


DD: Fuel Rail Pressure (FRP), Fuel Rail Temperature (FRT) and Fuel Rail Pressure Temperature (FRPT) Sensors

 **WARNING:** Vehicle fuel systems are pressurized even when the engine is not running. To avoid fire or personal injury, disable the fuel delivery system and relieve fuel system pressure before removing any fuel system component. Refer to the fuel system information at the beginning of pinpoint HC.

This pinpoint test is intended to diagnose the following:

- Fuel rail pressure (FRP) sensor (6B288).
- Fuel rail temperature (FRT) sensor (4702).
- Fuel rail pressure temperature (FRPT) sensor (9G756).
- Harness circuits: FRP, FRT, and FRPT.
- Powertrain control module (PCM) (12A650).

Tables and Graphs**FRP SENSOR VOLTAGE AND PRESSURE SPECIFICATIONS**

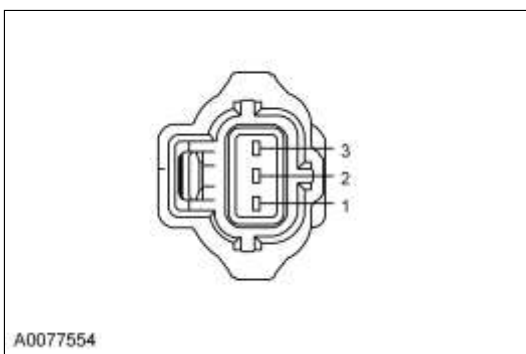
Voltage	Pressure (kPa)	Pressure (psi)
4.5	482	70
3.9	413	60
3.4	344	50
2.8	275	40
2.2	207	30
1.6	138	20
1.1	69	10
0.5	0	0

FRT SENSOR TEMPERATURE, VOLTAGE, AND RESISTANCE SPECIFICATIONS

Temperature		Sensor	
°C	°F	Volts	K Ohms
100	212	0.47	2.073
95	203	0.54	2.405
90	194	0.61	2.800
85	185	0.70	3.273
80	176	0.80	3.840
75	167	0.92	4.524
70	158	1.06	5.351
65	149	1.21	6.356
60	140	1.38	7.584
55	131	1.56	9.091
50	122	1.77	10.949
45	113	1.99	13.252

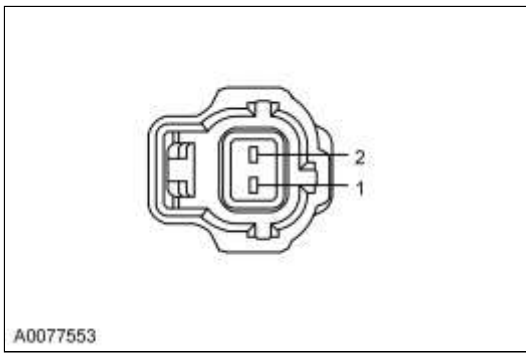
Temperature		Sensor	
°C	°F	Volts	K Ohms
40	104	2.23	16.123
35	95	2.48	19.720
30	86	2.74	24.253
25	77	3.00	30.000
20	68	3.26	37.332
15	59	3.50	46.745
10	50	3.73	58.911
5	41	3.95	74.745
0	32	4.13	95.501

Fuel Rail Pressure (FRP) Sensor Connector



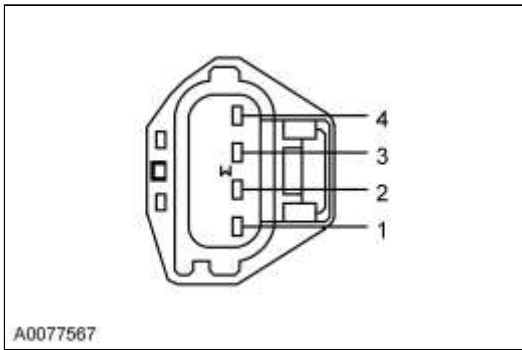
Pin	Circuit
3	FRP (Fuel Rail Pressure)
2	SIGRTN (Signal Return)
1	VREF (Reference Voltage)

