DIESEL FUEL CONTAMINATION TESTING PROCEDURE

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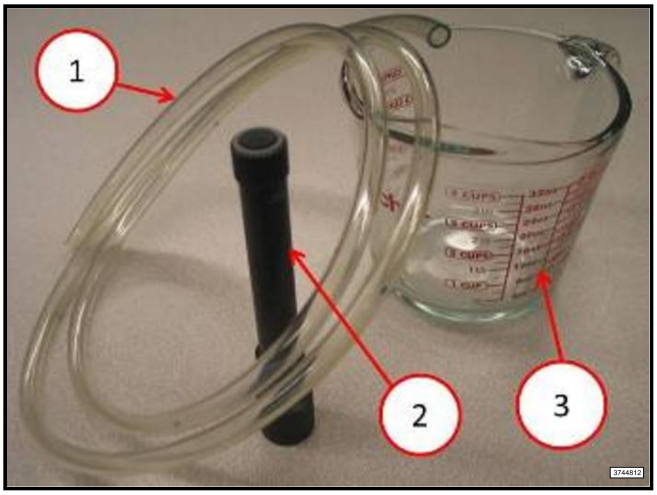
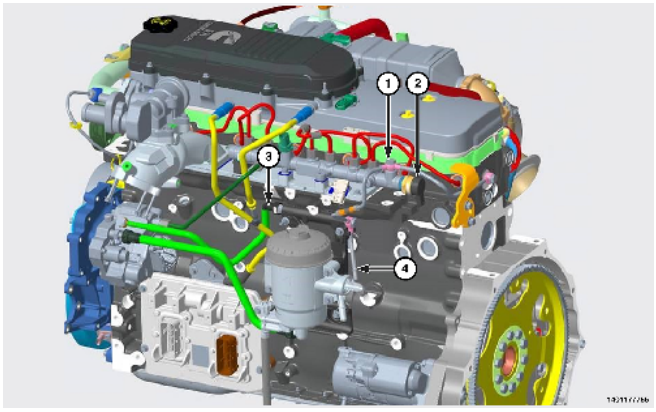
OVERVIEW

This procedure explains the proper method for extracting a fuel sample and specific methods to inspect for contamination of any kind. The contamination we are looking for on the clean side of the Fuel Filter is very small. We don't say dirt because it may be metal, water, plastic or any other contamination, other than clean diesel fuel. The smallest we can see with naked eye is about 30 Microns. Our Fuel Filters have a 5 Micron rating. The only way we car see this size of contamination is to properly collect it and view it. The fuel sample needs to be taken from the clean side of the system. In order to get a good clean side sample to inspect, perform the following procedure exactly.

Required Equipment
ONE LITER GLASS MEASURING CUP
FOUR FEET OF CLEAR, FLEXIBLE TUBING, 5/16 ID (available at the local hardware)
MULTI-BULB LED FLASHLIGHT
FUEL SYSTEM TEST PLUGS
FUEL SYSTEM TEST FITTING 9012
FUEL SYSTEM TEST CONNECTOR AND HOSE
CLEANER SPRAY
SELF LIGHTING MAGNIFIER (Optional)
All items used for collecting fuel MUST be cleaned with clean diesel fuel, brake clean, and air ONLY. Failure to clean these items will contaminate the fuel sample. Do Not use towels to wipe out the measuring cup.

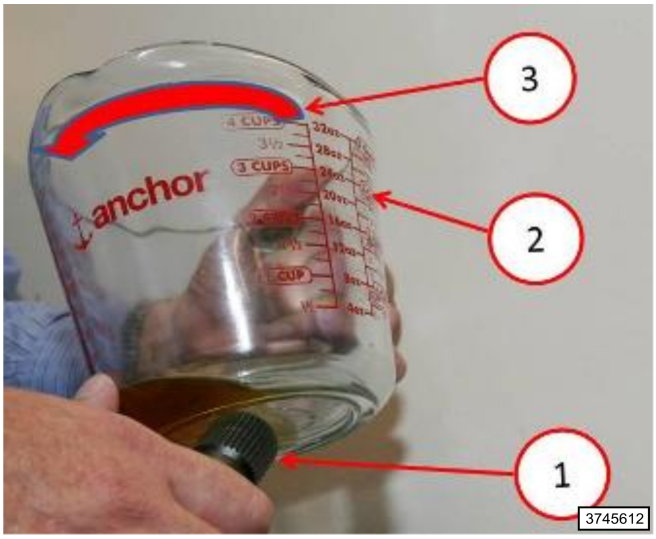


1. **CLEAN SIDE DIESEL FUEL SAMPLE COLLECTION AND INSPECTION**



A.	**CLEAN SIDE DIESEL FUEL SAMPLE COLLECTION AND INSPECTION**

NOTE: The three photos in this test step illustrate the steps in this test procedure for clarification.
NOTE: The fuel filter MUST NOT be removed or replaced prior to taking sample in order to get accurate results.
NOTE: Warm the engine before collecting the fuel sample.



