

M: Fuel System

 **WARNING:** Contact with exposed fuel injector wiring, if energized, may result in electric shock. Use care when working on or around energized fuel injector wiring. Fuel injector wiring supplies high voltage to operate the fuel injectors. Failure to follow this instruction may result in serious personal injury.

 **WARNING:** Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

 **WARNING:** Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

 **WARNING:** Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

 **WARNING:** When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

 **WARNING:** Clean all fuel residue from the engine compartment. If not removed, fuel residue may ignite when the engine is returned to operation. Failure to follow this instruction may result in serious personal injury.

Note: Regeneration may occur during normal operation. During regeneration, diagnostic procedures may display biased values. If a regeneration occurs during diagnostic procedures, allow the process to complete before continuing diagnostics.

This pinpoint test is intended to diagnose the following:

- fuel injector (9E527)
- fuel pressure control valve (9C968)
- fuel volume control valve (9J307)
- fuel rail pressure (FRP) sensor (9F838)

M1 CHECK FOR DTCS

Note: Repair any fuel injector circuit related DTCs before entering this pinpoint test.

Are DTCs P000E, P0087, P0088, P0093, P016D, P0170, P0171, P0172, P0191, P0263 through P0284, P029A, P029B, P029E, P029F, P02A2, P02A3, P02A6, P02A7, P02AA, P02AB, P02CC through P02DB, P054E, P054F, P062B, P127A, P228D, P228E, P228F, P2291, P262A, P2B00, P2B01, P2B02, P2B03, P2B11, P2B13, P2B15, P2B17, P2B19, P2B1B, P2B1D or P2B1F present?

Yes	For DTCs P02CC, P02CE, P02D0, P02D2, P02D4, P02D6, P02D8 and P02DA, GO to M2 . For DTC P0088, GO to M18 . For Transit, GO to M4 . For all others, GO to M3 .
No	GO to M3 .

M2 CHECK FOR FRONT END ACCESSORY DRIVE COMPONENT AND DRIVE LINE CONCERNS

Note: Mechanical noise caused by the front end accessory drive components, mechanically driven cooling fans, or other causes of unnecessary engine load may set certain fuel trim DTCs.

- Ignition ON, engine OFF.
- Check the front end accessory drive components and drive line for additional engine loads or concerns.

Are any concerns present?

Yes	REPAIR as necessary. CARRY OUT the Reset And Clear The Specified Function Reset Minimum Fuel Mass Adaptions For all cylinders on the scan tool for the affected cylinder. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM). Clear the PCM DTCs. REPEAT the self-test.
No	For F-650 / F-750 and F-Series Super Duty, GO to M3 . For all others, GO to M4 .

M3 CHECK THE VPWR VOLTAGE

Note: For a no start concern, follow the Yes answer.

Note: An open VPWR circuit concern is indicated by a VPWR PID value greater than 15 V while the engine is running.

- Ignition ON, engine running.
- Access the PCM and monitor the VPWR (VOLT) PID.

Is the voltage less than 15 V?

Yes	GO to M4 .
No	REPAIR the open VPWR circuit. Clear the PCM DTCs. REPEAT the self-test.

M4 CHECK THE LOW PRESSURE FUEL SYSTEM

Note: The fuel pump runs for 30 seconds then shuts off at ignition ON, engine OFF.

Note: On some vehicles, the FP PID may not turn off the fuel pump. Cycle the ignition from ON to OFF to command the fuel pump OFF.

- Ignition ON, engine OFF.
- For F-650 / F-750,
- Access the PCM and monitor the FLP (PRESS) PID.
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the fuel pump ON then OFF.
- For Transit,
- Access the PCM and monitor the LP_FUEL_SW (MODE) PID.
- Access the PCM and control the FP (MODE) PID.
- Command the FP PID to ON then OFF.
- For all others,
- Access the PCM and monitor the FLP (PRESS) PID.
- Access the PCM and control the FP (MODE) PID.
- Command the FP PID to ON then OFF.

