

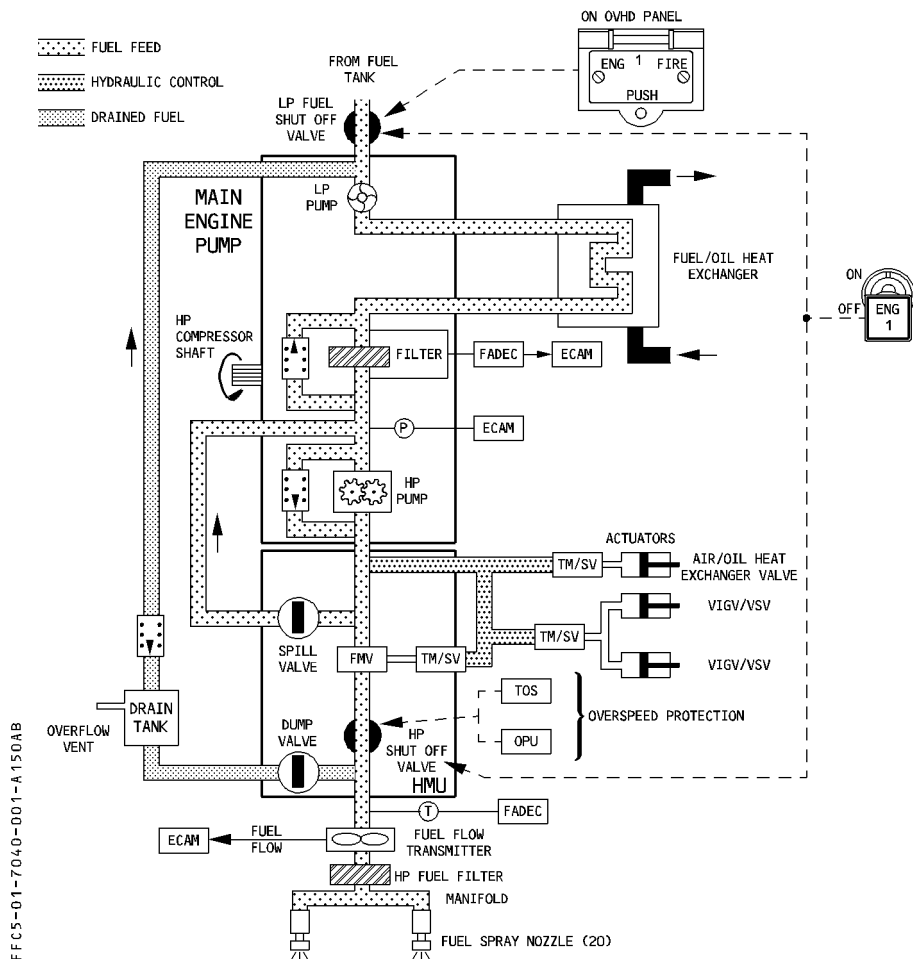
GENERAL

The fuel system supplies fuel to the combustion chamber at the required flow rate, pressure and temperature.

The fuel flows from the tank, via the Main Engine Pump and the fuel/oil heat exchanger, to the Hydromechanical Metering Unit (HMU) and to the fuel nozzles.

Control of fuel supply is made by the FADEC via the HMU. High pressure fuel is also used to provide pressure for some engine component actuators.

FOR INFO



MAIN ENGINE PUMP

The HP compressor shaft drives the HP fuel pump assembly. Fuel flows through the LP pump then through the fuel/oil heat exchanger, a filter, and the HP pump. Fuel then divides into two flows, one for the servo-valve actuators, and one for the metering valve of the HMU.

SHUTOFF VALVES

Moving the ENG MASTER switch to OFF directly commands the closing of the LP and HP fuel shutoff valves for that engine's fuel system.

At closure of the HP fuel shutoff valve the dump valve opens which permits to purge any remaining fuel from the burners to the drain tank. During engine starting fuel from the tank is returned to the LP fuel pump.

HYDROMECHANICAL METERING UNIT

The HMU is controlled by the FADEC and performs :

- Control of fuel flow to engine combustion chamber through the Fuel Metering Valve (FMV)
- Overspeed protection by closing the HP shutoff valve
- Actuation of the HP shutoff valve to start or stop the engine.

