



# **B767 FUELING PROCEDURES MANUAL**



**REVISION HIGHLIGHTS**

B767 FUELING PROCEDURES MANUAL	
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**REVISION 15 DATED 03-28-19**

**Chapter B767 Section 11 - FUEL MEASURING STICK TABLES FOR OFF ATTITUDE CONDITIONS**

Page 1, para 2.A., added "B767-323" to table; added note below table for clarification, per MPRR 44174.



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### **REVISION 14 DATED 10-07-16**

#### **Chapter Section 01 B767 B-767 FUEL SYSTEM - GENERAL**

Page 1 Para 1. Remove “(Ref. GRH 4.1.6)

#### **Chapter Section 02 FUEL LOADING REQUIREMENTS AND LIMITATIONS**

Page 1 para 1. Added (Ref. GRH 4.1.1),

Page 1 para 2. Added (Ref. GRH 4.1.6), Para 2. B. Correct spelling error

Per MPRR #42635



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### **REVISION 13 DATED 04-18-12**

Complete reissue of manual (revised to allow for all possible configurations), per MPRR 37993.

#### Chapter B767, Section 01

Page 1, Item 1. added “(Ref. GRH 4.1.6)”, per MPRR 38889.

Page 1, Item 1.A. added “and APU”, per MPRR 37993.

Page 1, Item 1.B. deleted “The fuel tanks are located in the interspar area of each wing outboard of the fuselage section”, per MPRR 37993.

Page 1, Item 1.C. deleted “The center auxiliary tank is deactivated on B767-281PC aircraft”, per MPRR 37993.

Page 1, Item 1.F. revised “Section 11” to “the Fuel Measuring Stick Manual”, per MPRR 37993.

Page 2, revised Figure 1, Pressure Fueling Station, per MPRR 37993.

Page 3, revised Figure 2, Fueling Station Door, per MPRR 37993.

#### Chapter B767, Section 02

Page 1, revised Item 1. “Requirements”, per MPRR 37993.

Page 1, revised Item 2. “Limitations”, per MPRR 37993.

Page 3, reordered sequence of Items 2.E.(1)(a) through (c), per MPRR 37993.

Page 3, reordered sequence of Items 2.E.(2)(a) through (c), per MPRR 37993.

#### Chapter B767, Section 04

Page 1, Item 1.B. revised “Section 11” to “Fuel Measuring Stick Manual”, per MPRR 37993.

Page 1, Item 1.C. deleted “inches-”, per MPRR 37993.

Page 2, Item 2.B. revised “inches” to “units”, per MPRR 37993.

#### Chapter B767, Section 06



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Page 1, Item 1.B. added “by following the procedure to open the MLG doors”, per MPRR 37993.

Page 2, Item 2.D. revised “Stick Tables, Section 11” to “Fuel Measuring Stick Manual”, per MPRR 37993.

Page 2, added new Item 2.J. “Close MLG doors if they were opened”, per MPRR 37993.

#### Chapter B767, Section 07

Page 1, Item 1.A. revised “Stick Tables, Section 11” to “Fuel Measuring Stick Manual”, per MPRR 37993.

Page 1, revised Item 2. “Begin Overwing Fueling”, per MPRR 37993.

#### Chapter B767, Section 08

Page 1, deleted Items 1.C. and 1.C.(1), per MPRR 37993.

Page 1, Item 2.A. deleted “Center Aux pressure defueling is not available with deactivated Aux tanks”, per MPRR 37993.

Page 5, deleted Item 5.B.(8) CAUTION “If pressure defueling center tank, follow center tank ground defuel/transfer procedures, Par. 1.C. of this section”, per MPRR 37993.

Page 7, deleted Item 5.D.(8) CAUTION “If transferring fuel from center tank, follow center tank ground defuel/transfer procedure, Par. 1.C. of this section”, per MPRR 37993.

#### Chapter B767, Section 10

Deleted contents of Section “Standard Fuel Distribution” (section now Intentionally Left Blank), per MPRR 37993.

#### Chapter B767, Section 11

Section “Fuel Measuring Stick Tables for Off Attitude Conditions” rewritten, per MPRR 37993.



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### **REVISION 12, DATED 06-06-11**

#### Chapter B767, Section 02

Page 2, fourth Warning revised to read “When thunderstorms or lightning are within a 5 mile (8 kilometer) radius of the immediate area, the refueling procedures should stop”, per MPRR 38058.



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### **REVISION 11, DATED 05-03-10**

**NOTE: Complete reissue of manual.**

**All pages now show Revision Number 11, dated 05-03-10.**

**This reissue corrects discrepancies in page numbering.**

Title Page, revised manual title from “B767 Fueling Manual” to “B767 Fueling Procedures Manual”, per MPRR 36921.

LEP revised to reflect Revision Number 11, dated 05-03-10, per MPRR 36921.