Fuel Rail Temperature (FRT) Sensor Connector



Pin	Circuit
2	SIGRTN (Signal Return)
1	FRT (Fuel Rail Temperature)

Fuel Rail Pressure/Temperature (FRPT) Sensor Connector



Pin	Circuit
3	FRT (Fuel Rail Temperature)
1	FRP (Fuel Rail Pressure)
4	SIGRTN (Signal Return)
2	VREF (Reference Voltage)

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6.

Vehicle	Connector	Pin	Circuit
Aviator	150 (60-32-58) Pin	B20, E20 E17 E49	VREF SIGRTN FRP
Crown Victoria, Five Hundred, Freestyle, Grand Marquis, Montego	150 (50-50-50) Pin	E36 B40, E40 E41 E37	FRT VREF SIGRTN FRP
E-Series 4.6L	170 Pin	B40, E57 E58 E32	VREF SIGRTN FRP
Escape, Mariner	150 (50-50-50) Pin	E28 B40, E40 E41 E37	FRT VREF SIGRTN FRP
Expedition,	190 Pin	E19	FRT

Vehicle	Connector	Pin	Circuit
F-150 5.4L, F-150 4.2L, Navigator		B29, E57 E58 E32	VREF SIGRTN FRP
Explorer SportTrac	104 Pin	66 90 91 8	FRT VREF SIGRTN FRP
Explorer 4.0L, Mountaineer 4.0L	150 (50-50-50) Pin	E36 E40, T40 E41 E37	FRT VREF SIGRTN FRP
Explorer 4.6L, Mountaineer 4.6L	150 (50-50-50) Pin	E40, T40 E41 E37	VREF SIGRTN FRP
F-150 4.6L	190 Pin	B29, E57 E58 E32	VREF SIGRTN FRP
Focus	150 (50-50-50) Pin	E31 E40 E41 E37	FRT VREF SIGRTN FRP
Freestar/Monterey, Sable, Taurus	104 Pin	10 90 91 63	FRT VREF SIGRTN FRP
Ford GT	104 Pin	90 91 63	VREF SIGRTN FRP
LS, Thunderbird	150 (60-32-58) Pin	E4 B55, E14 E17 E49	FRT VREF SIGRTN FRP
Mustang	170 Pin	E19 B40, E24 E33 E32	FRT VREF SIGRTN FRP
Town Car	150 (50-50-50) Pin	E36 B40, E40 E41 B37	FRT VREF SIGRTN FRP
All other vehicles	170 Pin	E19 B40, E57 E58 E32	FRT VREF SIGRTN FRP

Note: With the engine running, the FRP PID value may be 48-70 kPa (7-10 psi) higher than a fuel pressure reading taken with a mechanical gauge.

DD1 CONTINUOUS MEMORY DTC P0190, KOEO AND KOER DTCS P0192 AND P0193: CHECK FRP SENSOR FOR FUEL LEAKS

Note: Repair any fuel pump DTCs prior to this test.

- Key ON, engine running.
- Idle the engine for 2 minutes.
- Inspect the FRP vacuum hose between the intake manifold and the FRP sensor for air leaks and correct connection.
- Key in OFF position.
- Remove the vacuum hose from the FRP.
- Inspect the FRP and vacuum hose for traces of fuel.

Is fuel present?

Yes	INSTALL a new FRP sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC.
No	GO to DD2 .

DD2 CHECK THE VREF AND SIGRTN CIRCUITS FOR AN OPEN IN THE HARNESS

- Connect the vacuum hose to the FRP.
- FRP Sensor connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) FRP Sensor Connector, Harness Side	(-) FRP Sensor Connector, Harness Side
VREF - Pin 1	SIGRTN - Pin 2

Is the voltage between 4.5 V - 5.5 V?

