02-28 ATA 28 - FUEL SYSTEM

02-28-00 TABLE OF CONTENTS

02-28-05 GENERAL
   Introduction
   Sources
   Fuel tank location

02-28-10 DESCRIPTION
   Sub-systems
   Distribution

02-28-15 CONTROL AND INDICATION
   Control
   Synthetic table
   Indication

02-28-20 SYSTEM PROTECTION
   Introduction
   Circuit breakers
   Fire control panel

02-28-25 NORMAL OPERATION
   Introduction
   Airplane with full tanks and only APU operating (on ground)
   Normal operation (in-flight)
   Fuel balance procedure

02-28-30 ABNORMAL OPERATION
   Introduction
   BP 2 and STAND BY BP 2 failure
   Loss of rear tank gauging
   CAS messages

02-28-35 FUELING OPERATION
   Introduction
   Pressure refueling
   Gravity refueling
   Suction defueling
   Gravity draining
INTRODUCTION

Fuel system provides engines and APU with pressurized fuel.

It is composed of two tank groups which are normally independent:
- one LH group which supplies engine 1:
  - LH wing tanks,
  - LH center wing tanks,
  - rear tank,
- one RH group which supplies engine 2 and the APU:
  - RH wing tanks,
  - RH center wing tanks,
  - front tank.

Total usable fuel quantity is 16,730 lb / 7,588 kg / 2,497 USG / 9,450 l.

Weights are calculated for a fuel density of 6.7 lb per USG (0.803 kg/l).
FUEL circuit breakers
FIRE protection panel (Fuel switches)
FUEL system panel
CAS windows
HSI window
ENG-TRM-BRK window
FUEL and STAT windows

FIGURE 02-28-05-00 FLIGHT DECK OVERVIEW
**SOURCES**

<table>
<thead>
<tr>
<th>LH WING TANKS + LH CENTER WING TANKS + REAR TANK</th>
<th>RH WING TANKS + RH CENTER WING TANKS + FRONT TANK</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,054 lb</td>
<td>8,676 lb</td>
</tr>
<tr>
<td>3,653 kg</td>
<td>3,935 kg</td>
</tr>
<tr>
<td>1,202 USG</td>
<td>1,295 USG</td>
</tr>
<tr>
<td>4,549 l</td>
<td>4,901 l</td>
</tr>
</tbody>
</table>

**FUEL TANK LOCATION**

![Diagram of aircraft fuel tanks](image)

**FIGURE 02-28-05-01 TANK LOCATION**
Negative pressure relief valves (under the wings)

Gravity filler ports

FIGURE 02-28-05-02 LOCATION OF NEGATIVE PRESSURE RELIEF VALVES AND GRAVITY FILLER PORTS

FIGURE 02-28-05-03 LOCATION OF SUMP DRAIN VALVES (VIEW FROM UNDERNEATH)
FIGURE 02-28-05-04 PRESSURE FUELING PANEL AND FUELING CONNECTOR LOCATION
SUB-SYSTEMS

TANKS

Fuel storage consists of two tank groups. Each group normally supplies fuel to its respective engine. All tanks are a structural part of the airplane.

In case of failure in one of the engine supply systems, crossfeed units allow the following operations:
- supply of either of the two engines from any of the supply systems,
- fuel transfer from one side group (wing tanks and center wing tanks) to the other side group.

NOTE

It is not possible to transfer fuel from front tank to rear tank and vice-versa.

The tanks are pressurized by LP bleed air from both engines (intake independent from air conditioning system). The pressure is regulated at 2.9 psi and is automatically controlled by the pneumatic system.

The airplane may be pressure or gravity refueled or defueled by a pilot.

LH TANK GROUP

It is composed of the LH wing, the LH center wing and the rear tanks.

The LH wing tank is divided into two sections, outboard and inboard, separated by a rib with interconnection holes at the upper part and flapper valves at the lower part.