Does the LP_FUEL_SW PID state cycle from Low to Not Low (Transit) or is the FLP PID greater than 414 kPa (61 psi) (F-150) or is the FLP PID greater than 379 kPa (55 psi) (all others)?

Yes	GO to M5 .
No	GO to Pinpoint Test MA .

M5 CARRY OUT THE SUFFICIENT CLEAN FUEL TEST

- Carry out the Sufficient Clean Fuel Test. Refer to Section 4, [Diagnostic Procedures](#).

Is a concern present?

Yes	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	GO to M6 .

M6 RELATIVE COMPRESSION TEST

- Carry out the Relative Compression Test. Refer to the scan tool manufacturer's manual for specific information on the scan tool setup, operation, and specific cables and adapters required.

Do all cylinders pass the test?

Yes	For a no start condition with or without DTC P2291 and for DTC P2291 alone, GO to M13 . For all others, GO to M7 .
No	GO to M11 .

M7 MONITOR ALL THE FUEL BALANCING PIDS

Note: All PIDs may not be available on all vehicles.

- Ignition ON, engine running.
- Access the PCM and monitor the CYL_BAL_1 (MASS), CYL_BAL_2 (MASS), CYL_BAL_3 (MASS), CYL_BAL_4 (MASS), CYL_BAL_5 (MASS), CYL_BAL_6 (MASS), CYL_BAL_7 (MASS) and CYL_BAL_8 (MASS) PIDs.

Are all the fuel balance quantity PID values relatively in line with each other?

Yes	GO to M10 .
No	GO to M8 .

M8 VERIFY THE INJECTOR QUANTITY ADJUSTMENT OR INJECTOR CORRECTION FACTOR VALUES

Note: If all values read 0, select CANCEL and follow the injector correction factor (F-150) or injector quantity adjustment (all others) procedure as directed.

- Verify the PCM injector correction factor values (F-150) or injector quantity adjustment values (all others) displayed on the scan tool match with the injector correction factor value sticker (F-150) or injector quantity adjustment value sticker (all others) on the left hand valve cover (F-150) or the front engine timing cover (Transit and Transit Connect) or the crankcase vent oil separator (all others). Refer to the scan tool manufacturer's manual for specific information on the scan tool setup, operation, and specific cables and adapters required.

Do the PCM injector correction factor (F-150) or injector quantity adjustment values (all others) in the scan tool match the sticker on the engine?

Yes	GO to M9 .
No	ENTER the correct injector correction factor values (F-150) or injector quantity adjustment values (all others) into the PCM using a scan tool. Clear the PCM DTCs. REPEAT the self-test. VERIFY the repair by road testing the vehicle.

M9 RESET THE MIN FUEL MASS ADAPTION - ALL CYLINDERS

Note: All PIDs may not be available on all vehicles.

- Ignition ON, engine OFF.
- Using a scan tool, reset the min fuel mass adaptation - all cylinders. Refer to the scan tool manufacturer's manual for specific information on the scan tool setup, operation, and specific cables and adapters required.
- Ignition ON, engine running.
- Access the PCM and monitor the CYL_BAL_1 (MASS), CYL_BAL_2 (MASS), CYL_BAL_3 (MASS), CYL_BAL_4 (MASS), CYL_BAL_5 (MASS), CYL_BAL_6 (MASS), CYL_BAL_7 (MASS) and CYL_BAL_8 (MASS) PIDs.

Is the suspect cylinder contributing correctly?

Yes	Clear the PCM DTCs. REPEAT the self-test. VERIFY the repair by road testing the vehicle.
No	GO to M10 .

M10 CARRY OUT THE POWER BALANCE TEST

- Carry out the Power Balance Test. Refer to the scan tool manufacturer's manual for specific information on the scan tool setup, operation, and specific cables and adapters required.