Yes	For DTC P0190, GO to DD9 . For DTC P0192, GO to DD3 . For DTC P0193, GO to DD5 .
No	GO to C1 .

DD3 INDUCE A HIGH VOLTAGE ON THE FRP CIRCUIT

- Key in OFF position.

Note: If a diagnostic tool communication concern exists, immediately remove the jumper and follow the NO path in the RESULT/ACTION column.

- Connect a 5 amp fused jumper wire between the following:

Point A FRP Sensor Connector, Harness Side	Point B FRP Sensor Connector, Harness Side
VREF - Pin 1	FRP - Pin 3

- Key ON, engine OFF.
- Access the PCM and monitor the FRP V PID.

Is the voltage greater than 4.5 V?

Yes	INSTALL a new FRP sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC.
No	GO to DD4 .

DD4 CHECK THE FRP CIRCUIT(S) FOR A SHORT TO SIGRTN OR GND IN THE HARNESS

- Key in OFF position.
- Remove the jumper wire(s).
- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRP	SIGRTN

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-)
FRP	Ground

Is the resistance greater than 10K ohms?

Yes	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .
No	REPAIR the short circuit.

DD5 CHECK THE FRP CIRCUIT FOR AN OPEN IN THE HARNESS

- Key in OFF position.
- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) FRP Sensor Connector, Harness Side
FRP	FRP - Pin 3

Is the resistance less than 5 ohms?

Yes	GO to DD6 .
No	REPAIR the open circuit.

DD6 CHECK THE FRP CIRCUIT FOR A SHORT TO VREF

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
VREF	FRP

Is the resistance greater than 10K ohms?

Yes	GO to DD7 .
No	REPAIR the short circuit.

DD7 CHECK THE FRP CIRCUIT FOR A SHORT TO POWER

- Key ON, engine OFF.
- Measure the voltage between:

(+) FRP Sensor Connector, Harness Side	(-)
FRP - Pin 3	Ground

Is any voltage present?

Yes	REPAIR the short circuit.
No	GO to DD8 .

DD8 INDUCE A LOW VOLTAGE ON THE FRP CIRCUIT

- Key in OFF position.
- PCM connector connected.

Note: If a diagnostic tool communication concern exists, immediately remove the jumper and follow the NO path in the RESULT/ACTION column.

- Connect a 5 amp fused jumper wire between the following:

Point A FRP Sensor Connector, Harness Side	Point B FRP Sensor Connector, Harness Side
FRP - Pin 3	SIGRTN - Pin 2

- Key ON, engine OFF.
- Access the PCM and monitor the FRP V PID.

Is the voltage less than 0.1 V?

Yes	INSTALL a new FRP sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC.
No	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .

DD9 DTC P0191: CHECK FOR FUEL PUMP DTCS

- Check for self-test DTCs.

Are DTCs P1233, P1234, P1235, P1236, P1237 or P1238 present?

Yes	DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .
No	GO to DD10 .

DD10 INSPECT ALL THE VACUUM HOSES CONNECTED TO THE INTAKE MANIFOLD FOR LEAKS

- Key in OFF position.
- FRP Sensor connector connected.
- Key ON, engine running.
- Allow the engine idle to stabilize.
- Inspect all the vacuum hoses connected to the intake manifold for leaks.

Are any vacuum hose concerns present?

Yes	ISOLATE the fault and REPAIR as necessary.
No	GO to DD11 .

DD11 CHECK THE FRP CONNECTOR FOR DAMAGE OR CORROSION

- Key in OFF position.
- FRP Sensor connector disconnected.
- Inspect the sensor, wiring, and connector for damage, corrosion, or water intrusion.

Is a concern present?

Yes	REPAIR as necessary.
No	GO to DD12 .

DD12 CHECK THE FRP PID

Note: The fuel pressure is likely to increase after the fuel pressure is relieved with the system closed. The rate and amount of the fuel pressure increase is dependent upon the ambient air and fuel temperatures.

