A runway display may be created by manually selecting an appropriate VOR and the desired course

These methods provide a map display only are not reflected on the key page and cannot be tracked with CDI,

When possible enter the landing runway on the key or approach page
the runway display and associated extended centerline will then be available on the map to aid in maintaining position

Recommended Flight Path Angle

ILS → glide slope angle 2.5° to 3°
Use ILS is available
If not available use 3° descent

Make sure if the airplane is below the glide path near runway threshold

Do not continue to follow glide slope indication

Vehicle decision height

Select a visual aim point about 1,000 ft past the threshold and adjust the landing profile to a visual approach.

Install a sight float at ~35 ft will provide adequate threshold clearance at a touchdown point about 1,000 ft down the runway.

Visual Approach Slope Indicator

747-400 requires a 3 bar VASI which provides two visual glide paths.

The second glide path (upper) is about 1/4 higher than the first and is intended for use only by flight, cockpit, long bodied aircraft to provide sufficient threshold crossing height

The upper glide path is preceded by the middle and far bar. When the aircraft is on the upper glide path, the pilot will

see the middle and rear bars while and the four lower red.

Caveats

On runways where only 2 bar VASI systems are installed, DO NOT follow the glide slope indications because the difference between the eye reference path and the green path of the 2 & 2 results in a deceptively low approach with unacceptable insufficient threshold height & landing year touchdown may occur well short of the runway.

PAPI

Follow the "on glide path" indications of PAPIs at airports regularly served by B 727s.

Use PAPIs at other airports only with caution since reduced PAPIs may not provide adequate threshold crossing height for the B 727.

D55

Precision Approach Radar (PAR)

A PAR is an approach in which an air traffic controller provides lateral and vertical guidance to the pilot.

The PAR will be flown until the aircraft is established on the glide slope.

ILS

During reduced visibility conditions (below 3/4 mile or RVR 4000 ft. were anticipated aeroplanes to be manoeuvred parallel (CAT II and CAT III operations only).

Approach Preparation

Set the applicable approach on the PFD.

Category I → minimums are determined from the barometric altimeter and are referenced as a decision altitude (DA) DA is set using the MDA function of the DH/MDA selector.

Category II (Radar Altimeter Assisted)

DH Minimums → radar altitude are referenced as DH DH is set using the DH function of the DH/MDA

Category III (Radio Altimeter Not Authorized)
DH selected, set DH to zero and the DH displayed on the PFD.

Category III b - use (AP) radio altimeter decision height - (DH) as a decision point for continuing the approach.

Set the (AP) DH using the DH function of the DA (or DH) selector

Navigational Displays

All ILS navigational signal are displayed on the PFD and can also be displayed on the ND when EFIS panel APP mode is selected

When the flight director and localizer deviation exceed the localizer deviation scale change to the expanded scale when the localizer is captured

If the flight director or autopilot is not used the localizer deviation scale on the PFD will remain in normal scale during the approach.

The final approach track (magenta line) should be used along the same data to anticipate localizer interception

Begin the turn to the inbound localizer heading at the first movement of the localizer pointer.

By keeping the localizer deviation indication centered and the track line over the course line, the system automatically corrects for wind drift and little reference to actual heading is required.

ILS Approach

- When a complete ILS approach is flown, establish the flaps 10 maneuvering speed prior to starting the procedure turn. Monitor the map display and raw data to ensure the aircraft remains within the limits of the procedure turn.

If flying a transition route (No PT) or feeder route to final, slow to flaps 10 maneuvering speed approximately 3 miles prior to the OM or equivalent fix.

When descending on the localizer intercept heading, select the APP mode

on the MCP and observe the LOC and C/S assigned annunciations on the PFD.

When descending on the glideslope before reaching the center marker at equivalent fix, slow the flaps 10 maneuvering speed until later than 5 mile from touchdown,

Establish the landing configuration →

→ When maintaining a level altitude to the OM or equivalent fix, extend the gear and flaps 20. When the glideslope pointer leaves the upper peg and follow the speed to begin bleeding off.

→ When the pointer is one dot above the center position and the gear is down extend the flaps to 25 and slow to V_{REF} + 5 knots plus approach paid if required

MAGV

When descending on the G/S at flaps 10 maneuver speed, extend the gear and FLAPS 20 at 7 miles from the OM or equivalent fix and allow the speed to begin bleeding off. After the gear

volume, extend the flaps to 25 at a constant
power setting.

