

DCA24LA034

OPERATIONAL FACTORS/HUMAN PERFORMANCE

Attachment 7

Hawaiian Airlines Flight Crew Operations Manual [Excerpts]

November 14, 2024



717-200 Flight Crew Operating Manual
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Volume II
Operating Procedures

MANUAL ENGINE START PROCEDURE

CAUTION: Auto Abort protection is not available during a manual start. During the start, it is the responsibility of the crew to monitor engine parameters for start exceedances. In the event of start exceedance, start must be aborted.

Failure to observe the following may result in an engine fire:

- If tailwind component is 10 knots or greater, delay moving FUEL switch to ON position until there is an indication of increasing N1 rotation.
- If winds are greater than 30 knots, the airplane must be positioned into the wind (± 10 degrees).
- If the airplane cannot be positioned into the wind and the tailwind component is greater than 25 knots or if indications of increasing N1 cannot be attained, coordinate with ground crew and deploy thrust reversers to idle reverse. (Ground crew must activate override circuitry to allow reverser deployment prior to engine start). When at ground idle RPM, stow thrust reversers.

START Checklist COMPLETE

IGNITION Switch. ON

ENGINE START Switch. PULL

Pull ENG START switch and observe switch light illuminates.

Engine must be motored for 30 seconds at 19% N2 or greater.

NOTE: If ENG START switch will not remain latched, pull and hold ENG START switch and observe N₂ rotation.

TGT VERIFY LESS THAN 150°C

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MANUAL ENGINE START PROCEDURE (Continued)

FUEL Switch ON

Move the FUEL switch to ON and call "FUEL ON." Confirm the FUEL switch is firmly latched in the ON position by jiggling the switch and pushing down. Observe oil pressure rising. Observe normal fuel flow indication when the FUEL OFF message is extinguished.

NOTE: With the incorporation of SB 717-30A0009, the following alerts will be displayed with a MASTER CAUTION light when either fuel switch is selected to ON and the Air Data Heat (ADH) switch is OFF:

- PITOT AUX FAIL
- PITOT CAPT FAIL
- AOA HEAT R FAIL
- AOA HEAT L FAIL

The following alerts will also be displayed on the Systems Display (SD) after pushing the STATUS cue switch on the System Control Panel (SCP):

- STATIC R HEAT
- STATIC L HEAT

The RUDDER PITOT FAIL will be displayed only after pushing the MISC cue switch on the SCP.

TGT Rises

Call "TGT" when temperature indication increases.

Discontinue start if necessary to prevent exceeding the 700°C TGT limit.

CAUTION: *If TGT does not rise within 10 seconds after initial indication of fuel flow, discontinue start.*

N2 APPROXIMATELY 39%

Observe the ENG START switch retracts and switch light extinguishes.

NOTE: *If ENG START switch is manually being held open, release.*

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MANUAL ENGINE START PROCEDURE (Continued)

Ground Idle Rpm

Verify N_1 and N_2 indications stabilize at ground idle rpm. TGT
and ENG OIL quantity/pressure indicate in normal range.

IGNITION Switch. AUTO

[END]

Engine Running Turn

BLOCKING IN:

1. Advise Ground Control that you will need to keep an engine running at the gate and notify HAL Ramp Control that the right engine will remain running during the turn.
2. The aircraft Parking Brake will be Set and remain Set for the entire turn. (Verify brake temperatures remain within limits.)
3. Shutdown the left engine, leave the ISOL Valve in AUTO, turn OFF the left pack and complete the Parking Checklist with the exception that the Right Engine Fuel Switch, Beacon Light and Parking Brake will remain ON.
4. A pilot must remain at the controls at all times. (It is recommended that the ESS establish direct communications using a headset.)
5. The nose wheels and left main wheels should be chocked.
6. Ground personnel may now conduct normal turn operations being cautious to remain clear of the right side of the aircraft and the operating engine at all times.