Note: Prepare to record the FRP PID value within 5 seconds after the engine is shut off and also after the fuel pressure is relieved.

- FRP Sensor connector connected.
- Key ON, engine running.
- Allow the engine idle to stabilize.
- Access the PCM and monitor the FRP PID.
- Key in OFF position.
- Key ON, engine OFF.
- Record the FRP PID value within 5 seconds of the key off.
- Relieve the fuel pressure. Refer to the Workshop Manual Section 310-00 Fuel System for the Fuel System Pressure Release procedure.
- Disable the fuel pump.
- Key ON, engine OFF.
- Record the FRP PID value within 5 seconds of completing the fuel system pressure release procedure.

Is the difference between the recorded FRP PID values greater than 34 kPa (5 psi)?

Yes	GO to Pinpoint Test HC .
No	GO to DD13 .

DD13 COMPARE THE FRP PID TO THE MECHANICAL GAUGE

Note: Most mechanical gauges are referenced to atmospheric pressure. The FRP sensor is referenced to manifold pressure. In order to make a valid comparison, the engine must be off.

Note: The vehicle may exhibit a long crank until the fuel system is pressurized.

- Key in OFF position.
- Connect a mechanical fuel pressure gauge.
- Key ON, engine OFF.
- Monitor the mechanical gauge.
- Access the PCM and monitor the FRP PID.
- Compare the FRP PID value to the mechanical gauge.

- Key in OFF position.
- Pressurize the fuel system. Refer to the Workshop Manual Section 310-00 Fuel System for the Fuel System Pressure Release procedure to restore the fuel system pressure.
- Key ON, engine running.
- Allow the fuel pressure to stabilize.
- Key in OFF position.
- Key ON, engine OFF.
- Compare the FRP PID value to the mechanical gauge.

Are the FRP PID values within 34 kPa (5 psi) of the mechanical gauge readings?

Yes	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .
No	INSTALL a new FRP sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC .

DD14 CONTINUOUS MEMORY DTCS P0192 AND P0193: CHECK THE FRP CIRCUIT FOR AN INTERMITTENT CONCERN

Note: *Repair any fuel pump DTCs prior to this test.*

- Key ON, engine OFF.
- Access the PCM and monitor the FRP V PID.
- While observing the PID, carry out the following:
 - Tap on the sensor to simulate road shock.
 - Wiggle the sensor connector.
 - Wiggle, shake, and bend small sections of the wiring harness while working from the sensor to the PCM.
- Check the FRP connector for damage or corrosion.

Is a fault present?

Yes	ISOLATE the fault and REPAIR as necessary.
No	GO to Z1 .

DD15 KOEO AND KOER DTCS P0182 OR P0183: CHECK THE RESISTANCE OF THE FRT SENSOR

- Key in OFF position.
- FRT Sensor connector disconnected.
- Measure the resistance between:

(+) FRT Sensor Connector, Component Side	(-) FRT Sensor Connector, Component Side
FRT - Pin 1	SIGRTN - Pin 2

Is the resistance between 2K ohms - 96K ohms?

Yes	GO to DD16 .
No	INSTALL a new FRT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC .

DD16 CHECK THE FRT FOR INTERNAL SHORTS

- Measure the resistance between:

(+) FRT Sensor Connector, Component Side	(-)
FRT - Pin 1	Ground

Is the resistance greater than 10K ohms?

Yes	For DTC P0182, GO to DD17 . For DTC P0183, GO to DD19 .
No	INSTALL a new FRT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC .

DD17 CHECK THE FRT CIRCUIT(S) FOR A SHORT TO SIGRTN OR GND IN THE HARNESS

- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRT	SIGRTN

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-)
FRT	Ground

Is the resistance greater than 10K ohms?

Yes	GO to DD18 .
No	REPAIR the short circuit.

DD18 INDUCE A HIGH VOLTAGE ON THE FRT CIRCUIT

- PCM connector connected.
- Key ON, engine OFF.
- Access the PCM and monitor the FRT V PID.

