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1.11.00 CONTENTS

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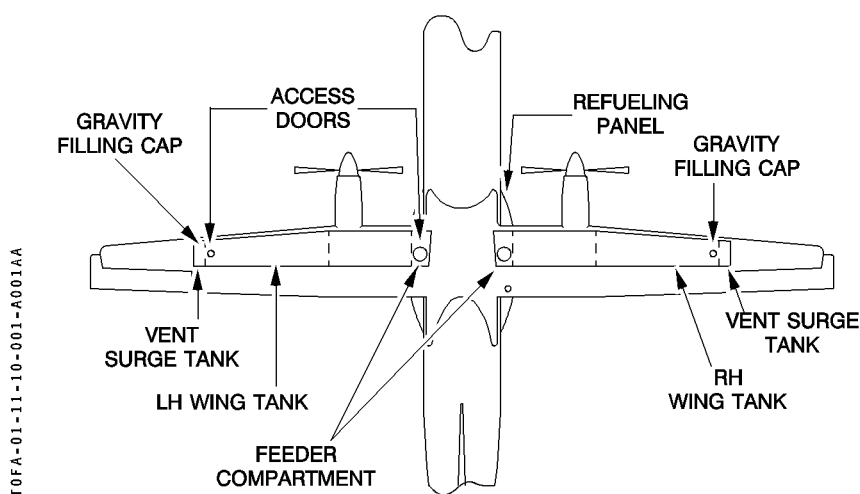
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10.1 DESCRIPTION

The fuel system includes :

- two tanks with one electrical pump and one jet pump in each tank,
- the vent system,
- the fuel quantity indicating system,
- the refuel/defuel system with associated controls and ind.



TANKS

The fuel is stored in two tanks, one in each wing, formed as an integral part of the wing structure. The maximum fuel capacity is :

	per tank	total
Volume	2868 l (758 US gal)	5736 l (1516 US gal)
Weight (density 0,785)	2250 kg (4960 lbs)	4500 kg (9920 lbs)

An additional volume in each tank allows a 2 % thermal expansion of fuel without spillage.

Each tank is equipped with two access doors located on the upper wing skin at each tank extremity to provide access to the interior and to essential equipment.

Water drainage is provided at the low points of each tank and can be performed up to 3° ground slope.

A temperature measuring device is installed in the left feeder compartment. Temperature is displayed on the pilot panel.

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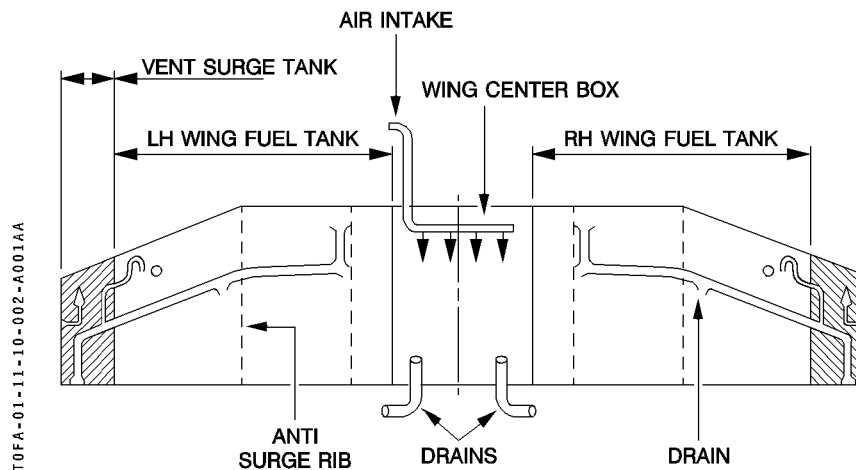
VENT SYSTEM

TANKS

The vent system ensures positive pressure in the whole flight envelope. Each fuel tank is air vented via an individual vent duct and a vent float valve to a 100 l surge tank located in the outer section of the wing. The surge tank is connected to the atmosphere via a flush NACA inlet and is designed to avoid icing obstructions. Fuel collected in the surge tank is directed back to the wing tank via the vent duct. The vent system also provides protection for the tanks in the event of accidental spillage during refueling.

WING CENTER BOX

The wing center box over the fuselage does not store any fuel and is crossed by two fuel pipes for cross engine feed and tanks refueling. To prevent fuel vapor concentration, the box is vented and drained.



