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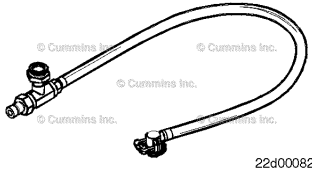
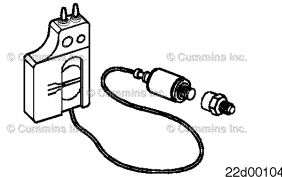
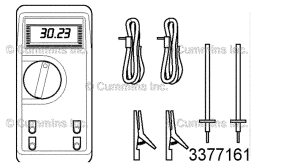
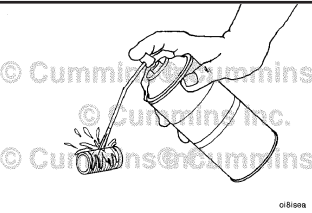
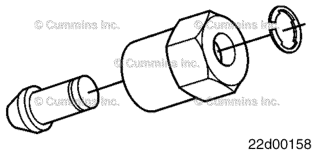
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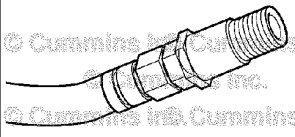
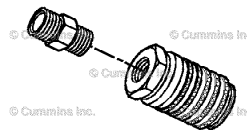
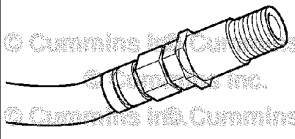
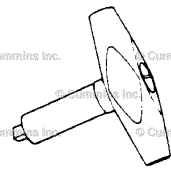
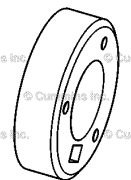
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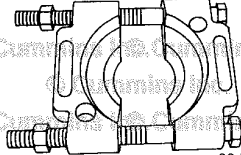
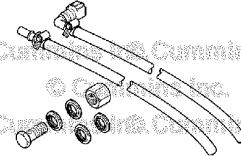
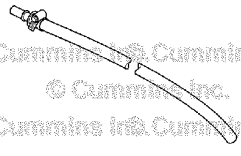
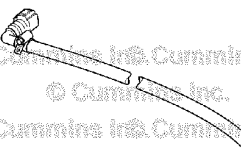
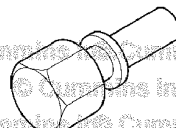
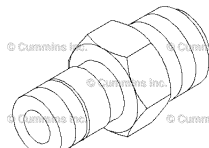
Service Tools

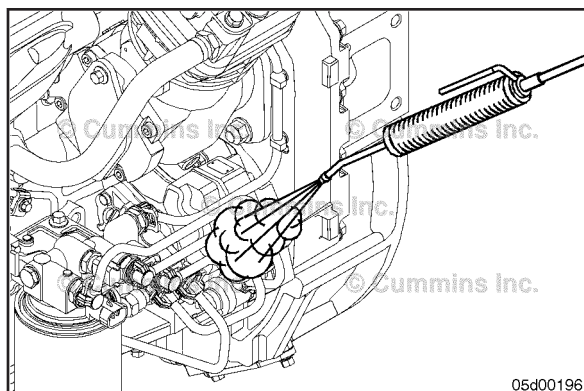
Fuel System

The following special tools are recommended to perform procedures in this section. The use of these tools is shown in the appropriate procedure. These tools can be purchased from a local Cummins® Authorized Repair Location.

Tool No.	Tool Description	Tool Illustration
3164044	Fuel Pressure Gauge Adapter Used to measure fuel pressure and detect air in the fuel system. Use with Pressure/Vacuum Module, Part Number 3164491 (engines without EGR only)	 22d00082
3164491	Pressure/Vacuum Module Used to measure fuel pressure and restriction.	 22d00104
3164488 or 3164489	Digital Multimeter Used to measure electrical circuits: Voltage (volts), resistance (ohms), and current (amps). 3164488 — Standard meter. 3164489 — Automotive meter with built in temperature adapter and tachometer.	 3377161
3824510	Quick Dry (QD) Cleaner Used to clean parts and tools safely.	 018000
3164325	Fuel System Leak Tester Used to cut off the fuel supply to the injector to diagnose it for leakage and malfunction. Used on fuel rails with 14 mm threads.	 22d00158
3823705	Graduated Beaker Used to measure fuel return flows.	 22d00140

Tool No.	Tool Description	Tool Illustration
3164618	Fuel Return Flow Hose (injector and fuel pump) The tool uses a special fitting to connect to the fuel return circuits to measure return flow from the injectors and fuel pump (EGR engines only).	 22d00217
3164621	Lift Pump Performance Test Orifice This tool connects to the diagnostic fitting on the inlet to the fuel filter. It is used to measure flow from the lift pump through an orifice without the engine running. The tool consists of a 0.043-inch orifice, Part Number 3045018, and a Compuchek® coupling, Part Number 3376859 (EGR engines only).	 3164621
3376859	Compuchek® Quick-Connect Coupling This tool connects to the diagnostic fitting on the inlet to the fuel filter. It is used when measuring inlet restriction when running the lift pump and does not contain an orifice (EGR engines only).	 3376859
3164583	Fuel Line Cap This tool is used to cap a quick-connect fuel line that has been disconnected from the engine. This prevents back-flow out of the line (engines without EGR only).	 3164583
3164617	Fuel Return Flow Hose (fuel rail pressure relief valve) The tool uses a special banjo fitting to connect to the fuel return circuit to measure return flow from the rail pressure relief valve.	 22d00217
3164025	Fuel Connector Remover Used to remove the high-pressure fuel connector from the cylinder head.	 22d00081
3823208	Torque Wrench (injector terminal nuts) This 13 in-lb torque wrench is used to tighten the injector solenoid terminal nuts.	 3823208
3164707	Fuel Pump Drive Gear Retention Tool Use to secure fuel pump gear drive while removing or installing drive gear retaining nut.	 22d00147

Tool No.	Tool Description	Tool Illustration
3375326	Bearing Separator Tool Use to remove the fuel pump gear.	 22d00101
4918354	Fuel Return Flow Tester Kit Used to check injector and HPCR pump drain flow.	 22d00227
4918433	Fuel Drain Hose Used with 5/16 quick disconnect fittings male connector (hose included in kit Part Number 4918354).	 22d00228
4918434	Fuel Drain Hose Used with 5/16 quick disconnect fittings female connector (hose included in kit Part Number 4918354).	 22d00229
4918464	Fuel Tube Plug Used to plug low pressure fuel lines.	 22d00232
3824842	Compucheck® Fitting Used to check fuel pressure/restriction. 10 mm O-ring connection.	 3824813



EFC Actuator Valve (005-007)

Preparatory Steps

⚠ WARNING ⚠

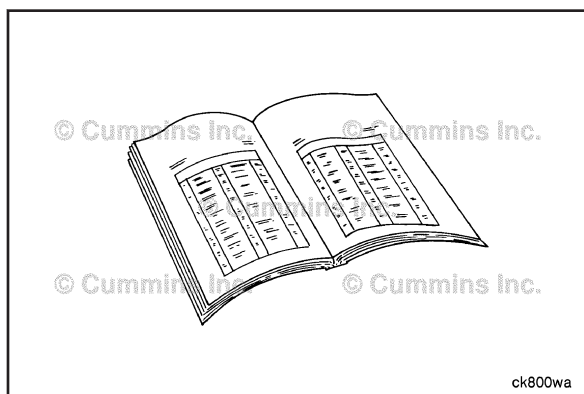
Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

⚠ WARNING ⚠

When using a steam cleaner, wear safety glasses or a face shield, as well as protective clothing. Hot steam can cause serious personal injury.

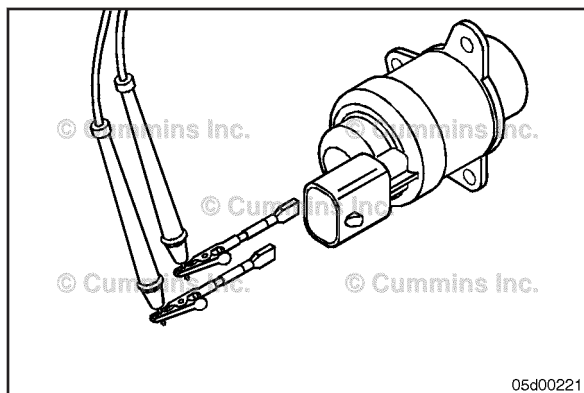
Steam clean the fuel pump and the area around the fuel pump.

Dry with compressed air.



Initial Check

Confirm that the lift pump is functional. Refer to Procedure 005-045 in Section 5.



Measure

Measure the resistance of the electronic fuel control actuator valve.

- Minimum Resistance: 0.1 ohms
- Maximum Resistance: 5 ohms

Install the electrical connection after measurement.

With the keyswitch ON and the engine cranking, check the high pressure injection pump.