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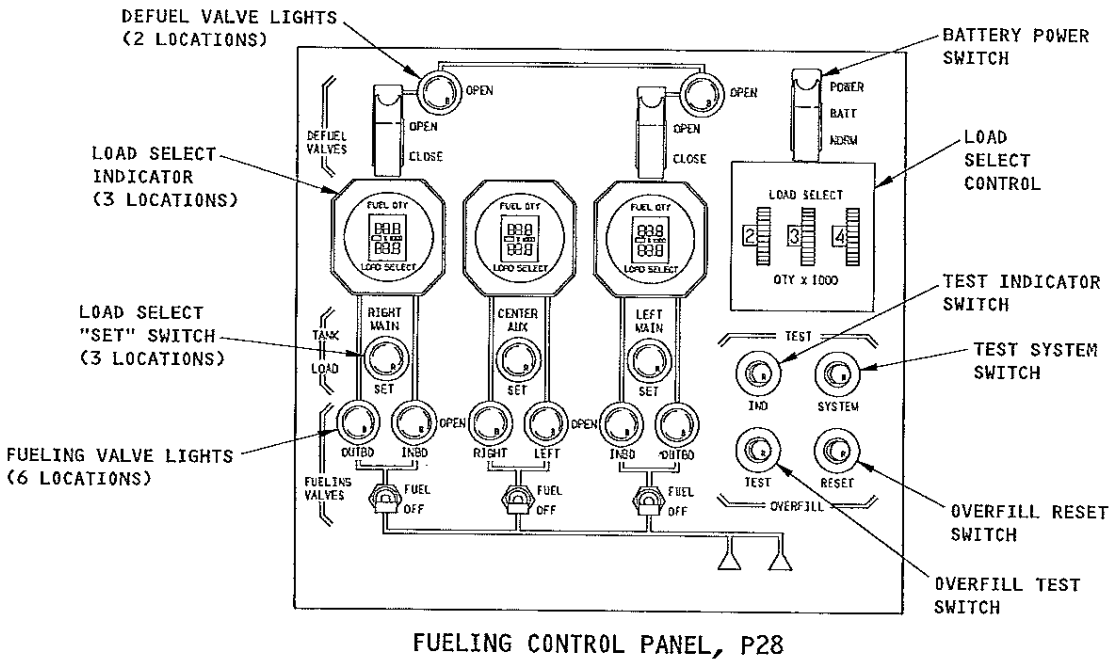
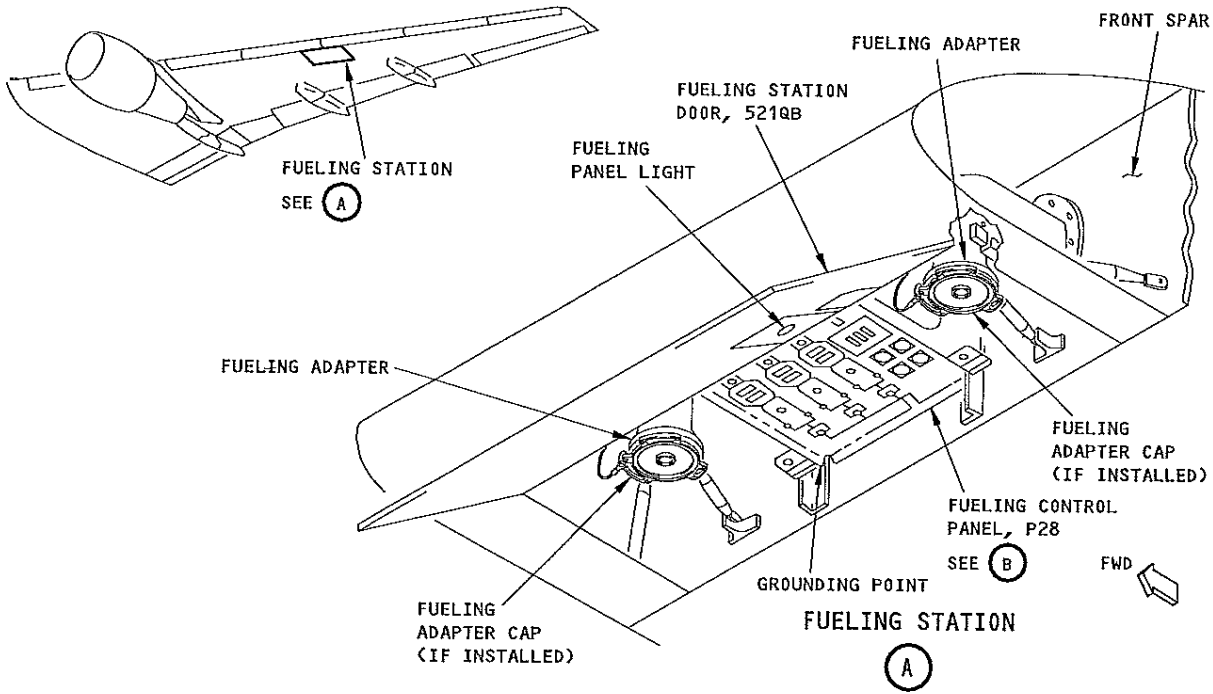
## SECTION 01

B-767 FUEL SYSTEM - GENERAL1. General

- A. The B-767 aircraft fuel system provides a means of storing fuel in the aircraft, distributing fuel to the engines and APU, pressure refueling and defueling, and provides a fuel quantity indicating system.
- B. There are three fuel tanks; the left and right main tanks and the center auxiliary tank. A surge tank is located near the top of each wing. The surge tanks are designed to contain overflow and to prevent fuel spillage.
- C. The aircraft is normally fueled into the left and right main tanks, and into the center auxiliary tank when necessary, using the pressure fueling method.
- D. The pressure fueling is controlled by the Fuel Quantity Indicating System (FQIS) processor unit (automatic fueling), or by the fueling operator (manual fueling). The operator can override the processor unit at any time during the fueling procedure by operating the fueling control switches at the fueling control station.
- E. The fueling control station is located on the underside of the left wing to leading edge. The station contains pressure fueling adapters, grounding points, a reading light, an interphone jack and a control panel. The control panel contains valve switches (FUEL and DEFUEL), valve OPEN lights, power switch NORMAL or BATTERY, the LOAD SELECT indicators, LOAD SELECTOR and SET switches, and TEST switches. Aluminum placards mounted on the inner surface of the fueling station door provide fueling procedures and appropriate cautions. Opening the fueling station door applies electrical power, 28 VDC from the ground handling bus, to the panel. If the ground handling bus is not powered, the panel power switch can be moved to BATT position.
- F. If no electrical power is available, the fueling shutoff valves can be operated manually. Fuel quantity can be measured without electrical power by using the measuring sticks located in the wing's lower skin and the dipstick calibration charts in the Fuel Measuring Stick Manual.



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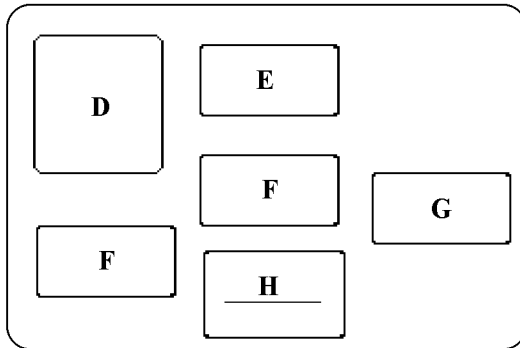
FUELING CONTROL PANEL, P28

(B)

Pressure Fueling Station  
Figure 1



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**Fueling Station Door**

**D.**

**FUELING PROCEDURE**

**NOTE:** BLUE LIGHT INDICATES FUELING VALVES OPEN AND FUELING. SEE OPERATIONS MANUAL FOR ADDITIONAL INFORMATION.

1. ATTACH GROUNDING JACKS AND THEN COUPLE FUELING NOZZLES.
2. TEST INDICATORS AND VALVE OPEN LIGHTS.
3. SET FUEL QUANTITY REQUIRED. BLANK SELECT WINDOW INDICATES MANUAL SHUTOFF, CONTROL OR AUTO FULL SHUTOFF.
4. OPEN FUELING SWITCHES FOR TANKS TO BE SERVICED. BEGIN FUEL FLOW.
5. TO CHECK SYSTEM, PUSH AND HOLD SYSTEM TEST. BLUE LIGHTS SHALL GO OUT AFTER 10 SECONDS FOR ALL FUELING SWITCHES IN THE "FUEL" POSITION AND FLOW TO THOSE TANKS SHALL CEASE.
6. TO CHECK OVERFILL SYSTEM PRESS OVERFILL TEST. BLUE LIGHTS SHALL GO OUT FOR ALL FUELING SWITCHES IN THE "FUEL" POSITION AND FLOW TO THOSE TANKS SHALL CEASE. PRESS THE OVERFILL RESET TO RESUME FUELING.