The LH Booster Pumps (BP) compartment is located in the LH feeder tank in the center wing section.

The LH tank group supplies the No 1 engine.
RH TANK GROUP

It is composed of the RH wing, the RH center wing and the front tanks. The RH wing tank is divided into two sections, outboard and inboard, separated by a rib with interconnection holes at the upper part and flapper valves at the lower part. The RH Booster Pumps (BP) compartment is located in the RH feeder tank in the center wing section. The RH tank group supplies the No 2 engine and the APU.

BOOSTER PUMPS

Four identical, three-phased, AC powered, immersed, centrifugal fuel Booster Pumps (BP) are installed in the fuel system. Each pump has a built-in inverter that converts 28 VDC to 115 VAC 400 Hz. Each center wing tank has a booster pump compartment in the aft part, which contains one booster pump and one stand-by booster pump. During a normal engine start (using the pedestal engine rotary switch), the normal booster pumps 1 & 2 are automatically set to on. They are not automatically set to off when the corresponding engine is shut-down. During the APU start (when APU START/STOP is depressed), the stand-by booster pump 2 is automatically set to on. It is not automatically set to off when the APU is stopped.
JET PUMPS

The jet pumps ensure that the booster pumps always remain immersed in their compartments. They are installed in the BP compartment, all identical and operate according to the venturi principle by using motive fuel flow delivered from the booster pumps.

In the LH tank group, six jet pumps transfer fuel from the LH wing tanks and rear tank into the LH booster pump compartment. Two lines provide fuel from the rear tank.

In the RH tank group, five jet pumps transfer fuel from the RH wing tanks and front tank into the RH booster pump compartment. One line provides fuel from the front tank.

FUEL QUANTITY MANAGEMENT COMPUTER

The Fuel Quantity Management Computer (FQMC) includes 2 independent channels performing the following functions:
- monitoring of fuel gauging and flow metering,
- low level management,
- refueling valves control,
- fuel used computation,
- fuel temperature measurement,
- center of gravity monitoring,
- monitoring of engines and APU oil levels,
- transfer valves control,
- system self-monitoring,
- management of level in hydraulic reservoirs.

The FQMC is located in a pressurized area (baggage compartment), away from hot air ducts, hydraulic piping and fuel piping.
NEGATIVE PRESSURE RELIEF VALVES

The outboard end of each wing has a negative pressure relief valve to ensure that internal tank pressure does not fall under atmospheric pressure.

➤ for location refer to figure 02-28-05-02.

GRAVITY FILLER PORTS

Each wing has one gravity filler port.

➤ for location refer to figure 02-28-05-02.

SUMP DRAINS

Ten sump drains are located underneath the aircraft.

➤ for location refer to figure 02-28-05-03.

VENT VALVES

There are 3 vent valves, LH, RH and rear tanks vent valves:

- LH and RH tanks vent valves are connected to the corresponding wing tanks,
- Rear tank vent valve is connected to the pressurization line.

These valves are commanded to open when airplane on ground and the refueling coupling lever is set to the up position.

NOTE

The fuel drain filler cup is stored in the aft servicing compartment.
GENERAL

The two independent groups of fuel tanks feed their respective engine. The RH tank group also feeds the APU.

The interconnection (X-BP) system permits any booster pump to supply pressurized fuel to any engine in the event of a failure of the two booster pumps on the same side. The X-BP controls 2 crossfeed units consisting mainly in 2 crossfeed valves which position is related to the X-TK switch position. By setting the X-BP on, supplies of engines 1 and 2 are interconnected and shuts off the fuel supply of the jet pumps located on the "arrow" side.

The crosstank (X-TK) system permits to connect LH and RH feeder tanks to compensate for asymmetric fuel consumption. The X-TK consists in a solenoid valve (spring-loaded closed) electrically commanded by the switch position, and actuated by the fuel pressure.

