

DCA24LA034

OPERATIONAL FACTORS/HUMAN PERFORMANCE

Attachment 9

Hawaiian Airlines Ground Service Manual [Excerpts]

November 14, 2024



GROUND SERVICE MANUAL (GSM)

Revision 34
09/28/23

Chapter 4: Line Service Procedures

4.1 General

| **ISARP:** GRH 3.2.1

4.1.1 Overview

1. Ground Service operations are performed by both direct employees of Hawaiian Airlines (within the state of Hawaii) as well as contracted vendors (at non-Hawaii locations).
2. Ground Service personnel employed directly by Hawaiian Airlines fall under three groups: Ramp, Line Service and Aircraft Appearance/Cabin Service.
3. Chapter 4: Line Service Procedures deals specifically with duties and responsibilities associated with Line Service operations and personnel. Line Service operations are defined as duties and activities relating to the following:
 - A. Service of aircraft
 - B. Fueling
 - C. Marshalling and Towing
4. Contracted vendors are responsible for all duties relating to ground handling operations.
5. Refer to Chapter 2: General Procedures for policies and procedures related to organization and management, training and qualifications, safety & security, dangerous goods and ground service equipment.

4.1.2 Door and Panel Area Inspections

4.1.2.1 Responsibility

1. It is the responsibility of each ground service individual to thoroughly inspect the aircraft for damage around the areas he/she is servicing.
2. If a servicing panel or door of the aircraft is accessed by an individual, that individual is responsible to inspect the area for damage.

4.1.2.2 Procedures

| **ISARP:** GRH 3.2.3

1. Prior to GSE positioning and door opening/closing, a visual inspection of the door/service panel and its surrounding area must be completed.
2. At minimum, visual inspections must include the following:
 - A. Inspection of the entire door/panel's exterior surface for signs of dents, scratches, scuff marks, or other indications of damage.
 - B. Inspection of the door/panel edges and frame around the entire edge of the door/panel for any signs of dents, scratches, scuff marks, or other indications of damage.
 - C. Inspect the aircraft fuselage surrounding the door/panel for any signs of dents, scratches, scuff marks, or other indications of damage. At minimum, this includes 1-2 feet beyond the distance that servicing equipment (such as hoses, cords, etc.) may come in contact with the aircraft.

3. Do not proceed if an observed damage does NOT have a silver circular sticker immediately adjacent to it ([refer to Figure 4-1](#) below for example). Stop the operation and follow procedures outlined below.
4. If unsure whether an existing silver circular sticker is associated with the damage in question, proceed with tasks in the "If damaged is noted" item within this section until advised by a supervisor that the aircraft is cleared to proceed with the operation.

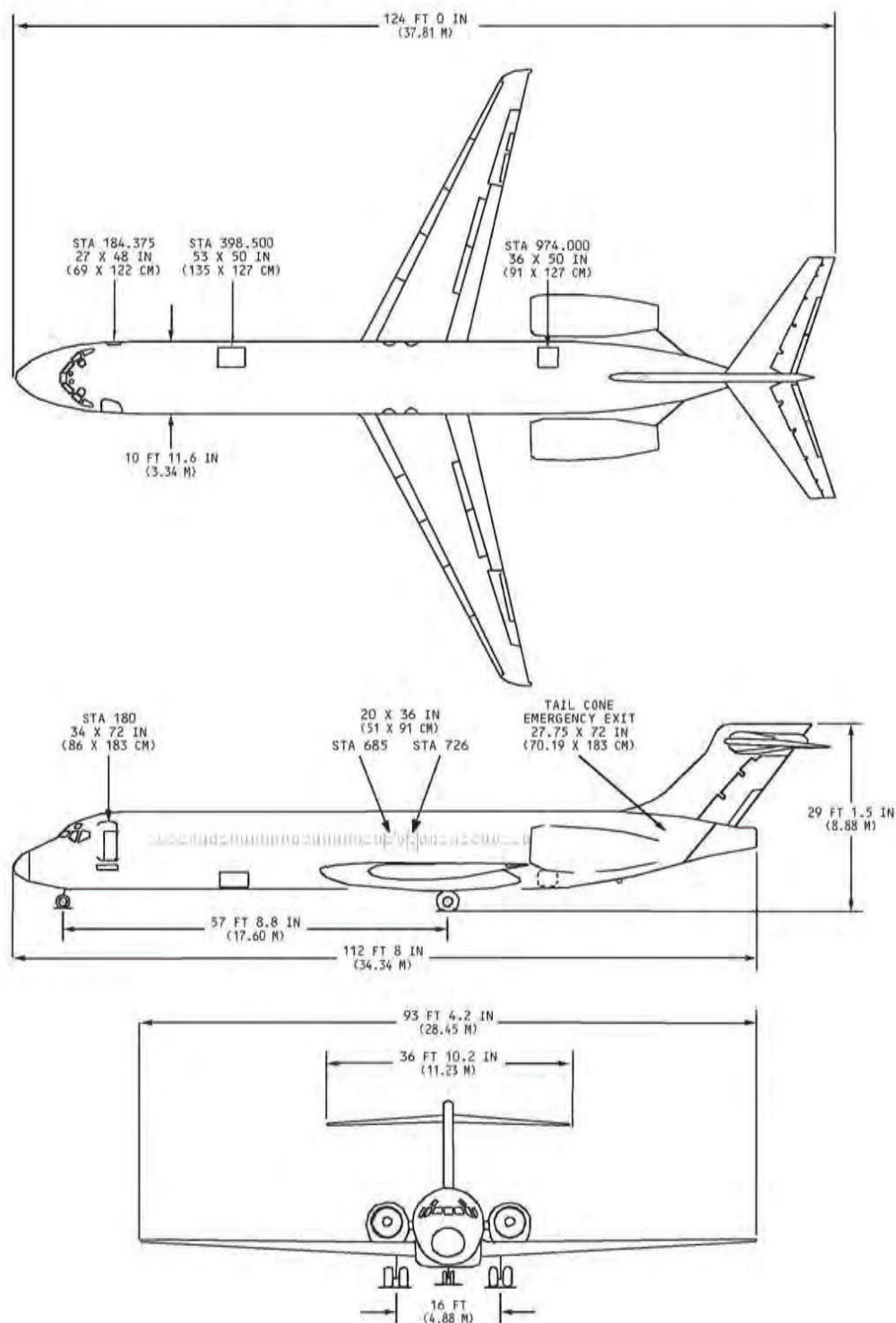
Figure 4-1: Damage Silver Circular Sticker

5. If damage is noted, notify a supervisor and provide the following information:
 - A. The specific aircraft number.
 - B. The time damage was noted.
 - C. Whether the damage was noted prior to offload, after offload, or after onload.
 - D. The supervisor will notify Ramp Control, who will advise Maintenance.

4.2 717 Servicing Procedures

4.2.1 Aircraft Dimensions

Figure 4-2: 717 Aircraft Dimensions

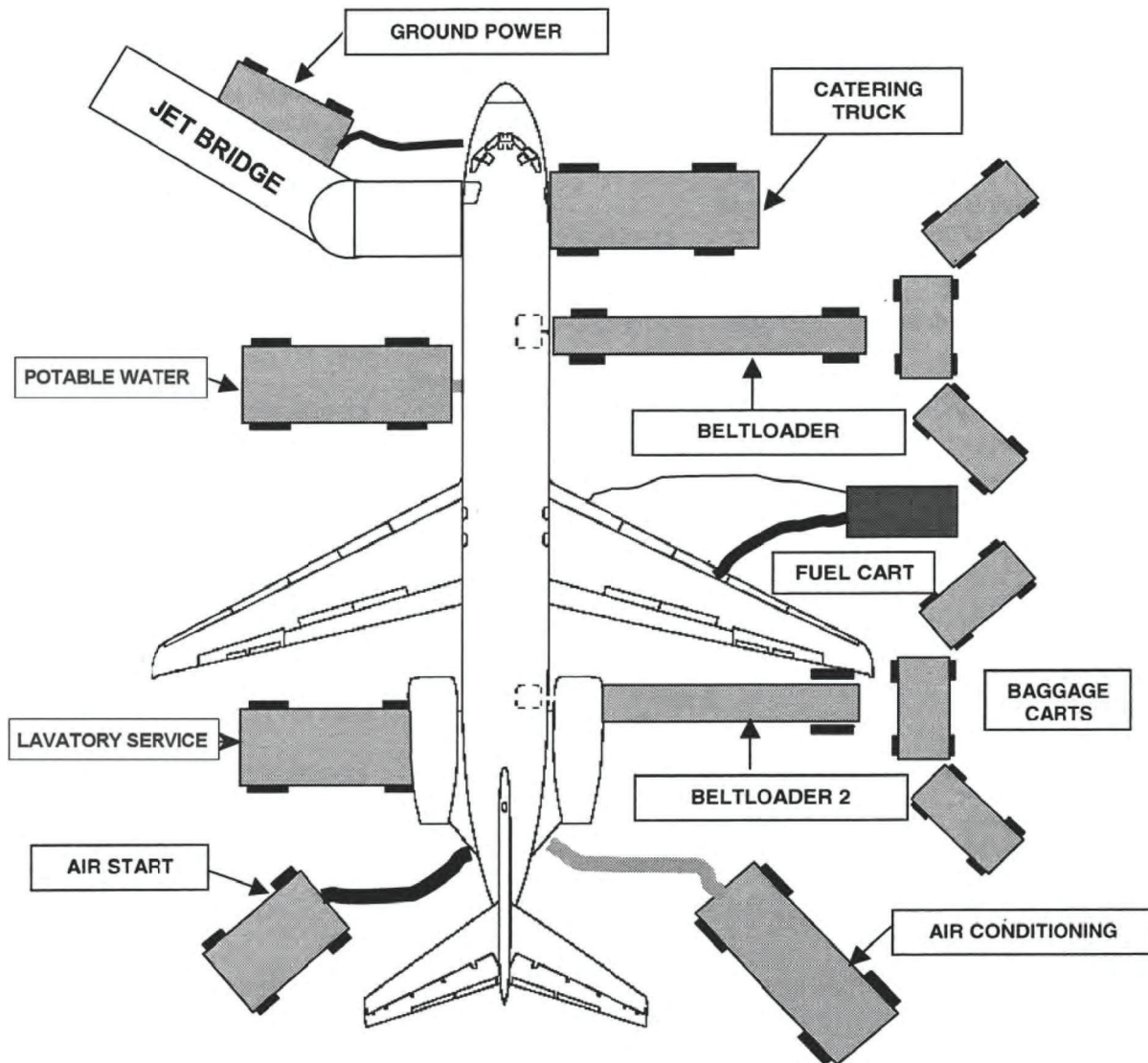


4.2.2 Aircraft Servicing Plan

4.2.2.1 Standard Plan

1. Shown is the plan to be followed by all stations using jet bridges.

Figure 4-3: Standard Servicing Plan – With Jet Bridge



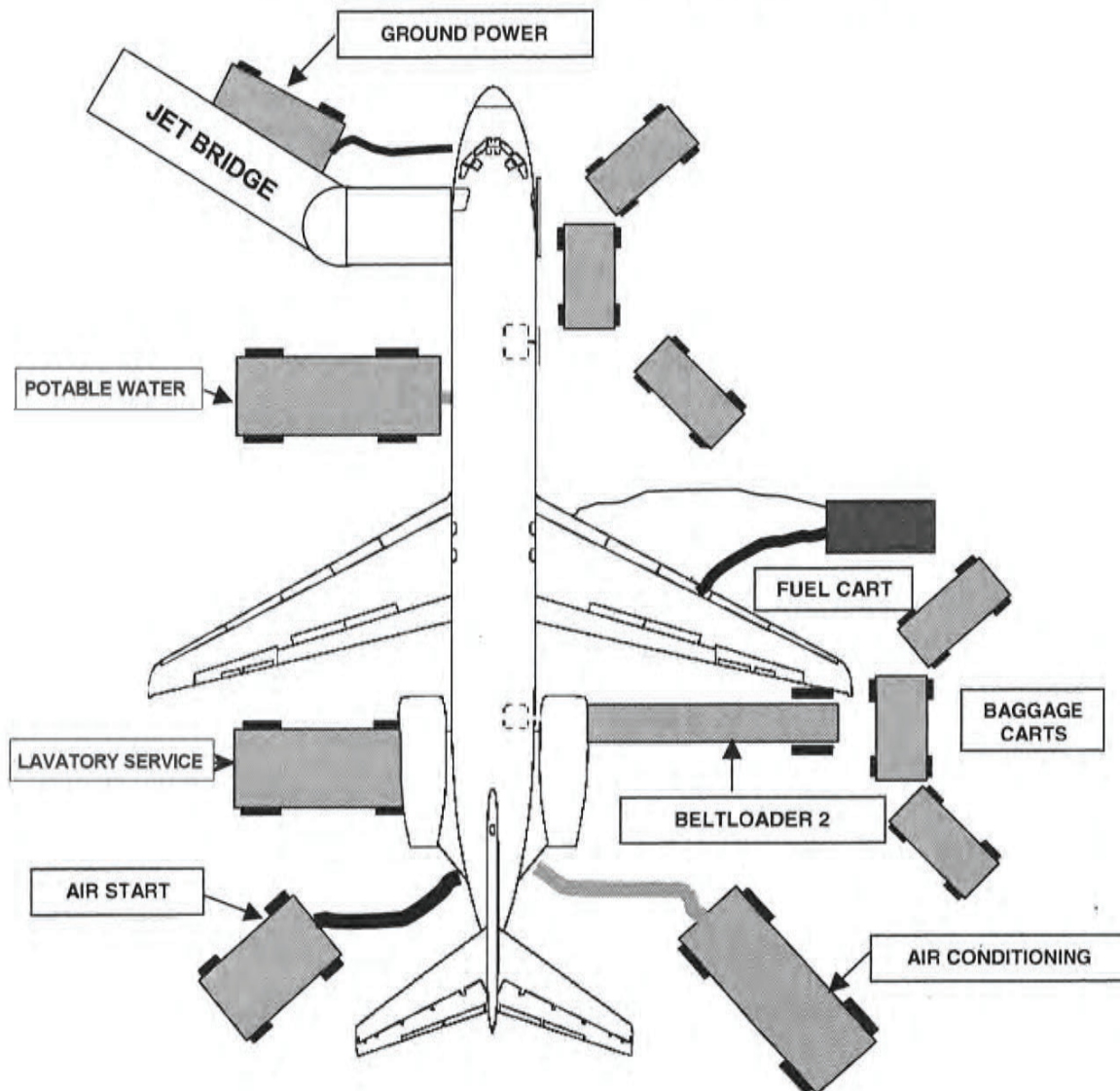
4.2.2.2 Alternate Plan

1. Shown is an optional alternate plan for all stations using jet bridges. Front Belt Loader is not used.

NOTE

For this plan, the Catering truck cannot be present.