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ENGINE FEED (See schematic p 13/14)

In normal conditions, each engine is supplied from its associated wing tank. Fuel flow/fuel used ind. allow the crew to monitor fuel consumption for each engine. Each tank is fitted with a 200 l feeder compartment always full of fuel protecting the engine feed system against negative or lateral load factors. In the feeder compartment, an electrical pump and a jet pump are installed. The jet pump is activated by HP fuel from the engine HMU and is controlled by a motive flow valve.

Note : Each electrical pump is able to supply one engine in the whole flight envelope.

In normal operation, the electrical pump is only used to start the engine. After start, jet pump takes over automatically.

If jet pump pressure drops below 350 mbar (5 PSI), the electrical pump is automatically activated to supply the engine.

A crossfeed valve, controlled by an electrically operated actuator, allows both engines to be fed from one side or one engine to be fed by either tank, allowing control of an unbalance situation

When the crossfeed valve is open, a blue "FUEL X FEED" light comes on memo panel.

In this case, the two electrical pumps are automatically actuated. It's possible to use only one fuel tank by switching off the opposite pump pb.

At the fuel outlet of each tank a fuel LP valve, controlled by the associated fire handle, is installed.

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QUANTITY INDICATING

The fuel tank capacity measurement system is such that the figures appear in terms of weight. The system is based on the fundamental relationship between the dielectric constant of the fuel and its density, to obtain a signal proportional to the mass of fuel in the tanks from a number of capacitance probes installed in the tanks.

Five probes are positioned in each tank and are electrically connected to the cockpit fuel quantity ind. Both fuel quantity indicating channels (one per tank) are independent. The fuel quantity ind. contains two digital displays showing the fuel mass in each of the two tanks. The accuracy on the total fuel indication, on ground, with attitude within $\pm 2^\circ$ of Pitch and $\pm 1^\circ$ of Roll is :

$\pm 1\%$ of full scale near zero level

$\pm 3\%$ of full scale at full level

For all other ground and flight conditions, outside this envelope (pitch and roll) accuracy of fuel indications will be degraded.

To enable the tanks content to be determined on the ground in case of quantity indicating system failure, two magnetic level indicators are mounted in each tank through the lower wing skin. Tables allow these readings to be converted into units of fuel mass with corrections made for aircraft attitude and fuel density (Refer to chapter 2.06).

Actual magnetic indicators marking is in cm of fuel in the tank.

REFUEL/DEFUEL SYSTEM

All refueling operations are controlled from the refueling panel installed in the RH main landing gear fairing.

Complete refueling can be achieved in about 15 mn through the single refueling connector which is located on the RH leading edge. Both wing tanks can be refueled with a refueling flow of about 24 m³/h (106 US gal/mn) with a maximum refueling pressure of 3.5 bars (50 PSI).

The refueling connector is connected with two refuel valves, one for each tank.

The refuel valves are located just under the refueling connector. They are solenoid controlled.

If aircraft is not electrically powered, refuel valves can be controlled manually thanks to two latches located on each side of refuel valves. When both latches are pulled, both refuel valves will be open as soon as fuel pressure is detected.

If aircraft is electrically powered, and in case of simple valve failure, refuel valves can be controlled in the same way.

From the valves outlets, the fuel is distributed by pipes to diffusers which allow the fuel to enter the tank without turbulence.

High level detection comprises two sensors in each tank installed on upper wing skin. When the high level is reached in a tank (2868 L/758 US gal for a zero bank angle) associated high level It illuminates on refueling panel and associated refuel valve is shut. The wing tanks can also be refueled by gravity via one overfiller point per tank. The system may be used to defuel the aircraft by applying a 0.77 bar (11 PSI) suction to the connector and opening the tank refuel valves.

