ME: Fuel Pump Control

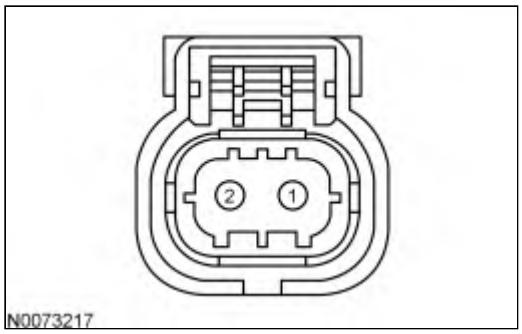
WARNING: Contact with exposed fuel injector wiring, if energized, may result in electric shock. Use care when working on or around energized fuel injector wiring. Fuel injector wiring supplies high voltage to operate the fuel injectors. Failure to follow this instruction may result in serious personal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

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:

- harness circuits: FPCV, FVCV, VBPWR and VPWR
- fuel volume control valve (9J307)
- fuel pressure control valve (9C968)
- PCM (12A650)

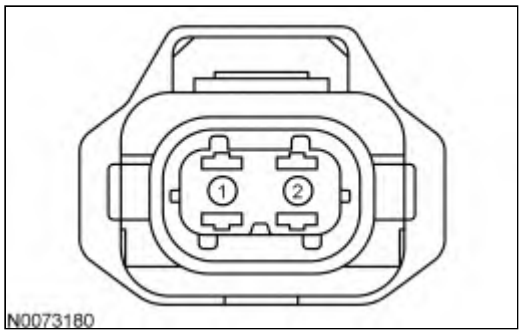
Fuel Pressure Control Valve Solenoid Connector



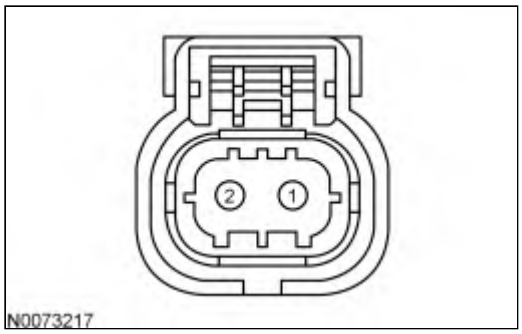
Pin	Circuit
2	FPCV (Fuel Pressure Control Valve)
1	VPWR (Vehicle Power)