Speed should be at V_{REF} + 5 knots when crossing
the OM or equivalent fix

Maintain the
glideslope intercept, the PNF sets the
missed approach altitude in the
Mcdu control Panel altitude selector

Maintain the desired speed on final
until ready to begin the flare off towards V_{REF} speed

To ensure adequate terrain clearance
before the main landing gear, remain
on the glideslope at least until the main
gear has passed the runway threshold

No flaps

Flight Directors Missed Approach
Using FLCH. (Flight level change)

If the Flight Directors is active and a missed approach became necessary.

- Simultaneously apply go around thrust and press either TO/GA switch if autothrottle are available

- Retract the flaps to 10.

- After a positive rate of climb is indicated retract the landing gear.

- After 400ft AGL call for LNAV or Heading select

- When climbing through 1000ft AGL
  - Call for FLCH.
  - Call for the speed select to V2+

Manual Missed Approach

- Apply go around thrust call for FLCH SPD
- and rotate to intercept the go around pitch attitude of 15°

When a pressure rate of climb is made called retract the landing gear.

At 1000ft AFE, retract flap using the same procedures as for takeoff.

ICS Approach - Engine temperature is the same as with all engine

Missed Approach - Engine temperature same but PT must provide additional rudder and the go-around pitch attitude with an engine out is 13°.

Automatic Approach & Landing

Autoland only in CAT II & III and when CAT I and 2 or Cat 3 is announced on the PFD and reportable.

Any peak deviation the autopilot

Wind Tailwind speed in the approach phase will be by HEADING SELECT, sometimes LNAV

If a complete approach procedure is being flown with the FMC, the LEGS page sequence altitude restriction must be deselected ATC clearance and MCP altitude selected manually

Note

To prevent a false capture of the GS the MCP must be initially set to a value higher than the glide slope intercept altitude approved on the PFD

- Max intercept angle for the localizer 120°

- The glide slope may be captured from

The localizer and glideslope will be armed if the aircraft is below 8000 ft.

Use the LOC mode, to prevent a glideslope capture until below the glideslope

- Selection of the APP mode arms the remaining modes for the multiple normal approach.

- Localizer capture is annunciated by the LOC on the annunciation of the PFD, usually accompanied by a green box. The CRS deviation

- The go around mode is armed when the glideslope is captured or flaps are extended.

After localizer capture the missed approach intercept heading may be preselected

Extend the gear and flaps as demanded in the SMAC procedure in the ILS app

Under 1500 ft mode annunciation will be FLARE

and ROLLOUT modes are armed and the PFD Autoland status displays the automatic landing capability of the system.

Autoland status annunciation (and) means that the autopilot system is fail operational.

Autoland status annunciation, (AND) means that the autopilot is fail passive.

(AND) or (AND) annunciation should mean that localizer & glideslope signal are being received

Check if (Signal) received, proceed descending

At 400 ft radio altitude, plane goes to ~~goals~~ goals for ~~using~~ descent altitude

From 400 to 60 ft radio altitude the plane FLARE is engaged + 25 ft the thrust levers retard

At 5 ft the ROLLOUT mode is engaged & Taxiways

At these cases, speeds are extended and automatic tracking stops

Reverse thrust demand the aircraft throttle

ILS localizer false courses when pedal select APPROACH mode from NAV SEC or CDU.

Warns 8° to 35 upwind from the published localizer course.

To minimize a false course capture during ILS approach

→ APPROACH mode should not be selected until sufficient steering signal is received from the beacon. Verified by the presence of a illuminated localizer deviation indicator and the glide slope deviation indicators on the PFD (localizer / glide slop diamonds)

→ If a false course capture occurs, it may be necessary to deselect and re-arm

the APPROACH mode in order to achieve a successful automatic approach on the correct localizer course

Automatic Missed Approach Using FLCH

~~To perform an automatic missed approach~~

Caution:

The TO/GA switch must be pushed before the aircraft descend below Acceptance plus two seconds to initiate the automatic go around. If pushed after the aircraft the go around continues.