Are all cylinders contributing correctly during the power balance test?

Yes	GO to M13 .
No	GO to M11 .

M11 CARRY OUT A CYLINDER COMPRESSION TEST ON THE SUSPECT CYLINDER

- Carry out a cylinder compression test on the suspect cylinder. Refer to the Workshop Manual Section 303-01, Engine.

Are any concerns present?

Yes	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	GO to M12 .

M12 VERIFY THE INJECTOR CORRECTION FACTOR VALUE OR INJECTOR QUANTITY ADJUSTMENT VALUE ON THE SUSPECT FUEL INJECTOR MATCHES WITH THE VALUE STORED IN THE PCM AND SHOWN ON THE ENGINE STICKER

- Verify the injector correction factor value (F-150) or injector quantity adjustment value (all others) on the suspect fuel injector matches with the value displayed on the scan tool and matches with the injector correction factor value sticker on the left hand valve cover (F-150) or the injector quantity adjustment value sticker on the front engine timing cover (Transit and Transit Connect) or the crankcase vent oil separator (all others). Refer to the scan tool manufacturer's manual for specific information on the scan tool setup, operation, and specific cables and adapters required.

Does the injector correction factor value (F-150) or injector quantity adjustment value (all others) on the suspect fuel injector match with the value displayed on the scan tool and match with the engine sticker?

Yes	For Transit, INSTALL a new Fuel Injector. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. CARRY OUT the Reset And Clear The Specified Function Reset Minimum Fuel Mass Adaptions For Cylinder X on the scan tool for the affected cylinder. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM) . Clear the PCM DTCs. REPEAT the self-test. For all others, INSTALL a new Fuel Injector. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. REPEAT the self-test.
No	ENTER the correct injector correction factor values (F-150) or injector quantity adjustment values (all others) into the PCM using a scan tool. Clear the PCM DTCs. REPEAT the self-test. VERIFY the repair by road testing the vehicle.

M13 CHECK FOR A BIASED FRP SENSOR

- Ignition ON, engine OFF.
- For Transit,
- Access the PCM and monitor the FRP_A (PRESS) PID.

- For all others,
- Access the PCM and monitor the FRP (PRESS) PID.

Is the PID value between 0 kPa (0 psi) and 6894 kPa (1,000 psi)?

Yes	For all vehicles with a no start condition, with or without DTC P2291, GO to M14 . For Transit and Transit Connect without a no start condition, GO to M17 . For all others, GO to M15 .
No	GO to Pinpoint Test MB .

M14 CHECK FOR SUFFICIENT FUEL PRESSURE IN THE FUEL RETURN LINE

- Ignition OFF.
- Wait 2 minutes.
- For Transit and Transit Connect,
- Disconnect the fuel return line at the fuel return fitting between the fuel injectors and the fuel cooler (Transit) or fuel return manifold (Transit Connect) and plug the line.
- Connect a suitable fuel hose to the fuel return fitting to check for fuel flow.
- Using a suitable clear container, catch any fuel that pours from the attached fuel hose.
- Ignition ON, engine OFF.
- Access the PCM and control the FP (MODE) PID.
- Command the FP PID to ON.
- For F-650 / F-750,
- Disconnect the fuel return line from cylinder number 8 fuel injector.
- Using a suitable clear container, catch any fuel that pours from the fuel return line.
- Ignition ON, engine OFF.
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the FPL_CMD PID to ON.
- Check for a visible steady stream of fuel from the fuel return line into the clear container.
- For all others,
- Disconnect the fuel return line from cylinder number 6 fuel injector (F-150) or cylinder number 8 fuel injector (all others).
- Using a suitable clear container, catch any fuel that pours from the fuel return line.
- Ignition ON, engine OFF.
- Access the PCM and control the FP (MODE) PID.
- Command the FP PID to ON.
- Check for a visible steady stream of fuel from the fuel return line into the clear container.