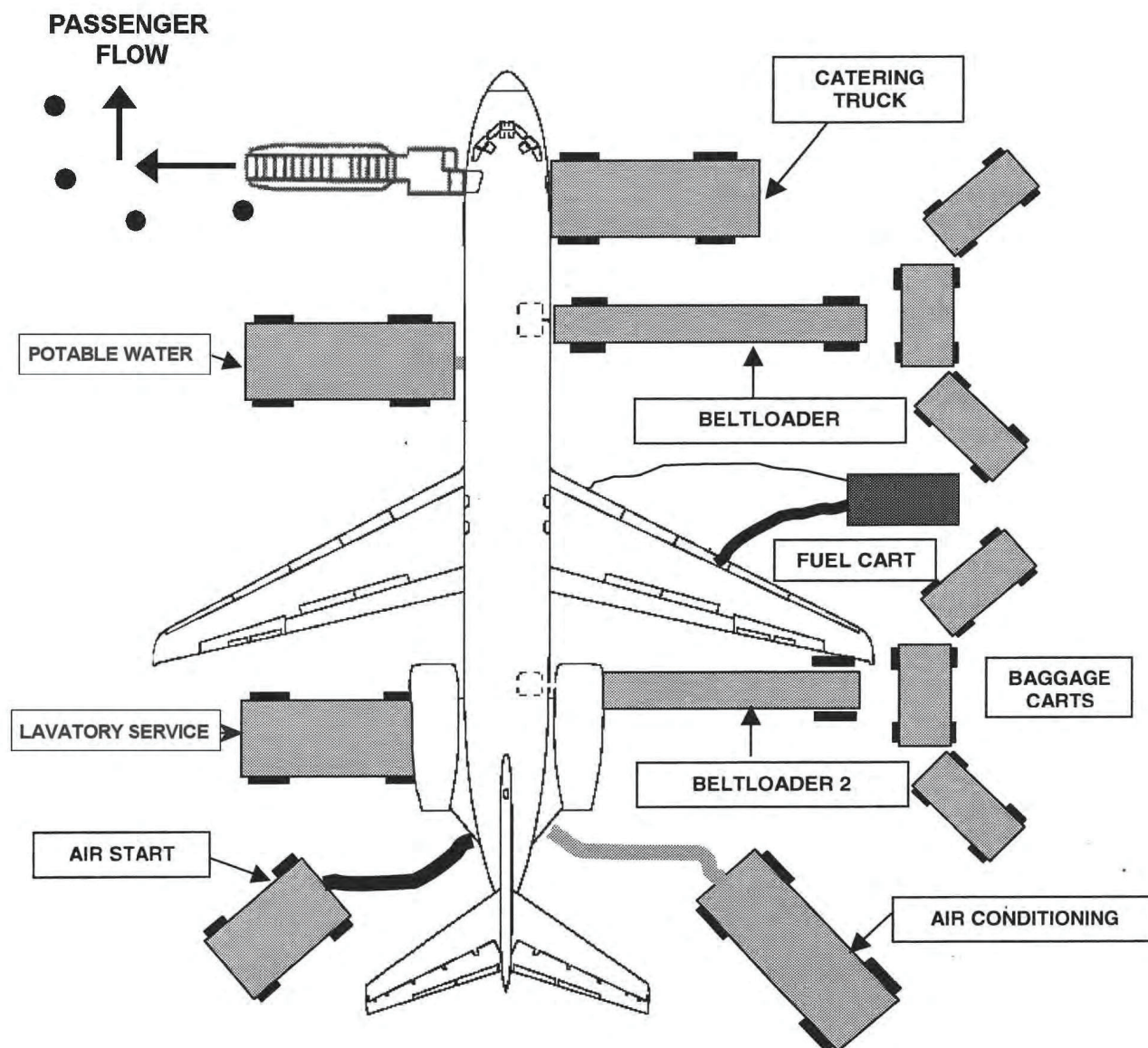
Figure 4-4: Alternate Servicing Plan – No Catering Truck



4.2.2.3 Standard Plan – No Jet Bridge

1. This plan is to be followed by all stations not using or not equipped with jet bridges.

Figure 4-5: Standard Plan – No Jet Bridge



4.2.3 717-200 Hazard Zones

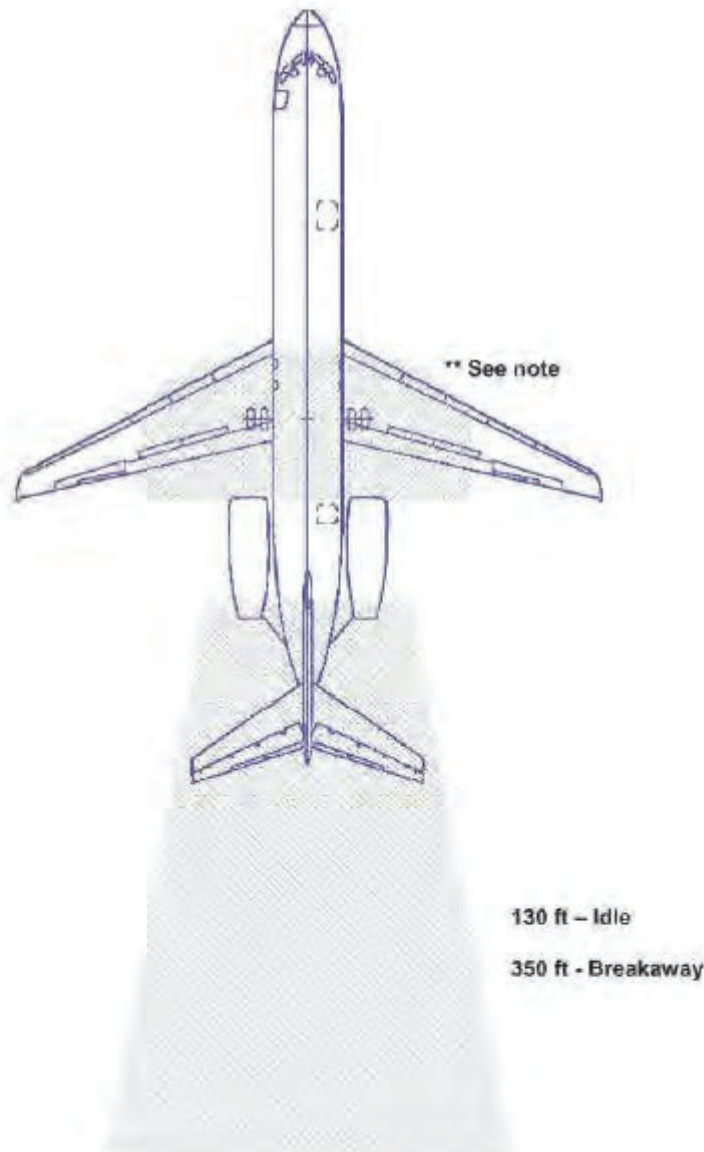
4.2.3.1 Blast and Suction Areas

- The general suction and blast hazardous areas are defined in the following table.

Table 4-1: Blast and Suction Areas – Distance In Feet from Engine Outlet

	@ Idle Speed	@ Breakaway Speed
Suction Hazardous Area	**	**
Blast Hazardous Area	130	350
** The wingtip clearance lines and the leading edge of the wing provide a visual reference of the engine suction hazard area.		

Figure 4-6: 717-200 Blast and Suction Areas



4.2.4 Air Start Requirements

1. Refer to 2.6 Ground Service Equipment (GSE) Safety for air start unit operation and precautions.

4.2.4.1 Procedures

CAUTION

All personnel must take positive action to avoid entering "hazardous or potentially hazardous" areas parallel to and forward of the inlet duct or entering the blast area AFT of an operating engine.

1. Pushback crew communicates with the flight crew to confirm both parties have the same expectations for the sequence of events (e.g., determining which engine will be started first, the location of ground equipment, when ground power/air will be disconnected).
2. Primary positioning of the air start unit is on the opposite side of the aircraft fuselage from the engine being started.
3. If primary positioning is not possible, air start unit may be placed on the same side of the aircraft fuselage as the starting engine. Agent performing the air start must ensure the following:
 - A. Unit is placed outside of the exhaust hazard area and suction zone
 - B. Unit is placed as far away from the engine as possible.
4. Attach the hose(s) to aircraft, ensuring the coupling is properly secured to the aircraft. Never start unit prior to hose attachment.

CAUTION

When connecting and disconnecting air start unit hose, walk directly underneath the fuselage, or close alongside it, keeping clear of engine danger areas.

5. Start unit per operating instructions and pressurize the hose(s).
6. Notify flight crew via interphone/headset to start engines.

NOTE

In the event that the interphone becomes unusable during pushback, ramp agent must use conventional hand signals for the departure.

7. Once the engine has started, and advised by flight crew, shut off air pressure.
8. Shutdown unit per operating instructions.
9. Disconnect air hose from the aircraft, close panel, and return the hose to the air start unit.

CAUTION

Engine starts using external pneumatic air without a functional interphone available to the Ramp Crew and the Flight Crew are prohibited.

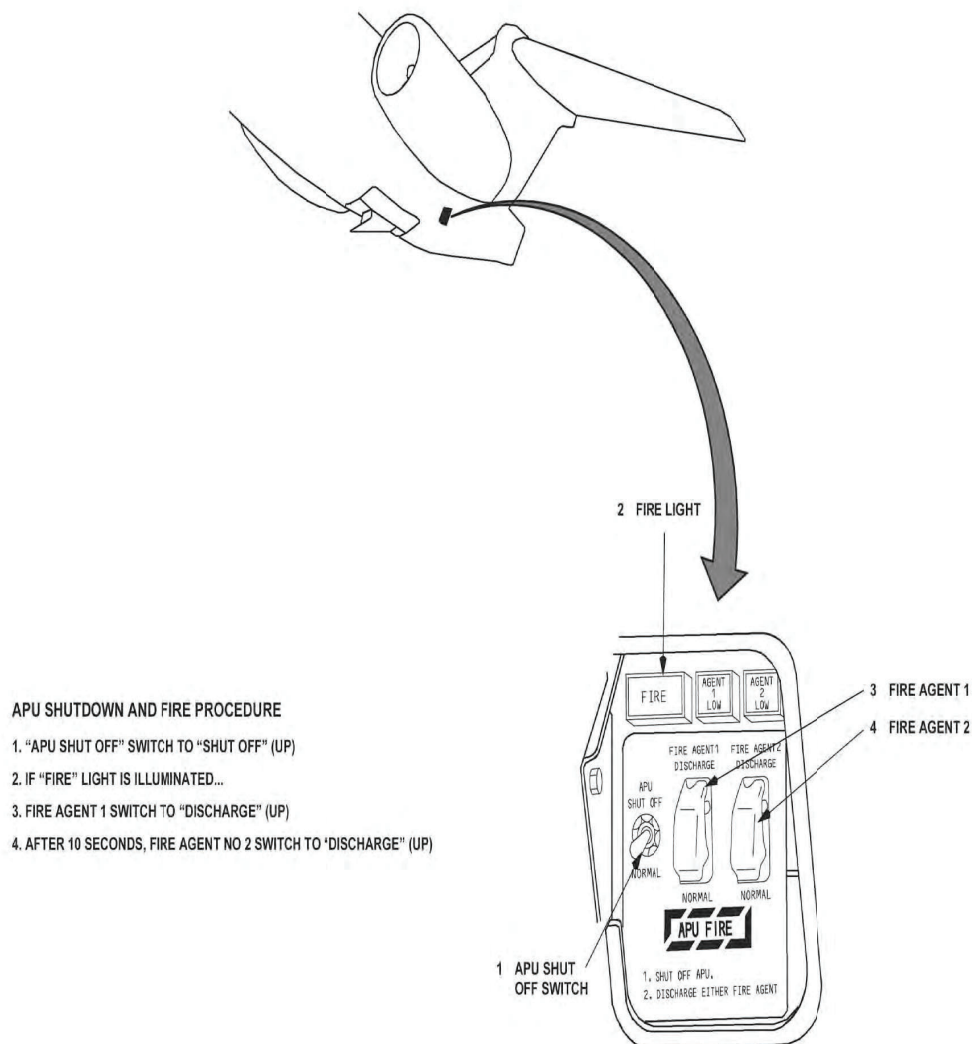
A. Auxiliary Power Unit – APU

- 1) Whenever available, ground electric power must be attached to conserve fuel.
- 2) The auxiliary power unit (APU) supplies pneumatic and electrical power for ground starting of the main engines, air conditioning and ground operation of the electrical systems.

B. Fire Control Panel

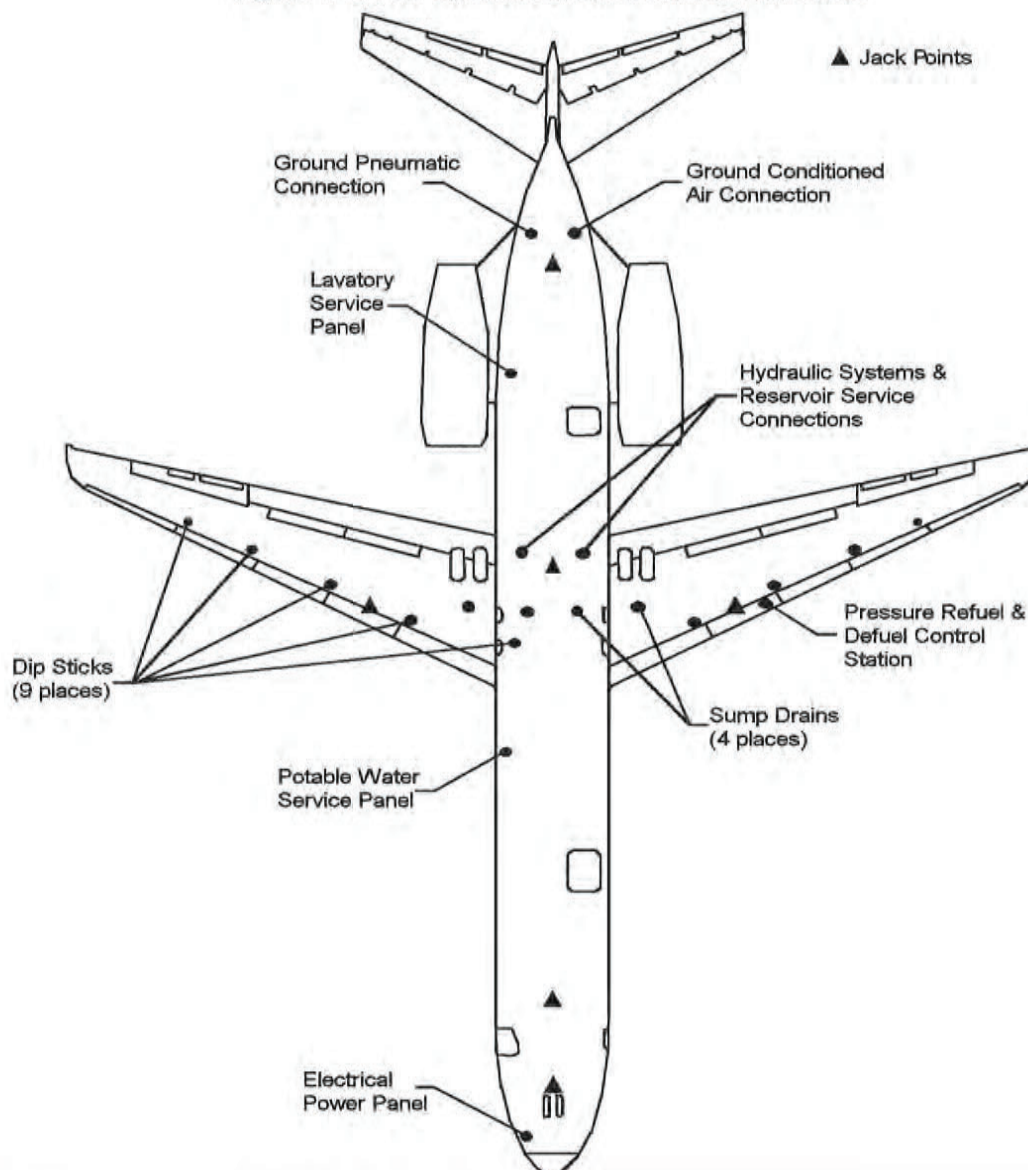
- 1) The remote APU Fire Control Panel is located on the fuselage, below the AFT portion of the number one (1) engine.