BLOCKING OUT:

1. Verify the brake temperature and pressure are normal. Wheel chocks can now be pulled. The aircraft can now be pushed back.
2. Complete the Engine Start Checklist and advise Ground Control that the right engine will be powered up for left engine start.
3. Coordinate with the ESS and conduct a Cross Bleed Start on the left engine.
4. Continue with normal block out procedures.

[END]

COLD WEATHER OPERATION (Continued)

Landing

Flight crew must be aware of the condition of the runway with respect to snow, ice, slush, or precipitation. Most favorable runway in relation to surface condition, wind, and weather should be used. A landing on, or dispatch to, a runway with a braking action of poor is undesirable and should not be planned unless other factors make this imperative. In very general terms, landing on a wet runway increases stopping distance approximately 1000 feet over a dry runway, and landing on an icy runway increases the stopping distance by more than 3000 feet. Appropriate landing distance should be obtained from the applicable charts and tables in the PERFORMANCE Volume, to include Estimated Effect Of Runway Surface Conditions and Reverse Thrust On Landing Distance and the Estimated Ice Covered Runway Landing Distance tables. Use maximum landing flap configuration when landing on a contaminated runway. As winter weather is often characterized by strong winds and crosswinds, guidelines for VREF additives outlined in APPROACH AND LANDING section of FCOM Performance Volume should be observed.

CAUTION: On wet, slippery, or contaminated runways, stopping distance is based on maximum manual anti-skid braking, and full reverse thrust.

If a landing is planned on a runway contaminated with snow, slush, standing water, or during heavy rain, the following factors must be considered: available runway length; visibility of runway markers and lights; snowbanks and drifts along the runway; wind direction and velocity; crosswind effect on directional control; braking action; possibility of effect on the airplane from slush and water spray (engine ingestion, damage to flaps, gear doors, etc.); and probability of hydroplaning and its effect on stopping distances.

A common form of hydroplaning is dynamic hydroplaning. It occurs when there is standing water on the runway surface. Water with a depth of about 1/10 of an inch acts to lift tire off runway surface. This condition can progress to where tires no longer contribute to directional control and braking.

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COLD WEATHER OPERATION (Continued)

Minimum dynamic hydroplaning speed of a tire has been determined to be 8.6 times square root of tire pressure in pounds per square inch. With a main wheel tire pressure of 180 PSI, calculated hydroplaning speed is approximately 115 knots. With a nosewheel tire pressure of 155 PSI, calculated hydroplaning speed of nosewheel tire is approximately 107 knots. Nosewheel tire hydroplaning might be encountered while executing a high speed turnoff. Calculated hydroplaning speed referred to is for start of dynamic hydroplaning. Once hydroplaning has started, it may persist to a significantly slower speed.

Braking action can become inhibited following application of chemical de-icers on an icy runway. When first applied, chemicals provide a watery film over snow and ice that results in an extremely low coefficient of friction. When in doubt about type of runway de-icing, ask tower specifically if chemical de-icers were used.

Blowing or drifting snow can create optical illusions of depth perception problems during landing or taxi-in. In crosswind conditions, they may create a false impression of airplane movement over the ground. It is possible to have an impression of no drift when in fact a considerable drift may exist. When landing under these conditions, runway markers or runway lights can help supply the necessary visual references.

When it has been established that a safe landing can be made, the airplane must be flown with the objective of minimizing the landing distance. The approach must be stabilized early. Precise control over drift and approach speeds is mandatory. Execute a missed approach if zero-drift condition cannot be established prior to touchdown. When making the transition to visual reference for landing, continue to utilize the glideslope and VASI information to control the glidepath as wet windshields and snow covered surfaces may distort depth perception. The airplane should be flown firmly onto the runway at the aiming point. Avoid holding off. Be prepared to manually deploy the spoilers if automatic deployment does not occur as wheel spinup may be delayed.