**E.**

7. MOVE FUELING SWITCHES TO "OFF" AT THE REQUIRED FUEL QUANTITY, OR AFTER AUTOMATIC SHUTOFF, OR AT THE SELECTED QUANTITY.
8. UNCOUPLE NOZZLES AND REMOVE GROUNDING JACKS.
9. ALL FUELING SWITCHES AND VALVES MUST BE IN THE OFF POSITION. VERIFY VALVE POSITION-BLUE LIGHT BULB OPERATION.

**F.**

**DEFUELING INSTRUCTIONS**

**NOTE:** BLUE LIGHT INDICATES DEFUEL VALVE IS OPEN.

1. TEST VALVE-OPEN LIGHTS.
2. TURN DEFUEL CAM TO "DEFUEL" POSITION IN ADAPTER(S).
3. ATTACH NOZZLE(S)
4. PUMP DEFUELING: OPEN MAIN TANK DEFUEL VALVE(S) AND DEFUEL USING MAIN AND / OR OVERRIDE PUMPS (FLIGHT DECK).

**G.**

5. SUCTION DEFUELING: OPEN THE DEFUEL VALVE FOR THE TANK(S) TO BE DEFUELED AND APPLY SUCTION.
6. CLOSE DEFUEL VALVE(S) AT THE DESIRED LEVEL. ALL DEFUEL SWITCHES AND VALVES MUST BE IN THE CLOSED POSITION. VERIFY VALVE POSITION-BLUE LIGHT BULB OPERATION.
7. REMOVE NOZZLE AND RETURN DEFUEL CAM TO "FUEL" POSITION.

**H.**

**CAUTION**

DO NOT EXCEED 50 PSI  
FUEL PRESSURE AT NOZZLE  
SERVICE WITH  
JET FUEL SPEC. ASTM D1655  
TANK USABLE FUEL QUANTITIES

L OR R MAIN **40669 lbs.**  
CENTER AUX **30552 lbs.**

EXAMPLE ONLY

OR

**H.**

**CAUTION**

Do Not Apply More Than 55 PSI  
Fuel Pressure At the Nozzle  
Refuel With Jet A/Jet A-1 Fuel  
As Specified By ASTM D 1655

Do Not Use Jet B/JP-4 Fuel  
In the Center Tank

Tank Usable Fuel Quantities  
L or R Main 6,070 U.S. Gal/22,977 L  
Center Aux 4,560 U.S. Gal/17,261 L

EXAMPLE ONLY BAC27TFS236

Fueling Station Door  
Figure 2

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## SECTION 02

FUEL LOADING REQUIREMENTS AND LIMITATIONS1. Requirements (Ref GRH 4.1.1)

- A. Fuel must conform to jet fuel specifications ASTM D1655, Jet A.
- B. The B767 has two main wing tanks (left and right) and one integral center tank. The maximum usable fuel capacities shown below are based on a fuel density of 6.702 lb / gallon.

MAIN TANKS	VOLUME - GAL. (L)	WEIGHT - LB. (KG)
Left	6,070 (22,977)	40,720 (18,470)
Right	6,070 (22,977)	40,720 (18,470)
Center -200	4,560 (17,261)	30,600 (13,880)
Center -300	12,000 (45,425)	80,510 (36,520)
Total -200	16,700 (63,216)	112,130 (50,820)
Total -300	24,140 (91,380)	161,940 (73,460)

- C. Left and right main fuel tanks must be loaded with approximately equal amounts of fuel to maintain a suitable center of gravity. Do not exceed a lateral imbalance of 1500 lbs.

2. Limitations (Ref GRH 4.1.6)

## A. Airplanes Without Jettison System

The center tank can be loaded with any amount of fuel, provided the main tanks are scheduled to be filled to capacity. However, if the main tanks are not scheduled to be full, up to 22,050 pounds (10,000 Kgs) of fuel may remain in or may be loaded in the center tank, provided the Maximum Zero Fuel Weight Limit is reduced by this amount of center tank fuel. All tanks may be filled simultaneously or in any sequence.

## B. Airplanes With Jettison System

- (1) Ensure these conditions are met:

- (a) A minimum of 10,300 pounds (4,672 kgs) of fuel are in the wing tanks.



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- (b) The weight of the fuel in the auxiliary tank plus actual Zero Fuel Weight does not exceed Maximum Zero Fuel Weight.
- (c) Balance limits are followed.

**WARNING:** AIRCRAFT AND FUELING SOURCE MUST BE PROPERLY BONDED BEFORE BEGINNING ANY FUELING OPERATION TO PREVENT POSSIBLE HAZARD OF ELECTRICAL DISCHARGE.

**WARNING:** GROUND EQUIPMENT MUST NOT BE POSITIONED UNDER WING TIPS DURING FUELING OPERATION. WING DEFLECTION DOWNWARD UNDER THE FUEL LOAD IS GREATEST AT THE WING TIPS. FUEL TANKS ARE VENTED THROUGH THE WING TIPS, AND AN EXPLOSIVE AIR/FUEL MIXTURE CAN DEVELOP IN THIS AREA.

**WARNING:** DO NOT OPERATE THE HF RADIOS OR WEATHER RADAR DURING FUELING OPERATIONS.

**WARNING:** WHEN THUNDERSTORMS OR LIGHTNING ARE WITHIN A 5 MILE (8 KILOMETER) RADIUS OF THE IMMEDIATE AREA, THE REFUELING PROCEDURE SHOULD STOP.

**CAUTION:** TO PREVENT DAMAGE TO FUELING SYSTEM COMPONENTS, DO NOT EXCEED 50 PSI FUEL PRESSURE AT THE FUELING NOZZLE.

**CAUTION:** ATTACH BONDING CABLES ONLY TO SPECIFIED POINTS ON THE AIRPLANE. BONDING CABLES ATTACHED TO COMPOSITE DOORS OR FAIRINGS DO NOT GIVE AN ELECTRICAL BOND. INCORRECTLY ATTACHED BONDING CABLES CAN CAUSE SCRATCHES. THESE SCRATCHES CAN CAUSE CORROSION AND CRACKS ON STRESSED PARTS.

- C. Electrical power from the APU, external power or battery is needed to operate the panel, valves and fuel quantity indicating system. Do not switch power sources while refueling.
- D. If the EICAS message Fuel QTY IND is displayed, maintenance personnel should perform fuel quantity BITE procedure per the Aircraft Maintenance Manual.

