

---

## Preflight Procedure – First Officer

The first officer normally does this procedure. The captain may do this procedure if needed.

Flight control panel ..... Check

FLIGHT CONTROL switches – Guards closed

Verify that the flight control LOW PRESSURE lights are illuminated.

Flight SPOILER switches – Guards closed

YAW DAMPER switch – ON

Verify that the YAW DAMPER light is extinguished.

Verify that the standby hydraulic LOW QUANTITY light is extinguished.

Verify that the standby hydraulic LOW PRESSURE light is extinguished.

Verify that the STBY RUD ON light (as installed) is extinguished.

ALTERNATE FLAPS master switch – Guard closed

ALTERNATE FLAPS position switch – OFF

Verify that the FEEL DIFF PRESS light is extinguished.

Verify that the MACH TRIM FAIL light is extinguished.

Instrument and  
NAV transfer switches ..... NORMAL

Fuel panel ..... Set

Verify that the FUEL VALVE CLOSED lights are illuminated dim.

Verify that the FILTER ICING lights are extinguished.

Fuel HEAT switches – OFF

Verify that the VALVE OPEN lights are extinguished.

CROSSFEED selector – CLOSED

Verify that the VALVE OPEN light is extinguished.

---

FUEL PUMP switches – OFF

Verify that the center tank fuel pump LOW PRESSURE lights are extinguished.

Verify that the auxiliary tank fuel pump LOW PRESSURE lights (as installed) are extinguished.

Verify that the main tank fuel pump LOW PRESSURE lights are illuminated.

Electrical panel ..... Set

BATTERY switch – Guard closed (NOTE: when the guard is in the closed position it automatically presses the switch to "START")

GALLEY power switch – ON

STANDBY POWER switch – Guard closed

Verify that the STANDBY PWR OFF light is extinguished.

Generator drive DISCONNECT switches – Guards closed

Verify that the LOW OIL PRESSURE lights are illuminated.

Verify that the HIGH OIL TEMP lights are extinguished.

DRIVE TEMPERATURE switch – As needed

BUS TRANSFER switch – Guard closed

Verify that the TRANSFER BUS OFF lights are extinguished.

Verify that the BUS OFF lights are extinguished.

Verify that the GEN OFF BUS lights are illuminated.

Overheat and fire protection panel

(Passenger airplanes) ..... Check

---

Do this check if the flight crew did not do the Electrical Power Up supplementary procedure. This check is needed once each flight day.

Verify that the engine No. 1, APU, and engine No. 2 fire switches are in.

Alert ground personnel before the following test is accomplished:

OVERHEAT DETECTOR switches – NORMAL

TEST switch – Hold to OVHT/INOP

Verify that the MASTER CAUTION lights are illuminated.

Verify that the OVHT/DET annunciator is illuminated.

Verify that the ENG 1 OVERHEAT and ENG 2 OVERHEAT lights are illuminated.

Verify that the APU DET INOP light is illuminated.

Do not run the APU if the APU DET INOP light does not illuminate.

**Note:** The fire warning light flashes and the horn sounds on the APU ground control panel when this test is done with the APU running. This can be mistaken by the ground crew as an APU fire.

TEST switch – Hold to FIRE

Verify that the fire warning bell sounds.

Verify that the master FIRE WARN lights are illuminated.

Verify that the engine No. 1, APU, and engine No. 2 fire switches are illuminated.

Verify that the WHEEL WELL light is illuminated.

Master FIRE WARNING light – Push

Verify that the master FIRE WARN lights are extinguished.

Verify that the fire warning bell cancels.

Verify that the engine No. 1, APU, and engine No. 2 fire switches stay illuminated.

Verify that the WHEEL WELL light stays illuminated.

---

Overheat and fire protection panel  
(Cargo airplanes) ..... Check

Do this check if the flight crew did not do the Electrical Power Up supplementary procedure. This check is needed once each flight day.

Verify that the engine No. 1, APU, and engine No. 2 fire switches are in.

Alert ground personnel before the following test is accomplished:

OVERHEAT DETECTOR switches – NORMAL

TEST switch – Hold to OVHT/INOP/A SMOKE

Verify that the fire warning bell sounds.