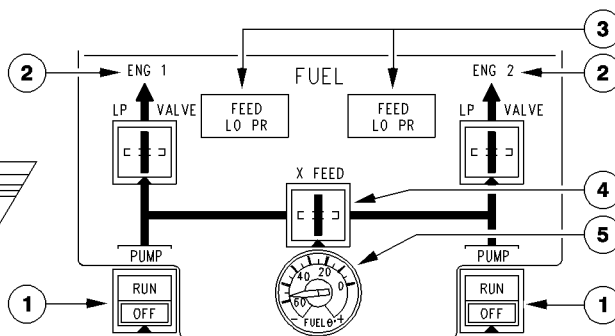
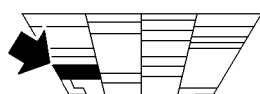
 ATR F.C.O.M.	FUEL SYSTEM		1.11.10		
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10.2 CONTROLS

FUEL PANEL

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① PUMP pb

Controls electrical pump and jet pump motive flow valve in each tank.

Pb pressed in :

* when jet pump delivery low pressure is detected (engine not running or jet pump pressure drop) :

- electrical pump is automatically activated
- jet pump motive flow valve is controlled open but will remain closed until a sufficient pressure is available.

* 30 seconds after HP fuel pressure is available and normal jet pump functioning is sensed by the 600 mbar (8.5 PSI) pressure switch, electrical pump is automatically switched off.

RUN illuminates green when electrical pump is activated.

OFF (p.b. released) electrical pump is deactivated, jet pump motive flow valve is controlled closed, OFF lt illuminates white.

② LP VALVE position ind.

The position of the fuel LP valve is displayed. Each valve is controlled by its associated fire handle.

IN LINE Flow bar illuminates green. The valve is open.

CROSS LINE The valve is closed, flow bar illuminates green and crosses the system flow line.

Note : During transient phases (opening or closing), flow bars are extinguished.

③ FEED LO PR light

The light illuminates amber and the CCAS is activated when the fuel delivery pressure drops below 300 mbar (4 PSI). This indicates pump failure or fuel starvation.

④ X FEED pb

Controls the operation of the fuel crossfeed valve.

IN LINE (pb pressed in) The flow bar illuminates green in line. The valve is opened.

Both electrical pumps are automatically actuated.

CROSS LINE (pb released) The flow bar illuminates green and crosses the system flow line. The valve is closed.

Note : During transient phases (opening or closing), flow bar is extinguished. Permanent extinguishing of both bars indicates a valve fault.

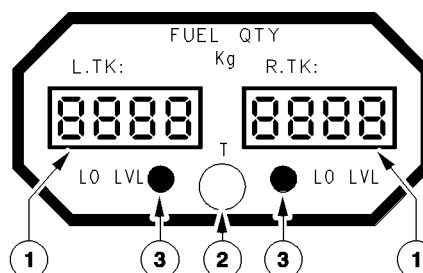
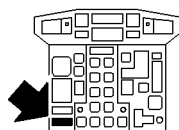
⑤ TANK FUEL TEMP. IND. (cf description p 7).

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FUEL QTY PANEL

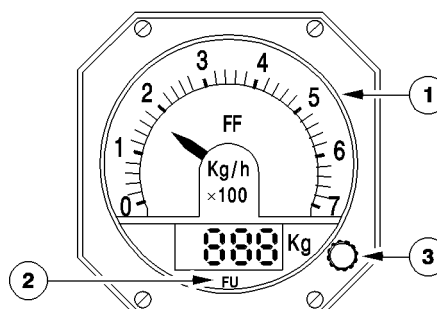
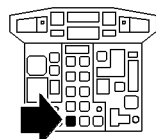
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- ① FUEL QTY indications
Fuel quantity in each tank is displayed in kg.
- ② Test pb
Pressing the test button will check both measurement channels and, if the functioning is normal, display all 8's.
At the same time, CCAS is activated, MC flashes amber, SC is heard.
- ③ LO LVL amber lights
Each light illuminates amber and the CCAS is activated when quantity of the concerned display becomes lower than 160 kg ; in addition, the corresponding electrical pump is automatically actuated.

FF/FU IND.