(CONTINUED)

COLD WEATHER OPERATION (Continued)

On touchdown, take positive action to lower the nose gear to the runway and maintain moderate forward pressure on the control column to assist in directional control. Avoid excessive forward control column pressure in order to retain maximum braking effectiveness and to reduce the possibility of nosewheel spray. Maintain centerline tracking, ensure spoiler deployment, and simultaneously apply brakes and reverse thrust smoothly and symmetrically, as appropriate to the braking action and runway length available to ensure a safe stop.

On wet, contaminated or slippery runways, immediately after nose gear touchdown, maximize anti-skid braking operation by applying full brake pressure smoothly and symmetrically while applying reverse thrust to the idle reverse detent. After reverse thrust is verified, gradually increase reverse thrust as required. If necessary, reverse thrust should be applied smoothly and symmetrically to maximum allowable as soon as possible since the reverse thrust effectiveness is greatest at higher speed. Full brake pressure, and reverse thrust should be maintained until a safe stop is assured. If autobrakes are used, the MAX position should be selected.

CAUTION: If Difficulty In Maintaining Directional Control Is Experienced During Reverse Thrust Operation, Reduce Reverse Thrust To Reverse Idle (Or Forward Idle Thrust If Required), Regain Directional Control, And Reapply Reverse Thrust As Necessary. Do Not Attempt To Maintain Directional Control By Using Asymmetric Reverse Thrust

If difficulty in maintaining directional control is experienced during reverse thrust operation, reduce thrust as required. Do not attempt to maintain directional control by using asymmetric reverse thrust as this will further aggravate the effects of weathervaning. Under emergency conditions, maximum reverse thrust may be used to a complete stop. The use of reverse thrust may cause a visibility problem from blowing snow forward as ground speed decreases and can melt dry snow which can impinge and freeze on cold surfaces. Take action as appropriate for the braking effectiveness and runway length available. Avoid rapid return to forward thrust when engine rpm is high. The resultant forward thrust may be high enough to cause the airplane to accelerate.

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COLD WEATHER OPERATION (Continued)

Maintain directional control primarily with rudder pedals. Use differential braking as needed. Be alert for drift toward downwind side of the runway. The rudder required in strong crosswinds may cause the nose gear to turn to an angle which could induce skidding. Therefore, it may be necessary to hold the nose gear steering wheel centered while controlling steering with rudder and brakes to maintain tracking.

If a skid develops, especially in crosswind conditions, reverse thrust will increase the sideward movement of the airplane. In this case, release brake pressure and reduce reverse thrust to reverse idle, and if necessary, forward idle. Apply rudder as necessary to realign the airplane with the runway and reapply braking and reversing to complete the landing roll. Use as much runway as necessary to slow the airplane. Do not attempt to turn off a slippery runway until speed is reduced sufficiently to turn without skidding. Consider that braking effectiveness in the last 2000 feet of the runway may be further reduced by painted surfaces and accumulation of fuel, oil, and rubber.

Taxi-In

If the approach was made in icing conditions or if the runway was covered by slush or snow, retract the flaps and slats to 18/T.O. EXT. Damage to the flaps and slats could occur if residual ice is present and the flaps and slats are fully retracted. Slush in puddles or runway low spots may be deeper than the maximum allowed for operation and cause damage to flaps or other parts. A check after parking should be made for any damage or the necessity to de-ice the flaps and slats area. After a satisfactory check, flaps and slats should be moved to UP/RET.

Use caution when entering ramp areas. Be alert for obscured taxi and parking lines and surface conditions that may not be conducive to good steering and stopping. Other airplanes may not be parked in proper positions and may not afford sufficient clearance due to contaminated parking areas. If in doubt, request assistance for proper parking and clearance from other airplanes and obstacles.

Parking

The area in which an airplane is to be parked should be clear of snow and slush. If this is impractical, the area around the main and nose gear wheel should be cleared to reduce the possibility of tires freezing to the ground.

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COLD WEATHER OPERATION (Continued)

Avoid a parking position during or immediately after completion of a turn. It is best to allow nosewheels to be centered and the airplane to roll forward a few feet to eliminate all side loads on main and nose gear struts.