Verify that the master FIRE WARN lights are illuminated.

Verify that the MASTER CAUTION lights are illuminated.

Verify that the OVHT/DET annunciator is illuminated.

Verify that the ENG 1 OVERHEAT and ENG 2 OVERHEAT lights are illuminated.

Verify that the FWD and AFT CARGO SMOKE lights are illuminated.

Verify that the APU DET INOP light is illuminated.

Do not run the APU if the APU DET INOP light does not illuminate.

**Note:** The fire warning light flashes and the horn sounds on the APU ground control panel when this test is done with the APU running. This can be mistaken by the ground crew as an APU fire.

Master FIRE WARN light – Push

---

Verify that the master FIRE WARN lights are extinguished.

Verify that the fire warning bell cancels.

Verify that the MASTER CAUTION lights stay illuminated.

Verify that the OVHT/DET annunciator stays illuminated.

Verify that the ENG 1 OVERHEAT and ENG 2 OVERHEAT lights stay illuminated.

Verify that the FWD and AFT CARGO SMOKE lights stay illuminated.

Verify that the APU DET INOP light stays illuminated.

TEST switch – Hold to FIRE/B SMOKE

Verify that the fire warning bell sounds.

Verify that the master FIRE WARN lights are illuminated.

Verify that the engine No. 1, APU, and engine No. 2 fire switches are illuminated.

Verify that the WHEEL WELL fire light is illuminated.

Verify that the FWD and AFT CARGO SMOKE lights are illuminated.

Master FIRE WARNING light – Push

Verify that the master FIRE WARN lights are extinguished.

Verify that the fire warning bell cancels.

Verify that the engine No. 1, APU, and engine No. 2 fire switches stay illuminated.

Verify that the WHEEL WELL light stays illuminated.

Verify that the FWD and AFT CARGO SMOKE lights stay illuminated.

EXTINGUISHER TEST switch ..... Check

TEST Switch - Push and hold

Verify that the three green extinguisher test lights are illuminated.

---

TEST Switch - Release

Verify that the three green extinguisher test lights are extinguished.

APU switch (as needed) ..... START

**Note:** If extended APU operation is required on the ground and fuel is loaded in the center tank, place the left center tank fuel pump switch ON to prevent a fuel imbalance before takeoff.

**CAUTION: Center tank fuel pump switches should be positioned ON only if the fuel quantity in the center tank exceeds 1000 lbs.**

**CAUTION: Do not operate the center tank fuel pumps with the flight deck unattended.**

**Note:** Whenever the APU is operating and AC electrical power is on the airplane busses, operate at least one fuel boost pump to supply fuel under pressure to the APU to extend the service life of the APU fuel control unit.

When the APU GEN OFF BUS light is illuminated:

APU GENERATOR bus switches – ON

Verify that the BUS OFF lights are extinguished.

Verify that the TRANSFER BUS OFF lights are extinguished.

Verify that the LOW OIL QUANTITY light is extinguished.

Verify that the APU LOW OIL PRESSURE light is extinguished.

Verify that the APU HIGH OIL TEMP light is extinguished.

Verify that the APU OVERSPEED light is extinguished.

EQUIPMENT COOLING switch ..... NORMAL

Verify that the OFF light is extinguished.

EMERGENCY EXIT LIGHTS switch ..... Guard closed

Verify that the NOT ARMED light is extinguished.

Passenger signs .....Set

NO SMOKING switch – AUTO or ON

FASTEN BELTS switch – AUTO or ON

Windshield WIPER selector ..... OFF

If the windshield wipers are not stowed, place the selector to PARK then OFF.

WINDOW HEAT switches ..... ON

Position the switches ON at least 10 minutes before takeoff.

Verify that the OVERHEAT lights are extinguished.

Verify that the ON lights are illuminated except at high ambient temperatures.

PITOT STATIC HEAT switches  
(airplanes with automatic pitot static heat) .....AUTO

PITOT STATIC HEAT switches  
(airplanes without automatic pitot static heat) ..... OFF

Verify that all PROBE HEATER lights are illuminated.

WING ANTI-ICE switch ..... OFF

Verify that the VALVE OPEN lights are extinguished.