- Push TOGA - Second switch this will cause the Thrust Lever to advance thrust and the airplane to initiate a go around pitch attitude.
- Retract the flaps to 10
- + Make a retract speed
- Ensure proper missed approach altitude is set in Mode Control Panel (MCP)

- After reaching a safe altitude > 400ft AGL & select LNAV or HEADING SELECT

Note: The
— after 1000ft select FLCH
- select spd to V_{ref} or Flap hug + 10 (V_{FA})
if need to remain at intermediate flap

Caution

VNAV will not be used when executing a missed approach.
FMC must command a climb or descent to an altitude at or above the missed App Alt

Balanced Approach With Engine Inoperative

Same but increase heading

Category II Hamburhead

If the CAWS autopilot disconnect between the center marker and touchdown
⇒ Mis App

If below 1500ft RA, Autoland Status Annunciation (ASA) Head display (AHD) 2 or 1 and 3 → Mis App

Below 500ft
→ deviation from the glide slope or localizer in excess of 1/3 dot (A dot is the distance between the center index and the first dot either side are above or below Flat index) 1/2 of a dot on the expanded localizer scale can be considered 1/3 of a dot on the normal data scale

- Any autothrottle malfunction (ATA)
- Any failure indication on the ADI or PFD
- pedals in flight instrument

See Revised Approach Description on page 4-193-4.

Category III b Monitor approach

Same as CAT II but CAN ② 3 not caused ? < 3

Description

- Contact to 1st officer
- autopilot in the heading select mode
- autothrottle engaged
- extend flaps & slow to manoeuvre spd

- Select APP mode on MCP
Verify GS and LOC on PFD

- LOC active when it changes to green

- Glide slope active → speed down to flap 20 and slow to flaps 20 manoeuvre spd

- GS one dot above centered position
→ flap 25 (30) & slow to VREF

- Cross OM or fix check alt 1000 ft

→ Ensure Mis Approaches is MCP Stations

→ 1000ft cap based on Fleet Class

→ Call 2000ft

— Call 1000ft

if at 1000ft CAN 3 or Employees → Call 911

if not - Go - Records

Visual Approach & Landing

- In Traffic Pattern → Set at flaps 10 maneuvering speed

Downwind leg → 2000 AFE

Turn from Base to Final 3 miles

If downwind extended → 2000 ft until within 7 miles from Threshold
3000 / mile rule

Use ND in the HSI mode with its mileage scale and trend vector to help in defining flare turn

- Landing configuration & rule from Threshold

Select "TA Only" mode when established on final approach.

"See & Avoid"

Not below flaps 1000 ft

Touch n GO.

No autothrottle

Take off accuracy may exceed if flap not retracted until ramp when Vref level or achieved

Rotation at or slightly below VREF beg until ready

Initial climb 2° less than normal T/O pitch because of higher than spd

Landing

Warning

Do not exceed 5° bank during landing and roll out to avoid out board engine pod striking the ground. (GB strike

Use Autopilot autoland

Above 5° below 1000 ft AGL (to correct or to account for crosswind) GO Around

Threshold height

3° visual approach
main wheel crossing at 50 ft the threshold
To touchdown within 1000 ft of the runway

Visual Aim Point

Height flight deck
at 3° glideslope selected visual aim point 1500 ft
past the threshold

No Back Under

Flare and touchdown

Start Flare 30 ft above RVV by
increasing pitch attitude 7° then smoothly
reduce thrust lever to idle.

Hold sufficient back pressure on the control
column to keep the pitch attitude constant.

Do not allow the aircraft to float but fly the
aircraft onto the runway

If the aircraft bounce, hold or re-establish a normal landing attitude and add thrust to control rate of descent.

Thrust need not to be added for shallow bounce or skip.

If a high hard bounce occurs → Go around

Pitch and Roll limits

To prevent a tail strike during landing
- To touchdown at proper spd
- Stop nose up rotation at touchdown
- Do not initiate flare
- Do not allow the pitch attitude to exceed 5° during the flare and landing

Aural Tones

Generated by the ground proximity system
- 2,500 ft, 35 kt. & 20 kt

- 1,000 ft tone. Threshold for the warning tone. The aircraft should be past altitude to cause the runway threshold when tone sound.

At 35 ft (tcas) reduce the descent rate

At the 20 ft tcas, complete the flare and reduce the thrust lever to idle

The aircraft must continue to descend during the flare manoeuvre

Use of Reverse Thrust

Maintain up to max reverse thrust until the airspeed decreases to 80 KIAS.

By 80 KIAS start reducing reverse thrust, increase the idle reverse and store the reverse (maximum forward idle detent) by 60 KIAS

Can be use below 60 KIAS with slap

Warning: Do not go forward after reverse thrust has been initiated

Automatic Brakes

Select from autobrake system →
- Max Auto (less than full manual braking)
- 3 or 4: with or slippery or limited distance
- 1 or 2: deceleration for routine operations

Use autobrake rather than manual on limited RWY, slippery, crosswind, engine inoperative, poor weather

Select it before landing.
Autobrake activates when idle immediately after main gear touchdown.

