Vehicle	Connector	Pin	Circuit
EcoSport 1.0L	B	2 1	FVRRTN FVR
Expedition, F-150 2.7L, F-150 3.3L, F-150 3.5L, Navigator, Ranger	D	2 1	FVRRTN FVR
F-150 5.0L	D	1 2	FVRRTN FVR
Ford GT	C	2 1	FVRRTN FVR
All other vehicles	E	2 1	FVRRTN FVR

Powertrain Control Module (PCM) Connector

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

Vehicle	Connector	Pin	Circuit
Aviator, Explorer 3.0L, Explorer 3.3L, F-150 2.7L, F-150 3.3L, F-150 5.0L, Mustang 5.0L, Transit TiVCT 3.5L	306 PIN	E107 E86	FVRRTN FVR
Corsair, Escape/Kuga, Explorer 2.3L, Mustang 2.3L	198 PIN	E84 E79	FVRRTN FVR
EcoSport 1.0L Manual Transmission	198 PIN	E78 E79	FVRRTN FVR
Edge 2.7L, Nautilus 2.7L, Transit GTDI 3.5L	306 PIN	E77 E78	FVRRTN FVR
Expedition, F-150 3.5L, Navigator	198 PIN	E95 E90	FVRRTN FVR
All other vehicles	198 PIN	E77 E78	FVRRTN FVR

HP1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS)

Note: *Diagnose and repair all circuit DTCs before diagnosing P0087 or P0088.*

- Ignition ON, engine OFF.
- Clear the PCM DTCs.
- Carry out the PCM self-test.

Are DTCs P0001, P0003, P0004, P0087, P0088, P00C6 or P053F present?

Yes	For DTC P0087, GO to HP2. For DTC P0088, GO to HP10. For DTCs P00C6 or P053F, GO to HP4. For all others, GO to HP5.
No	RETURN to Section 3, Symptom Charts for further direction.

HP2 CHECK THE LOW PRESSURE FUEL SYSTEM PRESSURE WITH ENGINE RUNNING

- Ignition OFF.
- Relieve the fuel pressure. Refer to the Workshop Manual Section 310-00, Fuel System for the Fuel System Pressure Release procedure.
- Mechanical fuel pressure gauge connected.
- Ignition ON, engine OFF.
- Pressurize the fuel system. Refer to the Workshop Manual Section 310-00, Fuel System for the Fuel System Pressure Release procedure to pressurize the fuel system.
- Ignition ON, engine running.
- Monitor the mechanical fuel pressure gauge.

Is the low pressure fuel system pressure greater than 310 kPa (45 psi)?

Yes	GO to HP3.
No	GO to Pinpoint Test HC.

HP3 COMPARE THE FLP PID TO THE MECHANICAL GAUGE

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

- Ignition 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.
- Ignition ON, engine OFF.
- Monitor the mechanical gauge.
- Access the PCM and monitor the FLP (PRESS) PID.
- Compare the FLP PID to the mechanical gauge.
- Ignition OFF.
- Pressurize the fuel system. Refer to the Workshop Manual Section 310-00, Fuel System for the Fuel System Pressure Release procedure to pressurize the fuel system.
- Ignition ON, engine running.
- Allow the fuel pressure to stabilize.
- Ignition OFF.
- Ignition ON, engine OFF.
- Compare the FLP PID to the mechanical gauge.

Are the FLP PID values within 153 kPa (22 psi) of the mechanical gauge readings?

Yes	GO to HP4.
No	INSTALL a new Fuel Pressure Sensor. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC. REFER to the Workshop Manual Section 310-01, Fuel Tank and Lines. Clear the PCM DTCs. REPEAT the self-test.

HP4 CHECK FOR LOW PRESSURE FUEL SYSTEM LEAKDOWN

- Relieve the fuel pressure. Refer to the Workshop Manual Section 310-00, Fuel System for the Fuel System Pressure Release procedure.
- Mechanical fuel pressure gauge connected.
- Ignition ON, engine OFF.
- Pressurize the fuel system. Refer to the Workshop Manual Section 310-00, Fuel System for the Fuel System Pressure Release procedure to pressurize the fuel system.
- Cycle the ignition several times to charge the fuel system.
- Ignition OFF.
- Wait 15 minutes.