NOTE

Operating crosstank inhibits the front and rear tanks jet pumps. It is not possible to transfer fuel from front tank to rear tank and vice-versa.
FUSELAGE TANK EMPTYING SEQUENCE

The fuel gauging system and the fuel transfer sequence are monitored and controlled by the FQMC. The FQMC manages the fuel transfer sequences so that the fuel from the forward and rear tanks is used first. When these tanks are empty, the FQMC uses fuel from LH and RH center and wings tanks.

When both engines are operating normally, fuel flow from LH and RH sides are the same. However, the forward tank capacity (2,564 lb) is greater than the rear tank capacity (1,962 lb). The difference is 602 lb.

As a consequence, after a fuel refueling above 16,128 lb, the fuel quantity in the forward tank will be greater than the fuel quantity in the rear tank. During flight, the rear tank will be emptied before the forward tank.

When this occurs, to prevent an asymmetrical fuel quantity from developing between the LH and RH wings tank, the FQMC automatically closes the forward tank fuel valve. At the same time, the FUEL TRAPPED IN FWD TANK CAS message is displayed to notify the crew that a quantity of unused fuel remains available in the forward tank.

To prevent this situation from occurring, it is recommended that the fuel quantity between the RH and LH tank groups be equalized at the beginning of the cruise segment. For description of fuel balance procedure during cruise, see CODDE 1 - ATA 28 - NORMAL OPERATION and CODDE 2 - NORMAL PROCEDURE - FLIGHT PHASES - CRUISE.

NOTE

FUEL TRAPPED IN FWD TANK appears in the CAS window to notify the crew that a quantity of unused fuel remains available in the forward tank.
CONTROL

---

FIGURE 02-28-15-00 FUEL SYSTEM OVERHEAD PANEL
### SYNTHETIC TABLE

<table>
<thead>
<tr>
<th>CONTROL</th>
<th>FUNCTION</th>
<th>TO ACTIVATE</th>
<th>TO DEACTIVATE</th>
<th>SYNOPTIC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Manually controls selection of pumps in LH / RH fuel lines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>NOTE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In Auto Start mode, BP 1 / 2 are automatically switched on at corresponding engine start</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **BP On**
- **Boost 1 On**
- **Boost 1 Off**
- **ST-BY On**
- **ST-BY Off**
- **Invalid data**
- **Failure**
- **Off**
<table>
<thead>
<tr>
<th>CONTROL</th>
<th>FUNCTION</th>
<th>TO ACTIVATE</th>
<th>TO DEACTIVATE</th>
<th>SYNOPTIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>X-BP</strong></td>
<td>- Manually controls the valve to open position in order to feed engines 1 and 2 with pressurized fuel from the RH or LH tank group</td>
<td>Push on to open the valve</td>
<td>Open</td>
<td><img src="image" alt="X-BP" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valve closed</td>
<td>Closed</td>
<td><img src="image" alt="X-BP" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Invalid data</td>
<td><img src="image" alt="X-BP" /></td>
</tr>
<tr>
<td><strong>X-TK</strong></td>
<td>- Manually controls the fuel transfer between LH and RH tank groups</td>
<td>Push on to open the valve</td>
<td>Open (1↔2)</td>
<td><img src="image" alt="X-TK" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valve closed</td>
<td>Open (1↔2)</td>
<td><img src="image" alt="X-TK" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Closed</td>
<td><img src="image" alt="X-TK" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Invalid data</td>
<td><img src="image" alt="X-TK" /></td>
</tr>
</tbody>
</table>
Fuel indications are displayed on:

- the MDU:
  - FUEL page,
  - STAT page.
- the PDU:
  - HSI window,
  - ENG-TRM-BRK window.

**MDU FUEL PAGE**

![Diagram](image-url)
**TEMP** Fuel temperature probe stands in the LH feeder tank and provides temperature indication on the FUEL page.