Figure 4-7: 717 External APU Fire Control



- 2) In the event of an APU fire:
 - a) Fire warning lights will illuminate and a fire warning horn will sound.
 - b) If both the fire warning light and warning horn are activated, push the external APU SHUTDOWN switch to turn off the APU.
 - c) Immediately discharge either of the fire extinguishers by pressing the APU BOTTLE DISCHARGE switch.
 - d) If the fire continues, press the second APU BOTTLE DISCHARGE switch.
 - e) Notify the flight crew and Maintenance. If the fire persists, notify the local Fire Department.
- 3) Do not discharge the fire bottles unless the horn is sounding and the light is illuminated. The flight crew has the ability to sound the horn to gain attention of the ground crew.
- 4) Do not use the external APU control for normal shutdowns.

Figure 4-8: 717 Ground Service Connection Points



10. Engine start at the gate

- A. These callouts are used if an engine is started at the gate before pushback. This can occur due to airport requirements or aircraft requirements (engine start with external pneumatic power, or electrical power for 787). For the safety of Ramp Personnel, only the right (#2) engine will be started at the gate. After the right (#2) engine is started and all ground equipment is disconnected, the aircraft will be pushed back onto the ramp or a taxiway. When push back is complete, Ramp Crew will verify the jet blast hazard area is clear for a crossbleed start of the left (#1) engine. The Flight Crew will not begin the crossbleed start until salutes have been exchanged, and the Ramp Crew is clear of the aircraft.

1) Face-to-Face Briefing

- a) Before commencing an engine start at the gate, the flight crew and ramp crew perform a face-to-face briefing. This will ensure both parties have a shared mental model on the expected sequence of events (i.e., discussing which engine will be started first, the location of ground equipment, when ground power/air will be disconnected, etc.)

- 2) If a face-to-face briefing cannot occur, the flight crew and ramp crew must conduct a briefing via headset, prior to engine start.

- 3) Use this script to communicate Engine Start procedures with the Flightdeck

Table 4-2: Ramp Crew Ready for MLG Chock Removal

Event	Flightdeck	Ramp Crew
Ramp crew establishes communications with the flightdeck		"Ground to Flightdeck."
	"Flightdeck, go ahead."	
The aircraft's parking brake is set; allow safe removal of main landing gear (MLG) chocks. Upon confirming the brakes are set, the ramp crew will remove the chocks when ready		"Confirm brakes are set."
	"Brakes set."	

Table 4-3: Circle Check Complete

Event	Flightdeck	Ramp Crew
Ramp crew establishes communications with the flightdeck after they remove the MLG chocks.		"Ground to Flightdeck."
	"Flightdeck, go ahead."	
Tug is connected and the ramp crew confirms the chocks are removed and personnel / equipment is clear of aircraft (circle check).		"Circle check complete; pitot covers removed." ⁽¹⁾
Ramp crew is ready to set the air start unit to deliver pressure required to start an engine.		"Ready for air start?" ⁽¹⁾
Flightdeck obtains clearance to start an engine at the gate from ATC/Ramp Control.	"Start air." ⁽¹⁾	
Engine start clearance, at the discretion of the ramp crew. ⁽²⁾⁽³⁾		"Air started, clear to start engine #__."
	"Cleared to start engine #__."	
Flightdeck notifies ramp crew of a successful engine start and that all external equipment can be disconnected.	"Engine #__ started, cleared to disconnect air and/or external power."	
		"Cleared to disconnect air and/or external"
⁽¹⁾ A321 / A330 only for the "pitot covers removed". ⁽²⁾ B717 starts the right (#2) engine at the gate, pushes back, then crossbleed starts the left (#1) engine on a ramp or taxiway ⁽³⁾ A321 & A330 will normally perform a cross bleed start during taxi.		

Table 4-4: Ready for Pushback

Event	Flightdeck	Ramp Crew
Ramp crew establishes communications with the flightdeck. "Ready for pushback" indicates all extra equipment has been removed.		"Ready for pushback"
	"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" (reads pushback instructions).	
		"Brakes released; cleared to push" (repeat back pushback instructions).

Table 4-5: Pushback Completed

Event	Flightdeck	Ramp Crew
Ramp crew completes pushback.		"Push complete, set brakes."
	"Brakes set; cleared to disconnect towbar."	
		"Brakes set; cleared to disconnect towbar."
Once the parking brake is set, Flight Crew verifies with Ramp Crew the hazard area is clear. Once clear, Flight Crew clears Ramp Crew to disconnect headset.	"Confirm jet blast hazard area clear?"	
		"Jet blast hazard area is clear" or "Negative, standby."
	"Cleared to disconnect headset."	
		"Cleared to disconnect headset."
The Ramp Crew will standby on the airport terminal side of the aircraft.		"Upon confirming the area is clear, the Ramp Crew will: Display the pin. Issue a salute."
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. When the Ramp Crew is completely clear of the aircraft, the Flight Crew may begin the crossbleed start of the left (#1) engine.	Return salute and flash taxi light once.	
NOTES If an abnormal indication 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." 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. The Flight Crew member operating the parking brake must always verbalize its movement so that all Flight Crew are aware of its status.		

4.2.5 External Power Use

ISARP: GRH 3.2.7

1. The following procedures pertain to the procedures for usage of external power on 717 aircrafts.

4.2.5.1 Usage

1. External power is utilized for all 717 aircraft where available as described in this section.
2. Establish external ground power and air conditioning as quickly as possible. This takes priority and is established before installing steering bypass clips or attaching tow bars or tow tractors.
3. If there is a delay in connecting external power or air conditioning, notify RAO (HNL) or Ramp/Ops Control as soon as possible so that RAO/Ramp/Ops Control may relay a message to the cockpit.

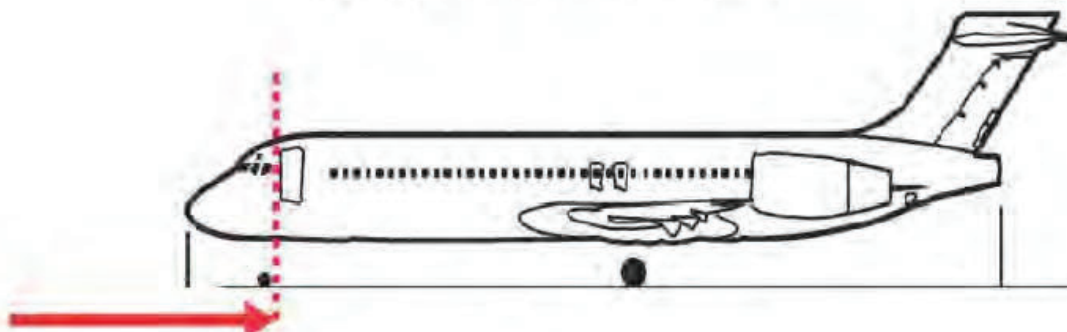
4.2.5.2 Sources

1. External power can be drawn from a variety of sources.
 - A. The active jet bridge – By default, Line Service uses external power from the active jet bridge.
 - B. The remote jet bridge – External power from the remote jet bridge may be used if the active jet bridge is not available.
 - C. A mobile ground power unit (GPU) – May be used if jet bridge external power is unavailable.

4.2.5.3 Ground Time

1. When scheduled ground time is 90 minutes or less, the Captain will turn on the auxiliary power unit (APU) during taxi. Upon successful connection of external power, the Captain will shut down the APU generator.
2. When scheduled ground time exceeds 90 minutes, the Captain will not turn the APU on. One engine will remain running to generate power until the external power is connected. In this scenario:
 - A. Ground personnel must be extra cautious of the running engine while external power is being connected.
 - B. Suction hazards exist within 8 feet of the leading edge of the wing when engines are at idle speed. Personnel must go no further back than the external power panels on the front of the aircraft. Boundary is specified by the dotted line in the image below.

Figure 4-9: Suction Hazard Boundary



- C. The jet bridge operator and ground personnel must work expediently to prevent delays in connectivity.
- D. In case of ground connectivity problems or delay, the Captain will turn on the APU.

4.2.5.4 Connecting the External Power

1. When connecting external power, at least two Line Service personnel are used. Only trained HA and/or vendor personnel may operate ground service equipment, including Ground Power Units.
 - A. Follow normal procedures for stopping and chocking the aircraft.
 - 1) If using external power from the active bridge, wait for the jet bridge to be secured to the aircraft.
 - 2) If using external power from a remote (not in use) bridge, Line Service may position the power cord near the front on the aircraft before arrival.
 - 3) When using the power cord from the remote jet bridge, cones must be placed on each side of the cord to ensure ground personnel are aware of the cord and do not run it over.
 - B. One Line Service agent retrieves the power cord and connect it to the external power panel on the aircraft. Verify that the power is off when connecting the cord. This can be determined by the light on the jet bridge panel.
 - C. For all 717 aircraft, cable holding straps are connected and used to allow the cable to hang horizontally and reduce the pull on the aircraft receptacle, minimizing the risk of the cable being disconnected and falling to the ground.
 - D. To use the cable holding straps, the ramp agent must:
 - 1) Before connecting power cable, a visual inspection must be performed for the external power receptacles and the GPU connectors for corrosion, contamination, overheating, or damage of cracks. If any damage is found, contact maintenance.

CAUTION

Do not install external power cord if damage is found.

- 2) Open the access door to gain access to the external power receptacles and panel.
- 3) Do a visual inspection of the external power receptacles and the GPU connectors for corrosion, contamination, overheating, or damage of cracks. If any such damage is found, call Maintenance.
- 4) Carefully hang the EEPH Hanger (PN 717-EXTPWRHOOKHAL) on the lower side of access Door/ Panel 110AL fuselage cut out to support power cord and prevent accidental disconnection.

Figure 4-10: Cable Connector



WARNING

Before connecting the ground power unit to the external power receptacle of the aircraft, make sure that the external electrical power supply is not energized. If it is energized, dangerous arcing can occur.

CAUTION

Do not use a ground power unit with a capacity less than 90 KVA. If a less powerful unit is used, an overload of the GPU could occur, and it could be necessary to re-set many computers in the aircraft.

CAUTION

Ensure that the weight of the chord and plug assembly will be fully supported by the external electrical power harness (EEPH) assembly. This prevents damage to the external power receptacle.

Figure 4-11: 717 Jet Bridge Panel



- 5) Carefully connect external power (400 Hz) chord plug.

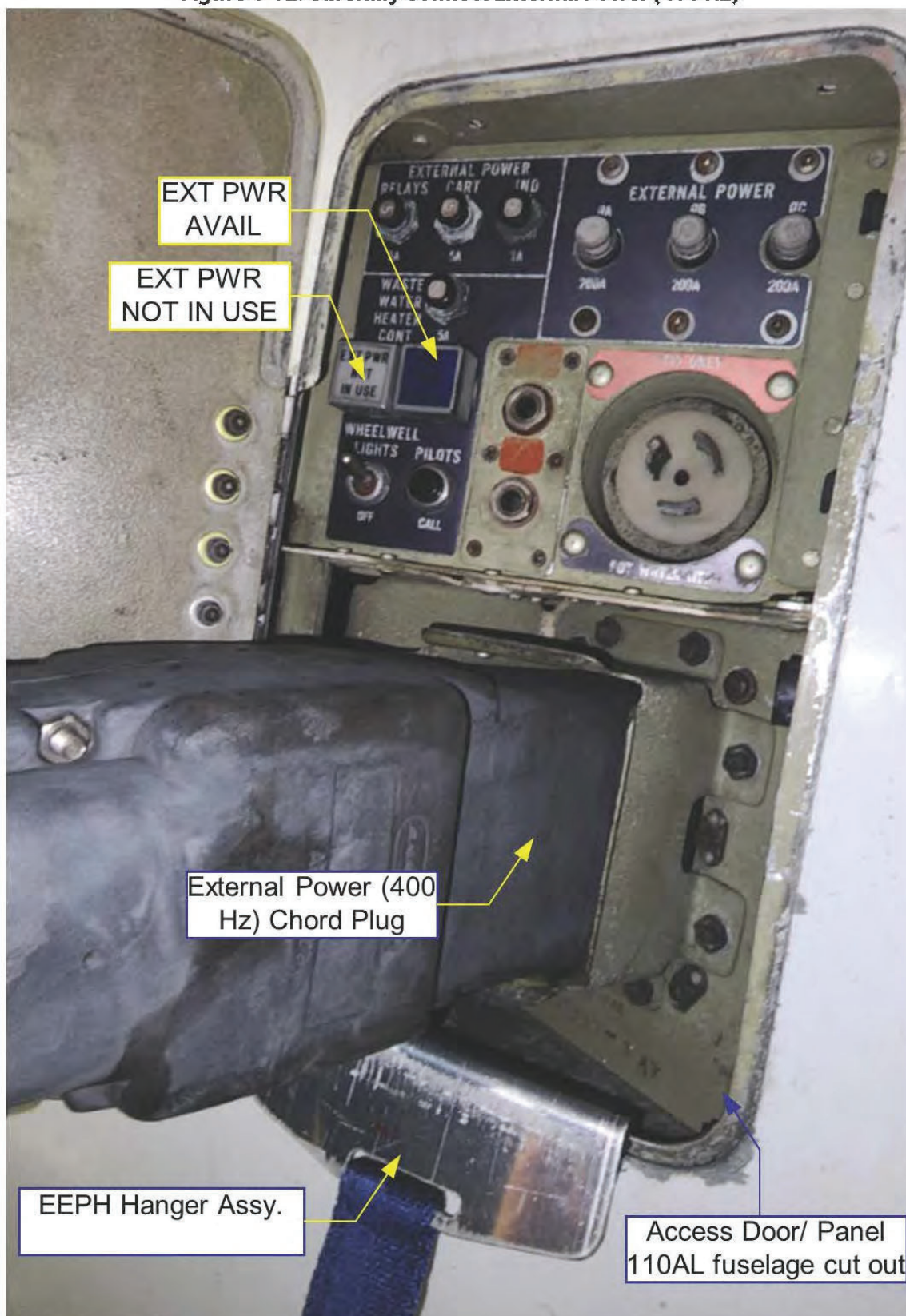
NOTE

Check and ensure that the receptacle guide to external power plug top and bottom clearances are even.