During roll on autobrake, if pedal is felt, take over by manual braking.
Released autobrake by smoothly applying brake pedal forces until autobrake system disarms and then smoothly release pressure

Autobrake can also be disarmed by
→ Advancing any thrust lever after landing
→ Moving the SPEEDBRAKE lever Down
→ Selecting DISARM or OFF position

Flaps 30 Land.

If braking is poor or slippery R will increase to landing with FLAPS 30. (increase more + fluid)

25° flap landing gross weight will apply Use FCAPS 30 V_{REF} speed plus normal wind additive (minimum V_{REF} + 5) for approach.

Slippery Runway Operation

Raising the speedbrakes spoils the left of thrusting at this high speed and places 20% of the weight onto wheel

Manual Brake Stopping

- Aft to idle as initially braking (pull)
- Do not pump, modulate etc.
- Do not release until safe taxi spd

Anti skid system prevent excessive skidding on locked wheel

Do not pump

P79

Steering and Heading Control (on RWY)

If Braking decreases the less cornering ability

If the aircraft begins to "drift" from the desired track or if an undesired heading change is detected, decrease the braking immediately if autobrake used, disconnect

Reverse Thrust contributes to controllability problems during a landing roll, best on a slippery runway with a crosswind

To correct back to centerline, reduce reverse thrust to increase idle and release brakes

Use the rudder, steering and differential braking to proceed once correcting past the runway centerline

When re-established near the runway centerline, apply max braking and reverse thrust to stop the aircraft

Conditions → steer from centerline
Increased steering effort more than normal pedal pressures

Steep turns

180 KIAS in 45 bank. Constant altitude

- Set the commanded airspeed bug to 180 K
- Begin heading & altitude
- Pitch attitude 3° nose up.
- Roll in
- Increase in left pressure to increase in bank
- Increase the pitch (angle of attack)
  45° Bank 4° to 4.5 nose up.
- Slight increase in thrust to maintain altitude

Instrument Indications

The ADI (attitude director indicator) is used for accurate pitch and bank information throughout the turn

Be alert to the direction and rapidity of the turn rate of altimeter movement

Airspeed slow to change so apply thrust at first positive change in airspeed indicated

Roller coil, 15 to 20° before
Reduce thrust x trim

Stall Characteristics

With Flaps up ⇒ very light buffet
control remains effective and performance not significantly degrade.
↑ increase buffet

Flaps extended. stick shaker and initial buffet

Effect of speed brakes - increase in stick shaker

Stall Recognition
- Onset of stick shaker or stall warning
- Buffet caused by aileron separation
- Rapid decrease of airspeed below V_2 during takeoff or V_{REF} during go-around / landing

Recovery: High altitude
initiate recovery at first warning or stall buffet.
- ↑ thrust to maximum.

- roll wings level and reduce pitch smoothly
- adjust pitch on accelerations

Above 20000 ft. recovery the pitch attitude to desired before the engines to accelerate

Caution: Do not extend flaps during stick altitude stall recovery.

Recovery: Ground Contact factors

. At first stall signs
- Disconnect autopilot
- press TOGA
- Advance Thrust levers
- Rotate to takeoff or go around pitch
- Do Not attempt control input to exceed 7° Pitch

- Follow Flight Directors
- if stick shaker adjust above attitude
- if obstacle clearance need adjust pitch upward in small increment
- Do not during flaps or landing gear

Windshear Recovery

~~At commencement~~ Takeoff

Windshear commencement suspected to Post ~~X~~ stagnate recovery stagnate

- Recall TOGA + Thrust to max
- Maintain wings level - established takeoff pitch
- Accept altering to maintain pitch attitude unless stick shaker
- Do not retract flaps

- Follow flight director
- Accept climb rate, pitch attitude
- Do not change flaps or landing gear

Approach

Below 1000 ft AGL

of 15 kt IAS

500 FPM vertical spd

5° pitch

- Last above or below glide slope

Windshear recovery ~~procedure~~ must

GO Resumed

- Recommend autopilot
Keep TOGA
Direct to navi
- Pitch to 15°
- Do not maintain airspeed
- Maintain pitch
- Do not retract

Follow flight director
- If stick shaker pitch up manually
- No change in flap or gear

TCAS Resolution advisory (RA)

An RA is a prediction that an intruder will enter your collision airspace within 20 second

When receiving a TCAS RA command
- Recommend autopilot, autothrottle and manually adjust pitch (Thrust promptly & smoothly to satisfy the RA command (vertical spot in the green area of the vertical speed display)

Maintain situational awareness since TCAS

may issue RAs in conflict with terrain considerations. (eg TCAS may command a descent in a area of rising terrain)

Windshear GPWS - Windshear warning take precedence over TCAS advisory

Autopilot Engage to make entry in MCP.