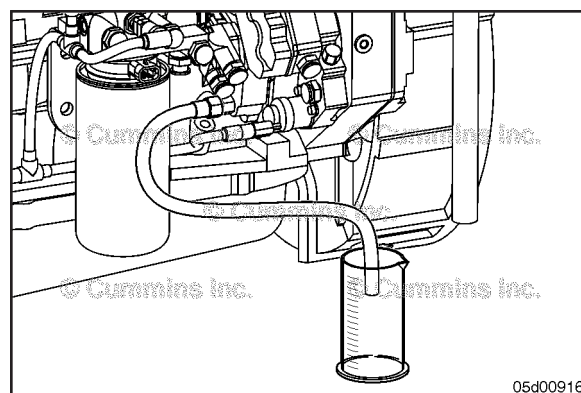
Check the high pressure injection pump fuel flow as follows:

- Disconnect the high pressure fuel line to the fuel rail from the high pressure injection pump.
- Connect a clear hose to the outlet of the high pressure injection pump.
- Place the high pressure fuel clear hose into an empty bucket.
- Crank the engine for 30 seconds and measure the fuel pump flow.

Minimum fuel pump flow is 75 ml [2.5 oz] in 30 seconds at 125 rpm or 90 ml [3.04 oz] in 30 seconds at 150 rpm for 4-cylinder and 6-cylinder engines.

If the minimum fuel flow is **not** achieved, the high-pressure injection pump is defective. Refer to Procedure 005-016 in Section 5.

If the minimum fuel flow is achieved, the electronic fuel control (EFC) actuator is defective.

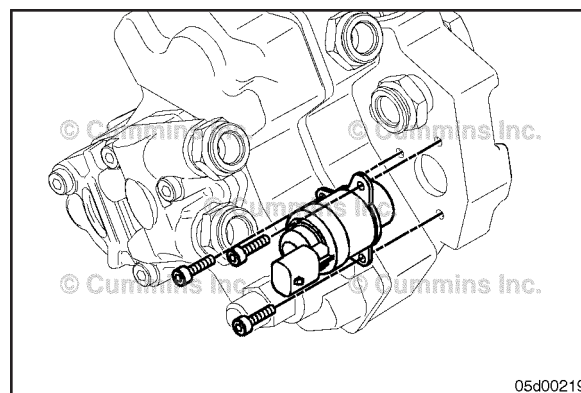


Remove

Remove the electrical connector

Remove the three capscrews.

Remove the EFC actuator by twisting and pulling outward.



Install

⚠CAUTION⚠

Do not pause more than 2 minutes between torque steps 1 and 2. This can cause the capscrews not to maintain their torque value. Leakage or engine damage can result.

NOTE: Lubricate the new o-ring with clean oil before installation.

Install a new o-ring on the electronic fuel control actuator.

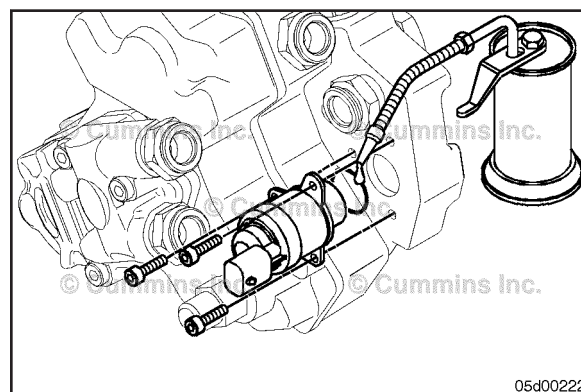
Install the electronic fuel control actuator by twisting and pushing inward until flush with the mounting surface.

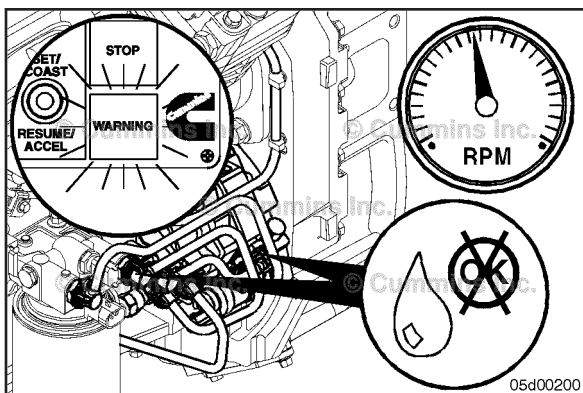
NOTE: Be sure the electronic fuel control actuator flange is flush with the mounting surface on the fuel pump before tightening the capscrews.

Torque Value:

Step 1	3 N•m	[27 in-lb]
Step 2	7 N•m	[62 in-lb]

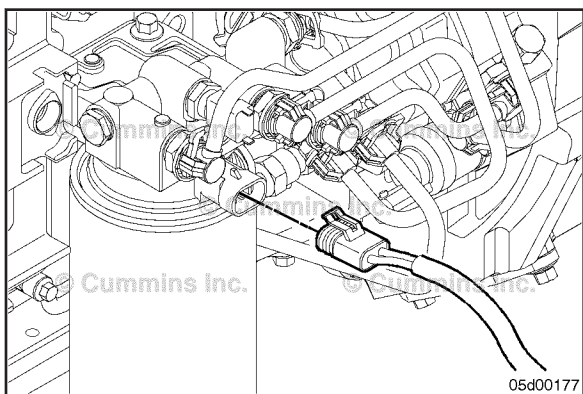
Install the electrical connector.





Finishing Steps

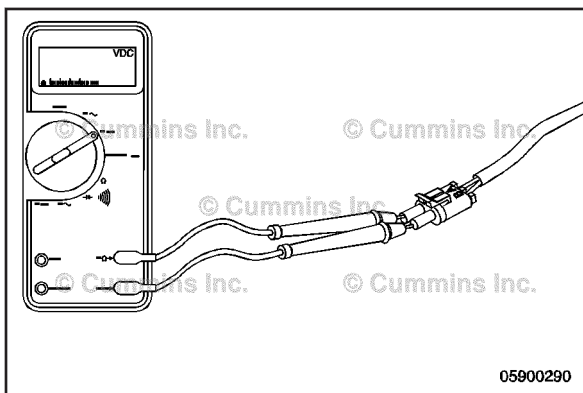
Operate the engine and check for leaks or fault codes.



Engine Fuel Heater, Electric (005-008) Initial Check

NOTE: The fuel heater is **not** controlled by the electronic control module (ECM). A bimetallic strip acts as a thermostat. The fuel heater will turn on below approximately 4°C [39°F] and turn off above approximately 27°C [81°F].

Remove the 2-pin connector from the fuel heater.



Check for proper voltage to the fuel heater thermostat control.

Fuel Heater Voltage

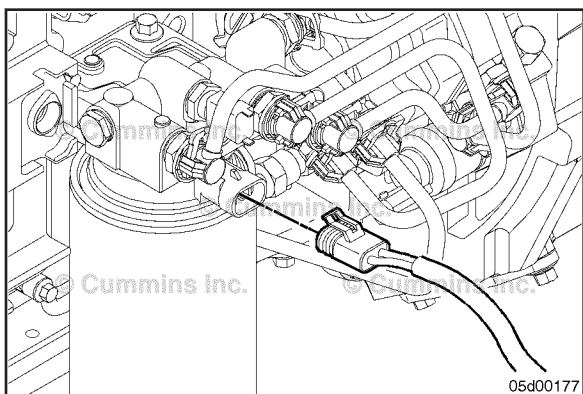
12-volt system - 12 VDC
24-volt system - 24 VDC

If the voltage is **not** within specifications, refer to the OEM troubleshooting and repair manual.

Check the wiring between the thermostat control and the fuel heater

Check voltage at the OEM harness connectors.

NOTE: Voltage out of the thermostat will be zero if the temperature is above the range needed to turn on the thermostat.



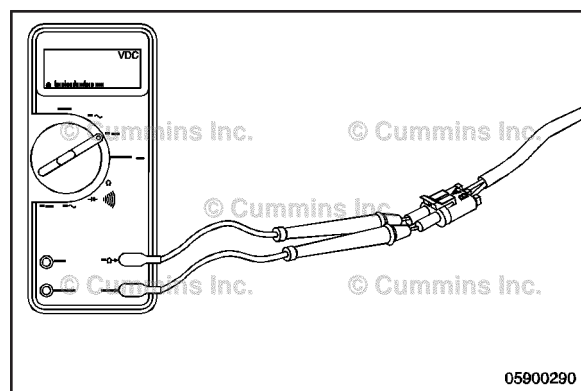
NOTE: The fuel heater on engines **without** EGR is controlled by the electronic control module (ECM). The CM800 ECM contains a relay that turns the fuel heater on and off based on the fuel temperature sensor reading.

NOTE: To test the voltage to the fuel heater, use the Fuel Heater Override test in INSITE™. Refer to INSITE™ documentation or Section 14 for more information.