Is the voltage greater than 4.5 V?

Yes	Unable to identify the fault at this time. GO to Z1 .
No	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .

DD19 CHECK THE FRT AND SIG RTN CIRCUIT(S) FOR AN OPEN IN THE HARNESS

- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) FRT Sensor Connector, Harness Side
FRT	FRT - Pin 1
SIGRTN	SIGRTN - Pin 2

Are the resistances less than 5 ohms?

Yes	GO to DD20 .
No	REPAIR the open circuit.

DD20 CHECK THE SENSOR SIGNAL FOR A SHORT TO VREF

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRT	VREF

Is the resistance greater than 10K ohms?

Yes	GO to DD21 .
No	REPAIR the short circuit to VREF.

DD21 INDUCE A LOW VOLTAGE ON THE FRT CIRCUIT

- PCM connector connected.
- Connect a 5 amp fused jumper wire between the following:

Point A FRT Sensor Connector, Harness Side	Point B FRT Sensor Connector, Harness Side
FRT - Pin 1	SIGRTN - Pin 2

- Key ON, engine OFF.
- Access the PCM and monitor the FRT V PID.

Is the voltage less than 0.2 V?

Yes	Unable to identify the fault at this time. GO to Z1 .
No	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .

DD22 DTC P0180: CHECK FOR THE PRESENCE OF DTC P0182 OR P0183

- Key ON, engine OFF.
- Check for self-test DTCs.

Are DTCs P0182 or P0183 present?

Yes	GO to DD15 .
No	GO to DD23 .

DD23 CHECK THE FRT CIRCUIT FOR AN INTERMITTENT CONCERN

- PCM connector connected.
- Access the PCM and monitor the FRT V PID.
- Carry out a thorough wiggle test on the FRT Sensor harness.

Is the FRT signal stable?

Yes	GO to DD25 .
No	ISOLATE the fault and REPAIR as necessary.

DD24 KOEO AND KOER DTC P0181: CHECK THE FRT_V PID

- Allow vehicle temperatures to stabilize prior to temperature sensor tests.
- Key ON, engine OFF.
- The normal test range is 0°C to 100°C (32°F to 212°F).
- Access the PCM and monitor the FRT V PID.

Is the voltage between 0.4 V - 4.5 V?

Yes	GO to DD25 .
No	DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .

DD25 COMPARE THE PIDS AFTER STABILIZING THE VEHICLE TEMPERATURE

- Access the PCM and monitor the FRT_TEMP, CHT and ECT PIDs.

Are the temperature PIDs nearly equal in value?

Yes	The fault is not present at this time CLEAR the DTCs. REPEAT the self-test.
No	GO to Z1 .

DD26 KOER AND CONTINUOUS MEMORY DTC P0190, KOEO AND KOER DTCS P0192 AND P0193: CHECK FRPT SENSOR FOR FUEL LEAKS

Note: Repair any fuel pump DTCs prior to this test.

- Key ON, engine running.
- Idle the engine for 2 minutes.
- Inspect the FRP vacuum hose between the intake manifold and the FRP sensor for air leaks and correct connection.
- Key in OFF position.
- Remove the vacuum hose from the FRPT.
- Inspect the FRPT and vacuum hose for traces of fuel.

Is fuel present?

Yes	INSTALL a new FRPT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC .
No	GO to DD27 .

DD27 CHECK THE VREF AND SIGRTN CIRCUITS FOR OPEN IN HARNESS

- Connect the vacuum hose to the FRPT.
- FRPT Sensor connector disconnected.
- Key ON, engine OFF.

- Measure the voltage between:

(+) FRPT Sensor Connector, Harness Side	(-) FRPT Sensor Connector, Harness Side
VREF - Pin 2	SIGRTN - Pin 4

Is the voltage between 4.5 V - 5.5 V?