NOTE

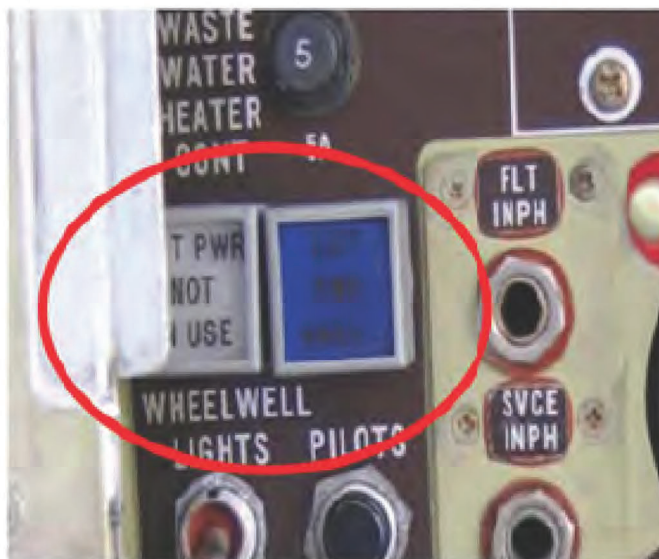
Verify that the GPU connector is properly attached to the external power unit before starting the GPU. If the connector is not properly attached, dangerous arcing could occur.

Figure 4-12: Carefully Connect External Power (400 Hz)



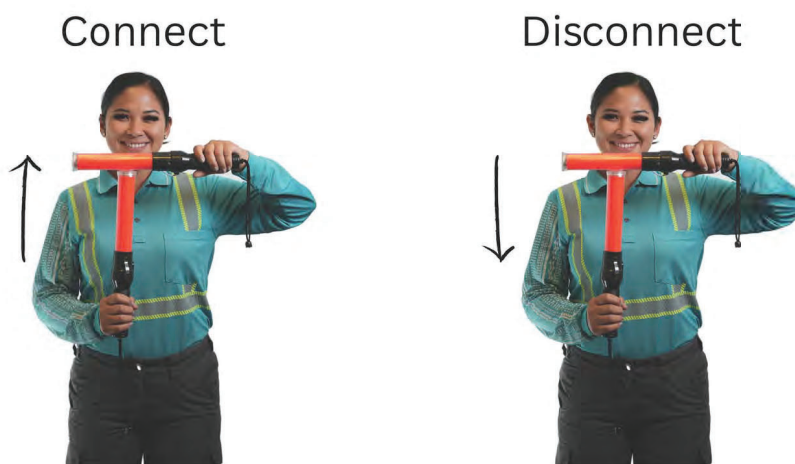
- E. Once connected, a second Line Service agent will switch the jet bridge power unit to the “on” position. When properly connected, two lights illuminate on the external power panel of the aircraft.

Figure 4-13: External Power Panels – 717 Power Panel



- F. The Connect/Disconnect Power signal to the Captain is made indicating that external power is connected. As an alternative, the Captain may be notified by headset.
- G. If the external panel lights do not illuminate, the Connect/Disconnect Power signal must still be indicated to the Captain, as the indicator bulbs may not be working.

Figure 4-14: Connect/Disconnect Power Signal



- 1) Line Service must wait for the “affirmative” (thumbs up) or “negative” (thumbs down) signal from the Captain.
 - a) If a “negative” signal is given, Line Service reattempts to hook up power.
 - b) If power cannot be established, Maintenance must be notified.

4.2.5.5 Disconnecting the External Power

1. Disconnecting external power requires communication between the Captain and ground personnel.
 - A. Approximately 10-15 minutes prior to scheduled departure (times may vary), the Captain will contact Line Service (or vice versa) to advise that it is safe to disconnect external power. This will occur by headset or hand signal.
 - B. After communication between Line Service and the cockpit has been made, a Line Service agent may turn off jet bridge power.
 - C. Line Service will disconnect the power cord and retract it.

4.2.5.6 Cabin Doors

1. Upon arrival, ground personnel must not open cabin doors unnecessarily. This is especially important during extended ground time, when air conditioning will be turned off and cool cabin air must be preserved.

4.2.6 Pre-Conditioned Air

1. Whenever available, use ground supplied pre-conditioned air to conserve fuel.

4.2.6.1 Connection Procedures

1. Where passenger bridge-mounted units are not available, position the cart in the appropriate location for the aircraft apron.
 - A. Do not position the pre-conditioned air hose in the engine ingestion hazard area or within the "danger zone" (a line from the nose of the aircraft to the wing tip) prior to aircraft arrival.
 - B. Do not position the pre-conditioned air unit within the Circle of Safety prior to aircraft arrival, except in locations where a predetermined staging area has been painted within the Circle of Safety.
2. The access panel is located at the AFT of the aircraft-right side.
3. If a mobile unit is being used, disconnect the cart tongue from the tow vehicle and set the parking brake.

CAUTION

Mobile units must ALWAYS be disconnected from the tow vehicle prior to connecting to the aircraft. Three-point connections are prohibited.

4. Connect the air delivery hose to the ground attachment inlet, verifying the coupling is properly secured, and the ducting is free of kinks and/or obstructions.
5. Confirm the unit is set for the proper type of operation desired (heating, cooling or ventilating) and that PSI/RPM are set to the appropriate level for the aircraft type (narrow body, wide body).

CAUTION

Never use the "jumbo" or "wide body" setting for 717 aircrafts. This will result in damage to the aircraft's interior ducting.

6. Start the unit per manufacturer's instructions.

CAUTION

Do not start the air conditioner if cabin doors are closed as the aircraft may become pressurized, making it dangerous to open the doors before depressurizing.

4.2.6.2 Disconnection Procedures

1. When application of preconditioned air is no longer necessary, stop the ground air-supply unit.
2. Disconnect air delivery hose and stow.

CAUTION

Mobile units must ALWAYS be disconnected from the tow vehicle prior to connecting to the aircraft. Three-point connections are prohibited.

3. Close and secure the access panel door, remove cart (where applicable), or secure the supply duct (when using a passenger bridge mounted unit).

4.2.7 Emergency Equipment

1. Emergency equipment and furnishings are in the aircraft for use during emergencies, or unusual conditions. The emergency equipment and furnishings include:
 - A. Evacuation equipment (slides).
 - 1) Evacuation slides are at specified emergency exit locations. The slides let the passengers and crew quickly exit the aircraft during an emergency.
 - B. First aid equipment.
 - 1) First aid kits are in specified locations in the cabin overhead. Cabin attendants, or medical persons can use this equipment to give aid to the passengers or crew.
 - C. Life vests and life rafts.
 - 1) For emergency water landings, there are life vests for all cockpit occupants, at cabin attendant stations, and in a compartment under each of the passenger seats. There are no life rafts aboard this aircraft, since it does not perform extended overwater operations.
 - D. Evacuation annunciation.
 - 1) Megaphones – Provisions for megaphones are in specified locations in the cabin. When noise levels are high during an emergency, cabin attendants can use these to give instructions to passengers.
 - E. Crash axes.
 - 1) There is a crash axe in the cockpit on the bulkhead behind the Captain.

4.2.8 General Arrival and Departure Requirements

4.2.8.1 Circle Check

| **ISARP:** GRH 3.2.8

1. The Circle Check is the final series of checks given an aircraft, connections to the aircraft, and its immediate vicinity prior to departure. No aircraft is dispatched or towed from any area, for any type of flight, until these checks are complete. Furthermore, if an aircraft returns to the ramp and is subsequently dispatched, the Circle Check must be repeated. Completion of the Circle Check must be communicated to the cockpit prior to commencing pushback.
 - A. Responsibility
 - 1) The Control Service agent is responsible for the final Circle Check and communicating completion to the Escort. The aircraft is not moved until this function has been completed.

B. Requirements**1) The following steps are required for all Circle Checks:**

- a) Check all cabin, cargo and service doors to make certain they are closed, locked and free of damage. Any damage must be documented and reported to Maintenance immediately. Where visible, check door handles to verify they are in the locked position.

NOTE

If additional bags are added after initial circle check is completed, another inspection of cargo doors is required.

- b) Inspect the aircraft tires for any obvious F.O.D. damage.
- c) Visually confirm that the ramp area is sufficiently free of ice, snow, etc.
- d) Confirm all external panels are closed and secured.
- e) Ensure any ground equipment not required for engine start has been removed.
- f) Verify landing gear lock pins have been removed (If not, call Maintenance for guidance)
- g) Ensure ground power has been disconnected and removed, unless required for engine start.
- h) Confirm the towbar has been properly secured at both the aircraft and tow tractor connection points.
- i) Verify that all ramp personnel and passengers are clear of, and a safe distance from, the departing aircraft.

4.2.8.2 Aircraft Departure**1. Line Service must complete all of the following before the aircraft is dispatched:**

- A. Ensure that the landing gear pins have been removed. If the pins have not been removed, call Maintenance immediately for assistance (do not remove pins yourself).
- B. Signal "Brakes On" to the Captain. Upon receiving affirmative, the wheel chocks are removed.
- C. Verify that the ground power system, air start unit and all other equipment attached to the aircraft, has been disconnected and removed.
- D. Verify that wing walkers are in position.
- E. After determining that the area in the path of the departing aircraft is clear of all obstructions, dispatch the flight by saluting the Captain. This indicates that the flight is cleared to leave. The Captain returns the salute to indicate that he/she is prepared to depart.

4.2.8.3 Starting Aircraft Engines**1. Responsibility**

- A. Adequate firefighting equipment is readily accessible during all engine starts.
- B. The Circle Check has been completed before engines are cleared to start.
- C. Only qualified personnel familiar with the marshalling signals and engine starting sequence for the aircraft must perform this function.

2. Engine Start

- A. Cabin entrance doors and stairways must be secured before engines are cleared for starting. The Line Service stands at a position to the aircraft where he/she is in clear view of the Captain of the flight and is able to see all engines.
- B. On aircraft equipped with ground to cockpit interphone communications, the Line Service agent uses voice communications with the Pilot-in-Command in lieu of hand signals. Hand signals may be used when interphone communication is unavailable.
- C. If hand signals are to be used for engine starting, the Line Service will not authorize engine start until the pushback is completed.
- D. If the flightdeck desires engine start sequence changed, the flightdeck signals the Line Service agent by number of fingers extended on their left hand to indicate engine to be started.
 - 1) The Line Service agent repeats the revised signal to indicate that he/she understands the sequence change.
 - 2) On aircraft equipped with ground to cockpit interphone, the change is communicated verbally.

4.2.9 Arrival Procedures

| **ISARP:** GRH 3.2.1

4.2.9.1 Responsibility

- 1. Each station's General Manager, or designee, has the overall responsibility to ensure all functions of aircraft preparation are completed prior to passenger acceptance and departure. However, it is also the responsibility of each individual to carry out their particular function with the greatest efficiency possible.

4.2.9.2 Preparation

- 1. General manager, or a designee, must conduct preparation for aircraft arrivals well ahead of arrival time by ensuring the following:
 - A. Qualified personnel are assigned and responsible for overseeing Line Service activities during airside operations.
 - B. Sufficient personnel and equipment are available for expeditious disembarking of passengers and unloading of cargo, fueling and cabin servicing.
 - C. The ramp area is free of obstructing vehicles and other equipment and has been inspected to ensure the absence of foreign object debris (FOD).
 - D. Make sure the ramp area is free of ice, snow, etc., to ensure safe aircraft movement.
 - E. During periods of ramp congestion, sufficient, qualified guide persons are provided to assist the signal person in maneuvering the aircraft to its parking position.

4.2.9.3 Aircraft Arrival

- 1. The following are required for all aircraft arrivals:
 - A. The aircraft is guided to and parked at the gate position assigned by Ramp Advisory Office or other airport authority.
 - B. Only qualified personnel, qualified with the marshalling signals shown, [refer to 4.6 General Reference](#), "Marshalling," are assigned as marshalling agent to guide the arriving aircraft.

- C. Two wing walkers (minimum) will position themselves at the entrance to the arrival gate area in a position visible to the marshalling agent: at the roadway where applicable, or at the end of the gate demarcation lines nearest to the taxiway if there is no marked roadway immediately behind the gate; and must remain visible to the marshalling agent at all times.

NOTE

The above is a minimum requirement. Stations may use additional wing walking personnel at different positions as needed.

- D. Prior to giving the “wing clear” signal, the wing walkers must ensure:
- 1) All personnel and ground equipment are positioned outside the gate demarcation lines, beyond the Circle of Safety, and well clear of the aircraft path.
 - 2) The aircraft path is free of obstruction, objects and impediments which may be struck, ingested, subject to jet blast or otherwise endanger the aircraft or adjacent personnel.
- E. After verifying the area is clear, wing walkers will begin duty as “Road Guards,” providing the “wing clear” signal to alert all ground traffic that an aircraft will be entering the gate area.

Figure 4-15: Wing Clear Position



- 1) “Wing Clear” position: The arm closest to the aircraft is extended upward, and the opposite arm is extended in the direction that the aircraft will be proceeding toward.

NOTE

The “stop” signal is given only if a situation exists that poses a safety risk to the aircraft approach into the gate area. The “stop” signal is not to be used to communicate that a marshalling agent is not present.

CAUTION

All persons not responsible for the arrival operation of the aircraft must stay beyond the Circle of Safety and well clear of the arriving aircraft and must not approach until receiving clearance (“thumbs up” signal) from the marshalling agent.

- F. Once the arriving aircraft has entered the gate area and is under the control of the marshalling agent, each wing walker will visually ensure sufficient clearance until the aircraft has come to a complete stop at the final position and the marshalling agent has given the “thumbs-up” signifying that it is OK to enter the Circle of Safety.
- G. After the aircraft has been marshalled into its final position and comes to complete stop, the wing walkers may change to the “hold” position until the marshalling agent has given the “thumbs up” signal, alerting all personnel that it is safe to approach and for traffic to continue behind the aircraft.

Figure 4-16: Wing Walker Hold Position



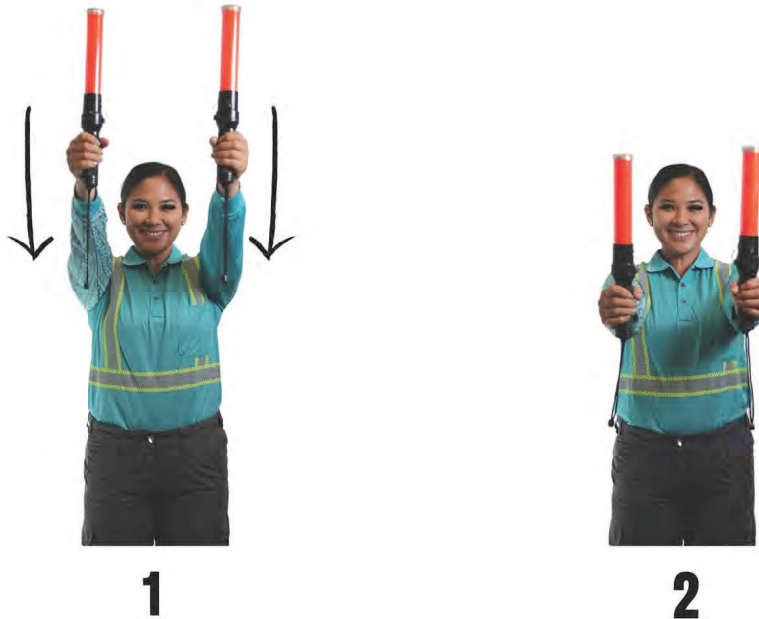
- 1) “Hold” position: Both arms are extended to the sides in a downward position, wands pointing toward the ground.
- H. At airports where an automated marshalling system is used, the marshalling agent must ensure the aircraft guidance docking system is operational, or that sufficient marshalling staff is present to manually guide in the aircraft.
 - 1) [Refer to 4.6 General Reference](#) for procedures regarding Automated Aircraft Guidance System marshalling.
- I. Prior to assuming guidance, the marshalling agent must verify:
 - 1) Wing walkers are visible, have proper equipment and are using proper signals.
 - 2) All personnel and ground equipment are positioned outside the gate demarcation lines, beyond the Circle of Safety, and well clear of the aircraft path.
 - 3) The aircraft path is free of obstructions, objects and impediments which may be struck, ingested, subject to jet blast or otherwise endanger the aircraft or adjacent personnel.