FMC altitude and entry format -
use 4 or more digit → feet → below 10000 (9,990ft)
use 3 digit at 10000 and above

CDU / FMC round to nearest 10 ft increment

ex 0 to 9 ft → 0000 → 10
10 to 99 → 0099 - 100

100 to 999 → 0999 - 1000

> 9990
Trans Alt msl S/A - 10000 or 010 - 10000
13500 13500
13S

Transit Alt ⇒ S/A
to 17000 ft
17996 FL180
21000 FL210
or 210

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FMC Enhancements & Considerations

Legs Legs Paye . Questions

Active waypoint is thwarted waypoint Heads

I want to go

- I set put the right waypoint on the top line of Legs page

→ Python - Pyrad

- intercept and track accessed data to the waypoint

Keypad speed

To proceed Direct to a Waypoint

- Select the LEGS page of the CDU
- Enter the desired waypoint over the active waypoint (CLR key)
- Check the N1 display for waypoint modified data
- Press the EXEC key

If desired the unneeded fields could easily be copied to the inactive area by selecting the RTE COPY prompt (any previously used area will be erased).

A beacon point for the area could based upon the waypoint bypassed may be generated by selecting ABEAM PTS prompts

Optimum Altitude: To save fuel

Optimum altitude increase 1000 ft / hrs of flight time

Save fuel by:
- go on RNAV same direction
- the vertical use of ARC
- turn well

Standard Operating Procedure Daily

SOPA

Communication

Use VHF-L for all ATC communication with ground, Tower, Departure, En Route ATC and approach.

Use VHF-R for ATIS, clearance, company communication and for monitoring GUARD

VHF C is normally dedicated to ACARS. When HF communication are required, use HF 1 as the primary radio and HF 2 as

Use of MCP

Flight Mode Annunciator (FMA) displays must be verified when autopilot and or flight director is use and a flight mode change occurs

Use of Ecas System

Clear Ecas alert and CPDLC received displayed message when possible. but deal with after cancelling

Preflight

Verify fuel on board

Record the current ATIS info

Verify fuel distribution is in accordance with Normal Fuel Loading Chart in the AFM

Obtain ATC clearance using ACARS Pre-departure clearance (PDC)

If ACARS PDC is not available, obtain the ATC clearance using voice procedures

Verify clearance altitude and transponder

After the latest ATIS is received, reload the planned departure runway and SID on the DEPARTURE page and execute EXECUTE

Ensure that the cleared route is the active FMC route or modified as required

Verify that the the cleared route is the active route

Set navigation frequencies and courses for departure on the NAV RAD page
→ for raw data backup & cross check to FMC navigation.

Note: Frequencies and courses set by the pilot must be cleared before proceeding

Call for the PREFLIGHT CHECK.
verify & respond to it

Before Start

When the pushback coordinator advises that they are ready to push
Transmit; "STANDBY"
Then do → place flight attendant advisory to off
- place Seat Belt switch ON
- place the No 4 HYDRAULIC DEMAND pump to AUX, check brake accumulator pressure indicator in the green
Check Verify the BRAKE SOURCE light is extinguished

- Place No 1 HYDRAULIC DEMAND pump to AUTO.

- Place the Beacon switch Both.

- Select DOOR synoptic and verify that all door indicate close x annunciator

F/O

- Push all fuel pump switches forward

containment fuel to ON.
Verify pump low pressure light are encouraged

- If the fuel quantity in tank 2 & 3 is greater than in tank 1 & 4, verify that all fuel X FEED switches are OPEN.

- If the fuel quantity in tank 2 & 3 is equal to or less than in tank 1 & 4, verify the X-FEED switches 1 & 4 are CLOSED and that OVERRIDE PUMP switches 2 & 3 are OFF.

Call for the BEFORE START CHECK and verify complete

- FO → Call for pushback clearance from ATC once ramp contacted.

Transmit "BRAKES RELEASED, CLEAR TO PUSH."

When pushback is complete, Hey transmit Brakes Set.