T0FA-01-11-10-006-B001AA



- A fuel flow/fuel used ind. is provided for each engine.
- ① FF indication
The mass fuel flow to the engine is indicated by a pointer on a scale graduated in kg/h X 100
 - R ② FU counter
On the digital read out, fuel used is indicated in kg. This value is computed by integration of the fuel flow parameter.
 - ③ FU reset knob
The fuel used counter is reset to 0 by pulling associated ind. reset knob.
- Note : All the digits (on the FU counter as well as on the FUEL QTY ind.) may be tested by the overhead panel ANN LIGHT switch on TEST position.*

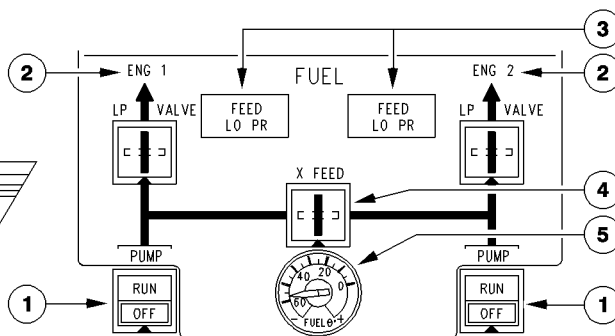
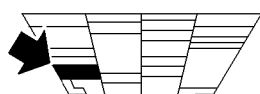
 ATR F.C.O.M.	FUEL SYSTEM		1.11.10		
			P 5	001	
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10.2 CONTROLS

FUEL PANEL

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① PUMP pb

Controls electrical pump and jet pump motive flow valve in each tank.

Pb pressed in :

* when jet pump delivery low pressure is detected (engine not running or jet pump pressure drop) :

- electrical pump is automatically activated
- jet pump motive flow valve is controlled open but will remain closed until a sufficient pressure is available.

* 30 seconds after HP fuel pressure is available and normal jet pump functioning is sensed by the 600 mbar (8.5 PSI) pressure switch, electrical pump is automatically switched off.

RUN illuminates green when electrical pump is activated.

OFF (p.b. released) electrical pump is deactivated, jet pump motive flow valve is controlled closed, OFF lt illuminates white.

② LP VALVE position ind.

The position of the fuel LP valve is displayed. Each valve is controlled by its associated fire handle.

IN LINE Flow bar illuminates green. The valve is open.

CROSS LINE The valve is closed, flow bar illuminates green and crosses the system flow line.

Note : During transient phases (opening or closing), flow bars are extinguished.

③ FEED LO PR light

The light illuminates amber and the CCAS is activated when the fuel delivery pressure drops below 300 mbar (4 PSI). This indicates pump failure or fuel starvation.

④ X FEED pb

Controls the operation of the fuel crossfeed valve.

IN LINE (pb pressed in) The flow bar illuminates green in line. The valve is opened.

Both electrical pumps are automatically actuated.

CROSS LINE (pb released) The flow bar illuminates green and crosses the system flow line. The valve is closed.

Note : During transient phases (opening or closing), flow bar is extinguished. Permanent extinguishing of both bars indicates a valve fault.

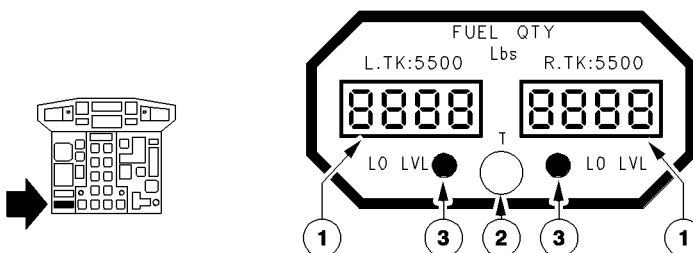
⑤ TANK FUEL TEMP. IND. (cf description p 7).

	FUEL SYSTEM		1.11.10		
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FUEL QTY PANEL

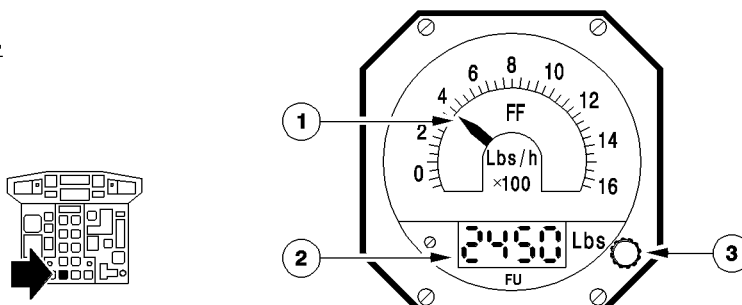
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- ① **FUEL QTY indications**
Fuel quantity in each tank is displayed in lbs.
- ② **Test pb**
Pressing the test button will check both measurement channels and, if the functioning is normal, display all 8's.
At the same time, CCAS is activated, MC flashes amber, SC is heard.
- ③ **LO LVL amber lights**
Each light illuminates amber and the CCAS is activated when quantity of the concerned display becomes lower than 352 lb ; in addition, the corresponding electrical pump is automatically actuated.