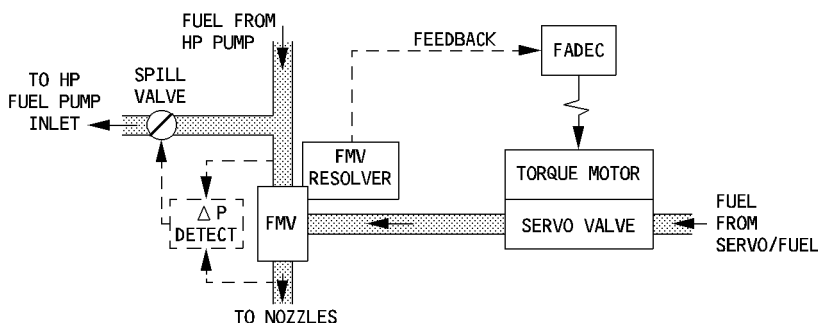
FUEL FLOW

FOR INFO

The Fuel Metering Valve (FMV) transforms FADEC orders through a torque motor and servo valve into fuel flow to the engine fuel nozzles.

The FMV resolver generates a feedback signal proportional to the FMV position.

The bypass valve maintains a constant pressure drop across the FMV to ensure that the metered fuel flow is proportional to the FMV position.



FFCS-01-7040-002-A150AA

	POWER PLANT		1.70.40	P 3
	FUEL SYSTEM		SEQ 150	REV 16

FOR INFO

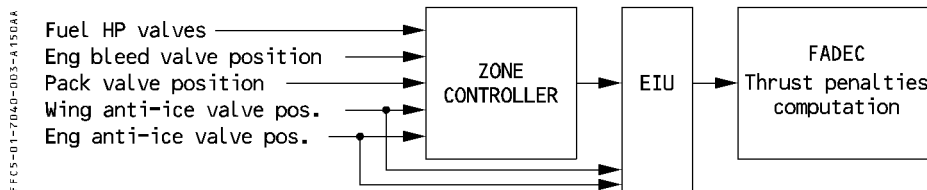
The FADEC computes the fuel flow that will maintain the target EPR.

As the FADEC maintains this EPR, it allows N3 to vary while remaining between N3 min and N3 max.

The FADEC also controls the engine parameters to :

- Limit acceleration and deceleration
- Avoid engine stall or flameout
- Limit maximum EPR, N1, N2 and N3
- Maintain air bleed pressure requirement.

The FADEC computes N3 correction, according to the bleed configuration.



OVERSPEED GOVERNOR SYSTEM

Turbine Overspeed Protection (TOS)

The FADEC provides protection against LP turbine overspeed due to LP shaft breakage between compressor and turbine. If it occurs, the engine is shut down by closure of the HP shutoff valve.

Overspeed Protection Unit (OPU)

Independent of the FADEC, the engine is fitted with the N1/N2 overspeed protection unit.

In the event of overspeed condition detected by the OPU which occurs when N1 reaches 91.3 % or N2 reaches 98.6 %, the OPU controls the engine shutdown by closure of the HP shutoff valve.

OVERTHRUST PROTECTION

An overthrust is detected when :

- The aircraft is on ground.
- One engine delivers more than 50% of the maximum takeoff thrust.
- The corresponding thrust lever and at least one other thrust lever are in the IDLE or REV detents.

If all these conditions are met, the FADEC initiates the shutdown of the affected engine by closure of the HP shutoff valve.

IDLE CONTROL

The FADEC has three idle modes :

Modulated idle

- Is selected :
 - In flight, when the flaps are retracted and the gear is up.
 - On ground, provided reverse is not selected.
- Varies in relation to :
 - Bleed system demand
 - Oil temperature
 - Mach number

Approach idle

- Selected in flight, when the flaps are extended to FLAP 2, FLAP 3 or FULL, or when the landing gear is down.
- Varies only in relation to the altitude.
- Allows the engine to rapidly accelerate from idle to go-around.

Reverse idle

- Selected on ground, when reverse thrust is selected.
- Slightly higher than forward idle thrust.

FUEL HYDRAULIC SIGNALS

FOR INFO

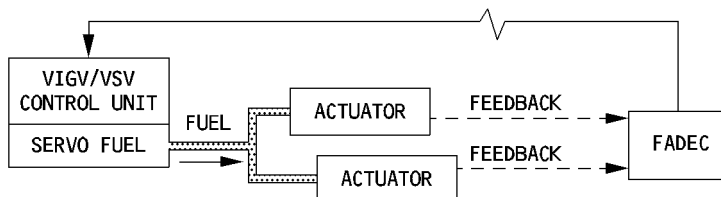
Fuel hydraulic signals are sent to :

- Air/Oil heat Exchanger Control Valve
- Variable Stator Vanes (VSVs) and Variable Inlet Guide Vanes (VIGVs)

The FADEC controls the VSV/VIGV system which positions the compressor variable vanes to provide optimum intermediate pressure and high pressure compressor efficiency to prevent surge during transient engine operations.

VSVs/VIGVs are fully closed at low engine power, and are fully open at high power.

VIGVs are controlled closed, if the FADEC detects an intermediate pressure or low pressure turbine overspeed.



FFCS-01-7040-004-A 150A