**FU** Fuel Used is computed by the FQMC. Computation starts as soon as one engine is running and stops when the two engines are shut off. It does not compute fuel consumed by the APU. It can be reset with the RESET FU soft key on the FUEL page.

**FQ** Fuel Quantity is supplied by the Data Acquisition Unit (DAU) and FQMC.

WING 1 and WING 2 buttons give access to a separate dialog box that displays individual fuel quantity for each wing tank.

Clicking on WING 1 or 2 opens their respective window.

To close the windows, place the cursor in the upper part, on the X box and click with enter button of the CCD.

**FR** Fuel Remaining is supplied by FMS. It is the result of Fuel Quantity inserted in the Preflight POF page at system initialization minus Fuel Used.

---

**FIGURE 02-28-15-02 FUEL FIELD WING 1 OR 2**

**WING 1 or WING 2**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT</td>
<td>Wing outboard tank fuel quantity</td>
</tr>
<tr>
<td>IN</td>
<td>Wing inboard tank fuel quantity</td>
</tr>
<tr>
<td>CTR</td>
<td>Center wing lateral tank fuel quantity</td>
</tr>
<tr>
<td>FEED</td>
<td>Feeder tank fuel quantity</td>
</tr>
<tr>
<td>WING 1 or 2</td>
<td>Sum of OUT, IN, CTR and FEED fuel quantities</td>
</tr>
</tbody>
</table>

When any of the fuel data is invalid, the corresponding indication is replaced by four amber dashes.
Low level management

Fuel levels are monitored for each group of tanks through two types of detection:
- one is on when fuel quantity in a group is less than 1,000 lb. It is based on fuel level detection thermistors located in center wing lateral tanks,
- one is on when fuel quantity in a feeder tank is less than 250 lb. It is based on tests on the fuel gauged quantities.

When the 1000 lb level is reached, amber LEVEL is displayed above the wing scales of the synoptic and FUEL LEVEL .. appears in CAS window.

When the 250 lb level is reached, only the fuel quantities: total (FQ), total circuit (FQ 1/2), WING 1/2 like that FEED and WING are displayed in amber in the MDU FUEL; LOW FUEL .. appears in CAS window.

When the gauging of any tank is lost, the corresponding digital readout displays four amber dashes and the quantities FQ, FQ 1 (or 2), WING 1 (or 2, in case of loss of a wing tank fuel quantity) are amber frame: 6490 lb for example.

Degraded gauging situations can occur during a loss of IRS (Inertial Reference System) or a loss of a fuel gauge.

In these cases DEGRADED GAUGING appears in CAS window.

FQ indication is amber framed when total gauging of any tank group (LH wing, center tank or RH wing) is lost.

**MDU STATUS PAGE**

![Status Page Indication](image)

**FIGURE 02-28-15-03 STATUS PAGE INDICATION**
**PDU**

The total Fuel Quantity (FQ = sum of the different tank quantities) and the Fuel Remaining (FR) are permanently displayed on the PDU.

![Fuel Quantity Indication on the HSI](image)

**FIGURE 02-28-15-04 FUEL QTY INDICATION ON THE HSI**

FF, FU and FQ are permanently displayed on ENG-TRM-BRK window of the PDU, however this window is not available in case of TCAS RA auto pop-up.

![PDU Engine Window Indications](image)

**FIGURE 02-28-15-05 PDU ENGINE WINDOW INDICATIONS**
FUEL PRESSURIZATION INDICATION

A fuel pressurization indication is available in the airplane aft servicing compartment (pressure gauge).

