, ETE, and fuel burn

destination weather at or above landing mins at ETA

no alternate required if:

- domestic** (3 - 2 - 1 = 0) (DISPATCH RELEASE on OFP)
 - <2000/<3
 - ETA +/- 1 hr.
 - if **both** marginal(≤ 600 & ≤2) one additional alternate designated
- flag** (6 - 3 - 2 - 1 = 0) (DISPATCH RELEASE on OFP)
 - < 6 hours (including POR to dest. for redispach)
 - 2000/3 and
 - 1500(for circling)/2 above lowest published minima
 - ETA +/- 1 hr
 - (2)approved route without available alternate & airplane has 2 hrs fuel
- supplemental (FLIGHT RELEASE on OFP)
 - alternate required unless island rule

alternate weather (if required) must be (FOM 7.1.12)

- VFR descent and landing from MEA in VFR conditions at ETA
- one approach add 400' & 1SM (1600m)
- two approaches add 200' & 1/2 SM (800m) to higher approach mins.
- one cat II 300' and 3/4sm (1200m) or RVR 4000 (1200m)
- one cat III 200' and 1/2sm (800m/700m intern'l) or RVR 1800' (550m)
- published alt. Mins on approach procedures will not be used
- conditional forecast below above must be taken into account
- alternate wx at or above landing mins at ETA for extended overwater flights(>50nm)

ETP airports, at ETA weather at/above applicable charted

approach mins for intended approach FOM7.1.31

Weather Codes

+FC Tornado/Waterspout
BCFG Patchy Fog
BR Mist (vis 5/8SM or more)
CB cumulonimbus cloud
DRDU Drifting Dust
DRSA Drifting Sand
DS Duststorm
DU/BLDU Dust / Blowing Dust
DZ/FZDZ Drizzle/Freezing Drizzle
FC Funnel Cloud
FG Fog (vis < 5/8SM)
FU Smoke
FZFG Freezing Fog
FZRA Freezing Rain
GR Hail (aprx 1/4" dia or more)
GS Sml Hail/Snow Pellets
HZ Haze
IC Ice Crystals
MIFG Shallow Fog
PL/SHPL Ice Pellets/ Showers
PO Well developed Dust/Sand Whirls
PRFG Patchy Fog on part of Arpt
PY Spray
RA/SHRA Rain / Showers
RE recent
RSN/BLSN Drifting / Blowing Snow
SA/BSA Sand / Blowing Sand
SG Snow Grains
SHGR Hail Shower
SHGS Sml Hail/Snow Pellet Showers
SN/SHSN Snow / Showers
SQ Squalls
SS Sandstorms
TCU towering cumulus
TS Thunderstorm
UP Unknown Precipitation
VA Volcanic Ash
VV vertical visibility
WS wind shear
/// *unreported*
\$ *unreliable*

Weight and Balance

- Weight & Balance Vol I **increased** ZFW (if no sable???)(>276.6)
- 4.1.3 acm weights
- 3 max diff for new w/b 300kgs, how to fill in forms
- 12.1.7 non standard fuel load, must provide capt. Copy of table used with flight #, date, registration
- 10 mel for loading sys
- 26 dangerous goods (vol II)

The Loading Agent's name and signature is required, unless there is no payload, or the payload did not change from a previous flight. (i.e. tech stop, payload is transit cargo, or in the case of diversion) The Captain's signature on the form is confirmation of receipt by the flight crew. When qualified ground personnel are not available to prepare or provide the form, the Captain will contact Operations Control in the GCC. The Captain is not responsible for the preparation or accuracy of the form. Low gross weight supp sp.1.2

non standard fueling table must be provided for non std fuel

loads and attached to w&b, x out norm table on form
last minute changes up to 300 KGS (661 lbs) or .5%MAC for
payload, number of people, COMAT, etc.
Captain may make changes with concurrence of person who
prepared form at his discretion FOM 14.1.2
Captains must initial any pen and ink changes made to the
Load Manifest (weight and balance) form.
dispatch time/initials for name, weight, BOW, ACM etc.
should get sable aheadof time for tech stop...contact dispatch
passenger wt and balance in Passenger operating manual
BOW doesn't have ACM's, cabin crew
DOW also includes catering, water, etc.... not listed on form

imbalance is in percent of max imbalance, ok to 100%
captain must sign both DG and SC (special cargo) NOTOCs
manual computation, BOW = dry op. wt. + ACM(W&B ch. 4)
tires W&B table 4.1.5
OFP Weight Limits are identified by:
-S - Structural (AFM limits)
-I - Inserted by Dispatcher
-P - Performance (AeroData)
3 letter hazmat codes on loadplan can be decoded on back of
hazmat quick ref sheet
Winds SP11.28
Put 2000 in step climb before requesting will give 2k winds