**NOTE:** Fuel tanks may be refueled prior to performing BITE procedure using the fuel measuring sticks.





E. The circuit breakers listed under the following panels must be closed during refueling:

- (1) APU/EXT Power Panel, P34
  - (a) FUEL QTY REFUEL, L2
  - (b) FLNG CONTROL, L3
  - (c) VALVES FLNG, L5
- (2) Main Power Panel, P6
  - (a) FUELING QTY, E4
  - (b) FUELING CONTROL, E5
  - (c) FUELING VALVES, E6
- (3) Overhead Circuit Breaker Panel, P11
  - (a) FUEL QTY NO. 1, C34
  - (b) FUEL QTY NO. 2, M19

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### AUTOMATIC FUELING OPERATION

#### 1. Prepare Fueling Station

- A. Open fuel station door. Make sure that the panel light comes ON, indicating that 28 VDC power is present at the fueling control panel.

NOTE: If panel light does not come on, place the power switch in the BATT position.

- B. Insert fuel nozzle bonding plug into grounding jack and connect fueling nozzle(s) to either or both fueling adapters.

NOTE: Fueling adapters have two positions, FUEL and DEFUEL. It should be in the FUEL position.

- C. Test load select indicators by pressing the IND switch; 88.8 should be displayed on the upper and lower LCD displays.

- D. Test fueling valves by press-to-test indicator lights.

- E. Set thumbwheels on the load select control to desired amount of fuel for the LEFT and RIGHT main tanks. Press the SET switch for the LEFT and then the RIGHT main tanks. Hold the SET switch for a minimum of 1 second. If center auxiliary tank fuel is required, set the load select control to the desired amount and press the center auxiliary SET switch for a minimum of 1 second.

NOTE: If an error is made during the selection process, press the appropriate SET switch to clear the load select display, and repeat the above procedure.

- F. Set the fueling valve switches for the appropriate tanks to FUEL. After 4 to 5 PSI of fuel pressure have been applied to the fuel valve, the blue valve OPEN lights will illuminate, indicating that the fueling valves are open

NOTE: If either fill valve in a tank is inoperative, the fueling rate for that tank will be reduced. The tank may be fueled to any quantity with either fill valve operative. Also, if necessary, an inoperative fill valve may be opened and closed manually or overwing fueling may be used.



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2. Begin Fueling

**CAUTION:** USE EXTREME CAUTION WHEN FUELING IF FUELING VALVE(S) HAS BEEN OPENED MANUALLY. NO ELECTRICAL SHUTDOWN PROTECTION EXISTS FOR MANUALLY OPENED VALVES.

A. Start fueling source.

**NOTE:** The fueling quantity processor will close the fueling valves automatically when the tank quantity reaches the SET quantity. This occurs for each tank being fueled to a pre-selected SET amount.

B. When fueling reaches the desired quantity, stop the fueling source and return the fueling valve switches for all applicable tanks to off.

**NOTE:** When fueling has reached the desired quantities and the processor has closed all opened fueling valves, release the deadman switch and return the applicable fueling valve switches to OFF.

C. Disconnect fueling nozzle(s) and bonding plug.

D. If selected to BATT, return power switch to NORM.

E. Close fueling station door.



### FUELING WITH ONE INOPERATIVE INDICATOR

#### 1. Prepare to Fuel using Cockpit Indicator or Measuring Stick

- A. It is permissible to use the cockpit indicator to fuel a tank with an inoperative fueling panel indicator. Automatic valve closing, except for overfill, will not be operative using this method. For this reason a qualified person, preferably a mechanic or crew member, must be in the cockpit and in interphone contact with the refueler at all times during the refueling operation. The refueler must be alert to position the fueling valve switch for the affected tank to OFF when advised by the person in the cockpit that the tank contains the desired amount of fuel.
- B. Prior to fueling a tank with an inoperative indicator, a magnastick measurement of the fuel remaining in that tank and pitch and roll must be taken (see [Fuel Measuring Stick Manual](#)). Check the stick chart to determine the amount of fuel remaining on arrival.
- C. Using the above pitch and roll, determine from the measuring stick tables which stick and the desired indication the fueling personnel will use to provide the desired quantity of fuel in the affected tank.
- D. Ensure compliance with Section 02 and Section 03 paragraph 1.A. and 1.B.
- E. Test the operative load select indicator by pressing IND TEST switch; 88.8 should be displayed on upper and lower LCD displays.
- F. Press-to-test the fueling valve lights.
- G. Withdraw the measuring stick to be used on the affected tank to engage the magnet and the float.
- H. Set the load select quantity on the tank with operable indicator (see Section 03 paragraph 1.E.).

#### 2. Begin Fueling using Cockpit Indicator

- A. Open the tank valves and begin fueling.

NOTE: Tanks are fueled simultaneously until within approximately 1500 lbs of the desired level in each tank.

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- B. Monitor the stick being used on the affected tank until within approximately two **units** of desired indication. At that point, stop fueling. Reset the magnet and float on the measuring stick to assure proper reading.
- C. Restart the fueling source and continue fueling at reduced rate to desired quantities.
- D. Shut down the fueling source when the required amount of fuel is loaded. Verify the stick reading and stow the stick.
- E. Close the fueling valves.
- F. Disconnect the fueling nozzle(s) and bonding plug.
- G. Close the fueling station door.

MANUAL FUELING OPERATION

1. Manual Fueling Settings
  - A. Ensure compliance with Section 02 and Section 03 paragraph 1.A. through 1.D.
  - B. Place the applicable fueling valve switches to FUEL.
2. Begin Manual Fueling Operation
  - A. Start the fuel source.
  - B. Monitor fuel quantity indicators for the amount of fuel in the tanks. Stop the fueling source and return applicable fueling valve switches to OFF when the desired fuel quantity has been reached. Verify that the blue fueling valve lights go out.
  - C. Shut down the fueling source.
  - D. Disconnect the fueling nozzle(s) and bonding plug.
  - E. If selected to BATT, return the power switch to NORM.
  - F. Close the fueling station door.

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FUELING WITHOUT ELECTRICAL POWER1. Prepare to Fuel Without Electrical Power

CAUTION: NO AUTOMATIC SHUTDOWN OR OVERFILL PROTECTION EXISTS WITHOUT ELECTRICAL POWER.

CAUTION: DO NOT USE MANUAL SHUTOFF VALVES TO REDUCE OR STOP FUELING. CLOSING THE MANUAL SHUTOFF VALVES DURING FUELING CAN CAUSE PRESSURE SURGES AND DAMAGE EQUIPMENT.

A. Gain access to the main tank fueling valves by removing applicable access panels aft of the wing trailing edge spar (see Figure 1).