FF/FU IND.

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A fuel flow/fuel used ind. is provided for each engine.

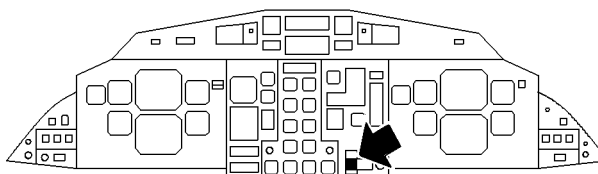
- ① **FF indication**
The mass fuel flow to the engine is indicated by a pointer on a scale graduated in lbs/h X 100.
- ② **FU counter**
On the digital read out, fuel used is indicated in lbs. This value is computed by integration of the fuel flow parameter.
- ③ **FU reset knob**
The fuel used counter is reset to 0 by pulling associated ind. reset knob.
Note : All the digits (on the FU counter as well as on the FUEL QTY ind.) may be tested by the overhead panel ANN LIGHT sw on TEST position.

 ATR F.C.O.M.	FUEL SYSTEM		1.11.10		
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X FEED advisory light

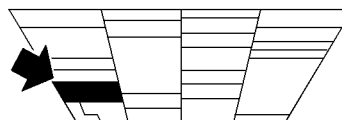
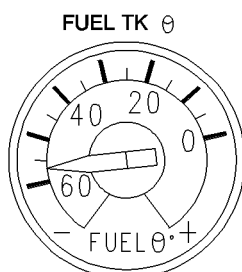
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Illuminates blue on memo panel when the crossfeed valve is selected open.

TANK FUEL TEMPERATURE INDICATOR

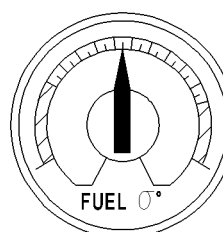
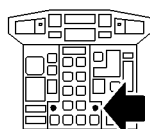
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A temperature measuring device is installed in the left feeder compartment.
Temperature is displayed on the overhead panel.

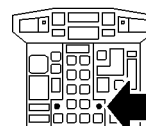
FUEL TEMP IND

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Fuel temperature is displayed.
Yellow sector : -54°C to 0°C
Green sector : 0°C to 50°C
Yellow sector : 50°C to 57°C
Red dash : -54°C and +57°C

FUEL CLOG LIGHT

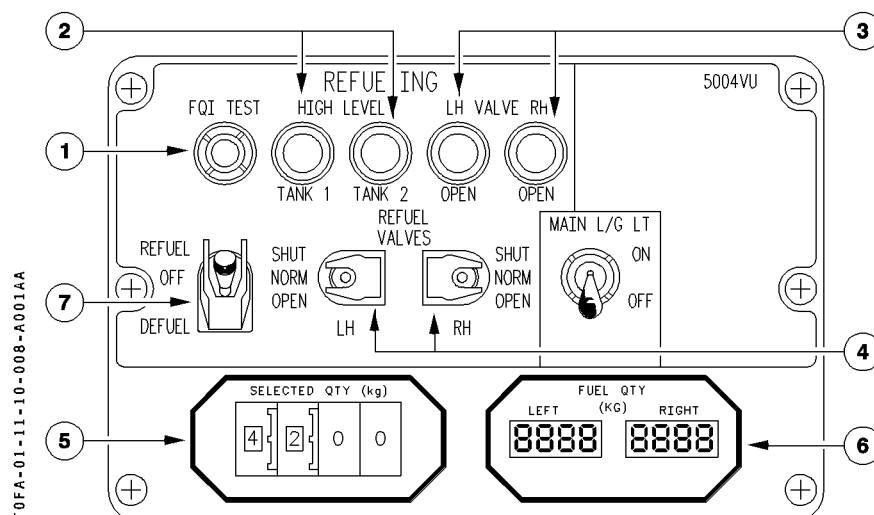


Light illuminates amber when fuel pressure loss in the corresponding HP fuel pump outlet filter exceeds 25 PSI.