ENGINE ANTI-ICE switches ..... OFF

Verify that the VALVE OPEN lights are extinguished.

Hydraulic panel .....Set

GROUND INTERCONNECT switch – CLOSE

ENGINE HYDRAULIC PUMPS switches – ON

Verify that the LOW PRESSURE lights are illuminated.

ELECTRIC HYDRAULIC PUMPS switches – OFF

Verify that the OVERHEAT lights are extinguished.

Verify that the LOW PRESSURE lights are illuminated.

---

Cabin altitude panel .....	Set
SMOKE CLEARANCE switch – Guard closed	
Air conditioning panel .....	Set
AIR TEMPERATURE source selector – As needed	
Verify that the DUCT OVERHEAT lights are extinguished.	
Temperature selectors – As needed	
Verify that the RAM DOOR FULL OPEN lights are illuminated.	
GASPER FAN switch – As needed	
Air conditioning PACK switches – Set	
One switch – ON	
Other switch – OFF	
ISOLATION VALVE switch – AUTO	
Engine BLEED air switches – ON	
APU BLEED air switch – ON	
Verify that the DUAL BLEED light is illuminated.	
Verify that the PACK TRIP OFF lights are extinguished.	
Verify that the WING-BODY OVERHEAT lights are extinguished.	
Verify that the BLEED TRIP OFF lights are extinguished.	
Cabin pressurization panel .....	Set



Verify that the AUTO FAIL light is extinguished.

Verify that the OFF SCHED DESCENT light is extinguished.

FLIGHT ALTITUDE indicator – Cruise altitude

LANDING ALTITUDE indicator – Destination field elevation

CABIN RATE selector – Index

CABIN ALTITUDE indicator – 200 feet below destination field elevation

FLIGHT/GROUND switch – GRD

Pressurization mode selector – AUTO

Verify that the STANDBY light is extinguished.

Verify that the MANUAL light is extinguished.

Lighting panel .....Set

LANDING light switches – RETRACT and OFF

RUNWAY TURNOFF light switches – OFF

TAXI light switch – OFF

ENGINE START switches ..... OFF

GRAVEL PROTECT switch (as installed) ..... OFF

Lighting panel .....Set

POSITION light switch – As needed

ANTI-COLLISION light switch – OFF

WING illumination switch – As needed

WHEEL WELL light switch – As needed

Flight director panel .....Set

Mode selector – OFF

ALTITUDE HOLD switch – OFF

PITCH COMMAND control – Full clockwise

---

Oxygen ..... Test and set

Crew and passenger oxygen pressure – Check

Verify that the pressure is sufficient for dispatch.

Check mask, hose and fittings for grease or damage.

Hold the mask away from face.

Supply lever – ON

Oxygen diluter lever – 100%

Emergency lever – ON

Verify that the flow indicator shows flow.

Supply and Emergency levers – OFF

Adjust the mask to the face and inhale. Verify that the mask pulls to face.

Oxygen diluter lever – NORMAL

Inhale and verify unrestricted flow. Verify that the flow indicator shows no flow.

Supply lever – ON

Oxygen diluter lever – 100%

Inhale and verify that the flow indicator shows flow.

Emergency lever – ON

Verify that there is a slight pressure in the mask.

Emergency lever – OFF

Stow oxygen mask.

STATIC SOURCE SELECTOR switch ..... NORMAL

Marker beacon lights ..... Test

Clock ..... Wind and set

Autopilot disengage light ..... Push to test

Verify that the AUTOPILOT disengage light is illuminated.

---

Flight instruments ..... Check

Set the altimeter.

Verify that the flight instrument indications are correct.

Verify that only these flags are shown:

- TCAS (as installed)
- expected RMI flags

Hydraulic system B LOW QUANTITY light ..... Verify extinguished

SYSTEM A HYDRAULIC QUANTITY indicator ..... Above RF

GROUND PROXIMITY panel ..... Check

FLAP/GEAR INHIBIT switch – Guard closed

Verify that the INOP light is extinguished.

Landing gear panel ..... Set

LANDING GEAR lever – DN

Verify that the green landing gear indicator lights are illuminated.