Is a steady stream of fuel from the attached fuel hose (Transit and Transit Connect) or the fuel return line (all others) visible?

Yes	For Transit and Transit Connect with a no start condition, REMOVE the fuel volume control valve solenoid and INSPECT for damage and corrosion. REPAIR as necessary. INSTALL a new Fuel Volume Control Valve solenoid. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CARRY OUT the Reset And Clear The Specified Function Fuel System - High Pressure Side on the scan tool. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM) . Clear the PCM DTCs. REPEAT the self-test. For Transit and Transit Connect without a no start condition, GO to M18 . For all others, CONNECT the fuel return line. GO to M15 .
No	CHECK the fuel return line for restrictions. REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.

M15 CHECK FOR FUEL INJECTOR RETURN LEAKS

- Ignition OFF.
- Wait 2 minutes.

- Disconnect the fuel injector return line where the left bank and right bank meet together (F-150) or from the secondary fuel filter (all others).
- Using a suitable clear container, catch any fuel that pours from the fuel return line.
- INSTALL the Fuel Line Return Plug, 8 MM (5/16") 310-193/2 to the female side of the return line connector to plug it (F-150) or the Fuel Line Return Plug, 8 MM (5/16") 310-193/3 to the secondary fuel filter return line port to plug it (all others).
- Ignition ON, engine OFF.
- For F-650 / F-750,
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the fuel pump ON.
- For all others,
- Access the PCM and control the FP (MODE) PID.
- Command the fuel pump ON.

Does fuel come out of the fuel return line?

Yes	GO to M16 .
No	REMOVE the Fuel Line Return Plug, 8 MM (5/16") 310-193/2 (F-150) or using the Fuel Line Disconnect Tool 310-250, remove the Fuel Line Return Plug, 8 MM (5/16") 310-193/3 from the secondary fuel filter (all others). Reconnect the fuel injector return line. For a no start condition with or without DTC P2291, GO to M20 . For all others, GO to M19 .

M16 CHECK THE LEFT BANK FUEL INJECTOR RETURN LINE FOR A LEAKING FUEL INJECTOR

- Find where the fuel injector return line from the left bank and right bank meet together and using hose locking pliers, pinch the line from the right bank.
- For F-650 / F-750,
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the fuel pump ON.
- For all others,
- Access the PCM and control the FP (MODE) PID.
- Command the fuel pump ON.

Does fuel come out of the fuel return line?

Yes	DISCONNECT the fuel injector return lines from the left bank of fuel injectors. CONNECT suitable fuel hoses to the fuel injector return ports on all of the fuel injectors on the left bank. Using a suitable clear container, catch any fuel that pours from the fuel injector return hoses. Run the low pressure fuel pump while observing which fuel injector return hose is leaking. INSTALL a new Fuel Injector for the cylinder in which the leaking fuel injector was observed. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. CARRY OUT the Reset And Clear The Specified Function Reset Minimum Fuel Mass Adaptions For Cylinder X on the scan tool for the affected cylinder. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM) . Clear the PCM DTCs. REPEAT the self-test.
No	DISCONNECT the fuel injector return lines from the right bank of fuel injectors. CONNECT suitable fuel hoses to the fuel injector return ports on all of the fuel injectors on the right bank. Using a suitable clear container, catch any fuel that pours from the fuel injector return hoses. Run the low pressure fuel pump while observing which fuel injector is leaking. INSTALL a new Fuel Injector for the cylinder in which the leaking fuel injector was observed. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. CARRY OUT the Reset And Clear The Specified Function Reset Minimum Fuel Mass Adaptions For Cylinder X on the scan tool for the affected cylinder. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM) . Clear the PCM DTCs. REPEAT the self-test.

M17 CHECK THE FUNCTIONALITY OF THE FRP SENSOR

- Ignition ON, engine running.