Both main and nose gear should be properly chocked. Parking brakes should be released to eliminate possibility of brakes freezing. If concerned about chocks holding on an icy ramp, parking brakes may be left on.

If parking for an extended period and extreme cold temperatures are expected, consider parking on sand or similar material to prevent freeze down.

In blowing snow, engine covers may be required, depending on length of stop. After engine shutdown, check engines air inlets for presence of water and/or ice. Remove any accumulations before installing engine inlet plugs and covers. If remaining overnight, ensure all cabin doors, cargo compartment doors, access doors, sliding windows, APU inlet door and outflow valves are closed. If the airplane is to remain inactive and the temperature is expected to go below freezing, drain all water and water waste systems and service the airplane in accordance with the Boeing 717 Maintenance Manual.

[END]

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AFTER START PROCEDURE

ELECTRICAL Control Panel

Move EXT power switch to OFF.

AIR Control Panel

Move PACK switches to AUTO.

Move ISOL switch to AUTO.

NOTE: If left engine is started first ISOL switch may be moved to AUTO position and L PACK switch moved to AUTO once left engine is stabilized.

ICE PROTECTION Control Panel

Move WINDSHIELD ANTI-ICE switch to ON.

Verify AIR DATA HEAT Switch is in the ON position (OFF light extinguished), and the "AIR DATA HEAT OFF" Level 1 alert is not displayed.

NOTE: Some aircraft have an updated model of windshield heat controller. This model does a self-test on power up causing a momentary WSHLD HEAT FAIL alert. This indication is normal.

Arm PROF

Arm FMS Profile by pressing the PROF switch on the FCP.

Transponder

Rotate mode selector to the XPNDR position.

Door Alerts

Verify no door alerts are annunciated.

Cockpit Door

Closed and locked.

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AFTER START PROCEDURE (Continued)

Departure Salute

Departure salute will be given by ground crew from the terminal side of the aircraft. This will confirm the pushback is complete, the aircraft is clear of equipment and the aircraft is able to move under its own power.

FLAP/SLAT Handle

Move FLAP/SLAT handle to preselected takeoff flap detent.

NOTE: The Captain may, as a part of the After Start Flow, turn off the APU Air switch or the APU Air and Master switches. In this case the F/O will verify the switches are in the desired position on the Taxi Check.

Load Closeout and FMS Weight Data

Print the Load Closeout when received via ACARS. Verify correct tail and flight number. One crew member shall read the ZFW, FOB, TOW, ZFW CG, TOW CG, and soul count from the printed load closeout while the other crew member verifies the correct data on the MCDU. The FO shall set the takeoff STAB TRIM setting, enter the reduced climb power setting as appropriate for the TOW.

When possible, review the load closeout prior to taxi. If the load closeout has not been received by the completion of the after start checklist, taxi to the departure runway is allowed. However, the FOM requires this review to be completed prior to take off.

[END]

Procedures & Techniques
Ground Operations**Chapter PT**
Section 10

Pushback/Towing

General

The following safety and operating precautions apply to all airplane towing procedures and should be strictly adhered to. These precautions include the following:

- Prior to any movement, ensure cabin is properly prepared, all cargo doors and main gear doors are closed and wheel chocks are removed.
- Ensure IRU alignment has been completed.
- Establish positive contact with towing personnel and ramp control.
- Verify hydraulic pressure is normal (No “BRAKE PRESS LO” alert annunciated) If brake pressure is below 2000, or “BRAKE PRESS LO” alert illuminates, turn AUX and TRANS pump switches to ON.
- Verify anti-collision lights are on.
- Release or set parking brakes only when so directed by towing personnel.
- In congested areas, request wing walkers to ensure clearance between airplane, adjacent airplanes, equipment, and buildings.
- Ensure towing speed is not excessive.
- Be alert for any situation which may require cockpit crew intervention with towing operation.
- Ensure last few feet of towing are in a straight line to align gear and relieve tire and tow bar twisting stresses.
- Ensure all towing personnel are well clear of airplane, pins removed, and a departure salute has been received prior to taxi.