Fuel Volume Control Valve Solenoid Connector

A



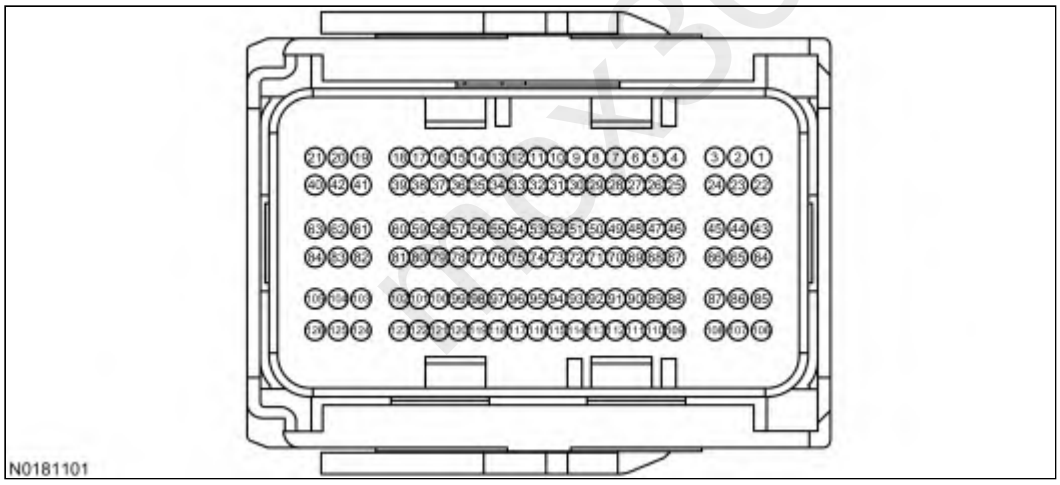
B



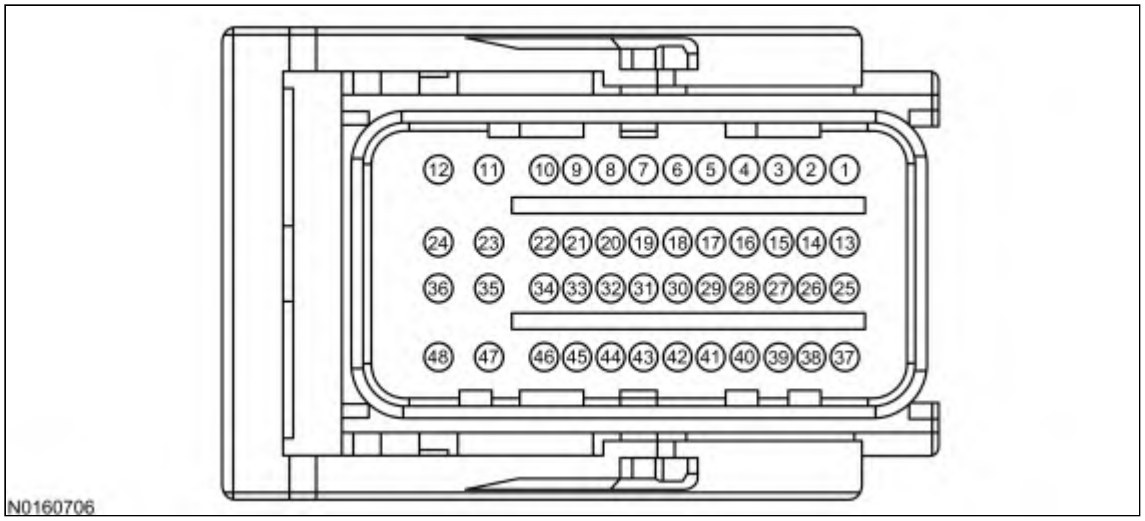
Vehicle	Connector	Pin	Circuit
Transit Connect	A	2 1	FVCV VBPWR
All other vehicles	B	2 1	FVCV VPWR