NOTE

If any hazards is observed, the marshalling agent will use the “stop” signal (or emergency stop signal, when appropriate) to hold the arriving aircraft in position until the hazard is cleared.

- J. Upon issuing the “ready to assume guidance” position, the marshalling agent is in charge of, and responsible for, the arrival of the aircraft.

Figure 4-17: Ready to Assume Guidance



- 1) “Ready to Assume Guidance” position: Facing the direction of the approaching aircraft, both arms are above the head in a vertical position with palms facing inward. Fully extend both arms forward and move them in an up-and-down motion.

CAUTION

If at any time during aircraft movement the marshalling agent is unsure of, or identifies immediate danger, he/she must STOP the aircraft.

- K. When the engines have safely spooled down, put chocks in front of and behind each forward and aft inboard or outboard wheel on each of the main landing gear trucks.

4.2.9.4 Arrival Team Approach

1. The arrival team is responsible to:
 - A. Verify the aircraft has been properly chocked and engines are shut down before approaching.
 - B. Wait for a “thumbs up” signal from the marshalling agent before approaching the aircraft.
 - 1) Ground personnel may NEVER open access panels before the aircraft has come to a full stop, with wheel chocks inserted, and engines shut down.
 - 2) Aside from risk of death or injury if clearance from landing gear or engines are misjudged, opening an access panel will cause the pilot to become distracted during crucial moments of taxi.
 - C. Test brakes on motorized equipment prior to attempting to interface with the aircraft.
2. Panel and Door Area Inspections
 - A. [Refer to 4.1.2 Door and Panel Area Inspections](#) for damage inspection guidelines.

3. Aircraft Bin Inspection

- A. Prior to loading, the Loading Agent inspects the cargo compartments and report any leaks or unusual odors or tears, bulges, or damage to the grill liner.

4.2.10 Departure Procedures

- 1. The following procedures must be adhered to during dispatching of all "Live Flights", or flights carrying passengers. Procedures for aircraft "Towing", or repositioning, refer to 4.2.11 Aircraft Towing of this chapter.
- 2. The aircraft beacon is turned on by the flight crew just prior to pushback or whenever an engine is about to be started. The beacon signifies to ground personnel and other aircraft that the aircraft is about to be moved or an engine is running. The beacon is not used by the flight crew to signal to the ground crew that the flight crew is ready.

4.2.10.1 Responsibilities

| **ISARP:** GRH 3.2.9

1. Lead Agent

- A. The Lead ensures that no aircraft is pushed or towed without a minimum of two (2) wing walkers. One of the wing walkers will be assigned as the Escort and must be trained on handling the tow bar and steering bypass pin, as well as post-pushback procedures (engine start, etc.) and hand signals.
- B. To allow for proper communication and safety of the aircraft during pushback, the Lead will assign only qualified personnel for pushback operations.
- | C. The Lead ensures that assigned staff are at the departure gate at least 5 minutes prior to scheduled departure time.
- D. Departing 717 aircrafts are not pushed back from the gate more than 5 minutes before scheduled departure times, unless an early departure is approved by HNL RAO, OGG Ramp or Dispatch/SOCC MOD.

2. Control Service Agent

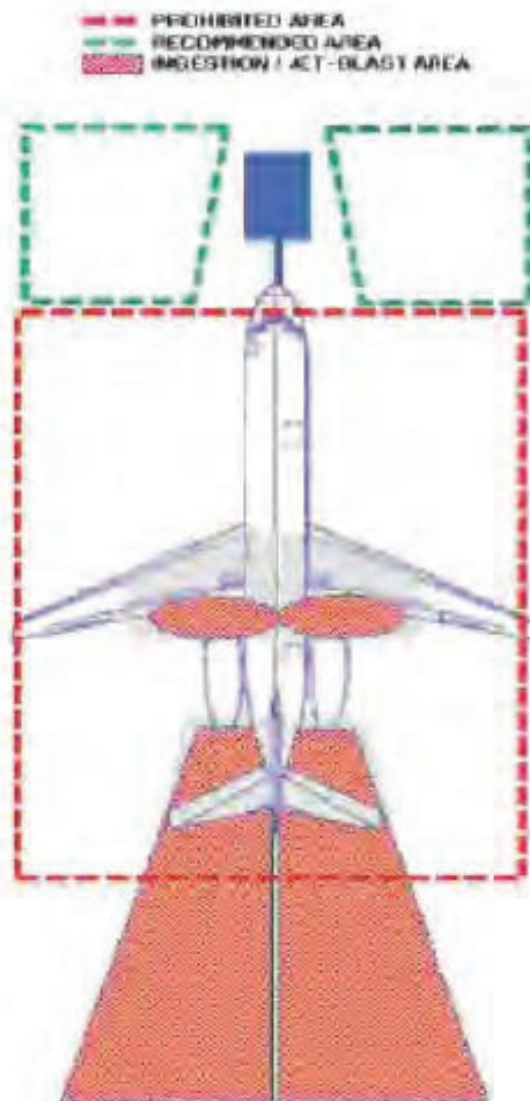
- A. The Control Service agent is in charge of and is responsible for the pushback, which includes operating the tow tractor and communicating with the flight crew.
- B. The Control Service agent will use the headset as the primary source of communicating with the flight crew.
 - 1) If there is no operable headset available, refer to procedures for Pushback Without Interphone.
 - | 2) An adequate supply of headsets is readily available for implementation into operations to maximize efficiency
- C. The Control Service agent is required to:
 - 1) Be familiar with the headset and proper cord attachment. (Or wireless headset operation, where applicable)
 - 2) Verify the headset is available and in working order. (For wireless headsets, ensure all necessary components are in working order)
 - 3) Verify that there are a minimum of two (2) wing walkers in position.
 - a) One of the wing walkers will be assigned as the Escort, and must be trained on handling of tow bar and steering bypass pin, as well as post-pushback hand signals (engine start, etc.).
 - b) Wing walkers must use high-visibility wands, paddles or gloves for all signaling during daylight hours. Illuminated wands must be used at night or in low visibility.

- 4) Receive permission from the flight crew any time the aircraft is to access the movement area (taxiway).
 - 5) Communicate clearly and concisely.
 - 6) Repeat the message back to the flight crew to verify it was received and understood. Responding to a message from the flight crew with "copy that" or "roger that" is unacceptable.
- D. The qualified Control Service agent is also responsible for the following duties:
- 1) Verify the towbar is operable and suitable for the specific aircraft type.
 - 2) Verify the tractor is serviceable and suitable for the specific aircraft type.
 - 3) Perform a walk around inspection (Circle Check) to verify that all doors and panels are closed and no damage to the aircraft exists. This includes a check of the aircraft tires for obvious F.O.D. damage and the opening of the fueling panel to ensure the fuel cap is on and the fuel panel latches are secured when the panel is closed. (See complete list of checks, refer to 4.2.8 General Arrival and Departure Requirements of this chapter.)
 - 4) Advise the flight crew, "Circle Check complete." and "Push Crew standing by for brakes to be set."
 - 5) Communicate with and assist flight crew at least 5 minutes prior to ETD, and remain in direct contact until all pushback functions have been completed.
3. Escort
- A. The assigned Escort will be responsible to:
- 1) Install the steering bypass pin in accordance with maintenance procedures.
 - 2) Connect the towbar and assist with connecting the tractor to the aircraft.
 - 3) Serve as a wing walker.
 - 4) Remove the tow bar.
 - 5) Remove steering bypass pin; verify lever is set. Show pin to Captain after tractor and personnel are clear of the Circle of Safety and in a Safe Area and prior to Salute to release Aircraft to Flight Crew.
 - 6) Notify the flight crew that the steering bypass pin has been removed by displaying the pin flag; and that all procedures have been completed and the aircraft is released by way of salute.
4. Wing Walkers
- A. A minimum of two (2) wing walkers is required for every departing aircraft. At least one of the wing walkers must be designated as the Escort and be trained on handling the towbar, steering bypass pin, post-pushback procedures and wing walkers must use deliberate hand signals when guiding an aircraft.
- 1) During pushback without interphone, the assigned Escort may be either a wing walker or the additional communications facilitator.
- B. The wing walkers will position themselves at the entrance to the departure gate area: at the roadway where applicable, or at the end of the demarcation lines nearest to the taxiway if there is no marked roadway immediately behind the gate.
- 1) The above is a minimum requirement. Stations may use additional wing walking personnel at different positions, as needed.
 - 2) Wing walkers must always remain in clear view of the Control Service agent.

Ground Service Manual (GSM)

5. The wing walker on the aircraft-right side will face towards aircraft-left, and will scan the area to ensure no obstructions, traffic, and/or safety hazards exist.
 - A. If any obstructions, traffic and/or safety hazards exist, the wing walker will signal the Control Service agent by crossing wands, paddles or arms ("Brake Set" signal).
6. The wing walker on the aircraft-left side will face towards aircraft-right, and scan the area to ensure no obstructions, traffic and/or safety hazards exist.
 - A. If any obstructions, traffic and/or safety hazards exist, the wing walker will signal the Control Service agent by crossing wands, paddles or arms ("Brake Set" signal).
7. When the area is deemed clear, the wing walkers will use hand signals to communicate this to the Control Service agent by extending the arm closest to the aircraft upwards, and extending the opposite arm in the direction that the AC will be moving.
8. If at any time during aircraft movement a safety hazard arises, the wing walker will signal the Control Service agent by:
 - A. Crossing wands, paddles or arms, or
 - B. Performing the "emergency stop" signal (waving wands, paddles or arms into a crossed position) as appropriate for the situation.
 - C. The "emergency stop" signal is only used in an emergency situation, in which immediate stop of the aircraft is required. Misuse of this signal could result in injury in the aircraft (standing Flight Attendants) or damage to equipment due to a sudden stop.
9. The wing walker function will be completed when the aircraft and pushback tractor have fully cleared the marked roadway, or to the end of the gate demarcation lines nearest to the taxiway if no there is no marked roadway immediately behind the gate.
10. The Escort assigned to wing walking duties will assume Escort duties immediately after their wing walking tasks are complete.
11. Transition from Wing Walking to Escort
 - A. For the purpose of escorting or wing walking, the Escort transitions the final pushback position on foot.
 - B. Upon completion of wing walking duties, and while transitioning between the wing walking position and the final pushback position, the Escort must remain positioned in a safe area. The below illustration shows the recommended area for the Escort to remain during push back in green.

Figure 4-18: Post-Wing Walking Safe Escort Area



4.2.10.2 Pushback with Interphone – Primary Method

1. Prior to Pushback (Minimum 5 minutes to Scheduled Departure)
 - A. The assigned Escort will be responsible to:
 - 1) Install the steering bypass pin in accordance with maintenance procedures.
 - 2) Connect the towbar and assist with connecting the tractor to the aircraft.
 - 3) Verify jet bridges have been removed from Aircraft and returned to a designated parking area.
 - 4) Remove wheel chocks after the BRAKES SET command has been issued and confirmed by the crew, and the passenger boarding bridge (PBB) or passenger stairs/ramp has been removed from the aircraft.

- B. The Control Service agent will be responsible to:
 - 1) Conduct the Circle Check.
 - 2) Connect headset and establish communication w/flight crew by saying, "ground to flightdeck." (Response is "flightdeck, go ahead.")
 - 3) Once established, communicate to the flight crew, "Circle check complete; ready for push."
 - 4) Verify wing walkers are in position.
- 2. Commencing Pushback
 - A. The Control Service agent assigned to aircraft pushback will re-establish positive communication with the flight crew via headset.
 - B. The flight crew will request clearance to release brakes by stating "Cleared to release brakes?" The Control Service agent will respond "Release brakes" when ready for brakes to be released. Flightdeck will respond "Brakes released, cleared to push" and provide pushback instructions. Read back any pushback instructions and reply "Brakes released, cleared to push." After reading pushback instructions, state "Clear to start engines." The flightdeck will respond "Cleared to start engines."
 - 1) If Ramp conditions exist that, in the opinion of the Control Service agent, warrant the delaying of an engine start, the "clear to start at your discretion" command may be replaced with, "hold engine start until _____" (such time as it is deemed safe to start engines).
 - 2) At the Captain's discretion, he/she may advise the Control Service agent "ready to start engines" and may relay any special pushback instructions obtained from ground control.
 - C. Prior to initiating pushback, verify the area is clear, and wing walkers are in position and ready for pushback.
 - D. Pushback speed are no faster than walking speed. The Control Service agent must maintain constant, safe speed; until completion of pushback and the flight crew has set brakes after coming to a complete stop.
- 3. Pushback Completed
 - A. The Control Service agent will state "Push complete; brakes set."
 - B. The flight crew will set the parking brakes and acknowledge brakes set by replying "Brakes set; cleared to disconnect towbar."
 - C. The Control Service agent will relay "brakes set" message to Escort via hand signal.
 - D. The Escort may disconnect towbar after brakes set confirmed.

NOTE

Although it is OK to disconnect the towbar any time after the "brakes set" message is confirmed, the Control Service agent must still maintain headset communication with the flightdeck until after both engines are started. Minimal movement of the tow tractor is used in the process of towbar disconnection/hookup to the tractor (i.e., no wide, looping circles near the aircraft).

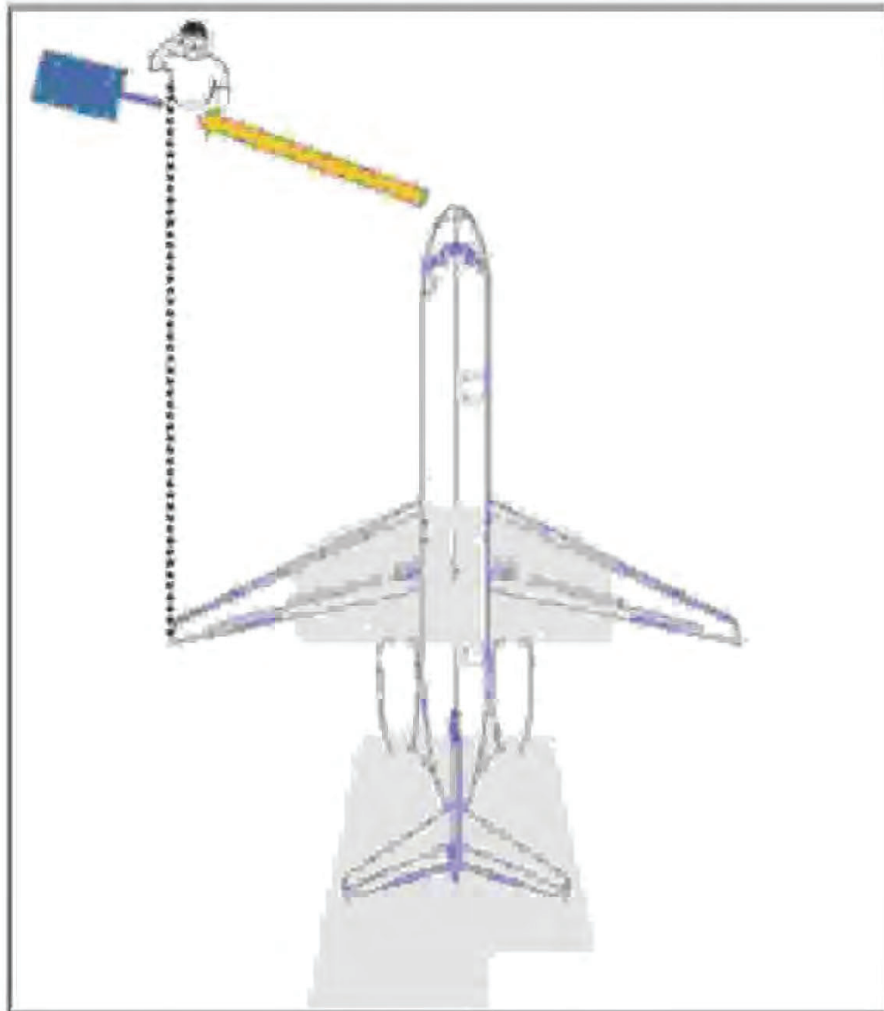
- E. If requested by the Captain, the Control Service agent and Escort MUST be available to participate in engine starts:
 - 1) The Control Service agent will relay "clear to start engine" signal to the Escort, and the Escort will acknowledge via hand signal to the Control Service agent. (Right arm extended to the side bent upward at the elbow, rotating wand at eye level. The left wand pointing at the engine to be started.)
- F. At all times, both the Escort and Control Service agent must be alert to potential hazards during engine start and be on the lookout for abnormal conditions (e.g., tailpipe fire). Any observed abnormal conditions must be communicated to the flight crew immediately.
- G. The Escort will disconnect the towbar (if not already disconnected).