Yes	For DTC P0190, GO to DD34 . For DTC P0192, GO to DD28 . For DTC P0193, GO to DD30 .
No	GO to C1 .

DD28 INDUCE A HIGH VOLTAGE ON THE FRPT CIRCUIT

- Key in OFF position.

Note: If a diagnostic tool communication concern exists, immediately remove the jumper and follow the NO path in the RESULT/ACTION column.

- Connect a 5 amp fused jumper wire between the following:

Point A FRPT Sensor Connector, Harness Side	Point B FRPT Sensor Connector, Harness Side
VREF - Pin 2	FRP - Pin 1

- Key ON, engine OFF.
- Access the PCM and monitor the FRP V PID.

Is the voltage greater than 4.5 V?

Yes	INSTALL a new FRPT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC .
No	GO to DD29 .

DD29 CHECK FRP CIRCUIT FOR SHORT TO FRT, SIGRTN, AND GND IN HARNESS

- Key in OFF position.
- Remove the jumper wire(s).
- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRP	SIGRTN
FRP	FRT

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-)
FRP	Ground

Is the resistance greater than 10K ohms?

Yes	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .
No	REPAIR the short circuit.

DD30 CHECK THE FRP CIRCUIT FOR AN OPEN IN THE HARNESS

- Key in OFF position.
- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) FRPT Sensor Connector, Harness Side
FRP	FRP - Pin 1

Is the resistance less than 5 ohms?

Yes	GO to DD31 .
No	REPAIR the open circuit.

DD31 CHECK FRP CIRCUIT FOR SHORT TO VREF AND FRT IN HARNESS

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRP	VREF
FRP	FRT

Are the resistances greater than 10K ohms?

Yes	GO to DD32 .
No	REPAIR the short circuit.

DD32 CHECK THE FRP CIRCUIT FOR A SHORT TO POWER

- Key ON, engine OFF.
- Measure the voltage between:

(+) FRPT Sensor Connector, Harness Side	(-)
FRP - Pin 1	Ground

Is any voltage present?

Yes	REPAIR the short circuit.
No	GO to DD33 .

DD33 INDUCE A LOW VOLTAGE ON THE FRPT CIRCUIT

- Key in OFF position.
- PCM connector connected.

Note: *If a diagnostic tool communication concern exists, immediately remove the jumper and follow the NO path in the RESULT/ACTION column.*

- Connect a 5 amp fused jumper wire between the following:

Point A FRPT Sensor Connector, Harness Side	Point B FRPT Sensor Connector, Harness Side
FRP - Pin 1	SIGRTN - Pin 4

- Key ON, engine OFF.
- Access the PCM and monitor the FRP V PID.

Is the voltage less than 0.01 V?

Yes	INSTALL a new FRPT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC.
No	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).

DD34 DTC P0191: CHECK FOR FUEL PUMP DTCS

- Check for self-test DTCS.

Are DTCs P1233, P1234, P1235, P1236, P1237 or P1238 present?

Yes	DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions.
No	GO to DD35.

DD35 INSPECT ALL THE VACUUM HOSES CONNECTED TO THE INTAKE MANIFOLD FOR LEAKS

- Key in OFF position.
- FRPT Sensor connector connected.
- Key ON, engine running.
- Allow the engine idle to stabilize.
- Inspect all the vacuum hoses connected to the intake manifold for leaks.

Are any vacuum hose concerns present?

Yes	ISOLATE the fault and REPAIR as necessary.
No	GO to DD36.

DD36 CHECK THE FRPT CONNECTOR FOR DAMAGE OR CORROSION

- Key in OFF position.
- FRPT Sensor connector disconnected.
- Inspect the sensor, wiring, and connector for damage, corrosion, or water intrusion.

Is a concern present?

Yes	REPAIR as necessary.
No	GO to DD37.

DD37 CHECK THE FRP PID

Note: The fuel pressure is likely to increase after the fuel pressure is relieved with the system closed. The rate and amount of the fuel pressure increase is dependent upon the ambient air and fuel temperatures.