Engine Start

When the pushback crew advises aircraft "Cleared to start Engines"

Turn all PACK selectors off
(if APU use wait 2 or 3 seconds before turning off)

Call "START ENGINE"
and 3 & 4 then 1 & 2

F/O - Announce ROTATION at first indication of N_2

Announce OIL PRESSURE

Position each fuel selector FUEL CONTROL
switch RUN at minimum stabilized RPM
(15% N_2 as minimum)

Monitor fuel flows

EGT should increase within 20 seconds after selecting RUN

- Monitor engine displays for normal indications until engine are stabilized at idle

Leave hand on the fuel control selector until EGT peak and begins to decay

EGT should remain within ECAS limit

N_2 should reach idle by 2 min from selecting RUN

After engines are started each engine oil quantity should decrease by a least 3 quarts

Observe the start selector release at 50% N_2 and the start valve light extinguish

Pushback complete, ATC transmit "Brakes SET"

Set the parking brake, check the brake pressure and transmit "BRAKES SET PRESSURE NORMAL"

START Engine = 4, 1, 2, 3

Before TAXI

After the last engine started has stabilized at idle

- Call for Engine Anti Ice ON, if required

F/O → Place APU switch OFF

→ Place the HYDRAULIC DEMAND pump selector to AUTO.

- Ropes

Turn the PACK control selector to NORMAL

Push the EICAS RECALL switch. Compare any abnormal message with known conditions

- Call for the BEFORE TAXI CHECK

F/O respond to the Before Taxi Check

Taxi after Clearance to Taxi Called

F/O. Request taxi clearance from ATC

Path detail understanding the taxi route, runway crossing

TAXI

Confirm flaps to 10 or 20 (extended flaps)

FCA - Check flaps position indicator

Do not delay entering runway the flaps

Review MCC data for the selected flaps setting is necessary

If long delay Captain may elect ~~recycle~~ engine 3 on all engines

Check for full travel of Rudder, Spoilers Ailerons and elevators.

Move the control smoothly & slowly through full range.

Ensure that the control wheel / column outer when pressure is released

Observe the secondary EICAS displays for deviations and deflection indications of control surfaces, and verify that the rudder indicator centers when the control pressure is released

Caution: Hold the nose wheel steering tiller when checking the rudder to prevent nose wheel movement.

Check flight instruments

After receiving the Final Weight Data ~~repeat the~~ if changes on " " " " or runway use RAY condition see sect p 4, 9 s. 2

Call for the TAXI CHECK, Verify taxi clear

All engine are running, proceed to All Engine Check section. SOPA (4-27)

If the 1, 2 or 3 = Delayed Engine Start section of SOPA (4-26)

If all off ~~re~~ accomplish before flight check list

All engine must be stabilized at idle for 2 min. before take off run.

Delayed Engine Start

Normal use, if all engines have shut down

F/O. If engine crossbleed start is used, refer to the Crossbleed Start procedure (COM 3.72
Start the APU if crossbleed start is not appropriate

When captain's pack reaches start pressure, engine

F/O Turns the PACK selector off

If during engine start, duct pressure does not remain within limits, turns all PACK selector OFF.

Using APU give 2 to 3 second between pack shut down

Call "START THE NUMBER ___ ENGINE"

Cap de communication établie

F/O. Pull the engine START switch and observe the start valve open light illuminate

During the start verify the pneumatic duct pressure on screen on EICAS is a minimum of 30 PSI less 1 PSI per 1000 ft of pressure altitude.

FCO

Annunciate "ROTATION" at feed indication of N_2

" "OIL PRESSURE" at feed indication

~~Then~~ " "NONE" at feed indication of N_2

N_2 indication & N_2 must be indicated by FCO

Position Left FUEL CONTROL switch to RUN at maximum motoring RPM (15% N_2 is minimum)

Monitor feed flow

EGT should rise within 20 sec after selecting RUN

Observe the start switch release at 50% N_2 and the start valve light extinguish

Leave hand on the fuel control switch until EGT peaks and begins to drop

Note: If starter operation is interrupted the starter may be re-engaged below 15% N_2

FCO - Monitor engine displays for normal indications until stabilized at idle

F/O → Observe normal engine acceleration
EGT should remain within EICAS limits
N1 readings must be verified by F/O & N2
N2 should reach idle by 2 minute before selecting R/W

After engine start the oil pressure should decrease by at least 3 pressure, otherwise push

Start remaining engines with same procedure
When all engine are started at idle.
Capt →
call for Engine Anti Ice ON if required