Verify that the red landing gear indicator lights are extinguished.

TAKEOFF CONFIG light (as installed) ..... Verify extinguished

CABIN ALTITUDE light (as installed) ..... Verify extinguished

ANTISKID switches ..... Guards closed

Verify that the ANTISKID INOP lights are extinguished.

AUTO BRAKE select switch ..... OFF

Verify that the AUTO BRAKE DISARM light is extinguished.

EPR reference selectors (on PDCS equipped airplanes) ..... Push

Engine instruments ..... Check

Verify that the REVERSER UNLOCKED lights are extinguished.

Verify that the START VALVE OPEN lights are extinguished.

Verify that the LOW OIL PRESSURE lights are illuminated.

Verify that the OIL FILTER BYPASS lights are extinguished.

Verify that the primary and secondary engine indications show existing conditions.

ENGINE OIL QUANTITY TEST switch..... Push

Verify that the oil quantity indicators move toward zero and return to the original position when the switch is released.

CARGO FIRE panel (as installed) ..... Check

This check is needed once per flight day or following a flight crew change.

DETECTOR SELECT switches – NORM

TEST switch – Push

Verify that the fire warning bell sounds.

Verify that the master FIRE WARN lights are illuminated.

Master FIRE WARN light – Push

Verify that the master FIRE WARN lights are extinguished.

Verify that the fire warning bell cancels.

Verify that the FWD and AFT lights stay illuminated.

Verify that the DETECTOR FAULT light stays extinguished.

Verify that the green EXTINGUISHER test lights stay illuminated.

Verify that the DISCH light stays illuminated.

VHF communications radios ..... Set

VHF NAVIGATION radios ..... Set for departure

Audio selector panel ..... Set

ADF radios ..... Set

**WARNING: Do not key the HF radio when the airplane is being refueled. Injury to personnel or fire can occur.**

HF radios ..... Set

WEATHER RADAR panel ..... Set

---

Transponder panel .....Set

STABILIZER BRAKE RELEASE knob ..... Verify released

**WARNING: Do not put objects between the seat and the aisle  
stand. Injury can occur when the seat is adjusted.**

Seat ..... Adjust

Adjust the seat for optimum eye reference.

Verify a positive horizontal (fore and aft) seat lock.

Rudder pedals ..... Adjust

Adjust the rudder pedals to allow full rudder pedal and brake pedal  
movement.

Seat belt and shoulder harness ..... Adjust

Do the PREFLIGHT checklist on the captain's command.

**Preflight Procedure – Captain**

The captain normally does this procedure. The first officer may do this procedure if needed.

Lights ..... Test

Master LIGHTS TEST and DIM switch – TEST

The fire warning lights are not checked during this test. Use individual test switches or push to test features to check lights which do not illuminate during the light test. Use scan flow to verify that all other lights are flashing or illuminated. Verify that all system annunciator panel lights are illuminated.

Master LIGHTS TEST and DIM switch – As needed

Flight director panel ..... Set

Mode selector – OFF

ALTITUDE HOLD switch – OFF

PITCH COMMAND control – Full clockwise

Autopilot panel ..... Set

Autopilot mode selector – MAN

Autopilot system select switch – As needed

Autopilot heading switch – Centered position

Autopilot AILERON engage switch – DISENGAGED

Autopilot ELEVATOR engage switch – DISENGAGED

Autopilot pitch mode selector – OFF

Oxygen ..... Test and set

Crew and passenger oxygen pressure – Check

Verify that the pressure is sufficient for dispatch.

---

Check mask, hose and fittings for grease or damage.

Hold the mask away from face.

Supply lever – ON

Oxygen diluter lever – 100%

Emergency lever – ON

Verify that the flow indicator shows flow.

Supply and Emergency levers – OFF

Adjust the mask to the face and inhale. Verify that the mask pulls to face.

Oxygen diluter lever – NORMAL

Inhale and verify unrestricted flow. Verify that the flow indicator shows no flow.

Supply lever – ON

Oxygen diluter lever – 100%

Inhale and verify that the flow indicator shows flow.

Emergency lever – ON

Verify that there is a slight pressure in the mask.

Emergency lever – OFF

Stow oxygen mask.