Note: Prepare to record the FRP PID value within 5 seconds after the engine is shut off and also after the fuel pressure is relieved.

- FRPT Sensor connector connected.
- Key ON, engine running.
- Allow the engine idle to stabilize.
- Access the PCM and monitor the FRP PID.
- Key in OFF position.
- Key ON, engine OFF.
- Record the FRP PID value within 5 seconds of the key off.
- Relieve the fuel pressure. Refer to the Workshop Manual Section 310-00 Fuel System for the Fuel System Pressure Release procedure.
- Disable the fuel pump.
- Key ON, engine OFF.
- Record the FRP PID value within 5 seconds of completing the fuel system pressure release procedure.

Is the difference between the recorded FRP PID values greater than 34 kPa (5 psi)?

Yes	GO to Pinpoint Test HC.
No	GO to DD38.

DD38 COMPARE THE FRP PID TO THE MECHANICAL GAUGE

Note: Most mechanical gauges are referenced to atmospheric pressure. The FRPT sensor is referenced to manifold pressure. In order to make a valid comparison, the engine must be off.

Note: The vehicle may exhibit a long crank until the fuel system is pressurized.

- Key in OFF position.
- Connect a mechanical fuel pressure gauge.
- Key ON, engine OFF.
- Monitor the mechanical gauge.
- Access the PCM and monitor the FRP PID.
- Compare the FRP PID value to the mechanical gauge.
- Key in OFF position.
- Pressurize the fuel system. Refer to the Workshop Manual Section 310-00 Fuel System for the Fuel System Pressure Release procedure to restore the fuel system pressure.
- Key ON, engine running.
- Allow the fuel pressure to stabilize.
- Key in OFF position.
- Key ON, engine OFF.
- Compare the FRP PID value to the mechanical gauge.

Are the FRP PID values within 34 kPa (5 psi) of the mechanical gauge readings?

Yes	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).
No	INSTALL a new FRPT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC.

DD39 CONTINUOUS MEMORY DTCS P0192 AND P0193: CHECK THE FRPT CIRCUIT FOR AN INTERMITTENT CONCERN

Note: Repair any fuel pump DTCs prior to this test.

- Key ON, engine OFF.
- Access the PCM and monitor the FRP V PID.
- While observing the PID, carry out the following:
 - Tap on the sensor to simulate road shock.

- Wiggle the sensor connector.
- Wiggle, shake, and bend small sections of the wiring harness while working from the sensor to the PCM.
- Check the FRPT connector for damage or corrosion.

Is a fault present?

Yes	ISOLATE the fault and REPAIR as necessary.
No	GO to Z1 .

DD40 KOEO AND KOER DTCS P0182 OR P0183: CHECK THE RESISTANCE OF THE FRPT SENSOR

- Key in OFF position.
- FRPT Sensor connector disconnected.
- Measure the resistance between:

(+) FRPT Sensor Connector, Component Side	(-) FRPT Sensor Connector, Component Side
FRT - Pin 3	SIGRTN - Pin 4

Is the resistance between 2K ohms - 96K ohms?

Yes	GO to DD41 .
No	INSTALL a new FRPT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC .

DD41 CHECK THE FRPT FOR INTERNAL SHORTS

- Measure the resistance between:

(+) FRT Sensor Connector, Component Side	(-)
FRT - Pin 1	Ground

- Measure the resistance between:

(+) FRPT Sensor Connector, Component Side	(-) FRPT Sensor Connector, Component Side
FRT - Pin 3	FRP - Pin 1
FRT - Pin 3	VREF - Pin 2

Are the resistances greater than 10K ohms?

Yes	For DTC P0182, GO to DD42 . For DTC P0183, GO to DD44 .
No	INSTALL a new FRPT sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC .

DD42 CHECK THE FRT CIRCUIT(S) FOR A SHORT TO SIGRTN OR GND IN THE HARNESS

- PCM connector disconnected.

