



4.24 Fuel Pump Relay

4.24.1 Description

The Land Rover V8 engine has a return-less fuel system. The fuel pressure regulator and filter are fitted to the 'in tank fuel pump module'. The system pressure is maintained at a constant 3.5 bar (52 Psi), with no reference to intake manifold pressure. The ECM compensates for the non-constant pressure drop across the injector nozzles.

The fuel is supplied to the injectors from a fuel pump fitted within the fuel tank. The electrical supply to this fuel pump is controlled by the ECM via a relay and an inertia fuel shutoff switch, which will turn off the fuel supply upon vehicle impact. The fuel system is pressurised to 3.5 bar as soon as the ECM is powered up, the pump is then switched off until engine start has been achieved. If the pump runs but the fuel pressure is out of limits, adaptive fuel faults are stored.

The ECM monitors the output power stage of the fuel pump relay drive for electrical faults. A fault is detected if any of the following conditions is satisfied: -

1. Fuel pump relay driver short circuit to battery positive, i.e. the driver voltage is greater than half the battery voltage when the driver is on.
2. Fuel pump relay driver short circuit to ground, i.e. the driver voltage is less than one third of the battery voltage when the driver is off.
3. Fuel pump relay driver open circuit, i.e. the driver voltage is greater than one third of the battery voltage but less than two thirds of the battery voltage when the driver is off.

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Component/ System	Fault Codes	Monitoring Strategy Description	Malfunction Criteria	Threshold value	Secondary Parameter	Enable Conditions	Time Required	MIL Illumination
Fuel Pump Relay	P1232	circuit continuity - short to battery positive	Voltage - drive on	voltage > 1/2 * Battery positive	battery voltage	7.5V < Battery positive < 17V	immediately/ continuous	no MIL illumination
	P1231	circuit continuity – short to ground	Voltage - drive off	voltage < 1/3 * Battery positive	engine speed time after fuel pump off	> 80 rpm > 0.5 sec		
	P1230	circuit continuity – open circuit	Voltage - drive off	1/3 * Battery positive < voltage < 2/3 * Battery positive				

If the above table does not include details of the following enabling conditions: - IAT, ECT, vehicle speed range, and time after engine start-up then the state of these parameters has no influence upon the execution of the monitor.