- (1) Main tank inboard actuator, left wing, 551 TB.
- (2) Main tank inboard actuator, right wing, 651 TB.
- (3) Main tank outboard actuator, left wing, 561 GB.
- (4) Main tank outboard actuator, right wing, 661 GB.

B. Gain access to the left or right center auxiliary fuel tank fueling valves [by following the procedure to open the MLG doors](#).

C. Manually open applicable shutoff valve, (see Figure 1):

CAUTION: MAKE SURE THERE IS NO MANIFOLD PRESSURE. DAMAGE COULD RESULT TO THE DIAPHRAM ON THE FUELING VALVE.

- (1) Verify that the fueling manifold has been depressurized.

CAUTION: DO NOT REMOVE RETAINER PLATE LOCKWIRE, SCREWS OR RETAINER PLATE, FUEL LEAKAGE WILL OCCUR.

- (2) Remove the lockwire from knurled knob on the valve override screw.
- (3) Turn the override screw (knurled knob) 10-13 complete revolutions in a counterclockwise direction.



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D. Ensure compliance with the warnings and cautions found in Section 02.

2. Begin Fueling Without Electrical Power

A. Open the fueling station door.

B. Insert fuel nozzle bonding plug into grounding jack and connect the fueling nozzle(s) to fueling adapters.

**CAUTION:** DO NOT EXCEED 50 PSI FUEL PRESSURE AT FUELING NOZZLE TO PREVENT DAMAGE TO FUELING SYSTEM COMPONENTS.

C. Start the fueling source.

D. Monitor fuel quantity in tanks with fuel quantity measuring sticks (see [Fuel Measuring Stick Manual](#)).

E. Shut down fueling source when required amount of fuel is loaded.

F. Manually close applicable shutoff valve:

(1) Verify fueling manifold has been depressurized.

(2) Turn the override screw 10-13 complete revolutions in clockwise direction.

(3) Install lockwire to knurled knob or valve override screw.

G. Disconnect fueling nozzle(s) and bonding plug.

H. Close fueling station door.

I. Install applicable wing access panels.

J. [Close MLG doors if they were opened.](#)

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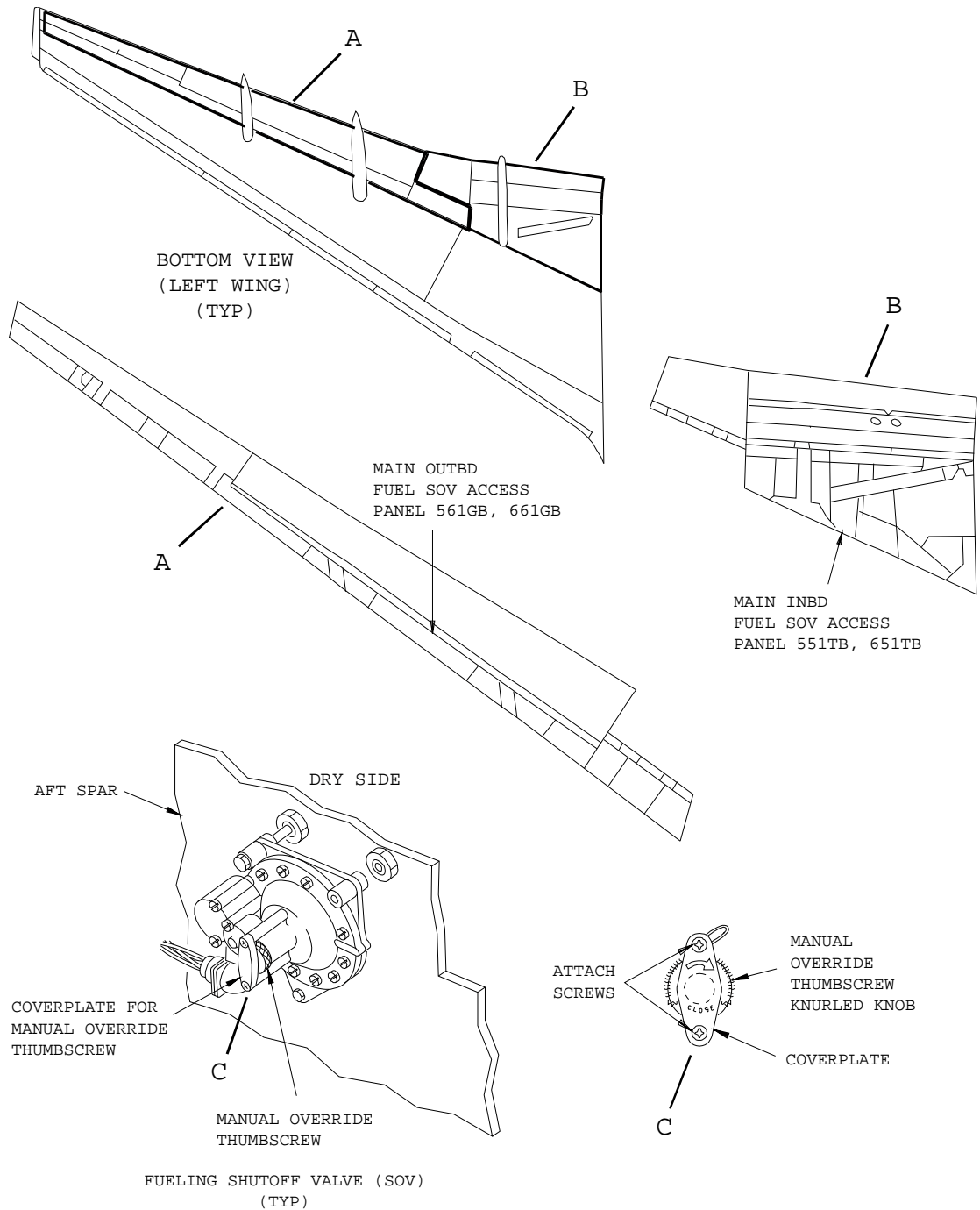


FIGURE 1 MANUAL FUELING SHUTOFF VALVE (SOV)

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## OVERWING FUELING

### 1. Overwing Fueling - General

- A. Overwing fueling of the left and right main tanks may be performed if pressure fueling equipment or electrical power is not available and is required when the outboard main tank is inoperative. With electrical power available fuel quantity can be monitored by load select indicators at the fueling station. With no electrical power available fuel quantity can be monitored with fuel quantity measuring sticks (see [Fuel Measuring Stick Manual](#)).

**NOTE:** Overwing fueling port directs fuel into the outboard section of the main fuel tanks.

- B. Ensure compliance with Section 02.
- C. Provide electrical power if available. If electrical power is not available, release and lower the applicable fuel measuring sticks.
- D. If available, place maintenance mats on wing where service personnel must walk.