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRT	SIGRTN

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-)
FRT	Ground

Is the resistance greater than 10K ohms?

Yes	GO to DD43 .
No	REPAIR the short circuit.

DD43 FOR THE FRPT SENSOR INDUCE A HIGH VOLTAGE ON THE FRT CIRCUIT

- PCM connector connected.
- Key ON, engine OFF.
- Access the PCM and monitor the FRT V PID.

Is the voltage greater than 4.5 V?

Yes	Unable to identify the fault at this time. GO to Z1 .
No	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .

DD44 CHECK THE FRT AND SIG RTN CIRCUIT(S) FOR AN OPEN IN THE HARNESS

- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) FRPT Sensor Connector, Harness Side
FRT	FRT - Pin 3
SIGRTN	SIGRTN - Pin 4

Are the resistances less than 5 ohms?

Yes	GO to DD45 .
No	REPAIR the open circuit.

DD45 CHECK FRT SIGNAL FOR SHORT TO VREF AND FRP

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRT	VREF

(+) PCM Connector, Harness Side	(-) PCM Connector, Harness Side
FRT	FRP

Are the resistances greater than 10K ohms?

Yes	GO to DD46 .
No	REPAIR the short circuit.

DD46 FOR THE FRPT SENSOR INDUCE A LOW VOLTAGE ON THE FRT CIRCUIT

- PCM connector connected.
- Connect a 5 amp fused jumper wire between the following:

Point A FRPT Sensor Connector, Harness Side	Point B FRPT Sensor Connector, Harness Side
FRT - Pin 3	SIGRTN - Pin 4

- Key ON, engine OFF.
- Access the PCM and monitor the FRT V PID.

Is the voltage less than 0.2 V?

Yes	Unable to identify the fault at this time. GO to Z1 .
No	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .

DD47 DTC P0180: CHECK FOR THE PRESENCE OF DTC P0182 OR P0183

- Key ON, engine OFF.
- Check for self-test DTCs.

Are DTCs P0182 or P0183 present?

Yes	GO to DD40 .
No	GO to DD48 .

DD48 CHECK THE FRT CIRCUIT FOR AN INTERMITTENT CONCERN

- PCM connector connected.
- Access the PCM and monitor the FRT V PID.
- Carry out a thorough wiggle test on the FRT Sensor harness.

Is the FRT signal stable?

Yes	GO to DD50 .
No	ISOLATE the fault and REPAIR as necessary.

DD49 KOEO AND KOER DTC P0181: CHECK THE FRT_V PID

- Allow vehicle temperatures to stabilize prior to temperature sensor tests.
- Key ON, engine OFF.
- The normal test range is 0°C to 100°C (32°F to 212°F).
- Access the PCM and monitor the FRT V PID.

Is the voltage between 0.4 V - 4.5 V?

Yes	GO to DD50 .
No	DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .

DD50 COMPARE THE PIDS AFTER STABILIZING THE VEHICLE TEMPERATURE

- Access the PCM and monitor the FRT_TEMP, CHT and ECT PIDs.

Are the temperature PIDs nearly equal in value?

Yes	The fault is not present at this time CLEAR the DTCs. REPEAT the self-test.
No	GO to Z1 .

DD51 CONTINUOUS MEMORY DTCS P0182 OR P0183: INTERMITTENT CHECK

- Key ON, engine OFF.

Note: *The PID referred to below may read as EFT on some diagnostic tools.*

- Access the PCM and monitor the FRT V PID.
- While observing the PID, carry out the following:
 - Tap on the sensor to simulate road shock.
 - Wiggle the sensor connector.
 - Wiggle, shake, and bend small sections of the wiring harness while working from the sensor to the PCM.
- Check the FRT or FRPT and PCM connectors for damage and corrosion.

Is a fault present?

Yes	ISOLATE the fault and REPAIR as necessary.
No	DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .