

Fuel Tank and Lines

Overview

For information on the system operation, refer to section 310-01 - Fuel Tank and Lines in the workshop manual.

Inspection and Verification



WARNING : Do NOT carry out any work on the fuel system with the engine running. The fuel pressure within the system can be as high as 1600 bar (23,206 lb/in²). Failure to follow this instruction may result in personal injury.



WARNING : Eye protection must be worn at all times when working on or near any fuel related components. Failure to follow this instruction may result in personal injury.



WARNING : This procedure involves fuel handling. Be prepared for fuel spillage at all times and always observe fuel handling precautions. Failure to follow this instruction may result in personal injury.



WARNING : After carrying out repairs, the fuel system must be checked visually for leaks. This should be done after the engine has been run, but with the engine switched OFF. Failure to follow this instruction may result in personal injury.



WARNING : If taken internally, DO NOT induce vomiting. Seek immediate medical attention. Failure to follow this instruction may result in personal injury.



WARNING : If fuel contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. Failure to follow this instruction may result in personal injury.



WARNING : Wash hands thoroughly after handling, as prolonged contact may cause irritation. Should irritation develop, seek medical attention. Failure to follow this instruction may result in personal injury.



CAUTION : Before disconnecting any part of the system, it is imperative that all dust, dirt and debris is removed from around components to prevent ingress of foreign matter into the fuel system. Failure to follow this instruction may result in damage to the vehicle.



CAUTION : The fuel pipes between the injectors and the rail must be discarded after each use, and new pipes installed. Failure to follow this instruction may result in damage to the vehicle.



CAUTION : It is essential that absolute cleanliness is observed when working with these components. Always install blanking plugs to any open orifices or lines. Failure to follow this instruction may result in damage to the vehicle.



CAUTION : Make sure that the workshop area in which the vehicle is being worked on is as clean and dust-free as possible. Areas in which work on clutches, brakes or where welding or machining are carried out are not suitable in view of the risk of contamination to the fuel system. Failure to follow this instruction may result in damage to the vehicle.



CAUTION : Make sure that any protective clothing worn is clean and made from lint-free non-flocking material. Failure to follow this instruction may result in damage to the vehicle.



CAUTION : Make sure that any protective gloves worn are new and are of the non-powdered latex type. Failure to follow this instruction may result in damage to the vehicle.



CAUTION : Make sure that clean, non-plated tools are used. Clean tools using a new brush that will not lose its bristles and fresh cleaning fluid prior to starting work on the vehicle. Failure to follow this instruction may result in damage to the vehicle.



CAUTION : Use a steel-topped work bench and cover it with clean, lint-free, non-flocking material. Failure to follow this instruction may result in damage to the vehicle.

- 1 . Verify the customer concern.
- 2 . Visually inspect for obvious mechanical or electrical faults.

Mechanical	Electrical
<ul style="list-style-type: none"> ● Fuel level ● Contaminated fuel ● Fuel supply line(s) ● Fuel return line(s) ● High-pressure fuel supply line(s) ● Fuel tank filler pipe ● Fuel leak(s) ● Fuel tank ● Fuel filler cap ● Fuel filter ● Push connect fittings ● Fuel rail ● Fuel injection pump ● Exhaust gas recirculation (EGR) system 	<ul style="list-style-type: none"> ● Battery charge and condition ● Fuse(s) ● Inertia fuel shutoff (IFS) switch ● Fuel pump module relay ● Fuel pump module ● Electrical connector(s) ● Damaged or corroded wiring harness ● Fuel volume control valve (FVCV) ● Fuel pressure control valve (FPCV) ● Engine control module (ECM)

3 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4 . Use the approved diagnostic system or a scan tool to retrieve any diagnostic trouble codes (DTCs) before moving onto the symptom chart or DTC index.

Make sure that all DTCs are cleared following rectification.