**WARNING:** DO NOT REMOVE FILLER CAPS BEFORE GROUNDING FUEL NOZZLES.

- E. Bond fueling nozzles to ground jacks adjacent to fill ports with nozzle bonding cables.

### 2. Begin Overwing Fueling

- A. Remove filler caps from main fuel tanks.
- B. Insert fueling nozzles into filler ports.

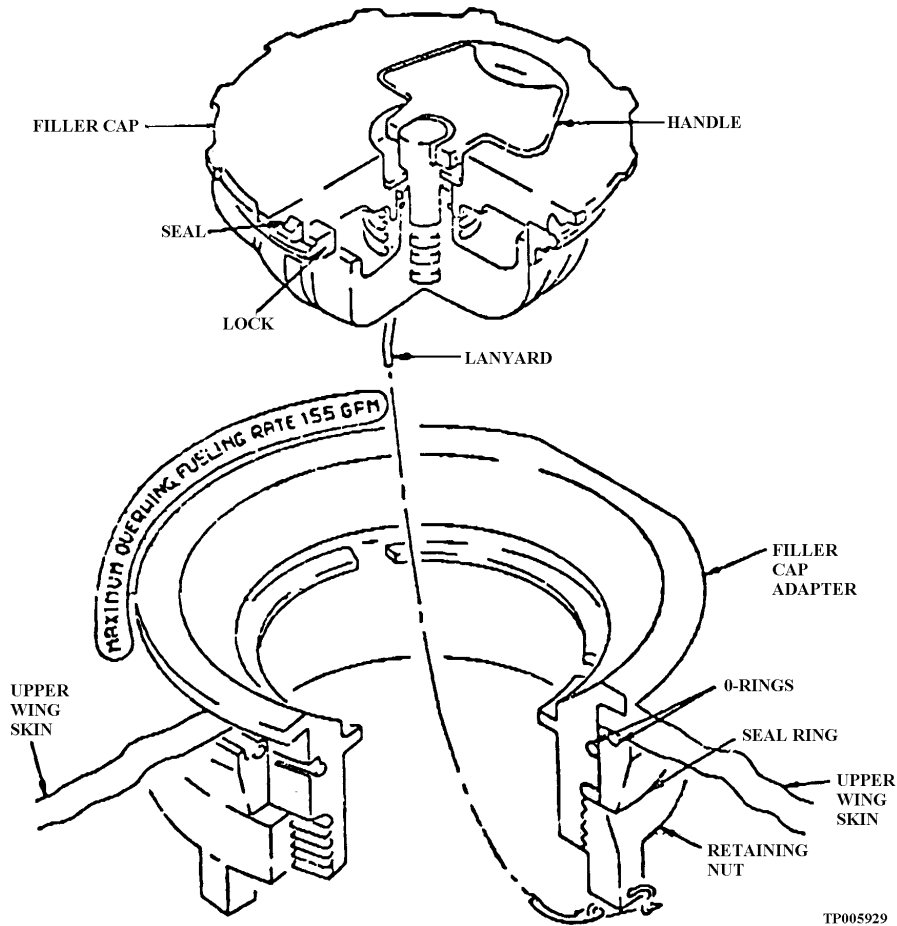
**WARNING:** DO NOT FILL THE FUEL TANKS AT A RATE MORE THAN SPECIFIED. WHEN THE FUEL RATE IS MORE THAN SPECIFIED, IT CAN CAUSE A STATIC DISCHARGE AND CAN CAUSE A FIRE OR AN EXPLOSION.

- C. Do not exceed fueling rate of 155 GPM (587 LPM).
- D. Start fueling source. Monitor fuel quantities loaded with load select indicators, or fuel measuring sticks as applicable.



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- E. Stop fueling source when required amount of fuel is loaded.
- F. Remove fuel nozzle and install filler cap.
- G. Disconnect bonding cable from ground jacks.
- H. Remove maintenance mats, if used.
- I. If opened, raise applicable fuel measuring sticks into stowed position and lock.
- J. If opened, close fueling station door.



Overwing Fueling  
Figure 1



## DEFUELING AND TANK-TO-TANK TRANSFER

### 1. General

- A. Defueling is accomplished by using either the pressure or suction method. Fuel extraction is through the fueling adapters at the wing fueling station. Tank-to-tank transfer is accomplished using the pressure method. Both operations are accomplished only on the ground. There are no provisions for tank-to-tank transfer in flight.
- B. Tank valves for fueling and defueling are controlled from the fueling station and must be properly positioned to accomplish either of the above operations. The fueling adapter must be set to DEFUEL prior to attaching the vehicle hose to remove fuel from the aircraft.

**WARNING:** DO NOT OPERATE THE HF RADIOS OR WEATHER RADAR DURING DEFUELING OPERATIONS.

**CAUTION:** DO NOT OPERATE HYDRAULIC SYSTEM IF FUEL IN EITHER TANK IS LESS THAN 600 U.S. GALLONS. HYDRAULIC SYSTEM OVERHEATING WILL RESULT IF THE HEAT EXCHANGER IS NOT SUBMERGED IN FUEL.

### 2. Defueling

- A. Main tank pressure defueling requires opening the Left or Right Defuel Valve and turning on the boost pump(s) in the tank. Center Aux pressure defueling require opening either or both main tank defuel valves and turning on the override pumps.

**NOTE:** The Center Aux tank defueling valve, if installed, is used for suction defueling only. DO NOT OPEN Center Aux tank defuel valve for pressure defueling.

- B. Suction defueling requires opening the applicable tank defuel valve (Left, Center Aux, Right) and applying vehicle suction to the fueling manifold. A boost pump bypass suction line connects each fuel tank to the fuel feed manifold. Boost pumps are not used.



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3. Tank-To-Tank Fuel Transfer

Transferring fuel to another fuel tank requires opening the receiving tank fueling valves, opening the supply tank fueling valves and turning on the boost pumps in the supply tank. When transferring out of the Center Aux tank, do not open the Center Aux Defuel Valve. Open both Main Tank Defuel Valves (or the opposite tank to which transfer is being made) and the Crossfeed valve.

NOTE: Transferring fuel is the same as pressure defueling, EXCEPT fueling adapter is not set to DEFUEL position and fuel is not removed from aircraft.

4. Functional Description

A. Defueling

- (1) Pressure Defueling - For pressure defueling, the fuel system must be configured as follows:
  - (a) The fueling adapters must be in the defuel mode before connecting the fueling nozzles
  - (b) The defueling valve for the tank being defueled must be open. (Center Aux Defueling Valve if installed is not required to be open for pressure defueling)
  - (c) At least one boost pump for the tank being defueled must be on.
- (2) Suction Defueling - Suction defueling requires a configuration of the fuel system similar to pressure defueling, except that the boost pumps for the tank being defueled must be off, and Center Aux Defuel Valve opened for suction defueling.
- (3) Tank-To-Tank Fuel Transfer - For transfer of fuel between tanks, the fuel system must be configured as follows:
  - (a) The receiving tank pressure fueling shutoff valves must be open.
  - (b) A main tank defueling valve must be open.
  - (c) At least one supplier tank boost pump must be operating.





- (4) If the defuel valve for the main tank being defueled (any method) fails closed and cannot be manually opened, opening the crossfeed valve and the opposite tank defueling valve still allows defueling. Suction defueling of Center Aux tank requires an operable defuel valve.
- (5) The fuel quantity indicating system allows monitoring of defueling.

#### B. Defuel Valve Operation

- (1) Switches at the fueling station control the defueling valves. The ground handling bus or the hot battery bus provides 28 VDC power. Opening the fueling control panel door energizes the fueling power control relay. Twenty-eight-volt DC power passes through the fueling power control relay to the defuel valve control switch. If the control switch is selected to OPEN, 28 VDC power passes through the control switch to energize the defuel valve control relay. The valve actuator receives 28 VDC power through the defuel valve control relay to open the valve.
- (2) The defuel valve control relay relaxes with the defuel valve control switch closed. The relaxed valve control relay provides a direct path for 28 VDC power to the valve actuator to close the valve. Inadvertently closing the fueling panel door before switching the defuel valve CLOSED creates the necessary condition for the direct flow of 28 VDC power to the valve actuator to close the valve.

#### C. Defuel Valve Indication

A blue DEFUEL VALVE light on the fueling station control panel provides indication of defuel valve position. THE DEFUEL VALVE lamp lights when the valve reaches full open. The full closed valve shuts off the DEFUEL VALVE light.



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5. Operation

A. Provide electrical power.

B. Pressure Defueling

(1) The following circuit breakers must be closed for defueling:

Circuit Breaker	Location
DEFUELING VALVES	P6
DEFUELING VALVES	P34
FUEL QTY No. 1	P11
FUEL QTY No. 2	P11
FUEL PUMP L FWD/R AFT	P11
FUEL PUMP R FWD/L AFT	P11
R AFT FUEL BOOST PUMP	P6
R FWD FUEL BOOST PUMP	P6
L AFT FUEL BOOST PUMP	P6
L FWD FUEL BOOST PUMP	P6

(2) Open fuel station door and check that panel light illuminates. This indicates presence of 28 VDC.

(3) Set fueling adapters to DEFUEL.

(4) Insert fuel nozzle bonding plug into grounding jack and connect fueling nozzle(s) to either or both fueling adapters.

(5) Select the power source by using the power select switch located on the fueling panel.

(6) Test load select indicators by pressing TEST IND switch; 88.8 should appear on upper and lower LCD display.

(7) Test defueling valve by press-to-test indicator light.



- (8) Set defueling valve switches to OPEN. The blue valve open indicator light should illuminate.

NOTE: The Center Aux tank defueling valve, if installed, is used for suction defueling. DO NOT OPEN Center Aux tank defueling valve for pressure defueling.

- (9) Place applicable boost pump switch on pilot's overhead panel to ON. Defueling will commence.
- (10) Watch load select indicators at fueling station for amount of fuel in tanks
- (11) Place applicable boost pump switch to OFF when required amount of fuel has been unloaded. The defueling operation can be stopped at any time by placing the defueling valve switch to CLOSE.
- (12) Set defueling valve switches to CLOSE.
- (13) Disconnect fueling nozzle(s) and bonding plug.
- (14) Set fueling adapter to FUEL.
- (15) Close fueling station door.
- (16) If tank has to be completely defueled, drain remaining fuel through sump drain valve.

#### C. Suction Defueling

- (1) The following circuit breakers must be closed:

DEFUELING VALVES      FUEL QTY NO. 1

DEFUELING VALVES      FUEL QTY NO. 2

- (2) Open fuel station door and check that panel light illuminates, indicating presence of 28 VDC.
- (3) Set fueling adapters to DEFUEL.
- (4) Insert fuel nozzle bonding plug into grounding jack and connect fueling nozzle(s) to either or both fueling adapters.



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- (5) Select the power source by using the power select switch located on the fuel panel.
- (6) Test load select indicators by pressing TEST IND switch; 88.8 should appear on upper and lower LCD display.
- (7) Test defueling valve by press-to-test indicator light.
- (8) Set defueling valve switches to OPEN. The blue valve open indicator light should illuminate.
- (9) Start defueling truck. Defueling will commence.
- (10) Watch load select indicators at fueling station for amount of fuel in tanks.
- (11) Place defueling valve switch at fueling station in CLOSE position when required amount of fuel is unloaded.
- (12) Stop defueling truck.
- (13) Disconnect fueling nozzle(s) and bonding plug.
- (14) Set fueling adapter to FUEL.
- (15) Close fueling station door.
- (16) If tank has to be completely defueled, drain remaining fuel through sump drain valve.

D. Tank-To-Tank Transfer

- (1) Provide electrical power.
- (2) The following circuit breakers must be closed:

Circuit Breaker	Location
DEFUELING VALVES	P6
DEPUELING VALVES	P34
FUEL QTY NO. 1	P11
PUEL QTY NO. 2	P11



Circuit Breaker	Location
FUEL PUMP L FWD/R AFT	P11
FUEL PUMP R FWD/L AFT	P11
R AFT FUEL BOOST PUMP	P6
R FWD FUEL BOOST PUMP	P6
L AFT FUEL BOOST PUMP	P6
L FWD FUEL BOOST PUMP	P6
FUELING VALVES	P34
FUELING CONTROL	P34
FUELING VALVES	P6
FUELING CONTROL	P6
R OVRD FUEL BOOST PUMP	P11
L OVRD FUEL BOOST PUMP	P11
R OVRD FUEL BOOST PUMP	P6
L OVRD FUEL BOOST PUMP	P6

- (3) Open fuel station door.
- (4) Select power source at power select switch at fueling panel.
- (5) Test load select indicators by pressing TEST IND switch; 88.8 should appear on upper and lower LCD displays.
- (6) Test fueling valve at press-to-test indicator light.
- (7) Test defueling valve by press-to-test indicator light.
- (8) Place fueling valve switch of receiving tank to FUEL.
- (9) Place defueling valve switch of supplier tank to OPEN.
- (10) Place applicable boost pump switch on pilot 's overhead panel to ON. Transfer will commence.
- (11) Watch load select indicator for amount of fuel in tanks.
- (12) Place applicable boost pump switch to OFF when desired amount of fuel has been transferred.