Powertrain Control Module-E (PCM-E) Connector

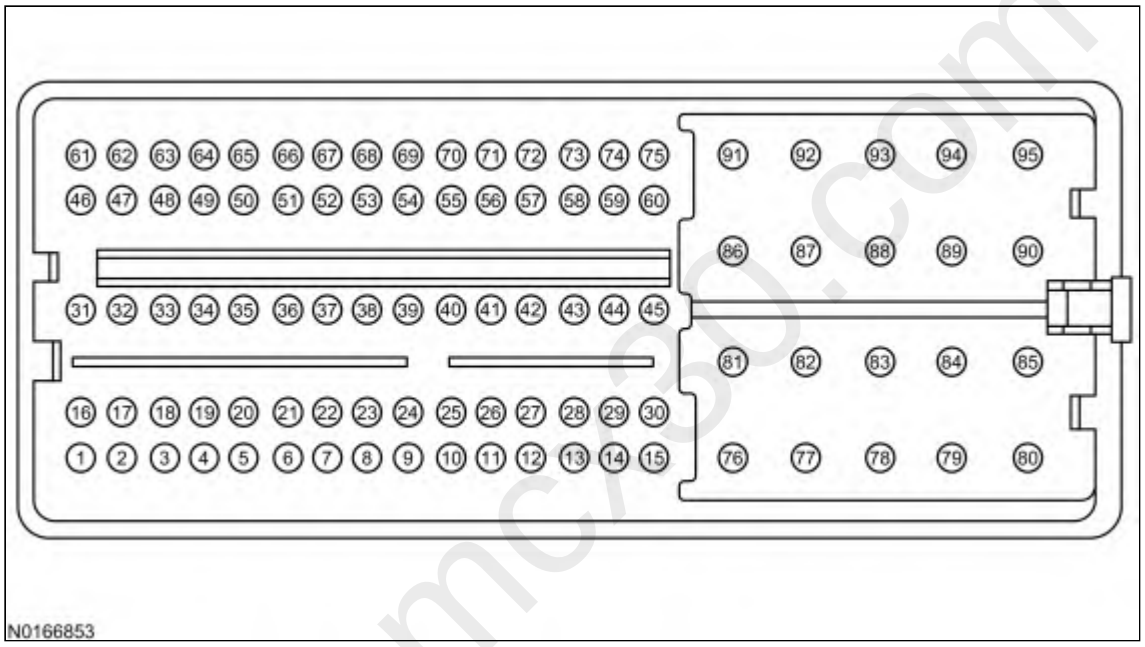
A



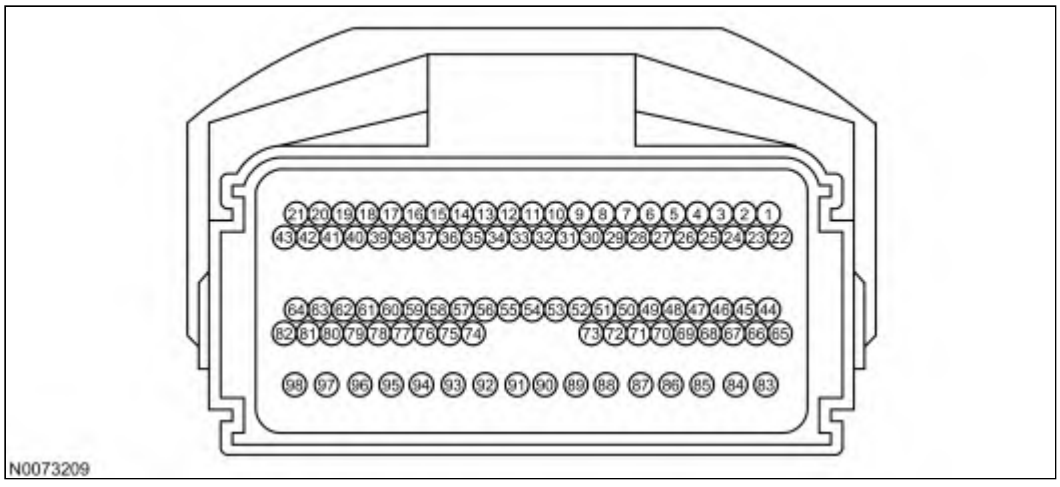
B


12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
36 35 34 33 32 31 30 29 28 27 26 25
48 47 46 45 44 43 42 41 40 39 38 37
N0160706

C


61 62 63 64 65 66 67 68 69 70 71 72 73 74 75
46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
91 92 93 94 95
86 87 88 89 90
81 82 83 84 85
76 77 78 79 80
N0166853

D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43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22
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82 81 80 79 78 77 76 75 74
73 72 71 70 69 68 67 66 65
98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83
N0073209

Vehicle	Connector	Pin	Circuit
F-Series Super Duty	A	43 1	FPCV FVCV
Transit	B	25	FVCV
Transit Connect	C	76 81	FPCV FVCV
All other vehicles	D	3 22	FPCV FVCV

ME1 CHECK FOR DTCS
Are DTCs P0001, P0002, P0003, P0004, P0089, P0090, P0091 or P0092 present?

Yes	For F-650 / F-750 and F-Series Super Duty, GO to ME2. For all others, GO to ME3.
No	For F-Series Super Duty and F-650 / F-750 with an engine no start concern, GO to ME2. For symptoms without DTCs, GO to ME2. For all others, RETURN to Section 3, Symptom Charts for further direction.

ME2 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 ME3.
No	REPAIR the open VPWR circuit. Clear the PCM DTCs. REPEAT the self-test.

ME3 CHECK THE VPWR OR VBPWR CIRCUIT FOR VOLTAGE

- Ignition OFF.
- Fuel Volume Control Valve Solenoid connector disconnected.
- For Transit,
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)
VPWR	Ground

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

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)
VBPWR	Ground

- For all others,
- Fuel Pressure Control Valve Solenoid connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Fuel Pressure Control Valve Solenoid Connector, Harness Side	(-)
VPWR - Pin 1	Ground

- Measure the voltage between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)
VPWR	Ground

Are the voltages greater than 10.5 V?

Yes	GO to ME4.
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

ME4 CHECK THE FPCV AND FVCV CIRCUITS FOR AN OPEN

- Ignition OFF.
- PCM-E connector disconnected.
- For Transit and Transit Connect,
- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-) PCM-E Connector, Harness Side
FVCV	FVCV

- For all others,
- Measure the resistance between:

(+) Fuel Pressure Control Valve Solenoid Connector, Harness Side	(-) PCM-E Connector, Harness Side
FPCV - Pin 2	FPCV

- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-) PCM-E Connector, Harness Side
FVCV	FVCV

Are the resistances less than 5 ohms?

Yes	GO to ME5.
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

ME5 CHECK THE FPCV AND FVCV CIRCUITS FOR A SHORT TO GROUND

- For Transit and Transit Connect,
- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)
FVCV	Ground

- For all others,
- Measure the resistance between:

(+) Fuel Pressure Control Valve Solenoid Connector, Harness Side	(-)
FPCV - Pin 2	Ground

- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)
FVCV	Ground

Are the resistances greater than 10K ohms?

Yes	GO to ME6.
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

ME6 CHECK THE FPCV AND FVCV CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- For Transit and Transit Connect,
- Measure the voltage between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)
FVCV	Ground

- For all others,
- Measure the voltage between:

(+) Fuel Pressure Control Valve Solenoid Connector, Harness Side	(-)
FPCV - Pin 2	Ground

- Measure the voltage between:

(+) Fuel Volume Control Valve Solenoid Connector, Harness Side	(-)
FVCV	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to ME7.

ME7 CHECK THE FUEL PRESSURE CONTROL VALVE SOLENOID AND FUEL VOLUME CONTROL VALVE SOLENOID RESISTANCE AT THE COMPONENT

- Ignition OFF.
- For Transit,
- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Component Side	(-) Fuel Volume Control Valve Solenoid Connector, Component Side
FVCV	VPWR

- For Transit Connect,
- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Component Side	(-) Fuel Volume Control Valve Solenoid Connector, Component Side
FVCV	VBPWR

- For all others,
- Measure the resistance between:

(+) Fuel Pressure Control Valve Solenoid Connector, Component Side	(-) Fuel Pressure Control Valve Solenoid Connector, Component Side
FPCV - Pin 2	VPWR - Pin 1

- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Component Side	(-) Fuel Volume Control Valve Solenoid Connector, Component Side
FVCV	VPWR

Are the resistances between 1.5 to 15 ohms (Transit) or 2 to 6 ohms (all others)?

Yes	GO to ME8.

No	INSTALL a new Fuel Pressure Control Valve or Fuel Volume Control Valve as necessary. 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.

ME8 CHECK THE FUEL PRESSURE CONTROL VALVE SOLENOID AND FUEL VOLUME CONTROL VALVE SOLENOID FOR A SHORT TO GROUND

- For Transit and Transit Connect,
- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Component Side	(-)
FVCV	Ground

- For all others,
- Measure the resistance between:

(+) Fuel Pressure Control Valve Solenoid Connector, Component Side	(-)
FPCV - Pin 2	Ground

- Measure the resistance between:

(+) Fuel Volume Control Valve Solenoid Connector, Component Side	(-)
FVCV	Ground

Are the resistances greater than 10,000 ohms?

Yes	For Transit, GO to ME9. For all others, GO to ME10.
No	INSTALL a new Fuel Pressure Control Valve or Fuel Volume Control Valve as necessary. 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.

ME9 CHECK THE FUNCTIONALITY OF THE FRP SENSOR

- PCM-E connector connected.
- Fuel Volume Control Valve Solenoid connector connected.
- 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	The test is complete and no concerns are present. Clear the PCM DTCs. REPEAT the self-test.
No	INSTALL a new High Pressure Fuel Injection Pump. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. CARRY OUT the Reset And Clear The Specified Function Fuel System - High Pressure Side on the scan tool. 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.

ME10 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).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.