STATIC SOURCE SELECTOR switch ..... NORMAL

MARKER beacon sensitivity switch ..... As needed

Marker beacon lights ..... Test

Clock ..... Wind and set

Autopilot disengage light ..... Push to test

Verify that the AUTOPILOT disengage light is illuminated.

Flight instruments ..... Check

Set the altimeter.

Verify that the flight instrument indications are correct.

Verify that only these flags are shown:

- TCAS (as installed)
- expected RMI flags

Standby instruments ..... Check

Gyro caging control – Pull, then release

Pitch trim control – As needed

Set the altimeter

Verify that the flight instrument indications are correct

Verify that no flags are shown.

STAB OUT OF TRIM light ..... Verify extinguished

SPEED BRAKE lever ..... DOWN detent

Verify that the SPEED BRAKE ARMED light is extinguished.

Verify that the SPEED BRAKE DO NOT ARM light is extinguished.

Reverse thrust levers ..... Down

Forward thrust levers ..... Closed

FLAP lever ..... Set

Set the flap lever to agree with the flap position.

Parking brake ..... Set

Verify that the parking brake warning light is illuminated

**Note:** Do not assume that the parking brake will prevent airplane movement. Accumulator pressure can be insufficient.

Engine start levers ..... CUTOFF

STABILIZER TRIM cutout switches ..... NORMAL

VHF communications radios ..... Set

VHF NAVIGATION radios ..... Set for departure

Audio selector panel ..... Set



---

**WARNING: Do not put objects between the seat and the aisle stand. Injury can occur when the seat is adjusted.**

Seat ..... Adjust

Adjust the seat for optimum eye reference.

Verify a positive horizontal (fore and aft) seat lock.

Rudder pedals ..... Adjust

Adjust the rudder pedals to allow full rudder pedal and brake pedal movement.

Seat belt and shoulder harness ..... Adjust

Call “PREFLIGHT CHECKLIST.”

---

## Before Start Procedure

Start the Before Start Procedure after papers are on board.

Flight deck door ..... Closed and locked      F/O

Verify that the CAB DOOR UNLOCKED light (as installed) is extinguished.

Verify that the LOCK FAIL light (as installed) is extinguished.

Do the Performance Data Computer System (as installed) Preflight Supplementary Procedure.

PDCS CDU flight mode selector (as installed) ..... As needed      C, F/O

Takeoff data ..... Complete      C, F/O

Verify the takeoff data to include:

- EPR
- N1
- V1, VR, and V2
- flap setting
- zero fuel weight
- temperature
- altimeter setting
- gross weight
- stabilizer trim setting

Fuel quantity indicators .....Check C, F/O

Verify that the fuel on the dispatch papers and fuel quantity indicators agree.

Verify that the fuel is sufficient for flight.

**Note:** Do not push the QUANTITY TEST switch when the airplane is being refueled. This will cause incorrect indications at the external fueling panel.

Total fuel and VREF indicator .....Set C

Zero fuel weight – Set

Flap selector – As needed

Verify VREF on the VREF pointer.

On airplanes without PDCS,  
EPR reference selectors .....Set C

Verify that the EPR reference bugs and digital readouts are correct.

On airplanes with PDCS,  
EPR reference selectors .....In C

Verify that the PDCS reference bugs and digital readouts are correct.

IAS bugs .....Set C, F/O

Set the speed bugs at V1, VR, V2 + 15, and flaps up maneuvering speed.

Airspeed cursor controls .....Set V2 C, F/O

HSI HEADING selectors .....Set C, F/O

HSI course selectors .....Set C, F/O

ALTITUDE alert controller .....Set C

Taxi and Takeoff briefings ..... Complete C, F/O

The pilot who will do the takeoff does the taxi and takeoff briefings.

As part of the takeoff briefing for the first flight of the day and following a change of either flight crew member, cabin altitude warning indications and memory item procedures must be briefed on airplanes in which the CABIN ALTITUDE and TAKEOFF CONFIG lights are not installed, or are installed but not activated. The briefing must contain the following information:

Whenever the intermittent warning horn sounds in flight at an airplane flight altitude above 10,000 feet MSL:

1. Immediately, don oxygen masks and set regulators to 100%.
2. Establish crew communications.
3. Do the CABIN ALTITUDE WARNING or Rapid Depressurization non-normal checklist.