COLOR SYMBOLOGY

<table>
<thead>
<tr>
<th></th>
<th>Green</th>
<th>Amber</th>
<th>Solid gray</th>
<th>Hollow gray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply line 1 or 2</td>
<td>Flow</td>
<td>Low pressure</td>
<td>Low pressure</td>
<td>Invalid source data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ BP on</td>
<td>+ BP off</td>
<td></td>
</tr>
<tr>
<td>Crossfeed line</td>
<td>Valve open</td>
<td>Valve open</td>
<td>Valve closed</td>
<td>Invalid source data</td>
</tr>
<tr>
<td></td>
<td>flow</td>
<td>+ BP off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross tank wing line</td>
<td>Valve open</td>
<td></td>
<td>Valve closed</td>
<td>Invalid source data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front / Rear tank</td>
<td>Normal operation</td>
<td>FWD / AFT CG exceedance</td>
<td>Invalid source data</td>
<td></td>
</tr>
<tr>
<td>line</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INTRODUCTION

Electrical circuit protection is provided by conventional trip-free circuit breakers located above the overhead panel.

The fuel shut-off valve controls are located on the fire control panel which is a part of the overhead panel.

CIRCUIT BREAKERS

FIGURE 02-28-20-00 FUEL CIRCUIT BREAKERS
FIRE CONTROL PANEL

The three FIRE pushbuttons activate the fuel shut-off valves corresponding to each engine or APU fuel supply system.

![Diagram showing FIRE pushbuttons and associated lights]

**FIGURE 02-28-20-01  FIRE CONTROL OVERHEAD PANEL**

**CIRCUIT PROTECTION DIAGRAM**

![Diagram showing circuit protection diagram]

**FIGURE 02-28-20-02  CIRCUIT PROTECTION DIAGRAM**
INTRODUCTION

In the following, typical on ground and in-flight situations have been selected to help the crew to understand the symbols provided in the various panels and displays.
AIRPLANE WITH FULL TANKS AND ONLY APU OPERATING (ON GROUND)

FIGURE 02-28-25-00 OVERHEAD PANEL DURING APU OPERATION
**FIGURE 02-28-25-01 FUEL SYNOPTIC DURING APU OPERATION**

<table>
<thead>
<tr>
<th>CONTEXT</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only APU running</td>
<td>- Overhead panel BOOST 1 pushbutton lighted OFF, BOOST 2 pushbutton lighted STBY</td>
</tr>
<tr>
<td>Fuel is coming from RH tank group to feed the APU</td>
<td>- APU synoptic in green</td>
</tr>
<tr>
<td></td>
<td>- BP 2 synoptic in green</td>
</tr>
<tr>
<td></td>
<td>- ENG 1 and ENG 2 synoptic in grey</td>
</tr>
<tr>
<td></td>
<td>- RH fuel lines synoptic in green</td>
</tr>
<tr>
<td></td>
<td>- X-TK and X-BP and their respective fuel lines synoptics in grey</td>
</tr>
<tr>
<td></td>
<td>- Fuel Quantity does not decrease despite APU consumption</td>
</tr>
</tbody>
</table>
NORMAL OPERATION (IN-FLIGHT)

FIGURE 02-28-25-02 OVERHEAD PANEL
**FIGURE 02-28-25-03  FUEL SYNOPTIC**

<table>
<thead>
<tr>
<th>NORMAL STATUS</th>
<th>RESULT</th>
</tr>
</thead>
</table>
| ENG 1 and 2 running  
Each tank group is feeding its respective engine  
Front and rear tanks not empty | - Overhead panel pushbuttons lights off  
- BP 1 and BP 2 and their respective fuel lines synoptic in green  
- Front and rear tanks fuel lines in green  
- ENG 1 and ENG 2 synoptic in green |

**ERRONEOUS INDICATION**

When the APU is stopped and the engine 2 is running, the symbol is displayed in gray (A) instead of green (B).