Check for proper voltage to the fuel heater during the Fuel Heater Override test.

Fuel Heater Voltage
12-volt system - 12 VDC
24-volt system - 24 VDC

If the voltage is **not** within specifications, refer to the OEM troubleshooting and repair manual.



Remove

⚠ WARNING ⚠

Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

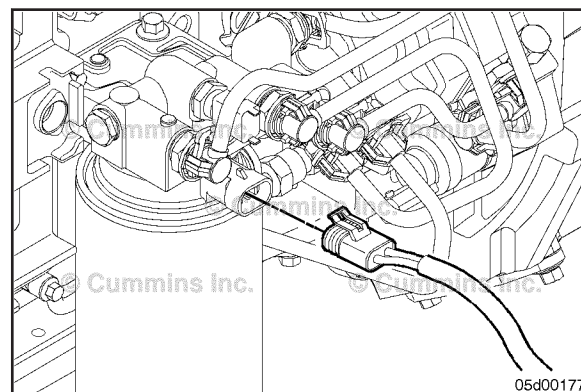
⚠ WARNING ⚠

When using a steam cleaner, wear safety glasses or a face shield, as well as protective clothing. Hot steam can cause serious personal injury.

Steam-clean the fuel heater and the area around the heater and fuel pump.

Dry with compressed air.

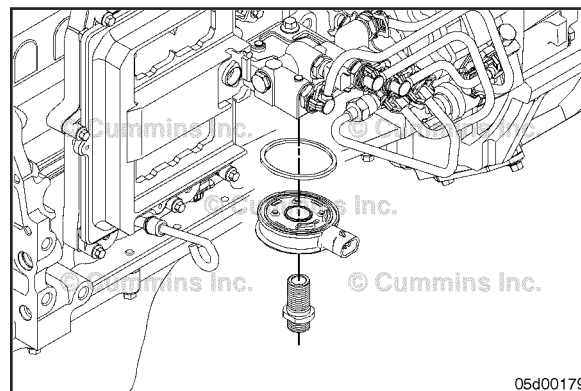
Disconnect the connector from the fuel heater.



Remove the fuel filter.

Remove the fuel filter spud.

Remove the fuel heater from the filter head. The heater should be able to be pulled off the filter head.

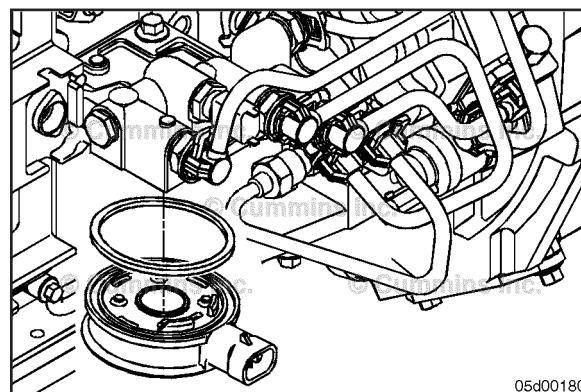


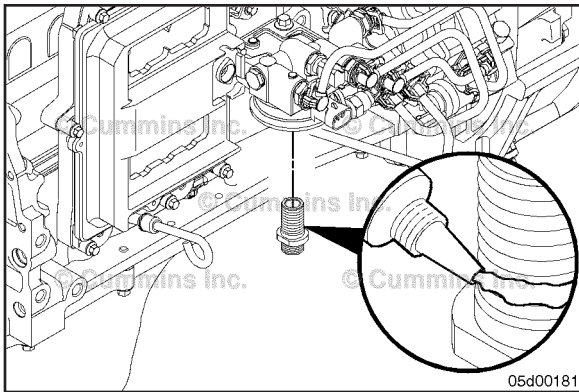
Install

⚠ CAUTION ⚠

Make sure that no dirt or debris enters the fuel heater to prevent the passing of contaminants to the high-pressure fuel pump and injectors. Small amounts of dirt and debris can cause a malfunction of these components.

Place the fuel heater, gasket side facing up, against the filter head.





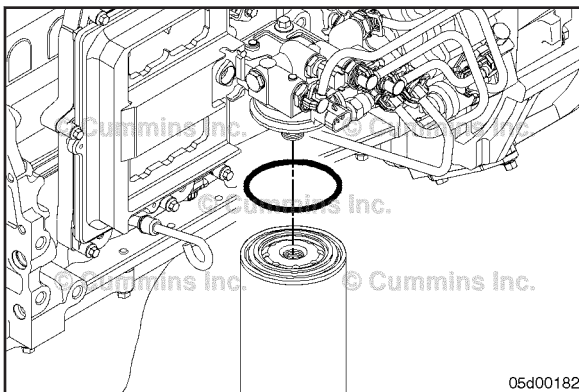
NOTE: Do **not** apply an excessive amount of Loctite due to its being passed into the fuel pump after installation.

Apply Loctite 648, or equivalent, to the filter spud.



Install the fuel filter spud.

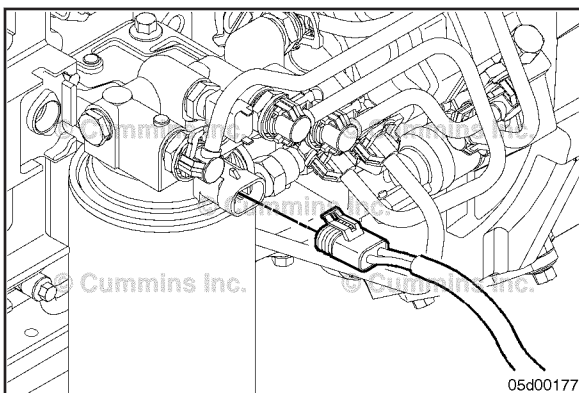
Torque Value: 30 N•m [22 ft-lb]



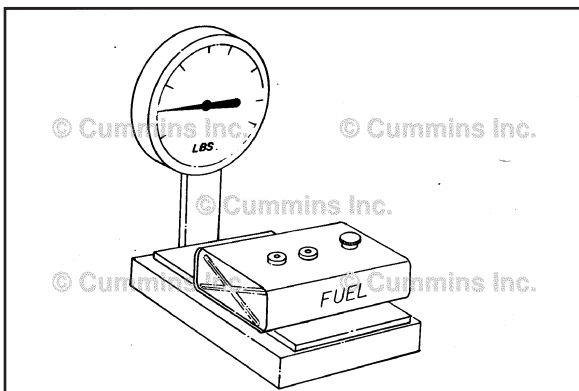
Install an o-ring between the fuel heater and the filter canister.

Install the fuel filter.

Torque Value: 34 N•m [25 ft-lb]



Connect the connector to the fuel heater.



Fuel Consumption (005-010)

Measure

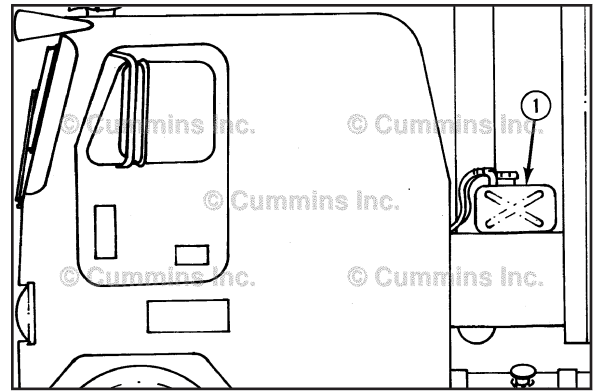
Refer to the fuel consumption checklist sheets in Section TS.

NOTE: The most accurate method of checking the fuel consumption is to weigh the fuel used. Use a scale capable of measuring within 0.045 kg [0.1 lb] to weigh the fuel tank. Use a remotely mounted tank with enough capacity to run 80 km [50 mi].

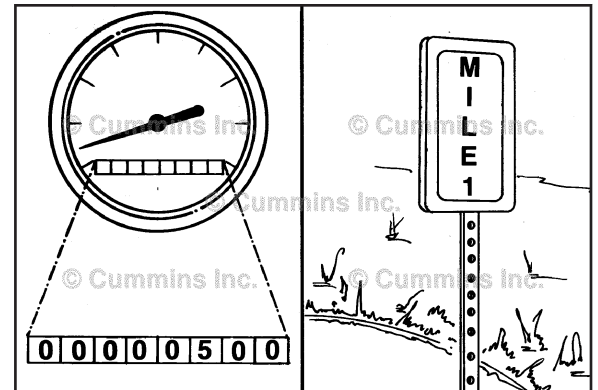
Fill the fuel tank. Weigh the tank with the fuel. The weight of Number 2 diesel fuel is nominally 0.844 kg per liter [7.04 lb per gal].

Install the remote tank (1).