DC Buses		
Battery OFF	AC bus 1 → Ground Service Bus (battery chargers)→ Backup is respective battery→	
	APU hot battery bus –3 IRU's DC power (will run DC or AC) –both outflow valves –APU inlet door –APU primary controller	main hot battery bus (fire <u>protection</u>) –all <u>fire extinguishers</u> (including engine fire switch unlocks) –spar fuel valves –APU fuel shutoff valve
Battery on	AC Bus 3 →DC bus 3 → Backup is respective hot battery bus.→	
	APU battery bus powers –engine fire/overheat detection loops –APU fire detection loops (and horn) –APU DC fuel pump –engine start air control –FO, cargo, service interphones, PA	main battery bus powers – <u>fuel valves</u> (all engines), –manual pressurization control –all crossfeed valves –trailing edge flap control –APU alternate controller –dome, storm, and selected indicator lights –IDG disconnect (all engines) –Captain’s interphone, L VHF (and tuning panel)
	ISFD (N418MC) dedicated battery/charger, up to 150 minutes after loss of power to the main battery bus.	
Ground Handling and Service Buses		
	AC bus 1 →	
	Ground Service Bus –main and APU battery chargers –fuel pumps for APU start –flight deck flood, navigation, and service lights –miscellaneous service outlets and equipment	
	can be connected to APU1 or EXT 1 with ground service switch at L1 on freighter, L2 on passenger	
Ground Only	Ground Handling Bus (ground only) Powers (stuff below wing) –lower cargo handling equipment and compartment lights –fueling system –auxiliary hydraulic pump 4(1) →powered when APU 1 or EXT 1 is available, defaults to EXT	Main Deck Cargo Handling Bus –main deck cargo handling equip –interlock prevents APU or EXT from simultaneously powering main bus and main deck cargo handling bus –LCF lights??? →powered when APU2 or EXT2 is available (at least one not selected) ,defaults to EXT

Handling buses only powered on ground

3-1-2, L-C-R

L (3) capt transf and both standby busses, both batt busses

C (1) is service bus & backs up standby & transfer buses

R (2)FO Transfer bus

transfer buses allow critical systems to be powered by a different bus when the sync bus is bad

AC Buses

AC bus 3 → Captains transfer bus→ or AC bus 1→Captains transfer bus→ or apu batt→apu hot batt bus→batt switch→apu stby inverter→ APU standby bus <u>Left PFD, ND, FMC</u>	AC bus 3 → or AC bus 1 →ground service bus (or main batt)→main hot batt bus→batt switch→main stby inverter→ <i>(main battery powers main standby bus for a min of 30 minutes)</i> Main standby bus –Left – CDU, EIU, ILS, VOR –primary EICAS display –standby ignition for all engines –various flight control components –standby instrument lights – RMI (N409MC - N429MC, N496MC - N499MC, N-PA, N-SG)
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AC bus 2→ or	AC bus 3→ or
Backup AC bus 1→	Backup AC bus 1→
–First Officer's Transfer Bus –Right – PFD, ND, EIU, FMC, CDU, ADC, EFIS control –Autothrottle servo –Lower EICAS display	Captain's Transfer Bus –APU standby bus (Freighter). –Center EIU –Left HF –center ADC (SG, 429, PA, 464, 465)