NOTE

Although it is OK to disconnect the towbar any time after the "brakes set" message is confirmed, the Control Service agent must maintain headset communication with the flightdeck until after both engines are started, and the crew has stated "clear to disconnect headset." Minimal movement of the tow tractor is used in the process of towbar disconnection/hookup to the tractor.

- H. Once Flight crew confirms engines have been started, they will issue the "clear to disconnect headset" command. The Control Service Agent responds "Cleared to disconnect headset."
- I. Control Service agent will relay this to the Escort via the "affirmative" signal (thumb or wand up).
- J. The Escort will remove the following, in the order noted below:
 - 1) Nose gear steering bypass pin, ensuring that the bypass pin lever is in the proper position
 - 2) Interphone jack, ensuring that the communications panel door is closed and secured.
- K. The Control Service agent will move the tractor and towbar out of the path of, and facing away from the aircraft. (Refer to Figure 4-19. Direction may vary, based on pushback direction and/or traffic conditions.)

Figure 4-19: Control Service Agent Positioning of Tractor and Towbar



- L. The Escort will move to the Signal Agent, confirm that personnel and equipment are in a Safe Area clear of Aircraft, and await the “Ready to Taxi” signal (nose gear lights flash once).
- M. When the “Ready to Taxi” signal (nose gear lights flash once) has been given, and the area is clear, the Escort will display the bypass pin flag and salute the flight crew, providing the “clear” signal.
 - 1) The Escort **MUST** verify that the area is clear, and that the nose wheel chock has been removed prior to issuing the “salute” to the crew.

- N. If there is an issue that requires reconnection of the interphone and reestablishment of communications, the flight crew will flash the nose gear lights three (3) times. In such cases, the following must be completed:
- 1) Signal Agent must resume their position, and present the "set brakes" signal (open hand closed to a clenched fist) to the crew.
 - 2) Control Service agent and Escort will approach the nose gear, and reestablish communication with the flightdeck.
 - 3) If the issue is able to be cleared at the location, above items K through M above must be completed again to release the aircraft.
 - 4) If necessary, the aircraft must be towed to an available gate to resolve the issue.
- O. The Escort will board the passenger seat of the tractor for transportation back to the terminal area following the salute to the crew to ensure the safety of the Escort.
- 1) The Escort will board the passenger seat of the tractor for transportation back to the terminal area following the salute to the crew to ensure the safety of the Escort.
- P. ► Before commencing an engine start at the gate, the Flight Crew and Ramp Crew performs a face-to-face briefing. This will ensure both parties have a shared mental model on the expected sequence of events (i.e., discussing which engine will be started first, the location of ground equipment, when ground power/air will be disconnected, etc.)
- 1) If a face-to-face briefing does not occur, the flight crew and ramp crew must conduct a briefing via headset, prior to engine start.
- Q. Pushback and engine start communication

Table 4-6: Removal of Ground Power and/or Air Conditioning

Event	Flightdeck	Ramp Crew
Prior to scheduled departure (10 to 15 minutes prior to pushback).	"Flightdeck, go ahead."	"Ground to Flightdeck."
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?"
	• If not ready: "Brakes set, standby." If ready: "Brakes set, cleared to disconnect external power and/or air."	
		"Cleared to disconnect external power and/or air."

Table 4-7: Ramp crew ready for MLG chock removal

Event	Flightdeck	Ramp Crew
Ramp crew establishes communications with the flightdeck		"Ground to Flightdeck."
	"Flightdeck, go ahead."	
The aircraft's parking brake is set; allow safe removal of main landing gear (MLG) chocks. Upon confirming the brakes are set, the ramp crew will remove the chocks when ready.		"Confirm brakes are set."
	"Brakes set."	

Table 4-8: Circle check complete

Event	Flightdeck	Ramp Crew
Ramp crew establishes communications with the flightdeck after they remove the MLG chocks.		"Ground to Flightdeck."
	"Flightdeck, go ahead."	
Tug is connected and the ramp crew confirms the chocks are removed and personnel / equipment is clear of aircraft (circle check).		"Circle check complete; pitot covers removed. ⁽¹⁾ 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" (reads pushback instructions).	
		"Brakes released; cleared to push" (repeats back pushback instructions).
Engine start clearance, at the discretion of the ramp crew.		"Clear to start engines."
	"Cleared to start engines."	
⁽¹⁾ A321 / A330 only for the "pitot covers removed".		

Table 4-9: Pushback Completed

Event	Flightdeck	Ramp Crew
Ramp crew completes pushback.		"Push complete, set brakes."
	"Brakes set; cleared to disconnect towbar."	
		"Brakes set; cleared to disconnect towbar."
The ramp crew will standby on the airport terminal side of the aircraft.	"Cleared to disconnect headset."	
		"Cleared to disconnect headset."
After pushback is complete, ramp agents are not required to remain at the aircraft for engine start unless requested by Flight Crew.		Upon confirming the area is clear, the ramp crew will: 1. Display the pin. 2. Issue a salute.
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 <u>after start</u> checklist after returning the salute and flashing the nose light once.	Return salute & flash taxi light once.	
NOTES - If an abnormal indication 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." - Once off headset, the Flightdeck can flash the taxi light three times to gain the attention of the ramp crew to re-establish communication. - The flight crew member operating the parking brake must always verbalize its movement so that all flight crew are aware of its status.		

CAUTION

When possible, avoid pulling an aircraft forward with engines running. If an aircraft is to be pulled forward after pushback with engines running, Pushback Operator must take precautions to reduce the risk of the aircraft engine thrust causing damage to the nose gear and towbar when stopping the aircraft.

Precautions for the Pushback Operator include:

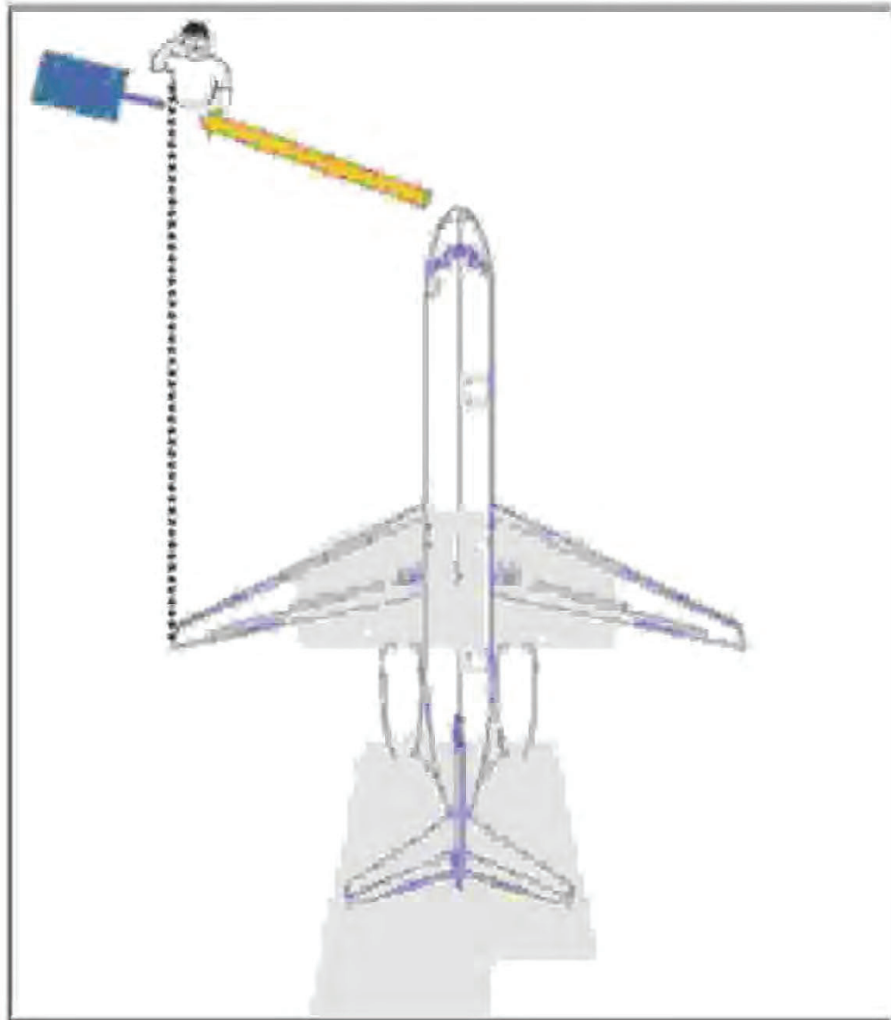
- Gentle application of pushback tractor brake.*
- Aircraft engine at idle thrust.*
- Towing operation at lowest gear available.*

4.2.10.3 Pushback Without Interphone – Alternate Method

1. This method is only used when headset is inoperable, and replacement is unavailable.
2. It is best practice to ensure an adequate supply of working headsets along with an adequate supply of replacement Headsets are readily available at all times to ensure clear and concise communication with flight crew.
3. Face-to-Face Briefing
 - A. 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 flightdeck and talking with the flight crew. The flight crew is responsible for ensuring the brief occurs and is satisfied with the coordinated plan.
4. 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 reviews marshaling signals in the FOM prior to commencing the pushback.
5. 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 flightdeck and talking with the flight crew. The flight crew is responsible for ensuring the brief occurs and is satisfied with the coordinated plan.
6. Prior to Pushback (At least 5 minutes before scheduled departure)
 - A. The assigned Escort will be responsible to:
 - 1) Install the steering bypass pin in accordance with maintenance procedures.
 - 2) Connect the towbar and assist with connecting the tractor to the aircraft.
 - 3) Ensure jet bridge has been removed from the aircraft and returned to designated parking area.
 - 4) Remove wheel chocks after BRAKES SET command has been issued and confirmed by the crew.
 - B. The Control Service agent will be responsible to:
 - 1) Conduct the Circle Check
 - 2) Confirm that an additional qualified agent is assigned to signal the crew when ready to push. Refer to "Commencing Pushback" below.
 - 3) Ensure wing walkers are in position
7. Commencing Pushback
 - A. When a pushback is being done without the use of the interphone, an additional qualified individual is required. This individual must be positioned in view of the Captain to facilitate communications between the flight crew and the Control Service agent. Communications will be relayed as follows:
 - 1) Indicate "ready to push" by pointing towards the tail with the index fingers or both hands.
 - a) Communicating the "ready to push" signal in this instance is also positive confirmation that the Circle Check has been successfully completed.

- 2) Relay the brake release signal to the Control Service agent when the Captain gives the “brakes released” hand signal, (unclenched fists with fingers spread), followed by the flightdeck pushback hitchhike signal.
 - 3) If the flightdeck is not ready to initiate pushback, the Captain will give the “gate hold” hand signal (raised hand and open palm), followed by the “brakes set” clenched fists signal.
8. The Control Service agent will perform the following:
- A. Prior to initiating pushback, verify the area is clear, and wing walkers are in position ready for pushback.
 - B. Commence pushback.
 - 1) Pushback speed is no faster than walking speed.
 - 2) During pushback, the flight crew will flash the nose wheel light to indicate stop if necessary. The aircraft must be brought to a gradual stop to prevent injury and/or damage.
 - 3) Engines will not be started until pushback is completed when interphone is not used.
9. Pushback Completed
- A. The tow tractor must remain in clear view of the flight crew.
 - B. The Escort will give the “brakes set” command.
 - C. The flight crew will set the parking brakes and acknowledge brakes set.
 - D. The Escort will relay “brakes set” message to the Control Service agent and Signal Agent via hand signal (clenched fist or crossed wands).
 - E. The Escort may disconnect towbar after brakes set confirmed.
- NOTE**
- Minimal movement of the tow tractor is used in the process of towbar disconnection/hookup to the tractor (i.e., no wide, looping circles near the aircraft).
- F. For all pushbacks without interphone, the Escort participates in engine starts.
 - 1) The Escort will relay “clear to start engine” signal to the flight crew via hand signal. (Right arm extended to the side bent upward at the elbow, rotating wand at eye level. The left wand pointing at the engine to be started.)
 - G. Flight crew acknowledges positive engine start (“good start”) to Escort, using the “affirmative” hand signal. Once received, the Escort will disconnect the towbar.
 - H. At all times, both the Escort and Control Service agent must be alert to potential hazards during engine start and be on the lookout for abnormal conditions (e.g., tailpipe fire, no light-off, etc). Any observed abnormal conditions must be communicated to the flight crew immediately via appropriate hand signals.
 - I. The Escort will remove the following, in the order noted below:
 - 1) Nose gear steering bypass pin, ensuring that the bypass pin lever is in the proper position.
 - 2) Headset jack (if applicable), ensuring that the communications panel door is closed and secured.
 - J. The Escort will return the Headset jack/cord (if applicable) to the Control Service agent.
 - K. The Control Service agent will move the tractor and towbar out of the path of, and facing away from the aircraft. (Refer to Figure 4-20. Direction may vary, based on pushback direction and/or traffic conditions.)