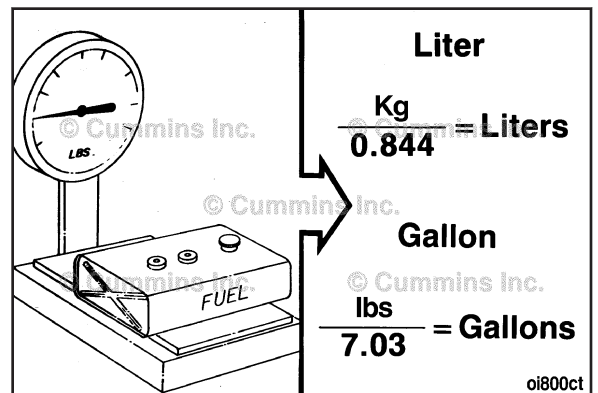
Install the return fuel line to the test tank, or the results will **not** be accurate.



Measure the distance traveled with an accurate odometer. The odometer's accuracy can be checked by using measured kilometers [miles].



After traveling the route, remove the tanks, and weigh the remaining fuel. Compute the fuel used in liters [gallons] as required.

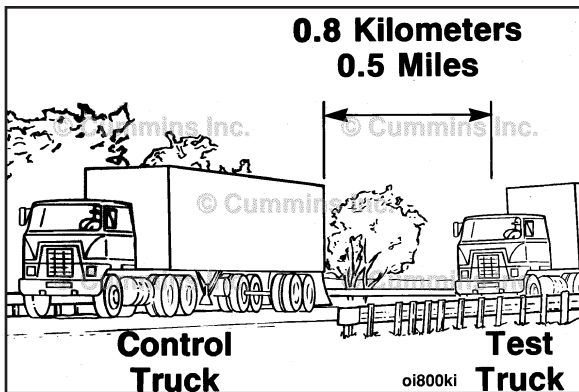


Compute the kilometers per liter or miles per gallon.

- Miles ÷ gallons = Miles per gallon
- Kilometers ÷ liters = Kilometers per liter

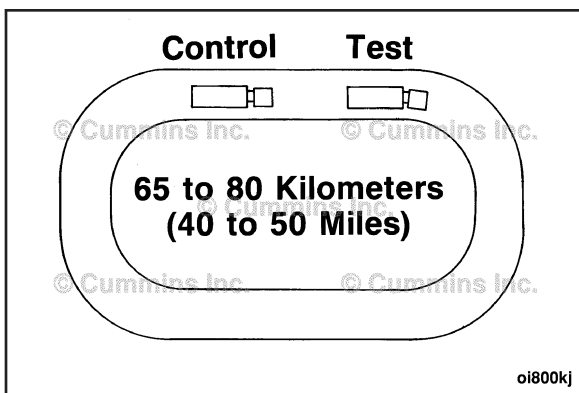
In addition to the measurement of the fuel used, the following factors provide points for running a test similar to the recognized Type II Society of Automotive Engineers Fuel Test.

These procedures are helpful in determining differences in fuel consumption between two vehicles under the same environmental, road, and test conditions.

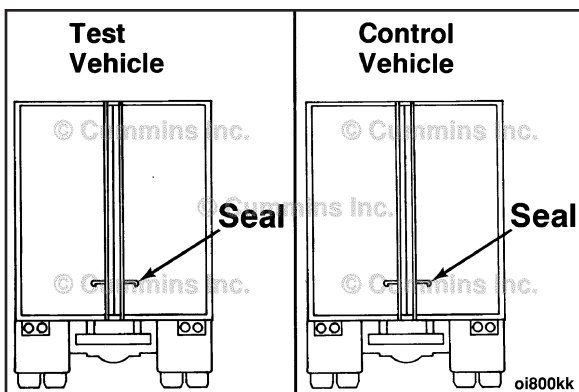


Perform the test with the test vehicle and a control vehicle. The control vehicle compensates for changes in traffic conditions.

The vehicles **must** stay close enough together to experience the same varying traffic and weather conditions, but **not** so close as to affect each other's driving or headwind.

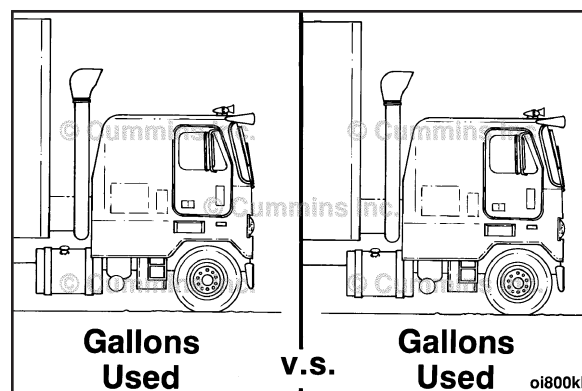


The test course **must** be 65 to 80 km [40 to 50 mi] long.



The test route and truck weights **must not** change during the test.

All the test results are based on comparing the fuel used by the test truck to the fuel used by the control truck.



Drive the truck on a warm-up test run. Drive enough tests to achieve the following:

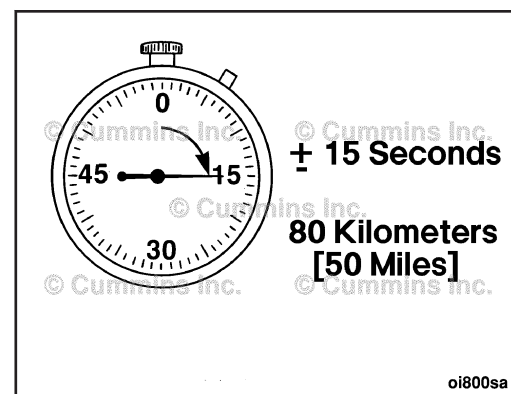


- The difference in elapsed time between each test run can **only** be ± 0.5 percent. This will be ± 15 seconds over 80 km [50 mi] at 97 km/h [60 mph].

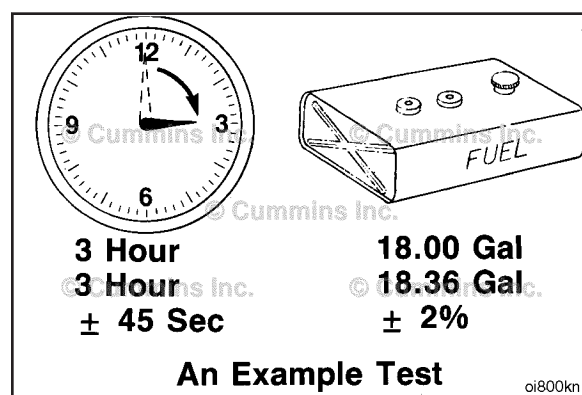
The fuel usage of the test truck between test drives **must** fall within a 2-percent range (e.g., 2.55 versus 2.60 km/liters [6.00 versus 6.12 mpg]).

The same range also applies between test drives of the control truck.

NOTE: The differences in traffic and driving practices can make the test drive fall out of the 2-percent range.

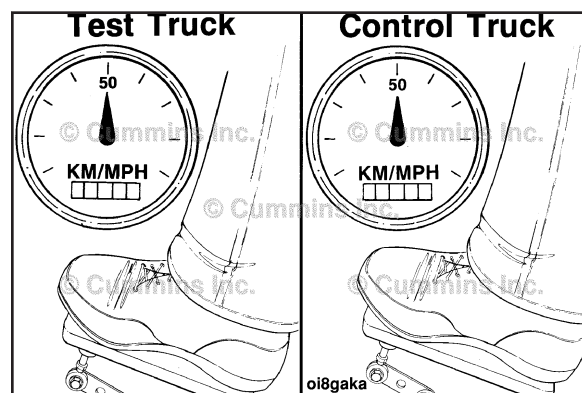


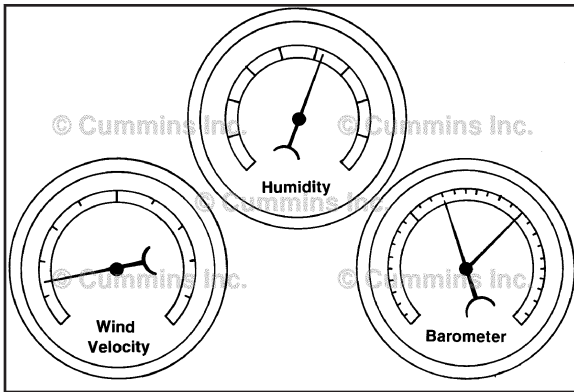
A minimum of three test drives that meet these conditions make a valid test. A single test drive is unreliable.



Use the same experienced drivers for all of the tests.

NOTE: The vehicle speeds **must** be representative of a typical operation.