Both pilots must verify on the overhead Cabin Altitude Panel that the cabin altitude is stabilized at or below 10,000 feet before removing oxygen masks.

Exterior doors .....	Verify closed	F/O
Flight deck windows .....	Closed and locked	C, F/O
Start clearance .....	Obtain	C, F/O

Obtain a clearance to pressurize the hydraulic systems.

Obtain a clearance to start the engines.

If pushback is needed:

Verify that the nose gear steering lockout pin is installed, or, if the nose gear steering lockout pin is not used, depressurize hydraulic system A during the hydraulic panel set step.

Fuel panel .....	Set	F/O
------------------	-----	-----

If the center tank fuel quantity exceeds 1,000 pounds (460 kilograms):

LEFT and RIGHT CENTER FUEL PUMPS switches – ON

Verify that the LOW PRESSURE lights illuminate momentarily and then extinguish.

---

If a LOW PRESSURE light stays illuminated turn off the affected CENTER FUEL PUMPS switch.

If there is fuel in the auxiliary fuel tank (as installed):

FWD and AFT AUXILIARY FUEL PUMPS switches – ON

Verify that the LOW PRESSURE lights illuminate momentarily and then extinguish.

If a LOW PRESSURE light stays illuminated turn off the affected AUXILIARY tank FUEL PUMPS switch.

AFT and FORWARD FUEL PUMPS switches – ON

Verify that the LOW PRESSURE lights are extinguished.

Hydraulic panel .....Set F/O

If pushback is needed and the nose gear steering lockout pin is not installed:

**WARNING: Do not pressurize hydraulic system A.  
Unwanted tow bar movement can occur.**

System A HYDRAULIC PUMP switches – OFF

Verify that the system A pump LOW PRESSURE lights are illuminated.

System B electric HYDRAULIC PUMP switches – ON

Verify that the system B electric pump LOW PRESSURE lights are extinguished.

Verify that the brake pressure is 2,800 psi minimum.

Verify that the system B pressure is 2,800 psi minimum.

If pushback is not needed, or if pushback is needed and the nose gear steering lockout pin is installed:

Electric HYDRAULIC PUMP switches – ON

Verify that the electric pump LOW PRESSURE lights are extinguished.

Verify that the brake pressure is 2,800 psi minimum.

Verify that the system B pressure is 2,800 psi minimum.

---

ANTI COLLISION light switch .....	ON	F/O
-----------------------------------	----	-----

GRAVEL PROTECT switch (as installed) .....	As needed	F/O
--	-----------	-----

If in icing conditions, set the switch to ANTI-ICE/TEST.

If not in icing conditions, set the switch to ON if the takeoff is from a gravel or contaminated runway.

Trim .....	Set	C
------------	-----	---

Check each trim for freedom of movement.

Stabilizer trim – \_\_\_\_ UNITS

Set the trim for takeoff.

Verify that the trim is in the green band.

Aileron trim – 0 units

Rudder trim – 0 units

Call “BEFORE START CHECKLIST.”	C
--------------------------------	---

Do the BEFORE START checklist.	F/O
--------------------------------	-----

---

## Pushback or Towing Procedure

---

The Engine Start procedure may be done during pushback or towing.

Establish communications with ground handling personnel. C

**CAUTION: Do not hold or turn the nose wheel steering wheel during pushback or towing. This can damage the nose gear or the tow bar.**

**CAUTION: Do not use airplane brakes to stop the airplane during pushback or towing. This can damage the nose gear or the tow bar.**

Set or release the parking brake as directed by ground handling personnel. C or F/O

When pushback or towing is complete:

Verify that the tow bar is disconnected C

Verify that the nose gear steering lockout pin is removed C

System A HYDRAULIC PUMPS switches – ON F/O

## Engine Start Procedure

Air conditioning PACK switches ..... OFF F/O

Start pressure ..... PSI F/O

The minimum start pressure at sea level is 30 psi. Decrease the minimum start pressure 0.5 psi for each 1,000 feet above sea level.

Start sequence ..... Announce C

Call "START \_\_\_ ENGINE" C

ENGINE START switch ..... GRD F/O

Verify that the N2 RPM increases. C, F/O

Verify that the oil pressure increases and call "OIL PRESSURE RISING" F/O

When N1 rotation is seen and N2 is at 20%, or (if 20% N2 is not possible), at maximum motoring and a minimum of 15% N2:

Engine start lever ..... IDLE C

Monitor fuel flow and EGT indications. C, F/O

At 35-40% N2, verify that the ENGINE START switch moves to OFF. If not, move the ENGINE START switch to OFF. F/O

Verify that the duct pressure increases when the ENGINE START switch moves to OFF. F/O

Verify that the START VALVE OPEN light extinguishes when the ENGINE START switch moves to OFF. F/O

Call "STARTER CUTOUT." F/O

Monitor N1, N2, EGT, fuel flow and oil pressure for normal indications while the engine accelerates to a stable idle. C, F/O

If the time from the initial EGT increase to stable idle is more than 30 seconds:

Make a maintenance logbook entry.

After the flight is completed, maintenance action is needed.

After the engine is stable at idle, start the other engine.

Starter duty cycle:

- normal start: 30 seconds on, 60 seconds off (3 cycles only, then 5 minutes cooling)
- slow start: 60 seconds on, 60 seconds off, (2 cycles only, then 5 minutes cooling)
- motoring (fuel off): 2 minutes on, 5 minutes cooling

Normal engine start considerations:

- do not move an engine start lever to idle early or a hot start can occur
- keep a hand on the engine start lever while monitoring RPM, EGT and fuel flow until stable
- if fuel is shutoff accidentally (by closing the engine start lever) do not reopen the engine start lever in an attempt to restart the engine
- failure of the ENGINE START switch to stay in GRD until the starter cutout RPM can cause a hot start. Do not re-engage the ENGINE START switch until the engine has stopped rotating. The starter drive shaft can break if the starter is engaged before the engine stops.

Do the ABORTED ENGINE START checklist for one or more of the following abort start conditions:

- there is no N1 rotation by 20% N2
- there is no oil pressure increase by 30 seconds
- the fuel flow is greater than 1100 pph/500kgph at start
- the EGT does not increase by 20 seconds after the engine start lever is moved to IDLE
- the N1 or N2 does not increase or increases very slowly after the EGT increases
- the EGT quickly nears or exceeds the start limit



---

## Before Taxi Procedure

Fuel HEAT switches ..... As needed F/O

Before takeoff with tank fuel temperature 0° C or below, set the fuel HEAT switches to ON for one cycle.

Fuel heat must be OFF for takeoff.

GENERATOR 1 and 2 switches ..... ON F/O

PITOT HEAT switches ..... ON F/O

WING ANTI-ICE switch ..... As needed F/O

ENGINE ANTI-ICE switches ..... As needed F/O

Flight recorder REPEAT switch ..... Push F/O

PACK switches ..... ON F/O

ISOLATION VALVE switch ..... AUTO F/O

APU BLEED air switch ..... OFF F/O

Flight/Ground switch ..... FLT F/O

On gravel or contaminated runways, the No Engine Bleed Takeoff Supplementary Procedure is recommended.

APU switch ..... OFF F/O

ENGINE START switches ..... LOW IGN F/O

Engine start levers ..... IDLE detent C

Verify that the ground equipment is clear. C, F/O

Call “FLAPS\_\_\_” as needed for takeoff. C

Flap lever ..... Set takeoff flaps F/O

Verify that the LE FLAPS EXT green light is illuminated.

Flight controls ..... Check C

Make slow and deliberate inputs, one direction at a time.

**After Landing Procedure**

Start the After Landing Procedure when clear of the active runway.

Engine cooldown recommendations:

- Run the engines for at least 5 minutes
- Use a thrust setting no higher than that is normally used for all engine taxi operations.