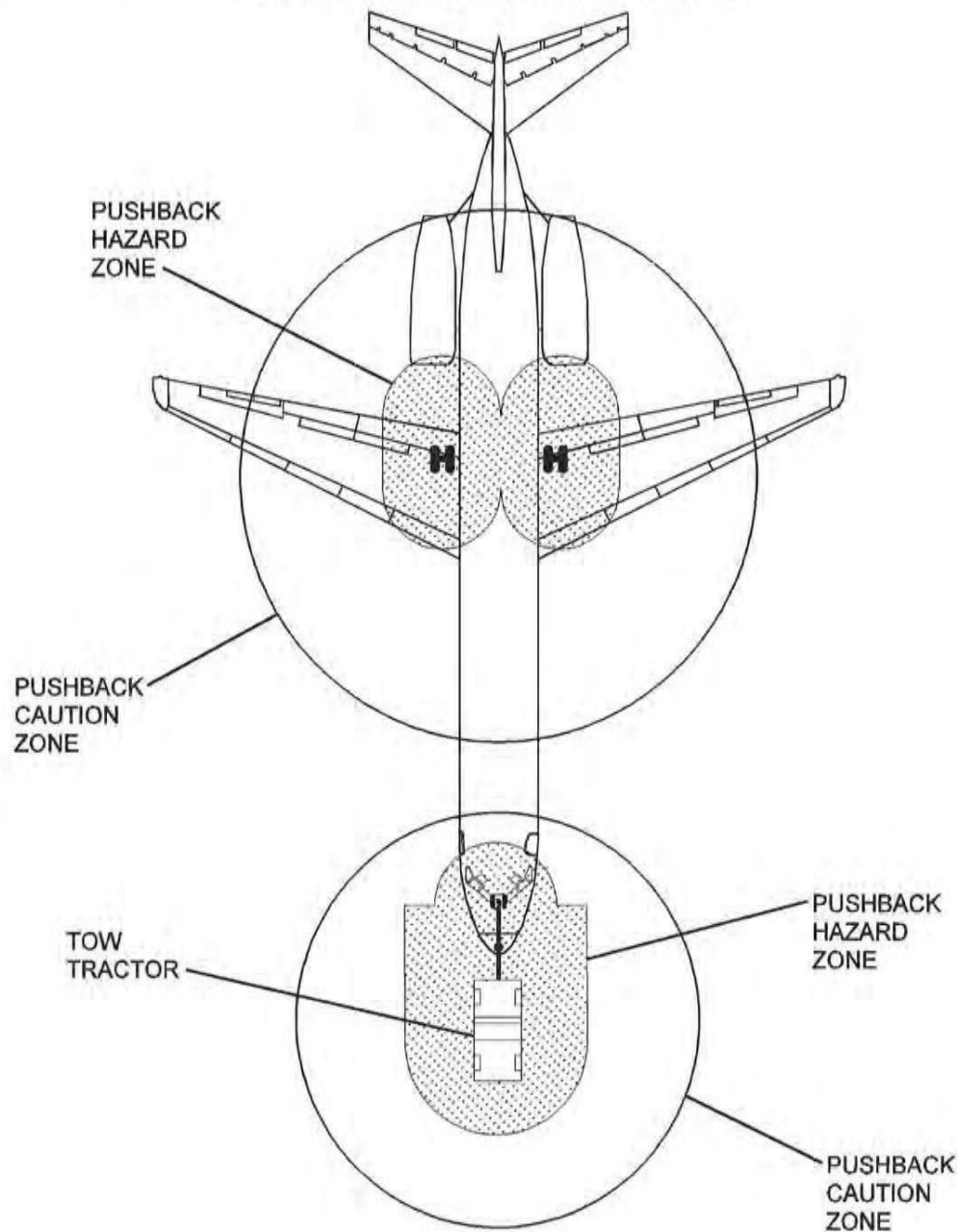
Figure 4-20: Control Service Agent Positioning of Tractor and Towbar



- L. The Escort will move to the Signal Agent and confirm that personnel and equipment are in a Safe Area clear of Aircraft.
- M. The Escort will move to the Signal Agent, confirm that personnel and equipment are in a Safe Area clear of Aircraft, and await the "Ready to Taxi" signal (nose gear lights flash once).
- N. When the "Ready to Taxi" signal (nose gear lights flash once) has been given, and the area is clear, the Escort will display the bypass pin flag and salute the flight crew, providing the "clear" signal.
 - 1) The Escort MUST verify the area is clear prior to issuing the "salute" to the crew.
 - 2) If there is an issue that prevents the crew from starting taxi, the crew will contact Ops Control (HCC in HNL) directly via air to ground radio for resolution.

4.2.10.4 Nose Landing Gear Pushback

Figure 4-21: Nose Landing Gear Pushback



WARNING: GROUND PERSONNEL MUST NOT ENTER THE PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVED. KEEP A MINIMUM OF 10 FEET (3 METERS) AWAY FROM TOW TRACTOR, TOW BAR AND LANDING GEAR. IF YOU ENTER THE PUSHBACK ZONE WHILE THE AIRCRAFT IS MOVED, INJURY OR DEATH TO PERSONNEL CAN OCCUR.

1. Preparation

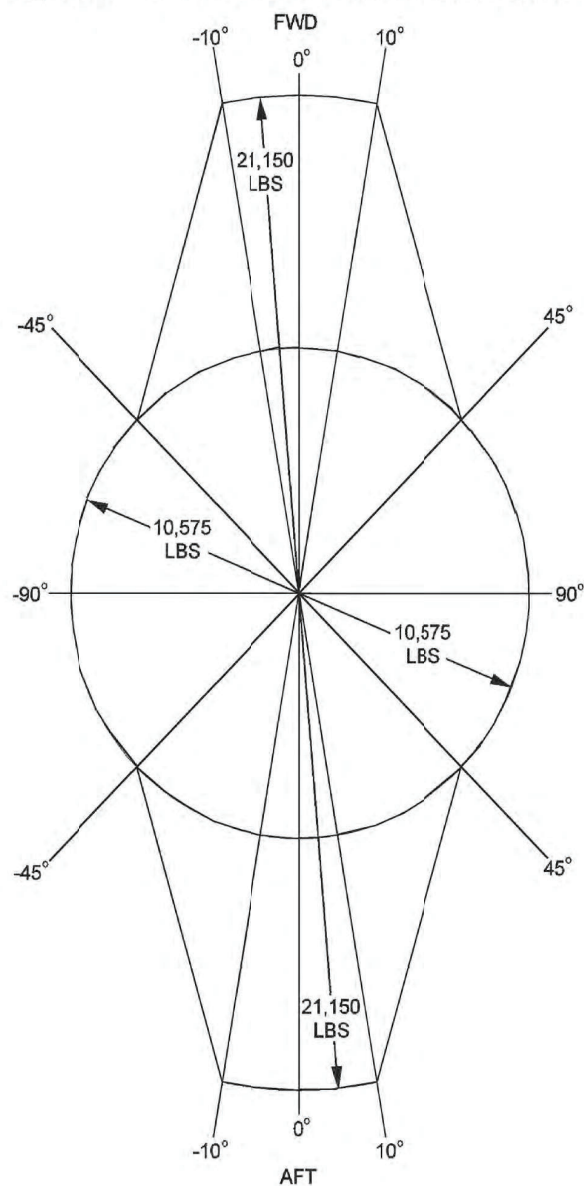
- A. Make sure the ground personnel keep a minimum distance of 10 ft. (3 m) from the tow tractor and the landing gear during the pushback tow procedure.
- B. Make sure that the pushback hazard zone around the aircraft is obeyed.
- C. Apply electrical power (Energize the Aircraft Electrical Power System).
- D. Make sure there is clear, short, and understandable communication between the ground personnel and the flight crew before and during the pushback procedure.
 - 1) Pilot or Brake Rider in flight compartment must maintain direct communication with the Control Service agent during aircraft movement. This will prevent injury to personnel and damage to aircraft.
 - 2) Correct interphone headset operation is vital to prevent injury to personnel and damage to aircraft. Communication between ground/flight crew personnel must be clear, concise, and understandable.
- E. Before connecting the towbar, confirm the nosewheel steering bypass valve lockpin is installed. This will help prevent injury to persons and damage to equipment.
- F. Place the nosewheel steering bypass valve handle in the bypass position and install the NLG steering bypass pin assembly (lockpin) before pushback.
 - 1) When the nosewheel steering bypass valve handle is put in the bypass position, the nosewheel can be turned to the maximum tow angle indicated by the red stripes painted on the left and right wheel well doors.
 - 2) Do not make turns larger than the maximum steering angle. This will help prevent damage to the main-gear tires from friction.
 - 3) Do not make sharp turns over surfaces that are rough or not level. This will help prevent damage to the rudder pedal shift drum bracket and/or steering lockout rods.
 - 4) Do not push or tow the aircraft if you can see more than 9.5 in. (241.3 mm) of chrome plate on the nose gear strut. This will help prevent damage to the nose gear strut.
- G. Make sure that the strut chrome is less than 9.5 in. (241.3 mm) long.
 - 1) Do not move the aircraft while the pilot aligns the inertial reference systems (IRS). If the aircraft is moved, the IRS alignment will start again.
 - 2) Make sure the hydraulic system pressure in the brake system is more than 2000 psi before you start the towing procedures. This will assure adequate capacity to stop the A/C.
 - 3) Make sure the nose gear wheels are aligned with the main landing gear wheels. This will help decrease tire and strut stresses. These stresses can cause hydraulic leaks through the shock strut seal.

2. Pushback Procedure

- A. Make sure that all of the aircraft doors and access panels are closed and locked.
- B. Make sure that all external equipment has been removed from the pushback area.
- C. Remove the wheel chocks.
- D. Confirm no landing gear pins are installed. If they are installed, call Maintenance immediately for removal.
- E. Advise the flight crew to release the aircraft brakes.

- F. Keep the pushback speed to a minimum.
- G. Make sure the Control Service agent keeps contact with the wing-walkers and is prepared to stop the pushback if a hazardous condition starts.
- H. If the towbar disconnects, the Control Service agent must instruct the flight crew to apply the aircraft brakes.
- I. Make sure that the ground personnel are aware of any hazardous conditions around the aircraft.
- J. If a hazardous condition is present, the ground personnel must signal the Control Service agent to stop the aircraft.
- K. During the pushback procedures, make sure that the nose gear pushback drawbar pull limits are obeyed.
- L. Make sure the wing walkers are positioned correctly to keep clearance between the aircraft and adjacent buildings and equipment.
- M. Make smooth starts and stops with the towing vehicle.
- N. Make sure the aircraft is put into motion before a change in direction is started.
- O. Make sure the stripe markings on the forward side of the nose gear cylinder and nose gear doors, are obeyed when a turn is made.
- P. To avoid a turn of more than the maximum towing angle, the tow tractor must be disconnected from the towbar and attached again at a new position.
- Q. The last 10 ft. (3 m) of the pushback movement must be in a straight direction.
- R. Make sure that the nosewheel is aligned in a forward and AFT direction with the centerline of the aircraft.
 - 1) The straight movement of the aircraft aligns the gear and relieves tire twisting stresses.
 - 2) Pushing back and steering loaded aircraft with a tractor capable of drawbar pull of 12,000 lbs or more may result in exceeding AFT drawbar pull limits. When pushing back on uneven or graded ramps, power must be applied smoothly and evenly to prevent damage to aircraft.

Figure 4-22: Nose Gear Pushback Load Limits



CAUTION

The tow tractor operator must have the turn limits in full view at all times while in a turn. This will help prevent damage to the aircraft.

CAUTION

Do not turn the nosewheels more than the maximum towing angle of 80 degrees. The maximum towing angle is shown by red stripes on the nose gear and nose gear doors. This will help prevent damage to the aircraft.

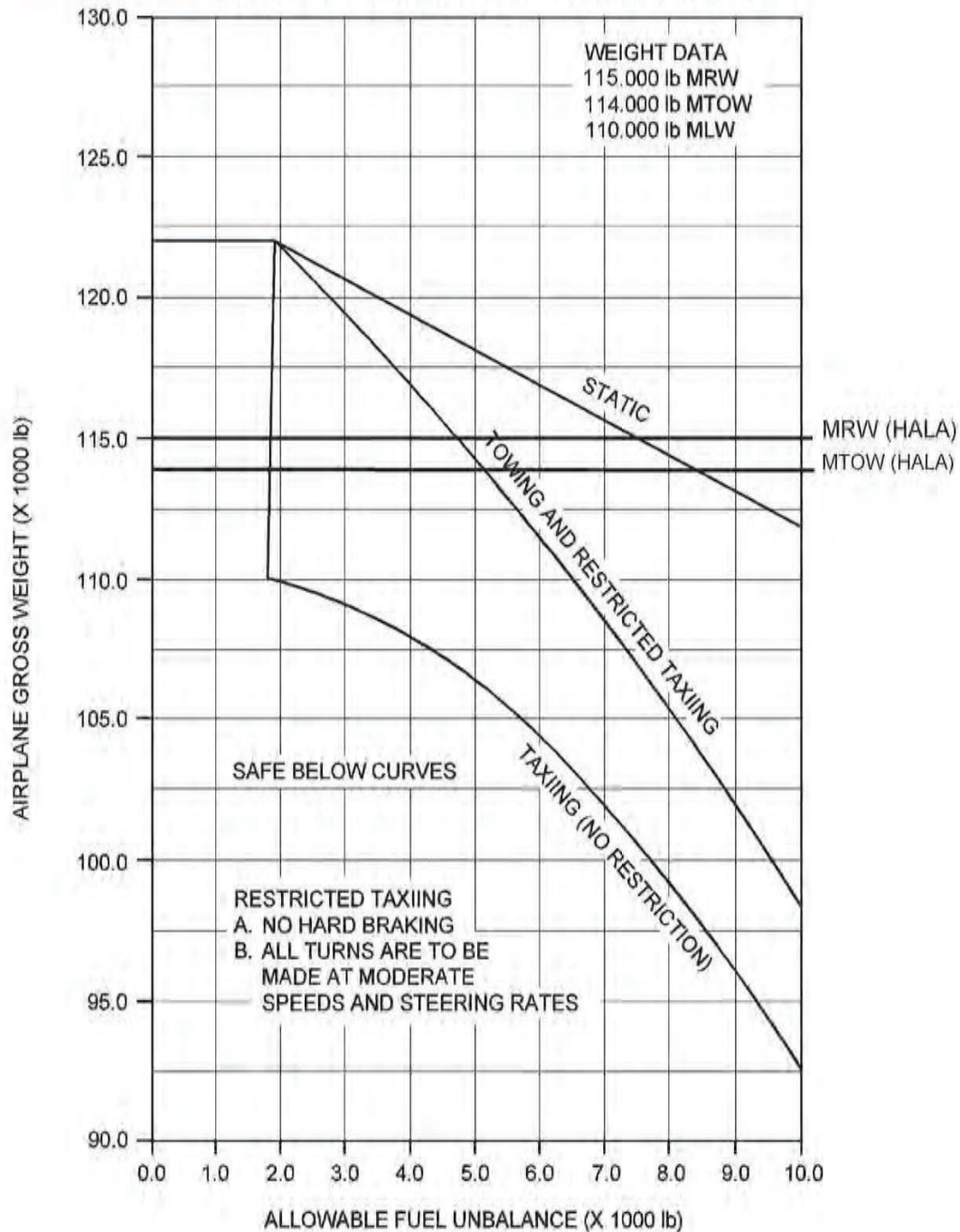
CAUTION

Make sure the nose gear wheels are aligned with the main landing gear wheels. This will help decrease tire and strut stresses. These stresses can cause hydraulic leaks through the shock strut seal.

3. Stop The Tow Tractor

- A. Advise the flight crew to set the aircraft parking brakes.
- B. Disconnect the towbar from the tow tractor after the parking brakes are set.
- C. Disconnect the towbar from the nosewheel.
- D. Before the nosewheel steering bypass valve lockpin is removed, make sure all persons and equipment are clear of the nosewheel. When the lockpin is removed, the bypass valve closes and causes hydraulic pressure to center the nosewheel. This will prevent injury to persons and damage to equipment.
- E. Remove the lockpin from the nosewheel steering bypass valve handle.
- F. Show the flight crew the removed nosewheel steering bypass valve lockpin and tell the flight crew that the engines are ready for start.
- G. After the engines start, make sure that the flight crew notifies the ground personnel that the aircraft is ready for dispatch.
- H. Advise the flight crew when the area is safe for operation.
- I. Clear the area.
- J. Make sure to disconnect the flight interphone.