F/O: → Place the APU switch OFF after to start the engine

- Turn the PACK control selector to NORMAL
- Push the EICAS RECALL switch. Compare any alert message with known condition and deal with it

All Engine Check

after the TAXI CHECK is complete and all engines are running and stabilized before the BEFORE TAKEOFF CHECK

FMC Read verify as appropriate

Before TAKEOFF

Capt. Doesn't do the BEFORE TAKEOFF CHECK until all the engines are running and the aircraft is approaching the takeoff position

DO NOT PUT any item on the cockpit glare shield forward of the Hoarbars

ensure Takeoff Briefing including GO-AROUND considerations (FCOM)

Capt → Verify the mode control panel is set for takeoff.

→ Check the flaps are in the correct position, shoulder harness on.

F/O →

announce "Flight Attendant prepare for departure" wait until he said that the cabin is secure.

F/O - Verify that the autobrake are selected to RTO.

→ Verify that the proper transponder code is set and place the TCAS selector to TO/RA Shoulder harness is on & YCM shoulder harness is on.

Verify all PACK selectors are NORMAL

(capt → call for the BEFORE TAKE OFF CHECK
Verify as appropriate and respond to
the Before Takeoff check

When on the runway and takeoff clearance
has been received. Place the Landing
(OUTBD for day all for night) and
STROBE Light switches to ON.

Takeoff

Do Not advance the Thrust Levers for takeoff until the BEFORE TAKEOFF CHECK is completed.

Repeat the marked clearance called and transition called.

After the aircraft is aligned with the runway, advance the Thrust Levers to ~ 1.1 EPR to allow the engines to stabilize.

Advance the Thrust Levers to ~ takeoff thrust and push the TO/GA switch by 80 KIAS

Scan the engine instrument to ensure proper performance

at 80 KIAS announce "CHECKS"

FO - Monitor EICAS message, the engine instrument and verify that the correct thrust is set. at 80 kt say 80 kt Throttle Hold at 100 → say 100

announce each 20 except with 10 knots Vr

3 to 5 knots prior Vr announce announce ROTATE — DEGREES

F/O announces engine parameters or fault engine

(

Capt → Confirm the speed and reset to the takeoff setting

Call GEAR UP after the altimeter and vertical speed display increase or positive climb

Monitor system especially airspeed + altitude for normal climb

Capt & call for flap retraction, call for climb. "FLAP 10" at the → S, F → FLAP UP

At the Thrust reduction point:
if the autothrottles are ON and VNAV is not engaged:

Call for "CLIMB THRUST"

F/O → if the autothrottle are ON and VNAV is engaged verify that CLIMB THRUST is set

If the autothrottles are ON and VNAV is not engaged:

◇ Select THRUST on the mode control panel when requested and then verify that CLIMB THRUST is set.

When the flaps are extended, check trim is set and workload/conditions permit FCC → Verify all PACK CONTROL selectors are positioned to NORMAL

Observe the EICAS gear and flap position displays are normal and place the gear lever to the OFF position.

En Route

A Icap Climp :
Use Radar
Confirm the operation of autopilot and alternate system required for Reduced Vertical Separation Minimum (RVSM)

Altimeter to 29.92 and primary alti agrees within 200ft

Immediate Hx pressure

Use oxygen mask (regulator at Normal)
when above FL250 and cockpit temp below above FL410
Next oxygen regulator to 100% when mask no longer required

FIC Spec, → Select ACTIVE ROUTE DATA
Line select the waypoint wind and enter forecast wind and (+0

Cap: Verify proper fuel configuration as climb occurs

FCO.

Accomplish the following procedures in conjunction with the FUEL synoptic.

When FUEL PUMP STAB C and R messages are displayed and tank quantity is zero, press stabilizer pump switches OFF.

When FUEL OVRD CTR C or R messages are displayed and tank quantity is less than 2000 lbs, push outer pump switches OFF.

When FUEL TANK/ENG messages displayed and quantity in Tank 2 is equal to or less than tank 1 or tank 3 is equal or less than tank 2 place OVERRIDE PUMP 2 & 3 switches OFF and CROSSFEED VALVE 1 and 2 switches OFF.

