



Fuel System Driveability Symptoms

PROBLEM	POTENTIAL CAUSE	CORRECTION
Hard Starting	<ol style="list-style-type: none"> 1. Driver/owner not following recommended start procedure. 2. Fuel contaminated, low quality, or wrong fuel. 3. Air filter plugged. 4. Excessive water in fuel filter. 5. Fuel pump intermittent or not energized by relay. 6. Fuel-lift pump fault. 7. Fuel return, drain, or vent line restricted, plugged, or damaged. 8. Coolant temperature sensor fault. 9. Glow plug fault. 10. Shut-off solenoid fault. 11. No cranking signal to PCM 12. Exhaust system restriction. 13. Low engine cranking speed. 	<ol style="list-style-type: none"> 1. Remind driver/owner of required procedure. Demonstrate procedure if necessary. 2. Drain off sample at fuel filter drain plug. Flush tank, lines, and filter if fuel is contaminated, wrong grade or type, suspect quality, or shows wax buildup. 3. Remove and clean filter, housing, air horn and inlet hose. Replace filter if plugged. 4. Drain off water at drain plug. Then remove, clean, and reinstall filter. 5. Check fuel pump circuit fuse, relay, wiring. 6. Test pump pressure at pump outlet. Replace pump if pressure is below 5.8 psi (40 kPa). 7. Check lines for damage. Verify flow with compressed air. Repair or replace lines as necessary. 8. Repair wiring or replace sensor if temperature readings are 5° greater or less than actual ambient air temperature. High resistance in sensor or circuit wiring will cause this. 9. Test voltage to and from relay/controller, and at plugs. Repair wiring, replace relay/controller, or replace glow plug(s) as needed. Refer to test procedures in this section and in sections 2 and 12. 10. Test and replace solenoid if necessary. Be sure solenoid fuse and wiring are OK beforehand. Look for bad connections if problem is intermittent. 11. Test with scan tool. Look for bad ground, connections, or damaged/failed crankshaft position sensor. 12. Look for damaged pipes, muffler, converter, especially on vehicles used off road. 13. Check state of charge of batteries, load test and check connections. Refer to test procedures in Section 12. Check engine oil viscosity to ensure it is correct for the ambient temperature. Refer to specifications in Section 1. Check starter draw to determine if starter is dragging. Refer to test procedure in Section 12.



Fuel System Driveability Symptoms (Continued)

PROBLEM	POTENTIAL CAUSE	CORRECTION
<p>No Start Condition (engine cranks but will not run)</p>	<ol style="list-style-type: none"> 1. Excessive amount of water or wax buildup in system. 2. Blown fuse. 3. No fuel to injection pump. 4. No fuel to injectors. 5. Engine fault: <ul style="list-style-type: none"> • broken camshaft • damaged injection pump gears • timing chain or gear failure 6. Fuel tank select valve problem. 7. No inject signal from PCM. 8. Injection pump failure. 9. PCM ground or feed circuit fault (on ground or ignition voltage reference signal). 10. PCM fault. 	<ol style="list-style-type: none"> 1. Draw off sample at drain plug. Drain and flush system if necessary. 2. Replace fuse. Check for shorts-grounds in affected circuit. 3. Test fuel-lift pump output. Replace pump if pressure is below 5.8 psi (40 kPa). Check lines and filter for restrictions if pump output is OK. Also test pump relay. Be sure pump relay is being energized when ignition switch is in crank or start position. Check fuel level in tanks 4. Check shut off solenoid. Check fuel solenoid driver feed (terminal A) and ground (terminal C) circuits. 5. Inspect and repair as needed. 6. Replace valve if it won't switch from main to auxiliary and back. NOTE: the valve will only operate if the fuel lift pump is energized! 7. Run scan tool test and replace failed sensor, harness wire, or connector. 8. Replace pump but only if failure is indicated by scan tool and pressure test. 9. Confirm with scan tool. Use multimeter to locate fault. 10. Confirm with scan tool before replacement.
<p>Engine Starts then Stalls</p>	<ol style="list-style-type: none"> 1. Air leak in fuel feed line. 2. Glow plug fault (cold ambient temperature). 3. Restriction in fuel tank vent or return lines. 4. Fuel-lift pump pressure below 2 psi (14 kPa) at injection pump, or 5.8 psi (40 kPa) at fuel pump outlet. 5. Idle rpm too low. 6. No injection signal to PCM (turbo diesel). 	<ol style="list-style-type: none"> 1. Inspect lines and repair as needed. Bleed injectors afterward. 2. Test and repair wiring, or replace failed glow plugs or relay/controller. 3. Inspect and clear restriction. Replace cap vent, or lines as needed. 4. Replace pump but only if fuel lines to pump are not blocked, plugged, or restricted. Also be sure flow through 2-stage filter is not restricted as well. 5. Adjust idle to required rpm. 6. Test with scan tool and replace failed sensor or harness.