Figure 4-23: Towing With Fuel Imbalance Chart



4.2.11 Aircraft Towing

4.2.11.1 Authority and Responsibility

1. The Senior Manager, Fleet Support has the authority to make any changes to this policy. Changes to the policy that will directly affect other work groups will be coordinated with the departments before any changes are finalized.
 - A. Controls
 - 1) The Supervisor on duty will be responsible to ensure procedures are followed during towing operations. At stations where no Fleet Support Supervisor is available the responsibility will fall back to the General Manager or designee.
 - 2) The Supervisor will accomplish periodic checks to confirm that the tow team individuals are qualified and towing procedures are followed.
 - a) During their checks they will assess if procedures are current with the operations.
 - b) At stations where no Fleet Support Supervisor is available the responsibility will fall back to the General Manager or designee.
 - c) Any changes to the procedures will require approval from the Senior Manager, Fleet Support.

4.2.11.2 Required Tow Team

1. (1) Tow tractor operator
2. (1) Brake Rider
3. (1) Tow tractor Headset Rider (during pushback)
4. (1) Service/Escort vehicle
 - A. For congested areas that may require stopping of ground traffic. Escort vehicle must comply with local Airport Authorities requirements.
5. (1) Forward guide (when towing in congested areas))
6. (2) Wing Walkers
 - A. When towing near terminal, hanger and/or when wing clearance is less than approximately 20' from any obstruction
7. (1) Tail guide
 - A. When towing near terminal, hanger and/or when tail clearance is less than approximately 20' from any obstruction

4.2.11.3 Tow Team Responsibilities

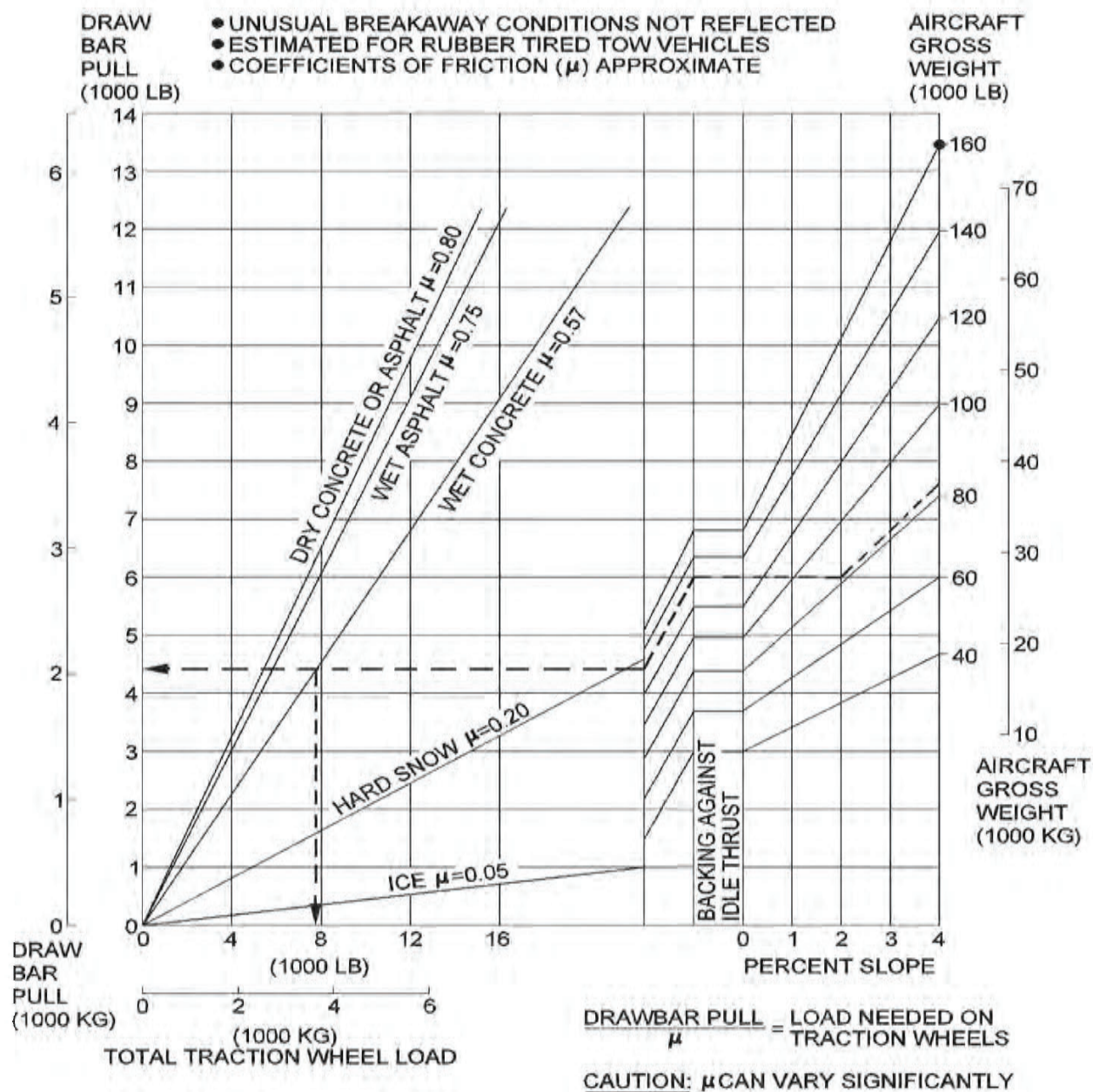
| **ISARP:** GRH 3.2.9

1. Tow Tractor Operator
 - A. The tow tractor operator is in charge of the towing operation, and responsible to:
 - 1) Ensures the vehicle is safe for intended operation.
 - 2) Set brakes whenever a tractor is unattended.
 - 3) ► Have a towing checklist ([Form HAL O404](#)) available.
 - 4) Verify all landing gear shock struts are normally inflated.

- 5) Verify landing gear pins are removed prior to departure. If the pins are not removed, call Maintenance immediately for removal.
 - 6) Remove all chocks.
 - 7) Verify the tow bar is properly connected.
 - 8) Verify steering system is bypassed or disconnected.
 - 9) Communicate tow plan with brake operator prior to movement.
 - 10) Be familiar with ramp and taxiway conditions.
 - 11) Take note of all potential clearance problems, obstructions and overhead clearances.
 - 12) Verify portable equipment, vehicles and stands are clear of tow path (even though ramp guidelines exist)
 - 13) Proceed with towing/pushing procedures ONLY when in visual contact with all necessary guides. If vision becomes obstructed, stop and reestablish contact with guides.
 - 14) Obtain the required tow team members.
 - 15) If VHF equipment exists, will monitor the same frequencies as the brake rider. If communications are lost between brake rider and the ground airport authorities, the tractor operator will become the primary source of communications with the authorities.
2. Responsibilities of the Service/Escort Vehicle Operator (HNL ONLY)
 - A. Ensures vehicle is equipped and complies with specific airport requirement.
 - B. Must have a source of VHF communications
 - C. Help identify potential hazards not readily visible by the tow tractor operator.
 - D. Will act as road blockers when entering the designated gate areas as required.
 3. Responsibilities of the Forward Guide
 - A. Assists tractor operator with visual clearances.
 4. Responsibilities of Wing Walker/Tail Guides
 - A. Guiding of aircraft is an important part of safe operations. Only authorized, trained personnel act as aircraft guides and wing walkers.
 - B. Assist the flightdeck whenever needed, to position the aircraft properly.
 - C. Uses standard hand signals.
 - D. Clears and monitors aircraft wing and/or tail travel paths in congested areas.
 - E. Warn oncoming traffic of aircraft movement.
 - F. Must remain in view and provide clearance signals to one of the following in charge.
 - G. Must use lighted wands during hours of darkness and/or poor visibility.

4.2.11.4 Towing Procedures and Requirements

Figure 4-24: Towing Procedures and Requirements



1. General Guidelines and Safety

- A. Only those individuals who have been properly trained and qualified may engage in taxi, towing or run-up operations.
- B. Towing is the preferred method to move aircraft.
- C. Taxiing of aircraft by maintenance personnel is to be avoided whenever possible but is permissible under the following circumstances:
 - 1) Logbook reports or scheduled maintenance indicate requirement for an engine run and/or taxi check.
 - 2) Towing would incur a departure delay.
 - 3) Local airport restrictions prevent towing unless emergency conditions exist.
- D. Avoid taxi in congested area. If taxi required, utilize guideperson and wing walkers.
- E. Taxi speed will be held to 15-18 mph or less and in gate congested areas (walking speed) and 5 mph down to 0 as directed by a guideperson.
- F. Be prepared to react in a safe manner in case of emergency.
- G. Applicable to Honolulu Hanger area:
 - 1) No taxi or engine run-up in or out of the hanger area. Guide person and wing walkers are required for towing aircraft in the hanger area. Any exceptions for engine runs in front of the hanger area must be approved by the Base Manager on duty.
- H. Do not use thrust reversers for braking.
- I. Maintenance engine operation and/or taxi will not be allowed with passengers on board the aircraft.

WARNING

All individuals in the main cabin are to be warned via intercom by the taxi mechanic in charge prior to commencing and terminating each movement of the aircraft during a taxi operation.

- J. Utilize the appropriate checklist and maintenance manual reference for tow/taxi/run-up procedures.

2. Procedures

- A. ► The towing checklist (Form HAL O404) must be utilized when towing an aircraft. The tow tractor driver will be responsible to have a checklist available.
- B. Gear pin installation is required during all maintenance towing operations.
- C. Communication between the tow tractor driver and brake rider is required for all towing operations. The aircraft interphone will be the primary source of communication. Alternative communication methods are permitted.
- D. Aircraft Very High Frequency (VHF) radio is required for all towing operations to communicate with airport authorities (ground, tower, ramp etc). Any tow team member assigned to monitor or communicate using this device must meet the requirements of the local Airport Authorities.
- E. During towing operations, the brake rider is responsible to communicate with the Airport Authorities seeking directions and approval prior movement. The brake rider will then relay directions to the tow tractor driver. The brake rider has an airport diagram out and visible during all towing operations.
- F. When towing to or from congested areas, wing walker(s) and or forward / rear guide must be used. A congested area is defined as: "one in which vehicles; equipment, buildings or other structures stand within, or in close vicinity of the tow path, such as a gate, hardstand, and maintenance hangar areas".

- G. When towing in any "Uncontrolled Areas" movement area not controlled by the Airport Authorities, an escort vehicle is required.
- H. During all towing operations when guests are not onboard aircraft, the tow operator will stop approximately 2 feet before the final stop line. A courtesy tire inspection will be accomplished by a tow team member to check for signs of tire defect (worn, cut, FOD damage etc.). Maintenance will be called to verify any defect.

3. Aircraft Towing Signals

- A. Verbal and hand signaling procedures have been established to prevent injury to personnel or damage to the aircraft, tractor or ramp equipment. It is the joint responsibility of the tractor operator and brake riding personnel to adhere strictly to the established signaling procedures, [refer to 4.6 General Reference](#).

CAUTION

During towing, the brake rider and the tractor operator must remain alert for signals given by personnel assigned to aid the movement of aircraft and remain in communication with each other.

- 1) During aircraft towing, a qualified brake rider maintains VHF communication with Airport Authorities. The tow tractor operator maintains contact with the brake operator via headset or other verbal means of communication.

NOTE

In HNL and other applicable stations, the tow tractor driver is responsible to communicate directly with the Airport Authorities seeking directions and approval to movement.

CAUTION

Do not use horn signals. It is possible to confuse horns of other automotive equipment with that of the vehicle towing the aircraft.

- 2) When the tractor operator is ready to tow the aircraft, call "brakes off." When the aircraft's brakes are fully released, the brake rider repeats, "brakes off."
- 3) When the aircraft's brakes are to be applied for other than emergency conditions, the tractor operator calls "brakes set." When the brakes have been parked, the brake rider repeats, "brakes set."
- 4) If an emergency arises that necessitates stopping the aircraft immediately, the tractor operator must call out "brake, brake, brake." The brake rider must apply "full brakes" instantly.

4. Ground Hand Signals

- A. [Refer to 4.6 General Reference](#) for the illustrated signals used by maintenance personnel to communicate with the pilot, or other qualified person, while taxiing, starting engines, towing, etc.
 - 1) The guide faces the aircraft forward of the left wing so that the pilot's eyes can be seen. When a taxiing aircraft approaches the ramp, the guide will attract the pilot's attention. When the pilot has indicated the general path to be followed, the guide moves to a spot facing the ultimate position of the aircraft and stands there, arms upraised.
 - 2) After the pilot has recognized the ultimate position, the guide remains in view and offers guidance as necessary, to accurately spot the aircraft.
 - 3) Prior to starting aircraft engines, the guide specifically requests that the person at the controls makes sure the parking brake is set.

- 4) Once the engines have been started and ground equipment removed, the guide notifies the flightdeck that all ground equipment is clear of the aircraft and ramp control responsibility has now been transferred to the ground guide.
- 5) Prior to taxiing, the guide waits for confirmation from the flightdeck that they have understood. Once positioned, the guide must be in view of the flightdeck at all times until the final ALL CLEAR is given and the aircraft leaves the blocks.

5. Towing Without Electrical Power

WARNING

Aircraft towing without electrical power is not conducted unless a minimum of one brake accumulator can be fully charged prior to the towing evolution.

- A. Special considerations must be made when moving the aircraft without electrical power. Most systems normally used during towing will not be available.
- B. The Tow Tractor Operator conducts a briefing with all participants of the evolution to discuss differences in towing without electrical power
- C. Interphone and radios will not be available. Hand-held radios must be used if towing is conducted in a movement area. When towing is completely within a non-movement area, standard hand signals are used, refer to 4.6 General Reference.
- D. Aircraft lighting will not be available. Vehicles with beacons may be required to accompany the aircraft based on specific airport requirements.
- E. Braking is limited to the brake accumulator charge.

CAUTION

The brake accumulator provides very limited braking capability; brakes are not used until the aircraft is parked except in an emergency. Avoid intermediate stops that may require use of the parking brake. Plan aircraft move accordingly.

6. Towing Without Aircraft Braking Capability

- A. Towing without aircraft braking capability may only be conducted in situations where extreme necessity requires the aircraft to be moved. Serious consideration is given to repairing at least one hydraulic brake system to a functional condition before moving the aircraft.
- B. When towing without aircraft braking capability, the Tow Tractor Operator ensures that all personnel involved in the evolution are fully briefed and familiar with the planned movement of the aircraft.
- C. Additional personnel will be required to act as chock walkers. In the event the aircraft must be stopped due to tow bar separation, chock walkers will carefully place a chock a short distance in front of the main gear tires to stop the aircraft from further movement.
- D. Due to the mass involved, the ability for a chock to stop the aircraft is questionable, therefore, any towing evolution conducted without aircraft braking capability will limit towing speeds to that at or less than a slow walk.
- E. Ground and/or RAO must be advised of the necessity for slower than normal movement as well as additional personnel in the vicinity of the aircraft.