Pilot Flying	Pilot Monitoring
The captain moves or verifies that the SPEED BRAKE lever is DOWN.	
	Start the APU, as needed.
	Set the PITOT STATIC HEAT switches to AUTO (airplanes with automatic pitot static heat).
	Set the PITOT STATIC HEAT switches to OFF (airplanes without automatic pitot static heat).
	Set the Flight/Ground switch to GRD.
	Set the exterior lights as needed.
	Set the ENGINE START switches to OFF.
	Set the AUTO BRAKE select switch to OFF.
	Set the flap lever to UP.
Set the weather radar to OFF.	
	Set the transponder mode selector as needed. At airports where ground tracking is not available, select STBY. At airports equipped to track airplanes on the ground, select an active transponder setting, but not a TCAS mode.

---

# Shutdown Procedure

Start the Shutdown Procedure after taxi is complete.

Parking brake .....Set    C or F/O

Verify that the parking brake warning light is illuminated.

Electrical power .....Set            F/O

If APU power is needed:

Verify that the APU GENERATOR OFF BUS light is illuminated.

APU GENERATOR bus switches – ON

Verify that the BUS OFF lights are extinguished.

If external power is needed:

Verify that the GND POWER AVAILABLE light is illuminated.

GROUND POWER switch – ON

Verify that the BUS OFF lights are extinguished.

Before engine shutdown, consider engine cooldown recommendations.

Engine start levers .....CUTOFF            C

If towing is needed:

Establish communications with ground handling personnel C

**WARNING: If the nose gear steering lockout pin is not installed and hydraulic system A is pressurized, any change to electrical or hydraulic power with the tow bar connected can cause unwanted tow bar movement.**

Verify that the nose gear steering lockout pin is installed, or, if the nose gear steering lockout pin is not used:

System A HYDRAULIC PUMP switches – OFF

Verify that the system A pump LOW PRESSURE lights are illuminated.

**CAUTION: Do not hold or turn the nose wheel steering wheel during pushback or towing. This can damage the nose gear or the tow bar.**

**CAUTION: Do not use airplane brakes to stop the airplane during pushback or towing. This can damage the nose gear or the tow bar.**

Set or release parking brake as directed by ground handling personnel

C or F/O

When towing is complete:

System A HYDRAULIC PUMP switches – ON

FASTEN BELTS switch ..... OFF F/O

ANTI COLLISION light switch ..... OFF F/O

FUEL PUMP switches ..... OFF F/O

**CAUTION: Do not operate the center tank fuel pumps with the flight deck unattended.**

**CAUTION: Center tank fuel pump switches should be positioned ON only if the fuel quantity in the center tank exceeds 1000 lbs.**

GALLEY power switch ..... As needed F/O

WING ANTI-ICE switch ..... OFF F/O

ENGINE ANTI-ICE switches .....	OFF	F/O
Hydraulic panel .....	Set	F/O
ENGINE HYDRAULIC PUMPS switches - ON		
ELECTRIC HYDRAULIC PUMPS switches - OFF		
GASPER FAN switch .....	As needed	F/O
Air conditioning PACK switches .....	Set	F/O
One air conditioning PACK switch – ON		
Other air conditioning PACK switch – OFF		
ISOLATION VALVE switch .....	AUTO	F/O
Engine BLEED air switches.....	ON	F/O
APU BLEED air switch .....	ON	F/O
Exterior lights switches .....	As needed	F/O
GRAVEL PROTECT switch (as installed) .....	OFF	F/O
Flight director mode selector .....	OFF	C, F/O
Transponder mode selector .....	STBY	F/O
After the wheel chocks are in place:		
Parking brake – Release		C or F/O
APU switch .....	As needed	F/O
Flight deck door .....	Unlock	F/O
Verify that the CAB DOOR UNLOCKED light (as installed) is illuminated.		
Oxygen regulators .....	Set	C, F/O
OXYGEN DILUTER lever – 100%		
SUPPLY lever – OFF		
Call “SHUTDOWN CHECKLIST.”		C
Do the SHUTDOWN checklist.		F/O

---

---

**Secure Procedure**

EMERGENCY EXIT LIGHTS switch .....	OFF	F/O
WINDOW HEAT switches .....	OFF	F/O
Air conditioning PACK switches .....	OFF	F/O
Call “SECURE CHECKLIST.”		C
Do the SECURE checklist.		F/O

Intentionally  
Blank