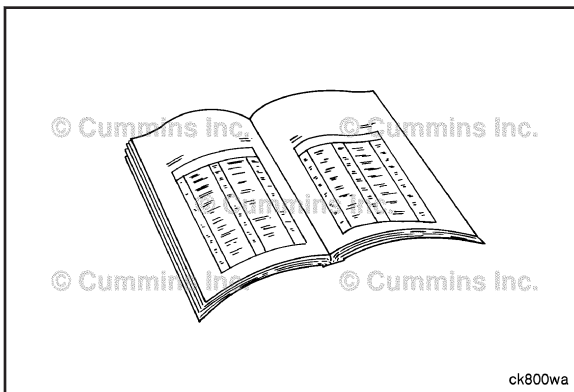




During the test, record the following:

- Ambient temperature
- Humidity
- Barometric pressure
- Wind velocity
- Wind direction.

NOTE: Avoid testing under any extreme conditions.



Fuel Pump (005-016)

General Information

⚠ WARNING ⚠

The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel. Do not loosen any fittings while the engine is running. Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to decrease to a lower level.

⚠ CAUTION ⚠

Use caution when disconnecting or removing fuel lines, replacing filters and priming the fuel system, so that fuel is not spilled or drained into the bilge area. Do not drop or throw filter elements into the bilge area. The fuel and fuel filters must be discarded in accordance with local environmental regulations.

⚠ CAUTION ⚠

Be sure that the fuel inlet and return valves are returned to the open position before cranking the engine. Engine damage can result if the valves are in the wrong position when the engine is cranked or started. Environmental damage can also occur.

There are four different mounting locations available for high-pressure fuel pumps. The pump can be mounted in a high or low position in either a front or rear gear train engine. Due to the number of different fuel pump mounting locations, the steps in this procedure have been written to be generic. Some of the illustrations do **not** represent the parts being removed or installed.

Refer to Procedure 005-999 in Section F.

Test

⚠CAUTION⚠

Clean all fittings before disassembly. Dirt or contaminants can damage the fuel system.

If the engine will **not** start, disconnect the high-pressure fuel outlet line from the high-pressure injection pump. Refer to Procedure 006-060 in Section 6.

Disconnect the fuel pump actuator connector.

Insert a clear hose to the outlet of the high-pressure injection pump, and run the other end into an empty bucket.

Crank the engine and measure the amount of fuel exiting the fuel pump.

NOTE: Do **not** crank the engine for 30 seconds continuously. Crank the engine in 10 second intervals with a 30 second break between cranking. This reduces the possibility of overheating the starter motor.

Fluid Measure	Time	Engine Speed	
4-cylinder	75 ml [2.5 oz]	30 seconds	125 rpm
6-cylinder	90 ml [3.04 oz]	30 seconds	150 rpm

If the high-pressure injection pump does **not** meet the flow specifications:

Check for air in the fuel. Refer to Procedure 006-003 in Section 6.

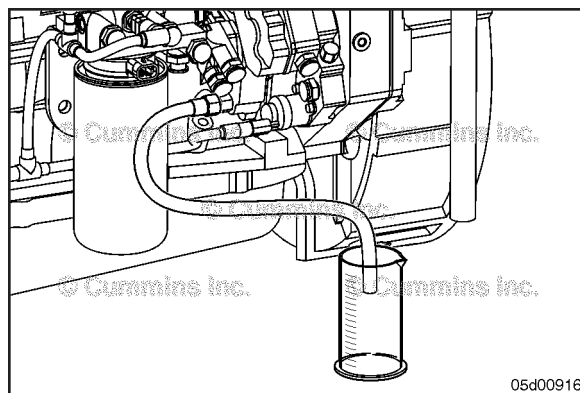
Check for inlet restriction. Refer to Procedure 006-020 in Section 6.

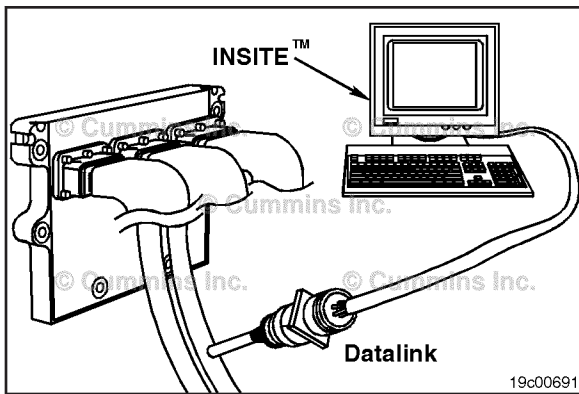
Check the fuel filter restriction. Refer to Procedure 006-015 in Section 6.

If these checks are acceptable, replace the fuel pump actuator. Refer to Procedure 005-007 in Section 5.

After replacing the fuel pump actuator, measure the fuel pump flow again. If the flow is **not** within specification, replace the fuel pump.

Connect the high-pressure fuel line and the fuel pump actuator electrical connection.





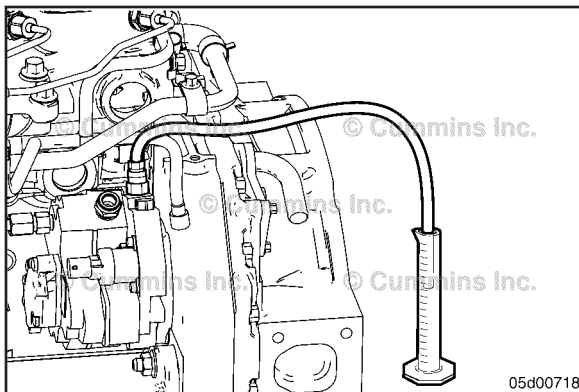
⚠ WARNING ⚠

The fuel pump high-pressure fuel lines and fuel rail contain very high-pressure fuel. Never loosen any fittings while the engine is running. Personal injury and property damage can result.

If the engine **can** be started, a measurement of the fuel return flow can diagnose a high-pressure fuel pump problem. The following steps describe how to test the high-pressure fuel pump return flow.

A malfunctioning fuel return overflow valve or fuel pump can result in high return from the fuel pump.

The return fuel flow from the pump **must** be measured at idle conditions. The Fuel System Leakage Test in INSITE™ electronic service tool can be used to increase system pressure and therefore increase the ability to detect high leakage.



Without Electric Lift Pump

Disconnect the fuel pump return line.

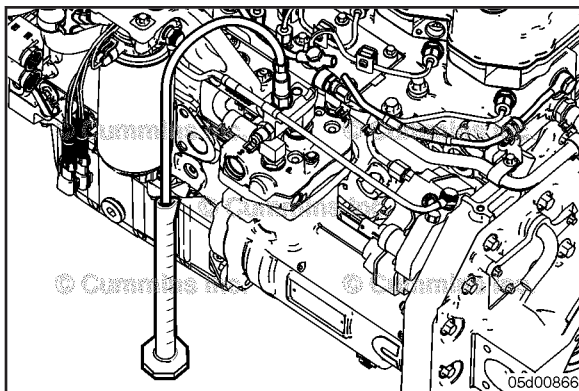


3.9L and 5.9L Engines

- Attach the fuel pressure gauge adapter, Part Number 3164044, to the fuel pump return fitting. Install a quick-disconnect block-off fitting, Part Number 3164583, on the disconnected drain line.

4.5L and 6.7L Engines

- Attach the female quick-disconnect fuel drain hose, Part Number 4918434, onto the fuel pump drain connection. Install a quick-disconnect block-off fitting, Part Number 4918464, on the disconnected drain line.



With Electric Lift Pump

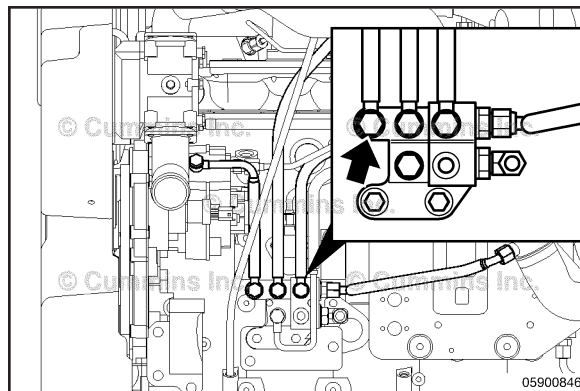
⚠ CAUTION ⚠

If tool Part Number 3164618 is installed at the fuel pump, it will block return flow and cause possible damage to the fuel pump. Install tool Part Number 3164618 only at the fuel return manifold.

Follow the fuel return line from the fuel pump to the fuel return manifold. At the fuel return manifold, remove the banjo bolt for fuel pump return line and install test fitting, Part Number 3164618.

For automotive and industrial applications, the return manifold is located near the top of the engine, beside the fuel rail.

For marine engines, the return manifold is located on the side of the engine block, next to the ECM.