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REFUELING PANEL



① FQI TEST pb

Pressing the test button will check both measurement channels and, if the functioning is normal, display all 8's on the FUEL QTY ind. on the refueling panel as well as in the cockpit. It will also shut the refuel valves, simulating a maxi level in both tanks. This test activates the CCAS.

② HIGH LEVEL light

The light illuminates amber when the high level sensor is submerged (maximum refueling quantity reached). The corresponding refuel valve closes automatically.

③ REFUEL VALVES position light

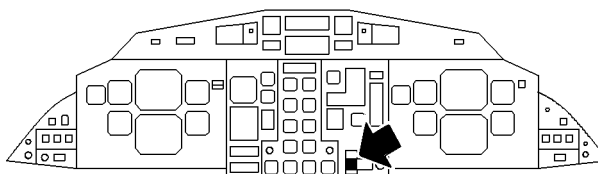
The light illuminates blue when the refuel valve is open. They extinguish during the fuel circuit test, indicating the valves have closed.

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X FEED advisory light

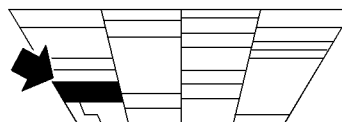
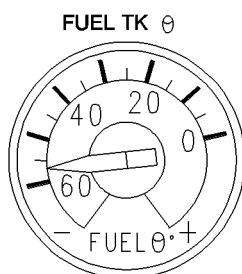
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Illuminates blue on memo panel when the crossfeed valve is selected open.

TANK FUEL TEMPERATURE INDICATOR

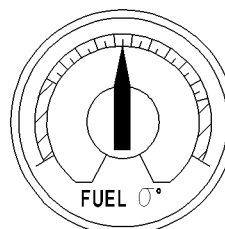
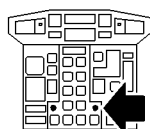
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A temperature measuring device is installed in the left feeder compartment.
Temperature is displayed on the overhead panel.

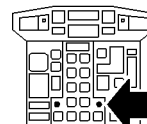
FUEL TEMP IND

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Fuel temperature is displayed.
Yellow sector : -54°C to 0°C
Green sector : 0°C to 50°C
Yellow sector : 50°C to 57°C
Red dash : -54°C and +57°C

FUEL CLOG LIGHT

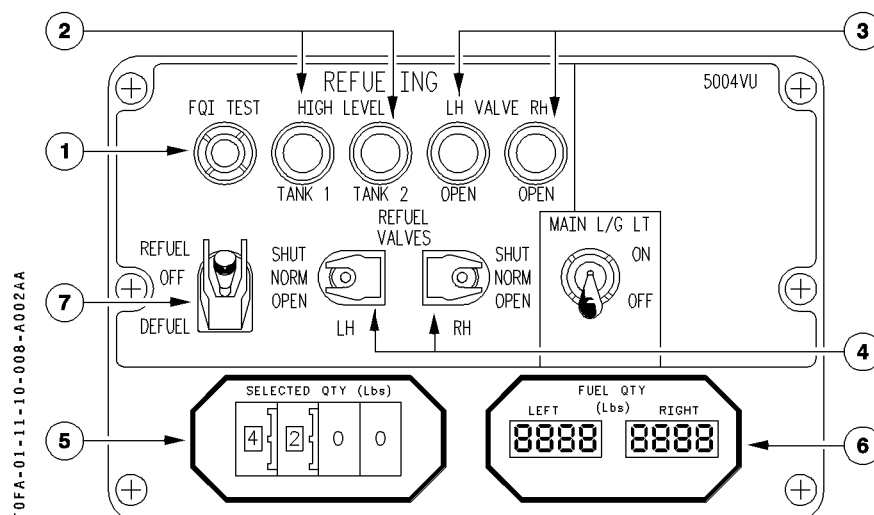


Light illuminates amber when fuel pressure loss in the corresponding HP fuel pump outlet filter exceeds 25 PSI.

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REFUELING PANEL



① FQI TEST pb

Pressing the test button will check both measurement channels and, if the functioning is normal, display all 8's on the FUEL QTY ind. on the refueling panel as well as in the cockpit. It will also shut the refuel valves, simulating a maxi level in both tanks. This test activates the CCAS.