Main AC Buses

C	R	L	AC bus 4
–AC bus 1 ground service bus hence hot batt buses back-up transfer busses	AC bus 2 First Officer's transfer bus	AC bus 3 Captain's transfer bus (hence APU Standby Bus) main standby bus DC bus 3 – both battery buses	Passenger stuff DC bus 4 - emergency lights DC bus 4 – APU TR
DOOR U/D FLT LK ELEC AC BUS 1 FUEL PUMP 3 FWD FUEL PUMP 2 AFT ENG 1 EEC MODE OUTFLOW VLV ANTISKID HEAT P/S L AUX HEAT P/S CAPT ENG 1 REVERSER >BLEED 1 OFF >NO LAND 3 >IRS AC CENTER >YAW DAMP LWR HEAT TAT (at landing) >IDLE DISAGREE (at landing)	DOOR U/D FLT LK ELEC AC BUS 2 FUEL PUMP 1 AFT ENG 2 EEC MODE ANTISKID ENG 2 REVERSER AILERON LOCKOUT WAI VALVE RIGHT WAI VALVE LEFT HEAT WINDOW R ELEC UTIL BUS L >BLEED 2 OFF >NO LAND 3 >ATC RIGHT >IRS AC RIGHT >YAW DAMPER LWR SPEEDBRAKES AUTO (at landing) >IDLE DISAGREE (at landing)	ELEC AC BUS 3 FUEL PUMP 2 FWD FUEL PUMP 3 AFT ENG 3 EEC MODE ANTISKID TEMP ZONE ELEC UTIL BUS R SPEEDBRAKE AUTO >ATC L >FUEL JETT A >BLEED 3 OFF >NO LAND 3 >IRS AC LEFT >JETT NOZZLE L	ELEC AC BUS 4 ENG 4 EEC MODE ANTISKID ELEC UTIL BUS R >FUEL JETT B >BLEED 4 OFF >JETT NOZZLE R BLEED ISLN APU BLEED ISLN R BLEED ISLN L HEAT R TAT HEAT WINDOW L HEAT R AOA HEAT P/S R AUX HEAT P/S F/O IDLE DISAGREE (at landing)

1- gold 60, 2 ,3 -chart 8, 4

FMA INDICATIONS			
Pre takeoff	TO/GA TO/GA LNAV VNAV FD		
TO/GA	THR REF TO/GA TO/GA LNAV VNAV		
65 knots 85 knots – RTO armed 100 knots – Baro snapshot	HOLD TO/GA TO/GA LNAV VNAV	V2 +10 to +25	
50'	HOLD LNAV TO/GA VNAV		(V1,Vr removed at liftoff) HDG SEL avail
250'	HOLD LNAV TO/GA VNAV CMD		AUTOPILOT TO CMD
400'	THR REF LNAV VNAV SPD		
1500' or flaps 5	THR REF LNAV VNAV SPD		Climb thrust
Accel ht.	THR REF LNAV VNAV SPD	Flap – 5 knots	(V2 removed when flaps retracted)
Flaps up or level off	THR REF LNAV VNAV SPD	Vref + 100 or Spd. limit(250)	
Speed restriction 10,000'	THR REF LNAV VNAV SPD	Econ climb speed	
15,000'	THR LNAV VNAV SPD		????
Level off before cruise	SPD LNAV VNAV ALT		
cruise	SPD LNAV VNAV PTH	Econ cruise speed	
DES NOW BEFORE 50	IDLE/HOLD LNAV VNAV SPD		
DES NOW W/IN 50	THR LNAV VNAV SPD/PTH	1250'/min	
FLCH	IDLE/HOLD LNAV FLCH		
T/D	IDLE/HOLD LNAV VNAV PTH		
PATTERN	SPD HDG ALT LOC G/S		
LOC & G/S CAPTURE	SPD LOC G/S		TO/GA ARMED THRUST REF is GA
	SPD FAC GP		-8
1500'	SPD LOC G/S ROLLOUT FLARE LAND 3		
50'	SPD / IDLE LOC FLARE ROLLOUT		
5'	IDLE ROLLOUT FLARE		
TO/GA	THR TO/GA TO/GA		