**FIGURE 02-28-25-04  ENG 2 ERRONEOUS SYMBOL**
FUEL BALANCE PROCEDURE DURING CRUISE

FIGURE 02-28-25-05 OVERHEAD PANEL DURING FUEL BALANCE PROCEDURE
Overhead panel pushbuttons:
- X-BP pushed on, and
- BOOST 1 pushed off

ACTION

RESULT
- Overhead panel X-BP pushbutton lighted and BOOST 1 pushbutton lighted OFF
- X-BP and corresponding fuel line synoptic in green
- BP1 synoptic in gray with OFF indication
- Fuel is transferred from RH wing tank to LH wing tank
INTENTIONALLY LEFT BLANK
INTRODUCTION

In the following, typical abnormal situations have been selected to help the crew to understand the symbols provided in the various panels and displays.
BP 2 AND STAND-BY BP 2 FAILURE

ABNORMAL STATUS

FIGURE 02-28-30-00  OVERHEAD PANEL DURING BP 2 AND ST-BY BP 2 FAILURE
FIGURE 02-28-30-01  FUEL SYNOPTIC DURING BP 2 AND ST-BY BP 2 FAILURE

<table>
<thead>
<tr>
<th>CONTEXT</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP 2 failure</td>
<td><strong>FUEL PRESS 2</strong> CAS message</td>
</tr>
<tr>
<td></td>
<td>BP 2 and its respective fuel line synoptic in amber</td>
</tr>
<tr>
<td>BOOST 2</td>
<td>BP 2 and corresponding fuel line synoptic remain in amber</td>
</tr>
<tr>
<td>overhead panel pushbutton pushed to light ST-BY</td>
<td></td>
</tr>
</tbody>
</table>
AFTER PROCEDURE COMPLETE

FIGURE 02-28-30-02  OVERHEAD PANEL
Overhead panel pushbuttons:
- X-BP pushed on, and
- BOOST 2 pushed off

- Engine 2 is fed by BP 1
- Overhead panel X-BP pushbutton lighted and BOOST 2 pushbutton lighted OFF
- X-BP fuel line in green
- BP 2 synoptic in gray with OFF indication
- RH tank group fuel is not used any more at this point and fuel quantity balance between the tank groups needs to be managed by opening and closing the X-TK valve
FUEL BALANCE PROCEDURE AFTER BP2 AND STAND-BY BP2 FAILURE

FIGURE 02-28-30-04  OVERHEAD PANEL
FIGURE 02-28-30-05 FUEL SYNOPTIC

<table>
<thead>
<tr>
<th>ACTION</th>
<th>RESULT</th>
</tr>
</thead>
</table>
| overhead panel pushbutton pushed | - Fuel is transferred from RH wing tank to LH wing tank
| | - overhead panel indication in amber
| | - X-TK valve and associated fuel line synoptic in green
| | - X-TK indication above the valve synoptic |
LOSS OF REAR TANK GAUGING

ABNORMAL STATUS

**FIGURE 02-28-30-06 FUEL SYNOPTIC DURING LOSS OF REAR TANK GAUGING**

<table>
<thead>
<tr>
<th>CONTEXT</th>
<th>RESULT</th>
</tr>
</thead>
</table>
| Loss of rear tank gauging | - **FUEL CMPTR FAULT CODE** (on ground) or **FUEL CMPTR FAULT CODE** (in flight) and **DEGRADED GAUGING** CAS messages  
- Rear tank and corresponding fuel line synoptic in gray, no indication of fuel quantity  
- Indication of LH tank group and total fuel quantity indicated in an amber frame |

**NOTE**

There is no indication on the overhead panel. There is no action required from the pilot.
## CAS MESSAGES