1	LED FLASHLIGHT
2	MEASURING CUP
3	SLOWLY TILT THE CUP TOWARD YOU

1. While the engine is warming up, clean the clear tubing with clean diesel fuel and the glass measuring cup using brake clean and compressed air only. Do not use a towel.
   NOTE: Do not use brake clean or other chemicals on any vehicle parts for the fuel handling system such as lines, pumps or fittings.
2. Monitor the scan tool until the vehicle has reached an operating temperature of 180°F (82°C).
3. Turn the engine off.
4. Remove the HPDP return line quick disconnect (Connection 3 in the fuel system connections figure above), and install the Fuel System Test Plug 8978D-26 from the Fuel Decay Tool 8978E into the male hose connector to prevent fuel leakage.
5. Install the Fuel System Test Connector Hose 8531B-1 to the fuel pump return line female fitting and using Fuel Decay Tool 8978E route into a fuel container.

6. Install Fuel System Test Fitting 9012 in place of the Fuel pressure regulator banjo connector (Location 1 in the fuel system connections, top graphic (A.).
7. Install the 5/16" diameter fuel hose Fuel System Test Fitting 9012, and put the other end of the hose into a fuel container.
8. Remove the vehicle fuel return line quick disconnect (Connection 4 in the fuel system connection figure above), and install Fuel System Plug 8978D-25 into the female hose connector to prevent fuel leakage.
9. Install a 5/16" diameter rubber fuel hose onto the male engine fuel drain tube (Connection 4) and put the other end into a fuel container. Make sure test lines are straight and slope downward their entire length. This will be your sample source hose.

NOTE: The fuel flowing from the return of the fuel injection pump MUST NOT be part of our sample. We are looking primarily for injector return fuel. in order to collect the fuel injector return flow sample only, the fuel injection pump return and the fuel pressure regulator flow must be separated.

1	LED FLASHLIGHT POINTING THROUGH BOTTOM OF CUP (Shine Toward the Handle - Contamination will gather along the trailing edge of the fuel)
2	SLOWLY TILT THE CUP TOWARD YOU

10. Start the engine, and continue monitoring the coolant temperature to maintain the 180°F (82°C).
11. Using the scan tool, navigate to PCM > System Tests > Fuel Pressure Override Test and select start.
12. Initiate the Fuel Pressure Override Test two consecutive times to further warm the fuel and allow the tubing to be thoroughly rinsed clean.
13. Start the Fuel Pressure Override Test a third time. At mid stream of the test move the clear tube to the measuring cup. Collect a sample of approximately 1/4 inch of fuel in the measuring cup.
14. Turn the engine off.

NOTE: Follow these next steps exactly to inspect the sample for contamination.

1	CONTAMINATION WILL GATHER ALONG THE TRAILING EDGE OF THE FUEL VIEW CAREFULLY, LOOKING FOR VERY SMALL PARTICULATE MATTER (May Look Cloudy)

15. Allow the sample to sit for 10 minutes in a dust free environment to allow the debris to settle to the bottom. **It is important to not allow any air born contaminates to get into the fuel sample. Do not shake, swirl, or agitate the fuel in any way. The contamination should settle to the bottom.**
16. Hold the measuring cup (2) by the handle in one hand and shine the LED flashlight (1) through the bottom of the container toward the handle of the cup.
17. Slowly tilt the measuring cup (2) toward you and keep the LED flashlight (1) at the **trailing edge** of the fuel as it comes down the bottom of the cup and inspect for contamination.
    - Any dirt in the fuel will collect and be pulled by this trailing edge of fuel **(see last figure)**. It may be any color and sometimes looks as though the fuel is cloudy. **This is the contamination**. If you see **ANYTHING AT ALL** the fuel is contaminated.

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Is the fuel sample contaminated?

Yes

- To ensure that the In Tank Lift Pump is operating properly, perform the Lift Pump Flow Test. For instruction and specifications on this procedure, refer to the CHECKING THE FUEL DELIVERY SYSTEM procedure, test step 5. After checking the In Tank Lift Pump operation, perform the DIESEL FUEL SYSTEM CLEANING PROCEDURE (Refer to 14 - Fuel System/Fuel Delivery - Standard Procedure) .
- Go To **2**

No

- Install new fuel filter and Mopar (CRC) fuel injector cleaner into the fuel tank at a ratio four times the recommend concentration.
- Go To **2**

2. **DIAGNOSTIC PATH**

Were you instructed to inspect for Fuel Contamination from the MIL LIGHT ON PRETEST PROCEDURE?

Yes

- Perform the diagnostic trouble code test that was found to be present (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Diagnosis and Testing).

No

- Go To **3**

3. **DIAGNOSTIC PATH CONTINUED**

Were you instructed to inspect for Fuel Contamination from a Non-DTC TEST PROCEDURE?

Yes

- Perform the DIESEL AFTERTREATMENT VALIDATION 6.7L procedure (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Return to Diagnostic Test that directed you to inspect for fuel contamination.