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Symptom Chart

Symptom	Possible causes	Action
Engine cranks,	<ul style="list-style-type: none"> ● Inertia fuel shutoff (IFS) switch ● Low/Contaminated fuel ● Fuel pump module fault ● Low pressure fuel system fault ● Air leakage ● Blocked fuel filter 	Check that the inertia switch has not tripped. Check the fuel level/condition. Check the fuel pump module operation, check the low pressure fuel system for leaks/damage. Check the intake

but does not start	<ul style="list-style-type: none"> ● Fuel volume control valve (FVCV) blocked/contaminated ● Fuel pressure control valve (FPCV) blocked/contaminated ● Fuel injection pump fault ● Crankshaft position (CKP) sensor ● ECM fault 	<p>air system for leaks. Check the fuel filter, check the FVCV and FPCV. Check the fuel injection pump. Check the CKP sensor. Refer to the relevant section of the workshop manual. Refer to the warranty policy and procedures manual if a module is suspect.</p>
Difficult to start	<ul style="list-style-type: none"> ● Glow plug system fault (very cold conditions) ● Low/Contaminated fuel ● Fuel pump module fault ● Low pressure fuel system fault ● Air leakage ● Blocked fuel filter ● Fuel volume control valve (FVCV) blocked/contaminated ● Fuel pressure control valve (FPCV) blocked/contaminated ● Exhaust gas recirculation (EGR) valve fault 	<p>Check the glow plug circuits. Check the fuel level/condition. Check the fuel pump module operation, check the low pressure fuel system for leaks/damage. Check the intake air system for leaks. Check the fuel filter, check the FVCV and FPCV. Check the EGR valves. Refer to the relevant section of the workshop manual.</p>
Rough idle	<ul style="list-style-type: none"> ● Low/Contaminated fuel ● Low pressure fuel system fault ● Air leakage ● Blocked fuel filter ● Fuel volume control valve (FVCV) blocked/contaminated ● Fuel pressure control valve (FPCV) blocked/contaminated ● Exhaust gas recirculation (EGR) valve fault 	<p>Check the fuel level/condition. Check the low pressure fuel system for leaks/damage. Check the intake air system for leaks. Check the fuel filter, check the FVCV and FPCV. Check the EGR valves. Refer to the relevant section of the workshop manual.</p>
Lack of power when accelerating	<ul style="list-style-type: none"> ● Air intake system fault ● Catalytic converter blocked ● Low fuel pressure ● Exhaust gas recirculation (EGR) valve fault ● Turbocharger fault 	<p>Check the intake air system. Check for a blockage/restriction in the exhaust system, install new components as necessary. Check the fuel pressure. Check the EGR valves. Check the turbocharger condition and actuator operation. Refer to the relevant section of the workshop manual.</p>
Engine stops/stalls	<ul style="list-style-type: none"> ● Low/Contaminated fuel ● Fuel pump module fault ● Low pressure fuel system fault ● High pressure fuel leak ● Air leakage ● Fuel volume control valve (FVCV) blocked/contaminated ● Fuel pressure control valve (FPCV) blocked/contaminated ● Exhaust gas recirculation (EGR) valve fault 	<p>Check the fuel level/condition. Check the fuel pump module operation, check the fuel system for leaks/damage. Check the intake air system for leaks. Check the FVCV and FPCV. Check the EGR valves.</p>
Engine judders	<ul style="list-style-type: none"> ● Low/Contaminated fuel ● Low pressure fuel system fault ● High pressure fuel leak ● Air leakage ● Fuel volume control valve (FVCV) blocked/contaminated ● Fuel pressure control 	<p>Check the fuel level/condition. Check the fuel system for leaks/damage. Check the intake air system for leaks. Check the FVCV and FPCV. Check the fuel injection pump. Refer to the relevant section of the workshop manual.</p>

	valve (FPCV) blocked/contaminated ● Fuel injection pump fault	
Excessive fuel consumption	<ul style="list-style-type: none"> ● Low pressure fuel system fault ● High pressure fuel leak ● Fuel temperature sensor leak ● Fuel volume control valve (FVCV) blocked/contaminated ● Fuel pressure control valve (FPCV) blocked/contaminated ● Fuel injector failure ● Exhaust gas recirculation (EGR) valve fault 	Check the fuel system for leaks/damage. Check the FVCV and FPCV. Check for injector DTCs. Check the EGR valves. Refer to the relevant section of the workshop manual.

DTC index

NOTE :

Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

NOTE :

For a full list of ECM DTCs, refer to section 303-14 - Electronic Engine Controls in the workshop manual.