- Access the PCM and monitor the FRP (VOLT) PID.
- Access the PCM and control the RPMDSD (RPM) PID.
- Increase the engine speed to 1,400 RPM.
- Access the PCM and control the FRP_DSD (PRESS) PID.
- Increase the FRP_DSD PID pressure to 180 MPa (26,106 psi) and monitor the FRP voltage.
- Decrease the FRP_DSD PID pressure to 40 MPa (5,801 psi) and monitor the FRP voltage.

Does the FRP voltage increase and decrease when the FRP_DSD PID pressure is increased and decreased during each step?

Yes	GO to M18 .
No	GO to Pinpoint Test ME .

M18 CARRY OUT THE HIGH PRESSURE FUEL SYSTEM TEST

- Carry out the High Pressure Fuel System Test. Refer to the scan tool manufacturer's manual for specific information on the scan tool setup, operation, and specific cables and adapters required.

Is a concern present?

Yes	For Transit and Transit Connect, REMOVE the fuel volume control valve solenoid and INSPECT for damage and corrosion. REPAIR as necessary. INSTALL a new Fuel Volume Control Valve solenoid. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CARRY OUT the Reset And Clear The Specified Function Fuel System - High Pressure Side on the scan tool. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM) . Clear the PCM DTCs. REPEAT the self-test. For all others, GO to M20 .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

M19 CHECK THE FUEL PRESSURE CONTROL VALVE OPERATION

Note: If the fuel pressure control valve is stuck closed, fuel pressure builds in the fuel rail and the engine starts while a continuous DTC may be set.

Note: Only a small volume of fuel will drain out of the tube when commanding the F_PCV PID low, and may take some time to appear. Allow adequate time for the fuel flow to begin and stop.

- Ignition OFF.
- Disconnect the fuel return line at the front (F-150) or back (all others) of the left hand fuel rail and plug the line using the Diesel Fuel Flow Tester 310-193.
- Connect a suitable fuel hose to the fuel return rail fitting and route it through the wheel well and into a suitable container that is lower than the fuel return rail fitting.
- Ignition ON, engine OFF.
- Access the PCM and control the F_VCV (PER) PID.
- Command the F_VCV PID to the lowest duty cycle value.
- For F-650 / F-750,
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the FPL_CMD PID to ON.
- Access the PCM and control the F_PCV (PER) PID.
- Command the F_PCV PID to the lowest duty cycle value while observing the fuel flow from the left hand fuel rail.
- Command the F_PCV PID to the highest duty cycle value while observing the fuel flow the left hand fuel rail.
- For all others,
- Access the PCM and control the FP (MODE) PID.
- Command the FP PID to ON.
- Access the PCM and control the F_PCV (PER) PID.
- Command the F_PCV PID to the lowest duty cycle value while observing the fuel flow from the left hand fuel rail.
- Command the F_PCV PID to the highest duty cycle value while observing the fuel flow the left hand fuel rail.

Does the fuel flow from the left hand fuel rail while the F_PCV PID is commanded to the lowest duty cycle value and stop when the F_PCV PID is commanded to the highest duty cycle value?

Yes	GO to M21 .
No	REMOVE the Fuel Pressure Control Valve and INSPECT it for damage. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. If damage is present, INSTALL a new fuel rail assembly. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. If no damage is present, INSTALL a new Fuel Pressure Control Valve. CARRY OUT the Reset And Clear The Specified Function Fuel System - High Pressure Side on the scan tool. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM). Clear the PCM DTCs. REPEAT the self-test.