NORTH AMERICA



803464AI (G00694) 6-10





803467AI (G00186) 6-10

EUROPE



803462AI (G00772) 6-10

MIDDLE EAST



803463A1 (G00412) 6-10

ASIA



803460AI (G00543) 6-10

SOUTHEAST ASIA



803409AI (G00834) 6-09

AFRICA

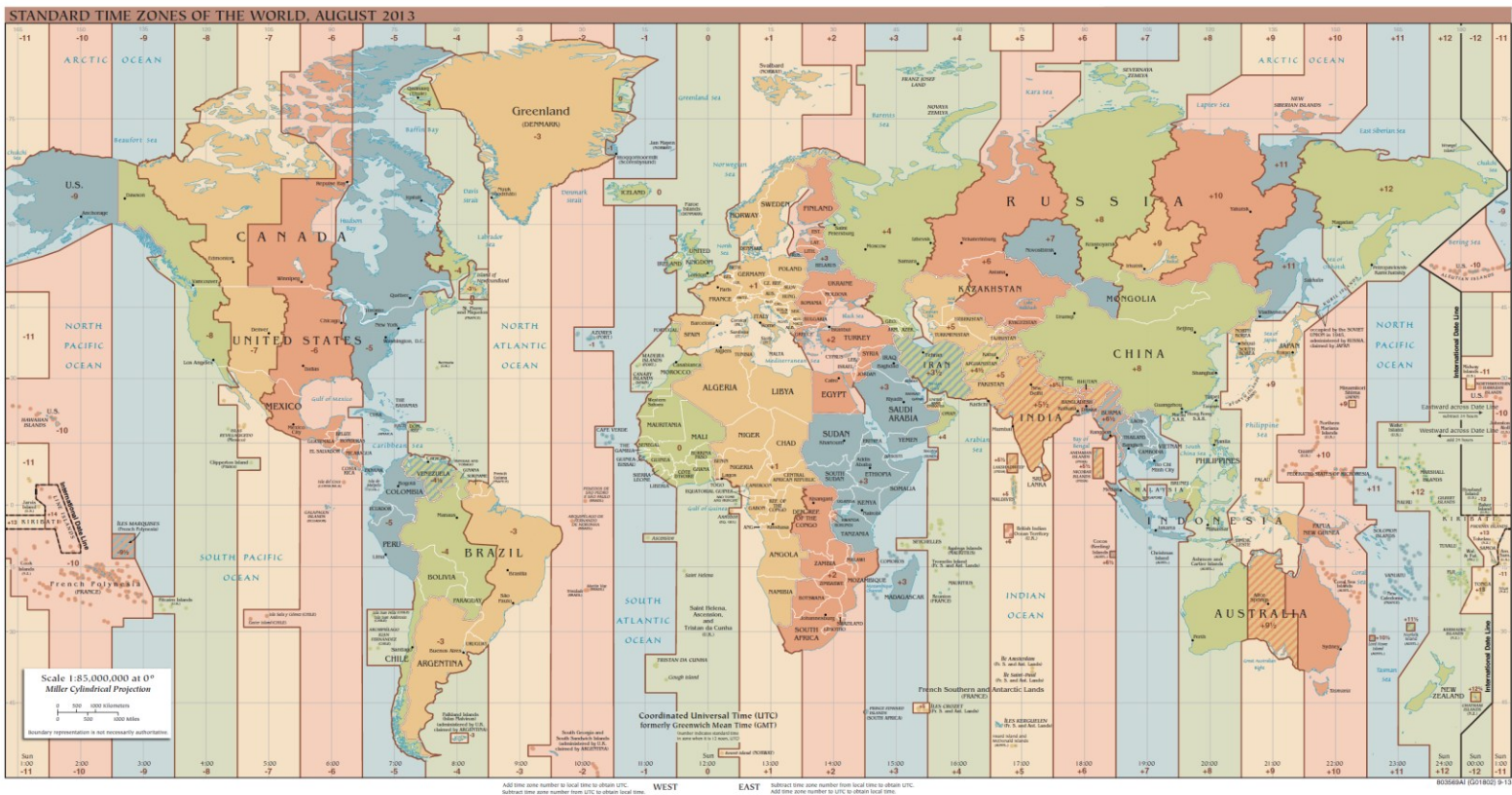


803459AI (G00392) 6-10

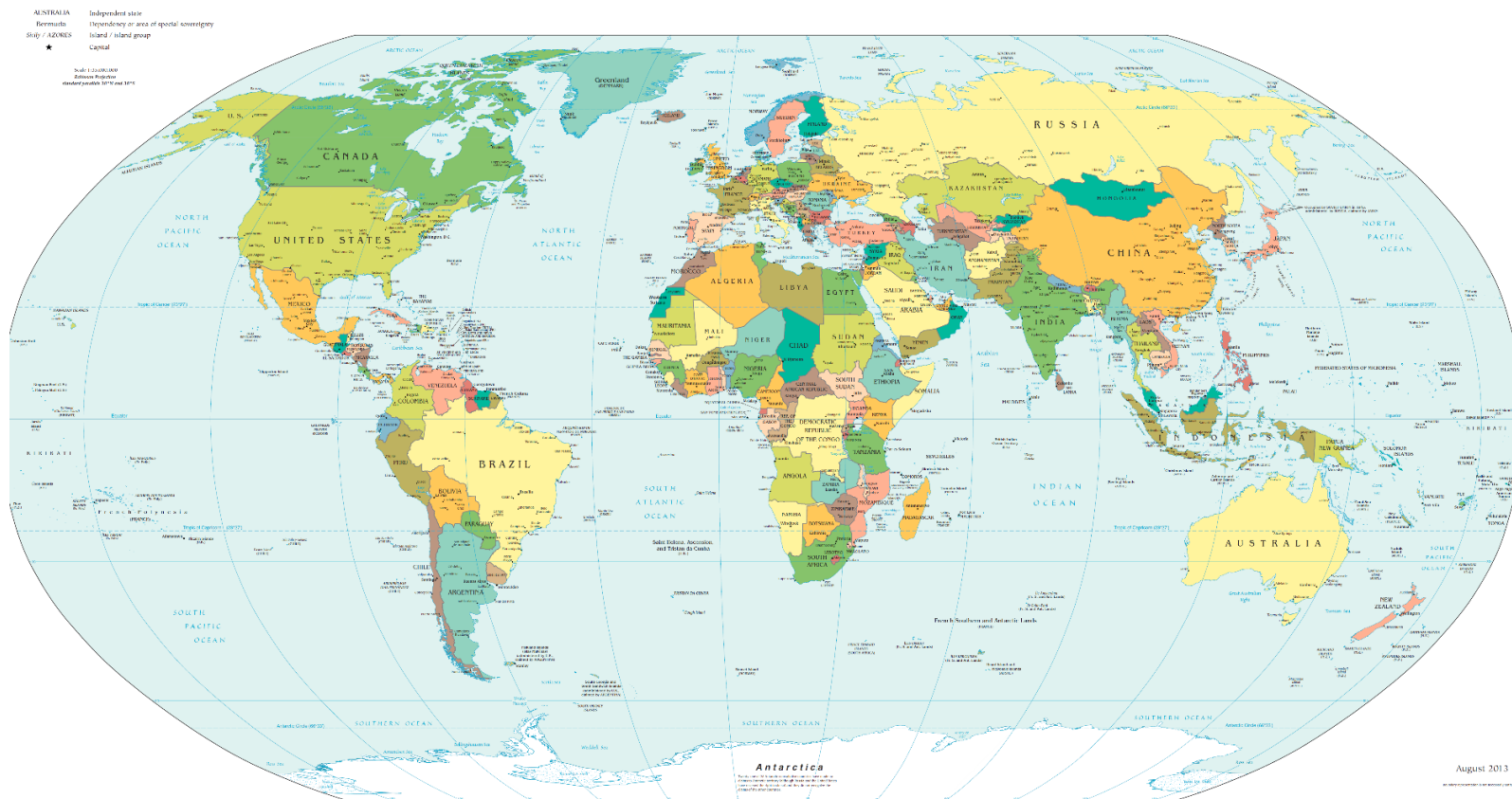
ARCTIC REGION