Perform a navigation accuracy check

Verify that the data programmed into the FMC agrees with the master flight plan, Jeppesen chart and ATC clearance

Verify navigation dest, PFD, ND to confirm CDU and VNAV tracking

Monitor and confirm entered waypoints
perform by accomplishing - Approaching
Over, after the waypoint

- monitor VNAV under

use VOR / DME radar mapping when

during DATA, route or height allocated
select TRCK on the heading/HDG (HDG)
selected, passing 700 ft above
Re-select VORA when out of polar region

At the lower altitude, VORA does not use
precede heading/altitude mode other
than LNAV, HDG SEL, NAV or HDG SEL
are inoperative.

cont →

Approaching the Waypoint
- Verify the identifier and coordinate of the
next FMC waypoint and compare with
Jeppesen VI/CO en route chart or
track message and ATC clearance
- Verify the FMC magnetic course and distance
to the next FMC waypoint using the CDUS
function and compare with the Master Flight
plan and the Jepp enroute chart

Direct the Waypoint

Verify the keyswitch accessed the CEGS page

(X) on waypoint on Master Flight Plan

After passing the Waypoint

Verify that CNAV is engaged

Verify the aircraft is heading and bound on the desired course to the next (active) waypoint

Periodically check oxygen, oil, hydraulic

Comply with the Engine Condition Monitoring (ECM) procedure

F/O → Tell us the T/O and CANV ID from the ACARS Normal Data page

Transmit the ACARS in Range clearance (20-30 min prior to landing

Record ATIS

Descent

Check of altimeters is in inch (in) / hectopascals (hPa) / millibar (mb)

Before FL180 or ~~at~~ ~~transition altitude~~ ~~alt~~ ⟹
Briefing on Taxi Route to the gate

Verify the descent and approach info is correctly preprogrammed in the FMC

Set minimum to the bugs

Set ~~the~~ Altimeter setting QNH on the standby altimeter

Announce QNH and the altitude passing ~~FL~~ 2 0 0 5 inches, 8 000 ft

FCO. ⟹ check presentation

~~pre~~ program FMC approach, runway approach and landing runway by accomplishing the DEP / ARR. ~~/~~

- Select the approach to the bugs from the DEP ARR page
- Check the LEGS page for correct waypoints etc
- Select the NAV RAD page and ensure frequencies and course are selected
- Select the flap configuration and Vref speed on the Approach REF page

Verify the transition record on the DESCENT FORECASTS page

After 18000 or leaving current altitude
- transition should be

F/O → Select RECALL on ECAS and review messages
Verify the Reading Reference is Round
Verify the Landing weight for RNG

XCM should be transitioned

Capt -
Call for the DESCENT CHECK.

Approach

Below FL180 hold at FIX FC 120 KSC

Verify DEP/ARR for approach

Verify navigation frequencies and course

Verify Landing Data Card for landing weight

Verify the FCAP/SPEED (V_{REF}) on the APPROACH REF page and V_{REF} is displayed on the PFD

Set the cleared level of autobrakes

Call for APPROACH CHECK

Below below 10000
Please landing light switches ON
OUTBD landing light should remain ON during approach unless deviation in TMC

Before FC 180 set alt warning ON

Update briefing and clock minimum
Verify TMC is programmed
Check navigation freq and course

At 10 to 5 nautical from touchdown
⇒ ① call for flap extension, in accordance with the aircraft checklist
② Call "GEAR DOWN" and check indicated

Once the speed brakes after the landing gear indicates down and green

After landing gear is down & green & below 10000ft
check T D > E
Call for landing flap setting and the CARDINAL CHECK and verify

Acquiring the Localizer (OM) are Final Approach Fix (FAF)

Landing

Select reverse idle thrust after main gear touchdown

F/O check speedbrake deploy, if even manually

Reverse thrust down to 80 kt IAS

at 60 kt reverse recovered idle thrust
(you can stay on reverse until end of runway)

Reverse cancelled (if used) and continue brake pressure to RNY turnoff

After Landing

after clearing RWY

Call "FLAP Up After Landing CHECK"

Record retract flaps of malfunction or ice.

alert controller to avoid secondary alert

Landing light OFF

Strobe OFF

Speedbrake lever Down

Check WX weather radar is OFF and the

auxiliary radar display is OFF or STBY

FIO - Taxi clearance

Wing Anti Ice off

Engine " " "

Set field elevation in Altitude window

of the HEDS mode control panel

Set Stab Trim to Green

Transponder to STBY

Anticollision off

Cool for 5 minute before start clearance

Starting

Start Engine after APU or external electrical

power.

- Release

When all engine area shutdown,

- Release parking brake

- Turn HYDRAULIC DEMAND pump off

IRS off

Complete parking checklist

~~Shutdown engine after 3~~

Securing

◇ Call for Securing Check