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- (13) Place refueling valve switch at fueling station to CLOSE.
- (14) Place fueling valve switch at fueling station to OFF.
- (15) If tank has to be completely defueled, drain remaining fuel through sump drain valve.
- (16) Close fuel station door.
- (17) Remove electrical power if no longer required.



## FUEL SUMP DRAINING

### 1. General

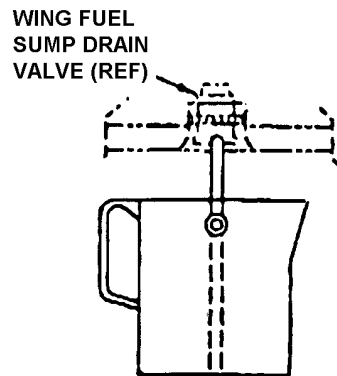
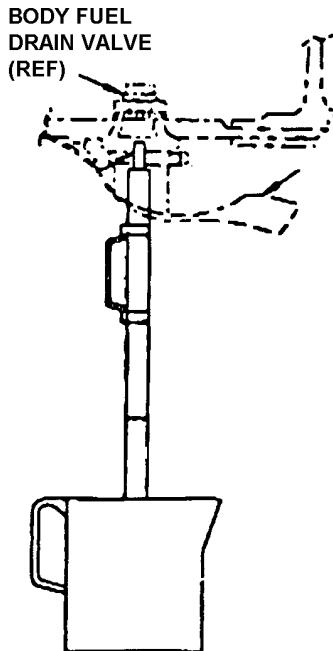
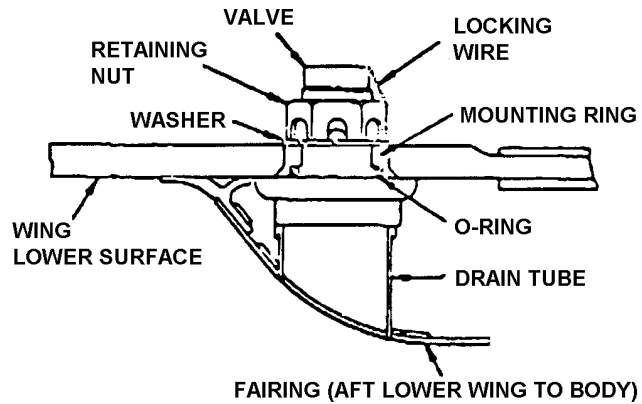
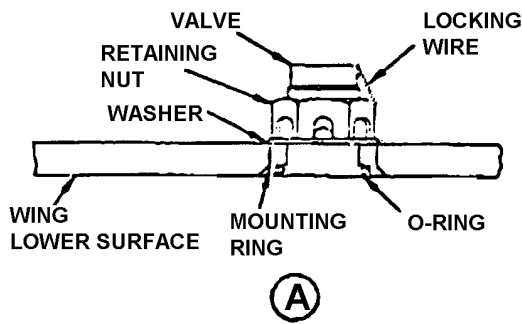
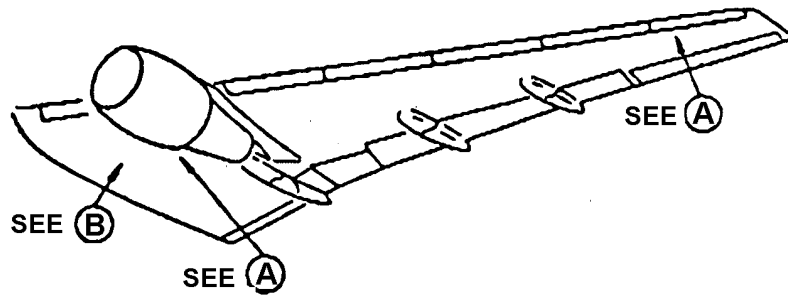
- A. The fuel tanks are equipped with an integral water scavenging system which operates whenever fuel boost pumps are operating. Also, each fuel tank sump has a drain valve to enable water to be drained from the tank. The sumps may be drained before or after fueling, but not during fueling. Water suspended in fuel settles at the rate of one foot per hour, and the maximum practical period of time should be allowed between fueling and sump draining to allow the water to settle.
- B. Periodic draining of fuel tank sumps is essential for removal of free water from fuel tanks, and as a check on the integrity of the water scavenge system. Abnormal amounts of water drained from an individual tank prior to fueling may indicate a blocked ejector pump, which requires removal and inspection for orifice contamination.
- C. Maintenance personnel drain all fuel tank sumps as specified in the maintenance program.

### 2. Drain Fuel Tank Sumps

- A. Unlock drain valve by rotating primary poppet 90 degrees with flat-blade screwdriver.
- B. Position fuel sampling equipment beneath sump drain valve with probe against primary poppet. Push upward against poppet until fuel flows into container.
- C. Drain each sump until fuel entering container is free of water (recommended minimum of approximately one quart).
- D. Release upward pressure on poppet and allow valve to close without leakage.
- E. Lock drain valve by rotating primary poppet 90 degrees.



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Fuel System Drains  
Figure 1





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FUEL MEASURING STICK TABLES FOR OFF ATTITUDE CONDITIONS1. General

- A. The B-767 airplanes are equipped with magnetic type dripless fuel measuring sticks. Seven sticks are installed in each wing's main fuel tank and one in each side of the center auxiliary tank. They are referred to as "FUEL MEASURING STICK NUMBER 1" for the auxiliary tank and "FUEL MEASURING STICK NUMBER 2" through "FUEL MEASURING STICK NUMBER 8" in the main tanks from inboard on the wing to the farthest outboard, respectively.
- B. A qualified person, either the ABX Flight Crew or Maintenance Representative, will take stick readings of the tanks. These stick readings will then be entered in the Aircraft Logbook along with the stick position, as applicable (left, center, right, etc.), and airplane ground attitude.
- C. The Fuel Measuring Stick Manual provides adequate information to determine fuel tank load by using measurements from the sticks and a measurement of airplane attitude.
- D. The applicable Fuel Measuring Stick Manual is co-located with this manual.

2. Fuel Measuring Stick Manuals

- A. The following table identifies the Boeing Fuel Measuring Stick Manual document number applicable to the airplane model operated by ABX.

Model	Document Number	Sticks	Tables
B767-223 B767-232 B767-281	D345T000-3	Inches	Pounds
<b>B767-323</b> B767-338	<b>*D345T028</b>	Inches	Kilograms
B767-383	D345T030	Centimeters	Kilograms

\*NOTE: **B767-323 with Winglets, use D345T028APB**

- B. The airplane model for a given registration number is determined by referring to Ops Spec D085, Aircraft Listing.

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