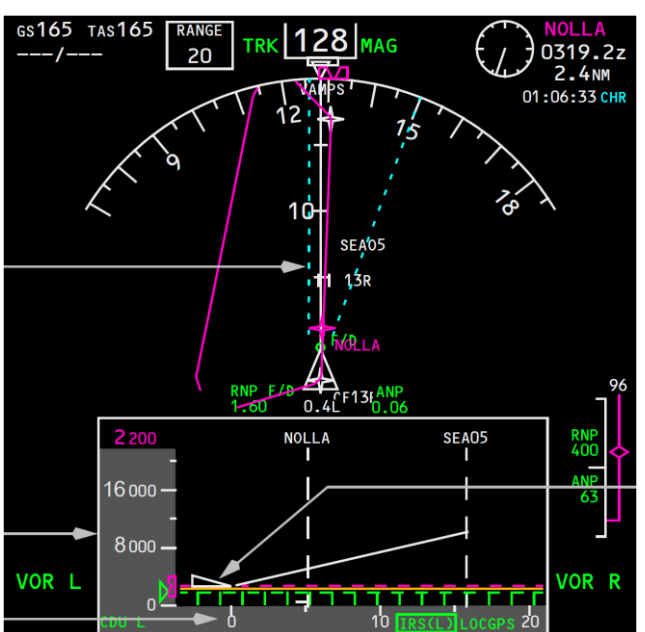
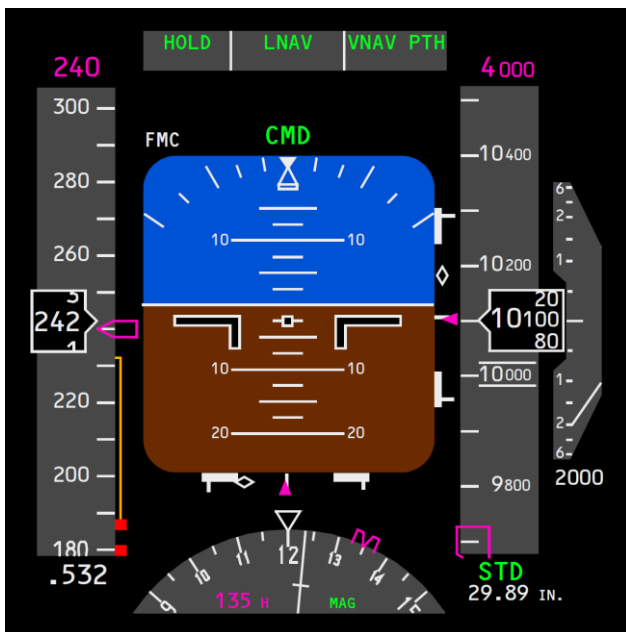
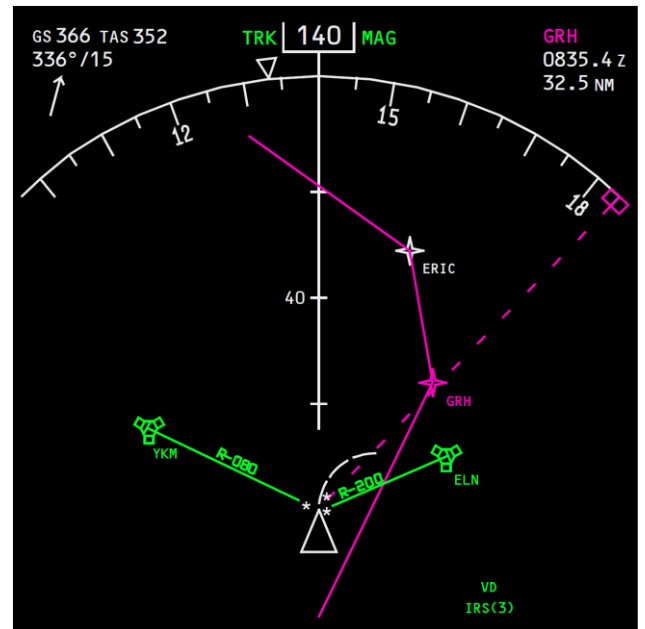
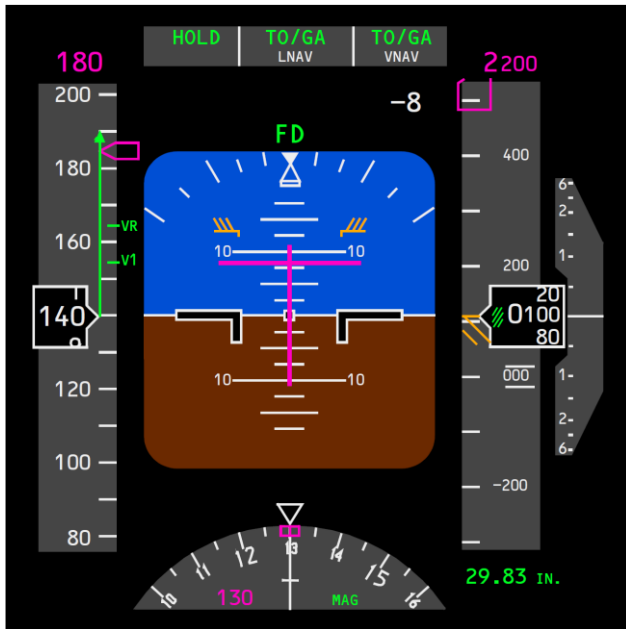