DTC	Description	Possible causes	Action
P008700	Fuel Rail/System Pressure - Too Low	<ul style="list-style-type: none"> ● Fuel rail pressure (FRP) sensor disconnected ● FRP sensor to ECM sensing circuit short circuit to ground ● FRP sensor supply circuit high resistance ● FRP sensor failure ● Fuel line leak ● Restricted fuel line ● Fuel pump module circuit high resistance ● Fuel pump module circuit short circuit to ground ● Fuel pump module failure ● Volume control valve fault ● Pressure control valve fault 	Refer to the electrical guides and check the FRP sensor circuits. For FRP sensor tests, refer to the relevant workshop manual section. Check the low pressure fuel lines for damage or restrictions. Check the fuel pressure. Check the low pressure fuel pump module circuits and operation. Check for fuel rail and high pressure fuel line leaks. Check for VCV and PCV DTCs and rectify as necessary.
P008800	Fuel Rail/System Pressure - Too High	<ul style="list-style-type: none"> ● Fuel rail pressure (FRP) sensor to ECM wiring (supply/sense): short circuit to each other ● FRP sensor to ECM sense circuit short circuit to power ● FRP sensor failure ● Fuel pressure control valve (FPCV) fault ● Fuel pump module circuit short circuit to power ● Fuel pump module failure 	Check the FRP sensor circuits, check the FPCV. Refer to the relevant section of the workshop manual. Check the fuel pump module circuits. Refer to the electrical guides.

P062700	Fuel Pump A Control Circuit / Open	<ul style="list-style-type: none"> Fuel pump module relay control circuit short circuit to power Fuel pump module relay failure 	Check the fuel pump and circuits. Refer to the electrical guides. Activate the relay and listen for an audible 'click'. Refer to the relevant workshop manual section. Repair/renew as necessary. Clear the DTCs and test for normal operation.
P062800	Fuel Pump A Control Circuit Low	<ul style="list-style-type: none"> Fuel pump module relay control circuit high resistance Fuel pump module relay control circuit short circuit to ground Fuel pump module relay failure 	Refer to the electrical guides and check the fuel pump circuits. Activate the relay and listen for an audible 'click'. Repair/renew as necessary. Clear the DTCs and test for normal operation.
P062900	Fuel Pump A Control Circuit High	<ul style="list-style-type: none"> Fuel pump module relay control circuit high resistance Fuel pump module relay failure 	Refer to the electrical guides and check the fuel pump circuits. Activate the relay and listen for an audible 'click'. Repair/renew as necessary. Clear the DTCs and test for normal operation.
P226900	Water in Fuel Condition	<ul style="list-style-type: none"> Water in fuel condition Water in fuel sensor circuit short circuit to ground Water in fuel sensor fault 	Drain the water from the fuel filter. Clear the DTC and retest. If the DTC resets, check the sensor circuit. Refer to the electrical guides. If no fault is found in the circuits, install a new sensor.
P228800	Injector Control Pressure Too High	<ul style="list-style-type: none"> Fuel pressure control valve (FPCV) minimum limit reached Fuel injector control pressure too high FPCV circuit fault FPCV failure Fuel pump module circuit short circuit to power Fuel pump module failure Fuel injection pump failure 	Check the fuel pressure, refer to the relevant section of the workshop manual. Check the fuel pump module circuits and the FPCV circuits. Refer to the electrical guides. For FPCV and fuel injection pump, refer to the relevant workshop manual section.
P229000	Injector Control Pressure Too Low	<ul style="list-style-type: none"> Fuel pressure control valve (FPCV) maximum limit reached Fuel injector control pressure too low Fuel line leak Fuel filter/system restriction FPCV circuit fault FPCV failure Fuel pump module circuit short circuit to ground Fuel pump module failure Fuel injection pump failure 	Check the fuel pressure. Check the fuel lines for leaks/damage. Check for a blocked/restricted fuel filter. Check the fuel pump module circuits. Refer to the electrical guides. Check the FPCV circuits. Check the fuel injection pump. Refer to the relevant workshop manual section.
P229200	Injector Control Pressure Erratic	<ul style="list-style-type: none"> Fuel injector control pressure: erratic FPCV circuit fault FPCV failure Fuel pump module circuit high resistance, short circuit to ground, short circuit to power Fuel pump module failure Fuel injection pump failure 	Check the fuel pressure, refer to the relevant section of the workshop manual. Check the fuel pump module circuits and the FPCV circuits. Refer to the electrical guides. For FPCV and fuel injection pump, refer to the relevant workshop manual section.