Is the low pressure fuel system pressure greater than 310 kPa (45 psi)?

Yes	GO to HP5.
No	GO to Pinpoint Test HC.

HP5 CHECK THE FUEL INJECTION PUMP RESISTANCE

- Ignition OFF.
- Fuel Injection Pump connector disconnected.
- Measure the resistance between:

(+) Fuel Injection Pump Connector, Component Side	(-) Fuel Injection Pump Connector, Component Side
FVR	FVRRTN

Is the resistance between 0.3 - 3.1 ohms?

Yes	GO to HP6.
No	INSTALL a new Fuel Injection Pump. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. REPEAT the self-test.

HP6 CHECK THE FVR AND FVRRTN CIRCUITS FOR AN OPEN

- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) Fuel Injection Pump Connector, Harness Side
FVR	FVR
FVRRTN	FVRRTN

Are the resistances less than 5 ohms?

Yes	For DTC P0087, GO to HP10. For all others, GO to HP7.
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

HP7 CHECK THE FVR AND FVRRTN CIRCUITS FOR A SHORT TO GROUND

- Measure the resistance between:

(+) Fuel Injection Pump Connector, Harness Side	(-)
FVR	Ground
FVRRTN	Ground

Are the resistances greater than 10K ohms?

Yes	GO to HP8.
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

HP8 CHECK FOR THE FVR AND FVRRTN CIRCUITS SHORTED TOGETHER

- Measure the resistance between:

(+) Fuel Injection Pump Connector, Harness Side	(-) Fuel Injection Pump Connector, Harness Side
FVR	FVRRTN

Is the resistance greater than 10K ohms?

Yes	GO to HP9.
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

HP9 CHECK THE FVRRTN CIRCUIT FOR A SHORT TO VOLTAGE

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

(+) Fuel Injection Pump Connector, Harness Side	(-)
FVRRTN	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	For DTC P00C6, GO to HP10. For all others, GO to HP12.

HP10 CHECK FOR CORRECT FUEL INJECTION PUMP OPERATION

- Fuel Injection Pump connector disconnected.
- Visually inspect for:
  - pushed out pins
  - corrosion
- Fuel Injection Pump connector connected.
- Ignition ON, engine OFF.
- Clear the PCM DTCs.
- Ignition ON, engine running.
- Wait 15 seconds.
- Carry out the PCM self-test.

Are DTCs P0087, P0088 or P00C6 present?

Yes	For DTCs P0087 or P0088, GO to Pinpoint Test Z. For all others, INSTALL a new Fuel Injection Pump. REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. REPEAT the self-test.
No	For DTC P053F, GO to HP11. For all others, The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

HP11 CHECK FOR DTC

- Clear the PCM DTCs.
- Allow the engine to cold soak long enough for the engine coolant temperature to drop below 37.8°C (100°F).
- Ignition ON, engine running.
- Allow the engine to idle for 6 minutes.
- Carry out the PCM self-test.

Is DTC P053F present?

Yes	GO to HP12.
No	The test is complete and no concerns are present. Clear the PCM DTCs. REPEAT the self-test.

HP12 CHECK FOR CORRECT OPERATION

- Disconnect all the PCM connectors.
- Fuel Injection Pump connector disconnected.
- Visually inspect for:
  - pushed out pins
  - corrosion
- Connect all the PCM connectors, and the fuel injection pump connector, and make sure they seat correctly.
- Ignition ON, engine OFF.
- Clear the PCM DTCs.
- Carry out the PCM self-test.
- Verify the concern is still present.

Is the concern still present?

Yes	For DTC P0003, GO to HP13. For all others, INSTALL a new Fuel Injection Pump.

	REFER to the fuel system WARNING information at the beginning of Pinpoint Test HC. GO to Pinpoint Test HC. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. REPEAT the self-test.
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

HP13 CHECK FOR CORRECT PCM OPERATION

- Disconnect all the PCM connectors.
- Visually inspect for:
  - pushed out pins
  - corrosion
- Connect all the PCM connectors and make sure they seat correctly.
- Carry out the PCM self-test.
- Verify the concern is still present.