803400AI (G01486) 6-09



Political Map of the World, August 2013





NORMAL MENU RESETS NON-NORMAL MENU

►FLAPS CONTROL◀

NOTE: Use flaps 20 and VREF20 for landing.

-----DEFERRED ITEMS-----

→ APPROACH

→ ALTN FLAPS ARM switch.....ALTN

→ ALTN FLAPS selector.....EXT

Monitor airspeed during extension.

CHECKLIST COMPLETE EXCEPT DEFERRED ITEMS

NORMAL ITEM OVRD NOTES CHKL OVRD CHKL RESET

Duty Time Limitations											
			Report for Duty ¹	Scheduled Limit	Operational Limit	Operate Followed By DH	Reserve Followed by Flight Duty	Article 33 Scheduled Limit	Article 33 Operational Limit	Land	
Two Person	Day	0500- 1559	13:00	15:00	16:00 ²	16:00					
	Night	1600- 0059	11:30	13:30	16:00 ²	15:30					
	Critical	0100- 0459	9:30	11:30	16:00 ²	13:30					
Three Person ⁴			14:00	17:00	18:00 ³		14:00	17:00			
	R-2, R-3		18:00	21:00	22:00		18:00	21:00			
Four Person			18:00	20:00			20:00	22:00	2		
	R-2, R-3		22:00	24:00			24:00	26:00			
¹ Domestic – Local Base Time; International – Acclimated Report Time (as defined by Part 117) ² A Crew Member shall not be required to deadhead by commercial air following flight Duty in the critical period except when deadheading to Base. ³ The portion of this duty period relating to the operation of flight(s) may be no greater than 14:00 consecutive hours (scheduled) or 17:00 consecutive hours (operational) <i>Dh followed by operate is the same??? Loose the column</i>											

International landings, scheduled <= 3 in duty period (one more with union pres approval), one additional for operational, duty day >14 hours with >2 landings will have min 2 captains

GDO (25P) 4 per year, only one per trip pairing, last month October, submit 5 days prior to GDP day, if delayed for WX,MX,ATC(on flight to base) you'll get it back (before Oct.),12 hour pay if not returned to base

Anti-icing			
	Ground ¹ OAT is 3 °C or below and anti-ice is required	Before Takeoff OAT is 3 °C or below and anti-ice is required	Flight ⁴
400 GE	Min 60% N1 ~ 30 seconds ≤ 30 minutes	min 60% N1 ~ 30 seconds and confirm stable engine operation before the start of the takeoff roll.	Nacelle anti-ice must be AUTO or ON
400 P&W	Min 50% N1 ~ 1 second ≤ 15 minutes.	min 50% N1 and confirm stable engine operation before the start of the takeoff roll.	Nacelle anti-ice must be AUTO or ON
-8	min. 40% N1 ≥ 5 seconds ≤ 60 minutes. ²	Min 40% N1 ≥ 5 seconds duration, confirm stable engine operation and ensure engine vibration indications are below 4 (run up to 55% may be done)	Engine anti-ice must be AUTO or ON

¹ Nacelle/Engine anti-ice must be selected ON immediately after **all** engines are started and remain on during all ground operations when OAT (ground) or TAT (flight) is ≤ 10 °C and ≥ -40 °C OAT), and visible moisture (vis ≤ 1SM or 1600m) or ground clutter

Takeoff with light coatings of **frost**, up to 1/8" (3mm) in thickness, on **lower wing surfaces** due to cold fuel is allowable; however, all leading edge devices, all control surfaces, and upper wing surfaces must be free of snow, ice and frost. Thin **hoarfrost** is acceptable on the upper surface of the fuselage provided all vents and ports are clear.