② HIGH LEVEL light

The light illuminates amber when the high level sensor is submerged (maximum refueling quantity reached). The corresponding refuel valve closes automatically.

③ REFUEL VALVES position light

The light illuminates blue when the refuel valve is open. They extinguish during the fuel circuit test, indicating the valves have closed.

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④ REFUEL VALVES switches

Control the operation of the valves for each tank. They are guarded at NORM.

NORM Valves are controlled by automatic fueling logic, depending on position of the mode selector switch and quantity preselection. Valves close automatically when high level is detected.

OPEN Valves open when the mode selector switch is in the refuel or defuel position and the high level sensor is not submerged.

SHUT Valves close regardless of the mode selector switch position.

Note : Refuel valves close automatically regardless of switch position, when overflow is detected in vent surge tanks.

⑤ SELECTED QTY ind.

The quantity for automatic refueling is controlled by the setting of the preselector. The counter displays the preselected total fuel quantity.

⑥ FUEL QTY ind.

This ind. has the same presentation as the one used in the cockpit.

CAUTION : When fuel quantity is ON, wait indicators are stabilized before taking into account fuel quantity indications.

⑦ Mode selector switches

Controls the operating mode for automatic fueling and the activation of REFUEL VALVES switches for manual operation.

OFF Refuel valves are closed, switches are not activated.

REFUEL Refuel valves may be operated by auto refueling logic (REFUEL VALVES switches on NORM) or manual refueling operation.

DEFUEL Refuel valves may be operated by manual defueling operation. With the mode selector in DEFUEL position and REFUEL VALVES in the OPEN position, all level protections are inhibited.

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10.3 ELECTRICAL SUPPLY/SYSTEM MONITORING

ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)
ENG 1 Electrical pump – Pressure sw controlling electrical pump activation/disactivation and motive flow valve opening/closure – Fuel feed pressure sw Fuel LP valve Fuel LP valve position ind. FF/FU ind.	DC ESS BUS (on lateral panel ELEC PUMP) DC ESS BUS (on lateral panel CTL and CAUTION) • DC BUS 1 (on lateral panel MOTOR 1) • HOT EMER BAT BUS (on lateral panel MOTOR 2) DC EMER BUS (on lateral panel IND) DC BUS 1 (on lateral panel FUEL FLOW FUEL USED)
ENG 2 Electrical pump – Pressure sw controlling electrical pump activation/disactivation and motive flow valve opening/closure – Fuel feed pressure sw + IND Fuel LP valve Fuel LP valve position ind. FF/FU ind.	DC ESS BUS (on lateral panel ELEC PUMP) DC ESS BUS (on lateral panel CTL and CAUTION) • DC BUS 2 (on lateral panel MOTOR 1) • HOT EMER BAT BUS (on lateral panel MOTOR 2) DC EMER BUS (on lateral panel IND) DC BUS 2 (on lateral panel FUEL FLOW FUEL USED)

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EQUIPMENT	DC BUS SUPPLY (C/B)
Refuel valves high level detection System	GND HDLG BUS (on lateral panel FUELING CTL and IND)
Left quantity ind.*	DC ESS BUS (on lateral panel L TANK)
Right quantity ind.*	DC ESS BUS (on lateral panel R TANK)
Crossfeed valve	DC ESS BUS (on lateral panel X FEED)
Tank fuel temperature indicator	DC BUS 1 (on lateral panel)

* Left and right cockpit quantity indicators will be supplied by GND HDLG BUS on ground for airplane servicing, when battery is off and refuel door open.

SYSTEM MONITORING

The following conditions are monitored by visual and aural alerts :

- Engine feed low pressure (below 300 mbar/4PSI)
 - See FEED LO PR procedure in chapter 2.05.03.
- Fuel tank low level (below 160 kg/352 Lbs)
 - See FUEL LO LVL procedure in chapter 2.05.03.
- Jet pump pressure drop (below 350 mbar/5PSI)
 - this condition is monitored only by visual alert. RUN green light illuminates on overhead panel.

10.4 LATERAL MAINTENANCE PANEL

The right side maintenance panel includes a readout display for failures of systems linked to the MFC (refer to 1.01.10/10.5). It can be used to test feeder jet pumps functioning.

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10.5 SCHEMATIC