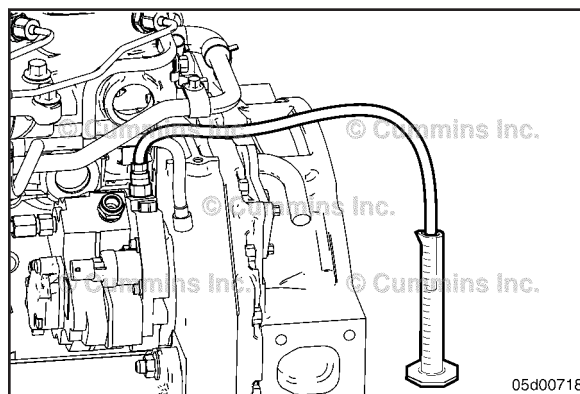
⚠ WARNING ⚠

Fuel can be returned at highly elevated temperatures. Wear safety glasses and protective gloves and clothing when performing this test. Avoid contact with returned fuel.

Place the end of the fuel pressure gauge adapter tool or fuel drain hose into a 500 ml graduated beaker, Part Number 3823705.

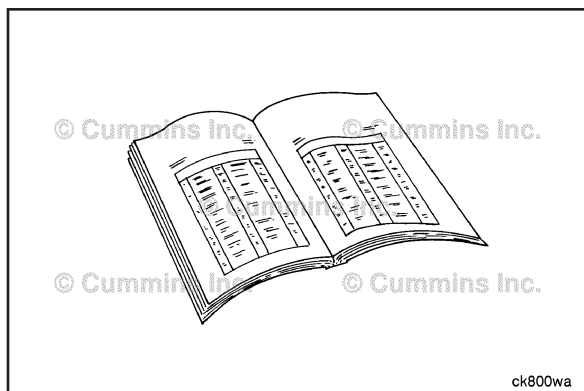
Start the engine.

Measure the flow rate by recording the amount of time required to fill the beaker to the 400 ml level. Flow Specification: Standard Idle Conditions (750 rpm) 4- and 6-cylinder 400 ml (maximum) in 25 seconds



Maximum Flow: Standard Idle Conditions (750 rpm)

4- and 6-cylinder	400 ml in 25 seconds
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Preparatory Steps

⚠ WARNING ⚠

Batteries can emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries. To reduce the possibility of arcing, remove the negative (-) battery cable first and attach the negative (-) battery cable last.

⚠ WARNING ⚠

Fuel is flammable. Keep all cigarettes, flames, pilot lights, arcing equipment, and switches out of the work area and areas sharing ventilation to reduce the possibility of severe personal injury or death when working on the fuel system.

⚠ CAUTION ⚠

Do not vent the fuel system on a hot engine; this can cause fuel to spill onto a hot exhaust manifold, which can cause a fire.

⚠ CAUTION ⚠

Drain the fuel-water separator into a container, and dispose of the contents in accordance with local environmental regulations.

⚠ CAUTION ⚠

Clean all fittings before disassembly. Dirt or contaminants can damage the fuel system.

- Disconnect the batteries. Refer to the OEM service manual.
- Disconnect the low-pressure fuel supply and drain lines. Refer to Procedure 006-024 in Section 6.
- Remove the low-pressure fuel supply and drain lines. Refer to Procedure 006-013 in Section 6.
- For engines with a low mount fuel filter, the fuel filter head **must** be removed to remove the fuel pump. Refer to Procedure 006-017 in Section 6.

Marine Applications

⚠ WARNING ⚠

Batteries can emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries. To reduce the possibility of arcing, remove the negative (-) battery cable first and attach the negative (-) battery cable last.

⚠ WARNING ⚠

Fuel is flammable. Keep all cigarettes, flames, pilot lights, arcing equipment, and switches out of the work area and areas sharing ventilation to reduce the possibility of severe personal injury or death when working on the fuel system.

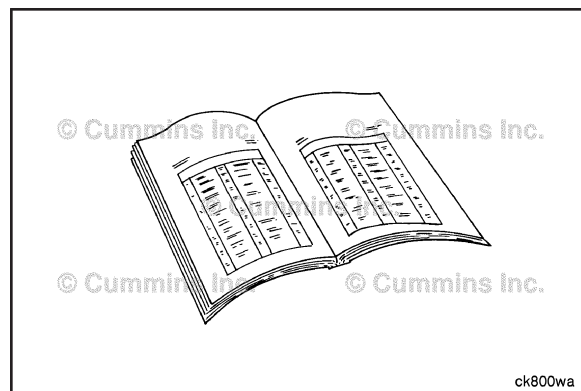
⚠ WARNING ⚠

Do not vent the fuel system on a hot engine; this can cause fuel to spill onto a hot exhaust manifold, which can cause a fire.

⚠ CAUTION ⚠

Use caution when draining the fuel system , so that fuel is not spilled or drained into the bilge area. The fuel must be disposed of in accordance with local environmental regulations.

- Disconnect the batteries. Refer to the OEM service manual.
- Remove the low-pressure fuel supply lines. Refer to Procedure 006-024 in Section 6.
- Remove the low-pressure fuel drain lines. Refer to Procedure 006-013 in Section 6.
- Apply a counter-torque to the fitting on the high-pressure pump to reduce the possibility of a leak or a loose fitting. Remove the high-pressure supply line from the fuel pump to the fuel rail (flared connection).
- Disconnect the fuel control actuator electrical connector.
- Remove the dipstick mounting capscrew and position the dipstick out of the way for pump removal.
- Remove the valve cover lubrication vent flex hose connector at the engine block mounted adapter. Refer to Procedure 003-002
- Remove the belt guard section located in front of the sea water pump. Refer to Procedure 008-001 in Section 8.



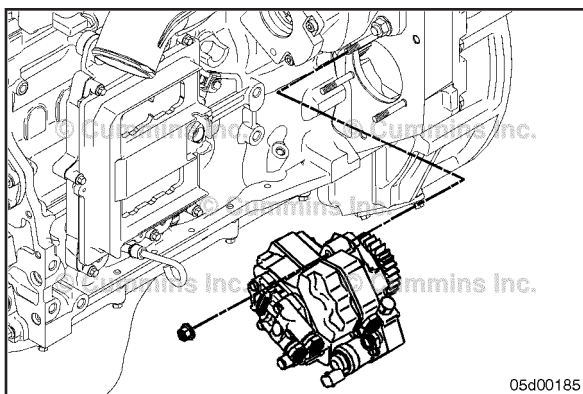


Remove

NOTE: A counter-torque **must** be applied to the fitting on the high-pressure pump. This is to prevent the fitting from being loosened and to prevent the possibility of a leak.

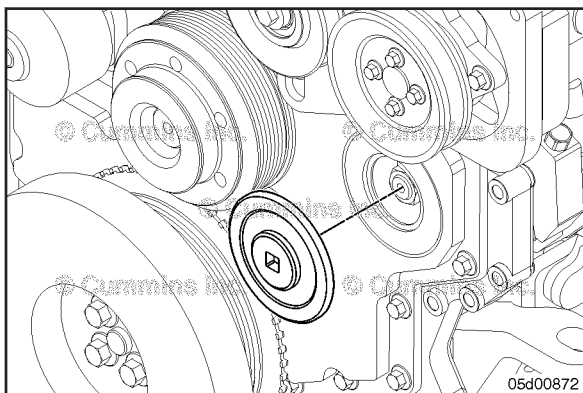
Disconnect the high-pressure supply line from THE high-pressure fuel pump to the fuel rail and loosen the holding brackets.

Disconnect the EFC actuator valve wire harness connector.



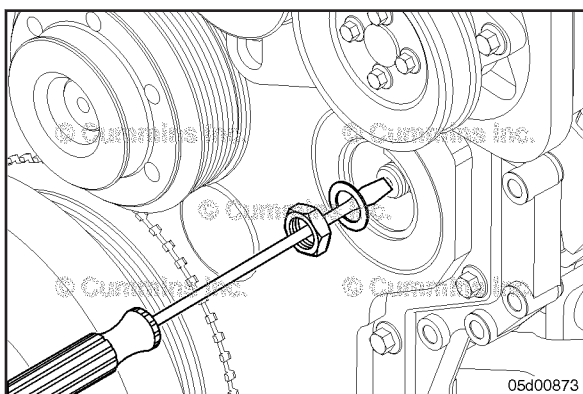
Rear Gear Train

Remove the three flanged fuel pump mounting nuts.
Remove the fuel pump from the gear housing.



Front Gear Train

Remove the fuel pump drive access cover with a 3/8-inch drive ratchet.



⚠CAUTION⚠

Place a clean cloth in the air-gap between the fuel pump drive gear and the gear cover, or use a screwdriver to prevent the mounting nut and lock washer from being dropped into the front gear train.

⚠CAUTION⚠

The fuel pump drive gear is captive between the gear housing and the gear cover. Do not rotate the engine while the gear is not supported by the fuel pump drive shaft. The gear, gear housing, or gear cover can be damaged.