M20 CHECK THE FUEL VOLUME CONTROL VALVE OPERATION

- Ignition OFF.
- Disconnect the fuel return line at the front (F-150) or back (all others) of the left hand fuel rail and plug the line using the Diesel Fuel Flow Tester 310-193.
- Connect a suitable fuel hose to the fuel return rail fitting and route it through the wheel well and into a suitable container that is lower than the fuel return rail fitting.
- Ignition ON, engine OFF.
- Access the PCM and control the F_PCV (PER) PID.
- Command the F_PCV PID to the lowest duty cycle value.
- For F-650 / F-750,
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the FPL_CMD PID to ON.
- Access the PCM and control the F_VCV (PER) PID.
- Command the F_VCV PID to the lowest duty cycle value while observing the fuel flow from the left hand fuel rail.
- Command the F_VCV PID to the highest duty cycle value while observing the fuel flow from the left hand fuel rail.
- For all others,
- Access the PCM and control the FP (MODE) PID.
- Command the FP PID to ON.
- Access the PCM and control the F_VCV (PER) PID.
- Command the F_VCV PID to the lowest duty cycle value while observing the fuel flow from the left hand fuel rail.
- Command the F_VCV PID to the highest duty cycle value while observing the fuel flow from the left hand fuel rail.

Does the fuel flow from the fuel rail while the F_VCV PID is commanded to the lowest duty cycle value and stop when the F_VCV PID is commanded to the highest duty cycle value?

Yes	INSTALL a new Fuel Pressure Control Valve solenoid. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CARRY OUT the Reset And Clear The Specified Function Fuel System - High Pressure Side on the scan tool. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM). Clear the PCM DTCs. REPEAT the self-test.
No	REMOVE the fuel volume control valve solenoid and INSPECT for damage and corrosion. REPAIR as necessary. INSTALL a new Fuel Volume Control Valve solenoid. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CARRY OUT the Reset And Clear The Specified Function Fuel System - High Pressure Side on the scan tool. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM). Clear the PCM DTCs. REPEAT the self-test.

M21 CHECK THE VOLUME CONTROL VALVE OPERATION WITH THE FUEL PRESSURE CONTROL VALVE OPERATION VALIDATED

- Ignition OFF.

- Disconnect the fuel return line at the front (F-150) or back (all others) of the left hand fuel rail and plug the line using the Diesel Fuel Flow Tester 310-193.
- Connect a suitable fuel hose to the fuel return rail fitting that drains into a suitable container.
- Ignition ON, engine OFF.
- Access the PCM and control the F_PCV (PER) PID.
- Command the F_PCV PID to the lowest duty cycle value.
- For F-650 / F-750,
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the FPL_CMD PID to ON.
- Access the PCM and control the F_VCV (PER) PID.
- Command the F_VCV PID to the lowest duty cycle value while observing the fuel flow from the left hand fuel rail.
- Command the F_VCV PID to the highest duty cycle value while observing the fuel flow from the left hand fuel rail.
- For all others,
- Access the PCM and control the FP (MODE) PID.
- Command the FP PID to ON.
- Access the PCM and control the F_VCV (PER) PID.
- Command the F_VCV PID to the lowest duty cycle value while observing the fuel flow from the left hand fuel rail.
- Command the F_VCV PID to the highest duty cycle value while observing the fuel flow from the left hand fuel rail.

Does the fuel flow from the left hand fuel rail while the F_VCV PID is commanded to the lowest duty cycle value and stop when the F_VCV PID is commanded to the highest duty cycle value?

Yes	REMOVE the fuel pressure control valve solenoid and check for damage and corrosion. If a concern is present, CARRY OUT the Diesel Fuel System Contamination Repair/Flushing procedure. REFER to the Workshop Manual Section 310-00, Fuel System, General Procedures. If no damage or corrosion is found, GO to Pinpoint Test ZZ .
No	INSTALL a new Fuel Volume Control Valve solenoid. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CARRY OUT the Reset And Clear The Specified Function Fuel System - High Pressure Side on the scan tool. REFER to Section 2, Clear The Continuous Diagnostic Trouble Codes (DTCs) And Reset The Emission Monitors Information in The Powertrain Control Module (PCM) . Clear the PCM DTCs. REPEAT the self-test.