<table>
<thead>
<tr>
<th>CAS MESSAGE</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FUEL CMPTR CONFIG</strong></td>
<td>On ground, problem of FQMC configuration</td>
</tr>
<tr>
<td><strong>FUEL CMPTR FAULT CODE</strong></td>
<td>On ground, fault detection on fuel management computer that may affect dispatch</td>
</tr>
<tr>
<td><strong>FUEL: FWD XFR FAIL</strong></td>
<td>Forward valve malfunction, possible forward CG exceedence</td>
</tr>
<tr>
<td><strong>FUEL: REAR XFR FAIL</strong></td>
<td>Rear valve malfunction, possible aft CG exceedence</td>
</tr>
<tr>
<td><strong>FUELING</strong></td>
<td>Non closing of either of the three vent valves or closing of the fuel shut-off and defueling valve or non closing of refueling door or non closing of fueling panel</td>
</tr>
<tr>
<td><strong>FUEL PRESS ..</strong></td>
<td>Fuel pressure in the indicating fuel group (1/2) is below 320 mbar when engine is on or booster pump is on.</td>
</tr>
<tr>
<td><strong>LOW FUEL ..</strong></td>
<td>Fuel quantity in the indicating fuel group tanks (1/2) is below 250 lb</td>
</tr>
<tr>
<td><strong>DEGRADED GAUGING</strong></td>
<td>Loss of IRS data or loss of one gauge or loss of a tank gauging</td>
</tr>
<tr>
<td><strong>FUEL CMPTR FAULT CODE</strong></td>
<td>In flight, failure code from fuel computer</td>
</tr>
<tr>
<td><strong>FUEL LEVEL ..</strong></td>
<td>Fuel quantity in the indicating fuel group tanks (1/2) is below 1,000 lb</td>
</tr>
<tr>
<td><strong>FUEL PRESS .. FAIL</strong></td>
<td>On ground engine off, failure of the fuel pressure sensor (1/2)</td>
</tr>
<tr>
<td><strong>FUEL TRAPPED IN FWD TANK</strong></td>
<td>Front transfer valve closed to avoid lateral asymmetry</td>
</tr>
</tbody>
</table>

### NOTE

**ERRONEOUS INDICATION**

**DEGRADED GAUGING** CAS message is not displayed in some loss of gauge or IRS configuration.
INTENTIONALLY LEFT BLANK
INTRODUCTION

The airplane is normally pressure-refueled.

All tanks can be automatically refilled fully or partially through the single-point fueling connector.

When pressurized fuel is not available, gravity refueling may be performed through two wing gravity filler ports.

The airplane may be defueled by suction through the normal pressure-refueling system. Gravity defueling is also possible through a drain line.

Except the gravity draining, all the fueling operations require monitoring from the fueling panel.

See the fueling panel and refer to sub-section 02-28-05 for the access door locations.

NOTE

The fueling panel remains electrically inhibited as long as the fuel vents are not open.

FIGURE 02-28-35-00 FUELING PANEL
PRESSURE REFUELING

To operate normally, the pressure refueling system needs only the battery 1 to be connected to the battery bus.

The refueling pressure must be between 30 psi and 50 psi maximum. Refueling stops automatically when the selected fuel quantity is reached with a precision of 50 lb.

FIGURE 02-28-35-01  REFUELING FILLER CONNECTOR
GRAVITY REFUELING

The airplane may be refueled through gravity filler ports located on each upper wing surface. Electrical power on the airplane is required for gravity refueling to allow fuel transfer from wing to center wing, front and rear tanks.

FIGURE 02-28-35-02 GRAVITY REFUELING PORTS

NOTE

For more information, refer to the Ground Servicing Manual (DGT681).
SUCTION DEFUELING

As well as for pressure refueling, the refueling filler connector can be used for suction defueling.

For this function, the valve is controlled by the DEFUELING guarded switch on the fueling panel.

Electrical power is required on the airplane as the suction defueling is performed by the booster pumps.

It is possible to defuel both tank groups or either LH tank group or RH tank group.

NOTE
For more information, refer to the Ground Servicing Manual (DGT681).

GRAVITY DRAINING

Electrical power is required on the airplane for the booster pumps to transfer the fuel to the feeder tanks.

For this function, the gravity defueling valve is manually actuated by its control lever.

It is possible to defuel both tank groups or either LH tank group or RH tank group.

NOTE
For more information, refer to the Ground Servicing Manual (DGT681).