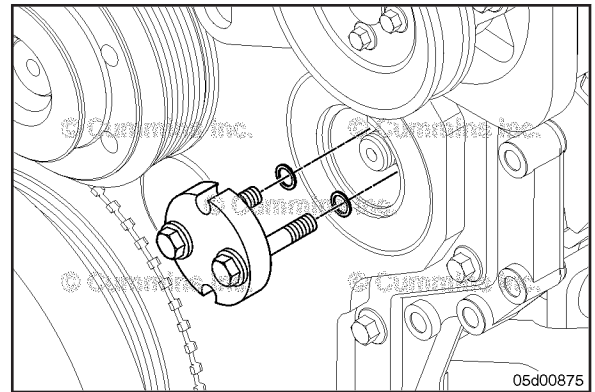
Remove the fuel pump drive gear retaining nut and lock washer.

⚠CAUTION⚠

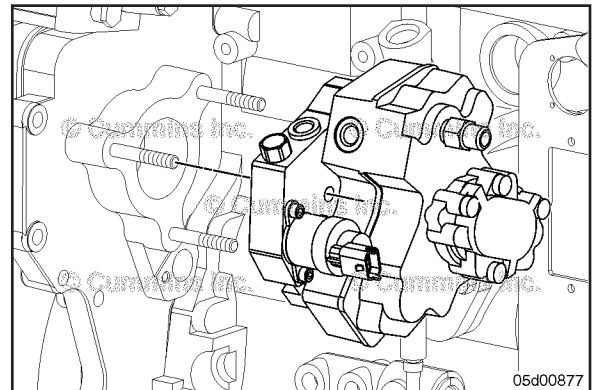
Protect the fuel pump drive shaft threads from damage during gear removal.

Install the fuel pump drive gear puller onto the drive shaft and gear.

Hold the gear puller while removing the fuel pump drive gear.

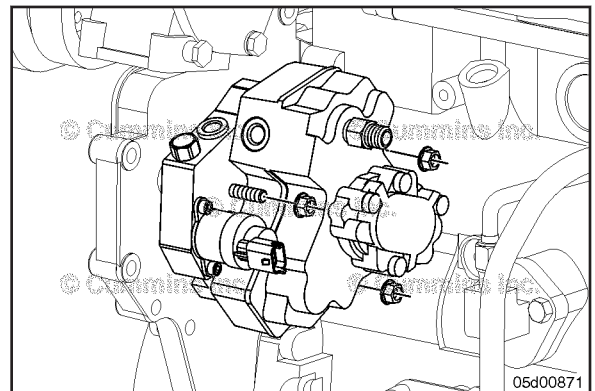


Remove the fuel pump assembly.

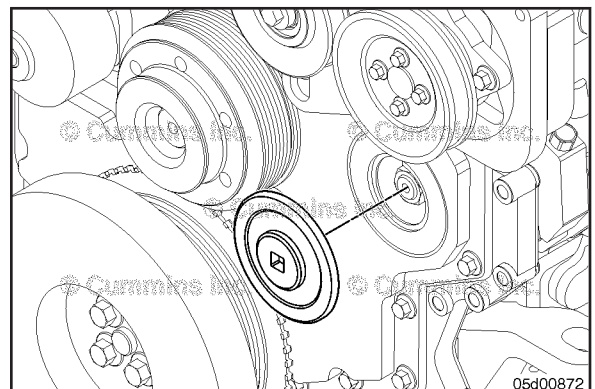


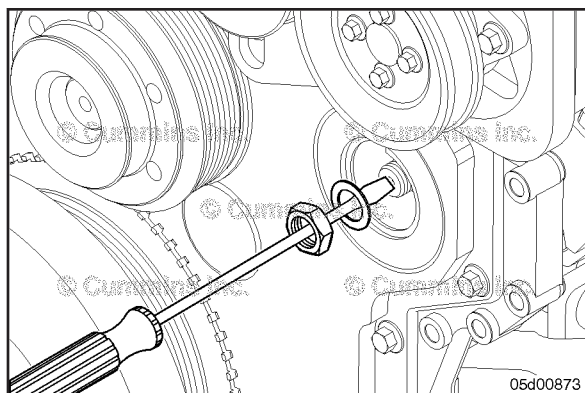
Marine Applications

Remove the three fuel pump flanged mounting nuts.



Remove the fuel pump drive access cover with a 3/8-inch drive ratchet.





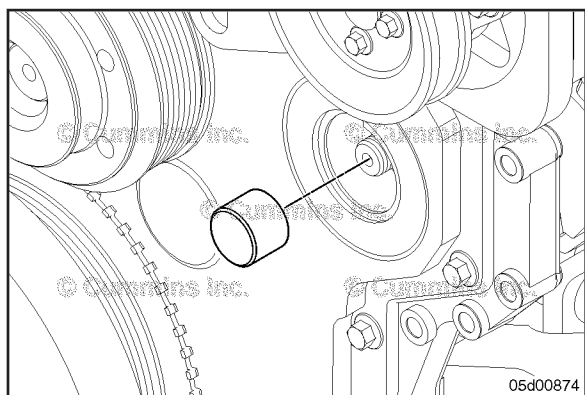
⚠ CAUTION ⚠

Place a clean cloth in the air gap between the fuel pump drive gear and the gear cover, or use a screw driver to prevent the mounting nut and lock washer from being dropped into the front gear train.

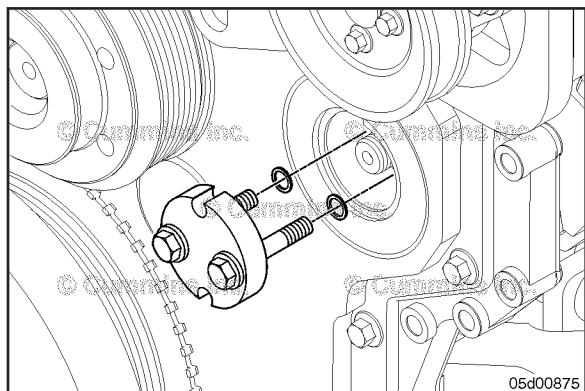
⚠ CAUTION ⚠

The fuel pump drive gear is captive between the gear housing and the gear cover. Do not rotate the crankshaft while the gear is not supported by the fuel pump drive shaft. The gear, gear housing, or gear cover can be damaged.

Remove the fuel pump drive gear retaining nut and lock washer.



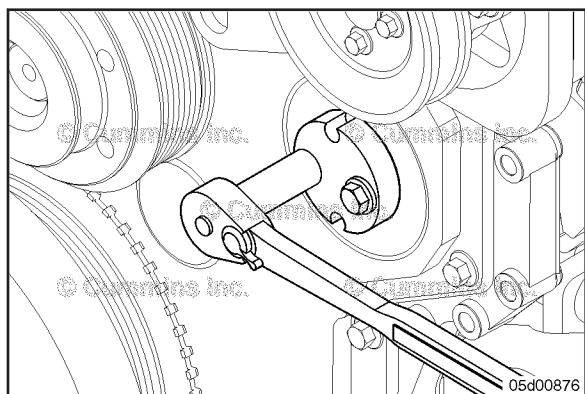
Install the spacer, Part Number 4918317, from service tool, Part Number 3163381, onto the fuel pump drive shaft.



⚠ CAUTION ⚠

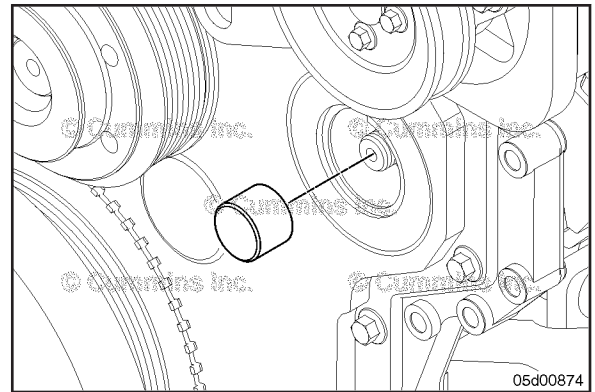
Protect the fuel pump drive shaft threads from damage while removing the fuel pump gear.

Install the fuel pump drive gear puller, Part Number 3163381, onto the fuel pump drive shaft and gear.

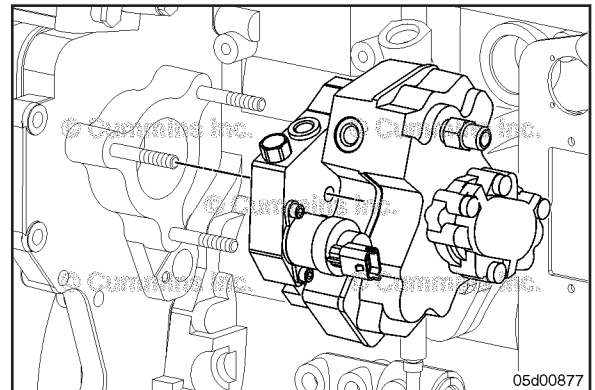


Use a ratchet and remove the fuel pump drive gear from the fuel pump drive shaft.

Remove the spacer, Part Number 4918317, from the fuel pump drive shaft.



Remove the fuel pump assembly.