Extremely cold. (SP.16.3) altitude corrections(-30)(SP16.8 **-8** demand pumps(-18 °C) and **-8** delay generators 2 minutes(< -35 °C for >4 hours), **400** (< -30 °C for >4 hours) MX must preheat engines fuel systems before start. [Additional info online](#)

² **-8** Operation in icing conditions can result in engine vibration indications above the normal operating range during ice shedding. If engine vibration indications are available and high engine vibration indications occur, run-up to 55% N1 or higher. If takeoff is not completed within 120 minutes total taxi time (including taxi-in, taxi-out, and ground holds), the engines must be inspected according to the AMM before takeoff, and if needed, manually de-iced. If needed, refer to previous flight Aircraft Log page for Taxi-in time.

After landing, Ice on flaps or airframe or **contaminated runway** → Do not retract the flaps to less than flaps 25

⁴ with no AUTO position, when TAT is ≤ 10 °C and ≥ -40 °C OAT), and visible moisture exists (vis ≤ 1SM or 1600m) should be ON, *~be proactive with no AUTO position, don't wait for visual cues (no AUTO assumes no ice detection or only advisory sys)*

Fan Ice Removal.... Caution ! GE GENX If moderate to severe icing conditions are encountered during flight for prolonged periods with N1 settings at or below 70%, or when fan icing is suspected due to high engine vibration, the fan blades must be cleared of any ice. Do the following procedure every 10 minutes on all engines, one engine at a time: increase thrust to a minimum of 70% N1 for 10 to 30 seconds.

400 GE CF-6 Ice crystal icing (see QRH) (ICI) primary ice detection(AUTO position) does not detectmust be turned ON, TAT is ≤ 10 °C (including below -40 °C OAT), ≤ 22,000' WAI ON (until flaps out), ICI exists with visible moisture and one or more

- amber or red radar returns below a/c
- appearance of liquid water on windshiled when too cold for rain(sounds different)

- autothrottle is unable to maintain selected speedbrake
- TAT stays near 0 C (may give erroneous indications) L10.21

Dispatching a flight into known or forecast severe icing conditions is prohibited. FOM 7.1.12

Caution ! Do not operate nacelle or wing anti-ice when TAT is above 10 °C

no icing detection N747BC/N419M

Nose Check (Pre-Takeoff Check as defined by the FAA)

-Nose Check Representative Aircraft Surfaces

- Windshield Wiper Mechanism
- Fuselage Nose

- Perform a Wing Check if:

- the Nose Check is inconclusive;
- the holdover time will be exceeded prior to takeoff;
- the holdover times are uncertain due to changing conditions.

Wing Check (Pre-Takeoff Contamination Check as defined by the FAA) visual inspection of all representative aircraft surfaces (wing area upper surfaces, wing leading edges, engine inlets.) which are visible from any window while onboard the aircraft.

- The Post De/Anti-icing Check qualifies as a Wing Check if -accomplished within 5 minutes of takeoff.
- This check is performed by the flight crew and is required:

- when the Nose Check is inconclusive;
- when the holdover time is exceeded prior to takeoff;
- when military fluids are used;
- during conditions of heavy snow (provided Type IV fluid used).

-The **Wing Check is not authorized** when the holdover time has been exceeded and the following conditions exist:

- Type I fluid has been applied during freezing drizzle, light freezing rain, or rain on cold soaked wings (return for de/anti-icing);
- Type II or Type IV fluid has been applied during freezing drizzle, light freezing rain, or rain on cold soaked wings (return for External check or additional de/anti-icing);
- Ice pellets or small hail have fallen (return for de/anti-icing)

Takeoff must occur within **five minutes** of the most recent check

If there is snow or ice accumulation on the wing, consider delaying the flight control check until after deicing/anti-icing is accomplished.