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Pushback/Towing (Continued)

REMOVAL OF GROUND POWER AND/OR AIRCONDITIONING		
EVENT	FLIGHT DECK	RAMP CREW
Prior to scheduled departure. (10 to 15 minutes prior to pushback)		"Ground to Flight Deck."
	"Flight Deck, Go Ahead"	
Flight Crew confirms aircraft status and clears the ramp crew to disconnect external power/air. Upon confirming the brakes are set, the ramp crew will remove the chocks when ready.		"Confirm brakes are set. Are You Ready to Disconnect External Power and/or Air?"
	"Brakes Set, Standby" (if not ready) or "Brakes Set, Cleared to Disconnect External Power and/or Air"	
		"Cleared to Disconnect External Power and/or Air"

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Pushback/Towing (Continued)

CIRCLE CHECK COMPLETE		
EVENT	FLIGHT DECK	RAMP CREW
Tug is connected and the ramp crew confirms the chocks are removed and personnel / equipment is clear of aircraft (circle check).		"Ground to Flight Deck."
	"Flight Deck, Go Ahead"	
		"Circle Check Complete; Ready for Push."
	"Standby for Push Clearance"	
After pushback clearance is received from ATC/Ramp control, the parking brake is released.	"Cleared to Release Brakes?"	
		"Release Brakes"
	"Brakes Released, Cleared to Push (pushback instructions)"	
		"Brakes Released, Cleared to Push (reads back pushback instructions)."
Engine Start Clearance, at the discretion of the ramp crew.		"Clear to Start Engines."
	"Cleared to Start Engines."	

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Pushback/Towing (Continued)

PUSHBACK COMPLETED		
EVENT	FLIGHT DECK	RAMP CREW
Ramp Crew completes pushback		"Push Complete, Set Brakes."
	"Brakes Set" "Cleared to Disconnect Towbar"	
		" <i>Brakes Set</i> , Cleared to Disconnect towbar"
Once engines have been started and parameters are stabilized, the headset can be removed.	"Cleared to Disconnect Headset"	
		"Cleared to Disconnect headset"
The Ramp Crew will standby on the airport terminal side of the aircraft.		<i>Upon confirming the area is clear, the ramp crew will:</i> 1) <i>Display the Pin.</i> 2) <i>Issue a Salute.</i>
The Flight Crew will verify with each other that the Tug/Towbar are disconnected, the Pin is displayed & and Salute is received. The Pilot on the respective side of the aircraft that the ramp crew is on should return the salute to the ramp crew. Full control now transfers to the flight crew. The flight crew performs the After Start Checklist after returning the salute and flashing the nose light once.	Return Salute & Flash taxi light once	

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Pushback/Towing (Continued)

PUSHBACK COMPLETED		
EVENT	FLIGHT DECK	RAMP CREW
NOTES: <i>If an abnormal occurs during pushback, the flight crew and ramp crew will communicate in plain language with each other. i.e., "We have an abnormal indication, stay connected and standby."</i> <i>Once off headset, the Flight Deck can flash the taxi light three times to gain the attention of the ramp crew to re-establish communication.</i> <i>It is essential to verbalize the movement of the parking brake so that all pilots on the flight deck are aware of its status.</i>		

Pushback Without An Interphone

Performing a pushback without an interphone uses the same process as a normal pushback but uses hand signals in place of the standard callouts. The flight crew should review marshaling signals in the FOM prior to commencing the pushback.

Face to Face Briefing

Before commencing a pushback with hand signals, the Flight Crew and Ramp Crew must perform a face-to-face briefing to confirm both parties have a shared mental model on the expected sequence of events. This includes hand signals to be used for both a normal pushback and any abnormal event that may occur. Normally the ramp crewmember in charge of the pushback will initiate the briefing prior to door closure by entering the flight deck and talking with the flight crew. The flight crew is responsible for ensuring the brief occurs and is satisfied with the coordinated plan.

[END]