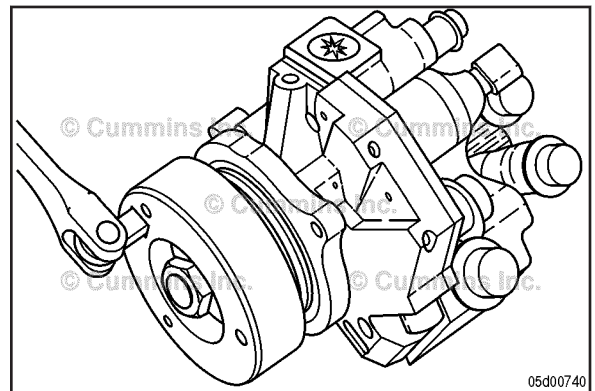


Disassemble

Rear Gear Train

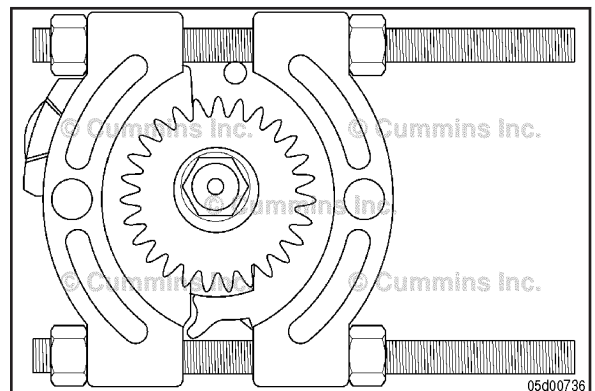
Use a fuel pump retention tool, Part Number 3164707, and a ½-inch breaker bar to retain the fuel pump drive gear.

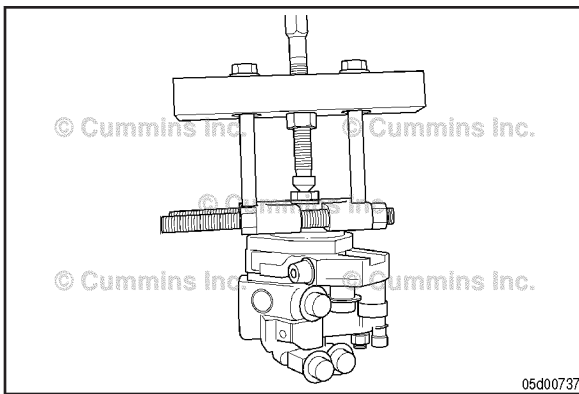
Loosen the clamp load of the fuel pump drive gear retaining nut by rotating it **counterclockwise**. Do **not** remove it from the shaft.



Install a bearing separator, Part Number 3375326, or equivalent, between the fuel pump mounting flange and the drive gear.

Secure the bearing separator.



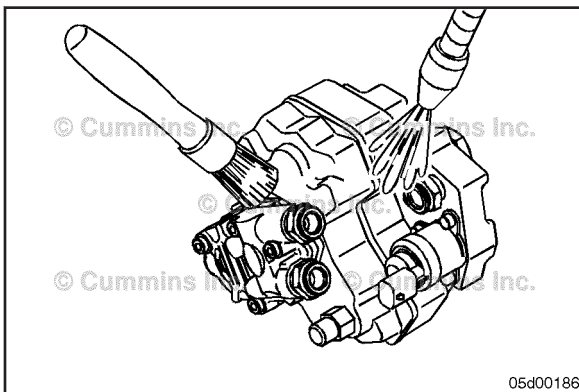


Install a Snap-On™ puller, Part Number CG150-02, or equivalent onto the bearing separator, Part Number 3375326, and the fuel pump driveshaft.



Rotate the puller screw until the drive gear is separated from the driveshaft.

Remove the drive gear retaining nut, lock washer, and drive gear from the fuel pump driveshaft.



Clean and Inspect for Reuse

⚠ WARNING ⚠

When using solvents, acids, or alkaline materials for cleaning, follow the manufacturer's recommendations for use. Wear goggles and protective clothing to reduce the possibility of personal injury.

⚠ WARNING ⚠

Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

⚠ CAUTION ⚠

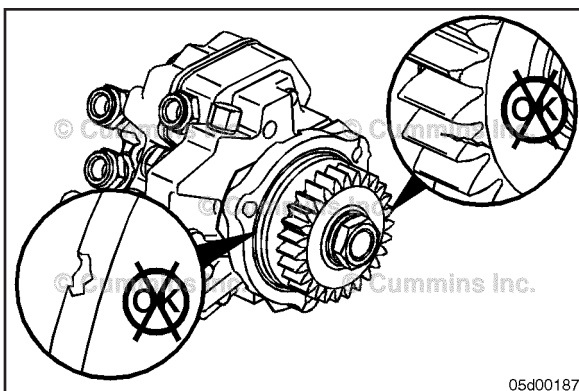
Use solvent or cleaner that will not harm aluminum.

⚠ CAUTION ⚠

Do not allow the cleaner to enter the fuel fittings. Dirt and debris can damage the fuel system.

Clean the fuel pump with solvent.

Dry with compressed air.



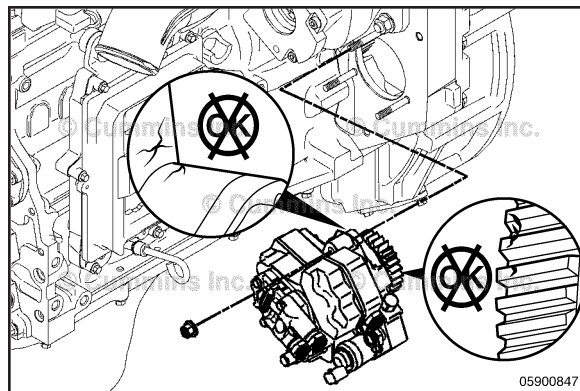
Inspect the driveshaft and gear for damage. Replace if damage is found.

Inspect the o-ring seal for damage. Replace if damage is found.

Inspect the o-ring seal area for damage. Clean and repair any burred surfaces.

Inspect the gear housing, high-pressure pump mounting bore, and mounting studs for cracks.

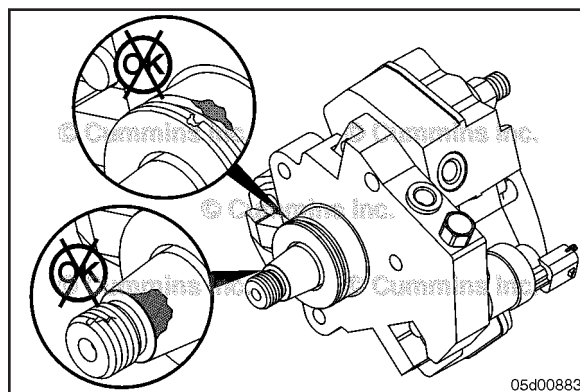
Replace if damage is found.



Marine Applications

Inspect the driveshaft for damage. Replace the fuel pump if damage is found.

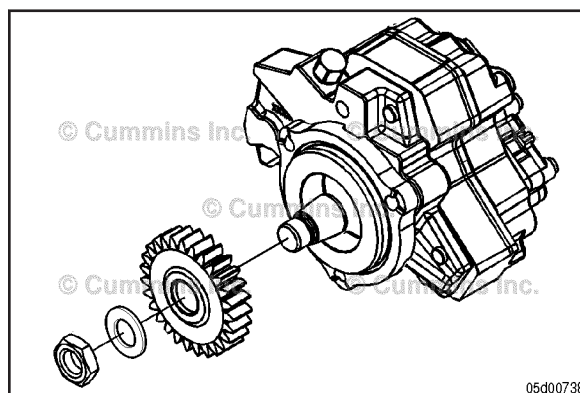
Inspect the o-ring seal area for damage. Clean and repair any burred surfaces.



Assemble

The pump driveshaft nose and drive gear shaft mating surface **must** be clean and dry prior to assembly.

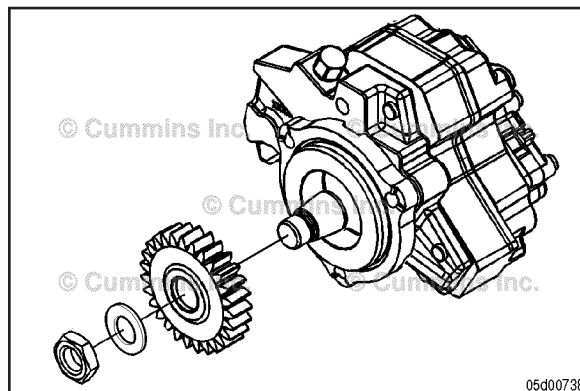
Wipe off the driveshaft and gear with solvent and a lint-free cloth. Do **not** touch the mating surfaces after wiping.



Rear Gear Train

Install the drive gear onto the driveshaft.

Install the driveshaft lockwasher and retaining nut and finger tighten.



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