Is the concern still present?

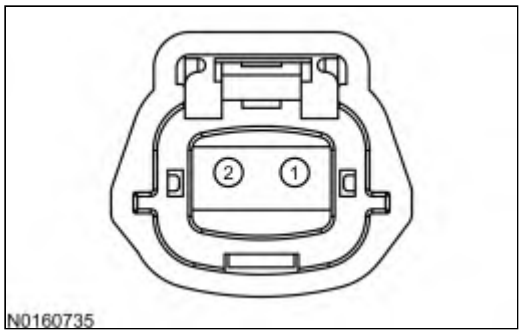
Yes	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a Replacement PCM.
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

HU: Intake Air Systems

This pinpoint test is intended to diagnose the following:

- air cleaner assembly (including air cleaner element) (9600)
- air inlet tube (9F843)
- clean air tube hose and resonator (9R504) and (9F593)
- intake manifold runner control bank 1 (IMRC1) solenoid (9J559)
- intake manifold runner control bank 2 (IMRC2) solenoid (9J559)
- intake manifold runner control bank 1 (IMRC1) sensor (9P471)
- intake manifold runner control bank 2 (IMRC2) sensor (9P471)
- throttle body assembly (9E926)
- harness circuits: IMRC, IMRC1, IMRC1A, IMRC2, IMRC2A, SIGRTN, VPWR and VREF
- PCM (12A650)

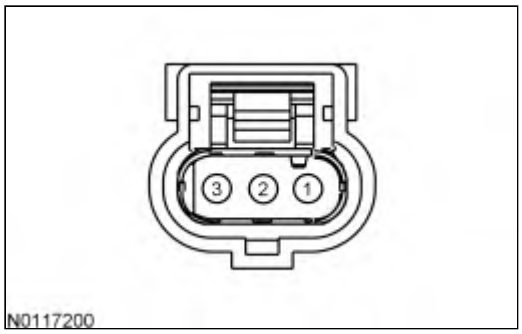
Intake Manifold Runner Control Bank 1 (IMRC1) Solenoid Connector



Pin	Circuit
1	VPWR (Vehicle Power)
2	IMRC1A (Intake Manifold Runner Control Bank 1 Actuator)

Intake Manifold Runner Control Bank 1 (IMRC1) Sensor Connector

A



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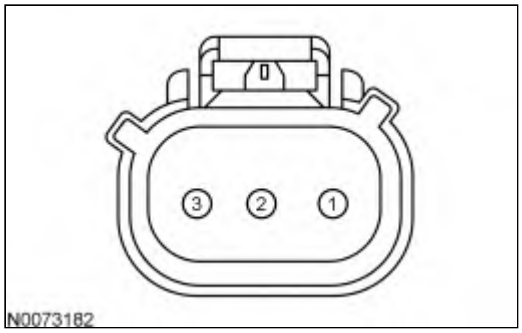
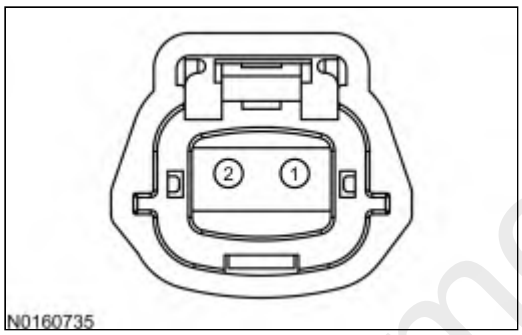


Vehicle	Connector	Pin	Circuit
F-150	A	2 1 3	IMRC1 SIGRTN VREF
F-Series Super Duty, Mustang	B	1 3 2	IMRC1 SIGRTN VREF

Intake Manifold Runner Control Bank 2 (IMRC2) Solenoid Connector



Pin	Circuit
1	VPWR (Vehicle Power)
2	IMRC2A (Intake Manifold Runner Control Bank 2 Actuator)

Intake Manifold Runner Control Bank 2 (IMRC2) Sensor Connector

A