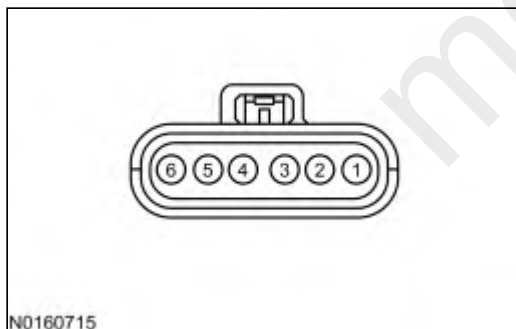


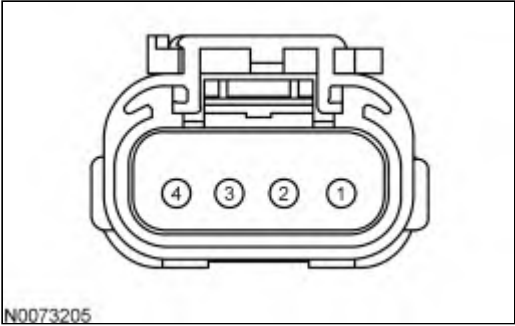
MA: Fuel Pump Control - Low Pressure Pump

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:

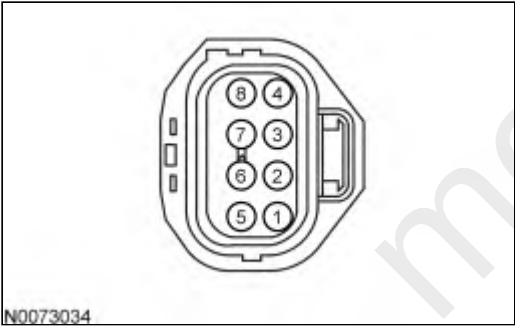
- fuel pump (FP) (9H307)
- fuel pump control module (9D412)
- fuel pump relay
- harness circuits: B+, GND, FP, FPC, FPM, FPPWR, FPRTN, and VPWR Fuel
- PCM (12A650)

Fuel Pump (FP) Assembly Connector**A****B****C**



Vehicle	Connector	Pin	Circuit
F-650 / F-750	A	1	FPGND
		2	FPPWR-B
Transit	B	3	FPRTN
		4	FPPWR
Transit Connect	B	5	FPRTN
		1	FPPWR
All other vehicles	C	3	FPRTN
		4	FPPWR

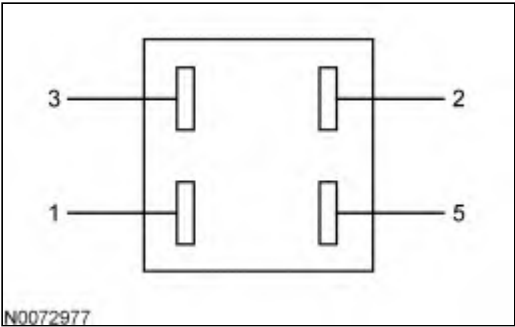
Fuel Pump Control Module Connector



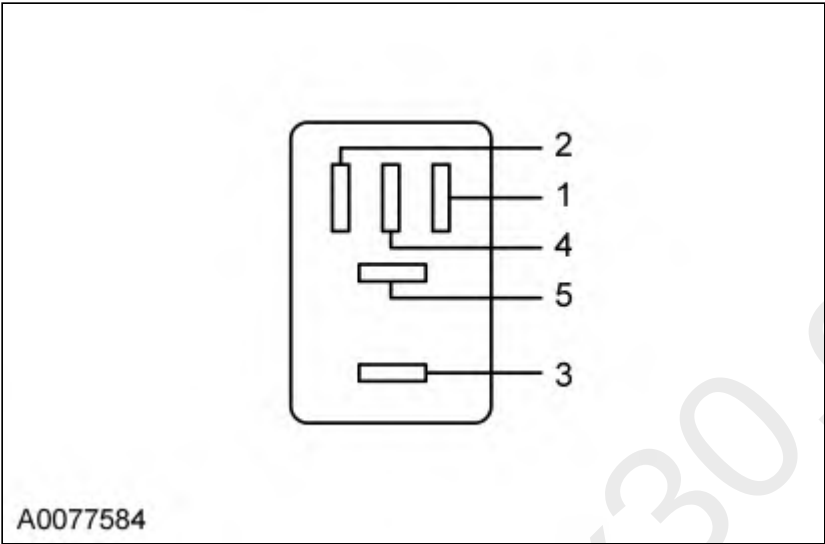
Pin	Circuit
8	FPRTN (Fuel Pump Return)
5	FPPWR (Fuel Pump Power)
7	FPM (Fuel Pump Monitor)
3	FPC (Fuel Pump Command)
4	GND (Ground)
1	VPWR Fuel

Fuel Pump (FP) Relay Connector

A

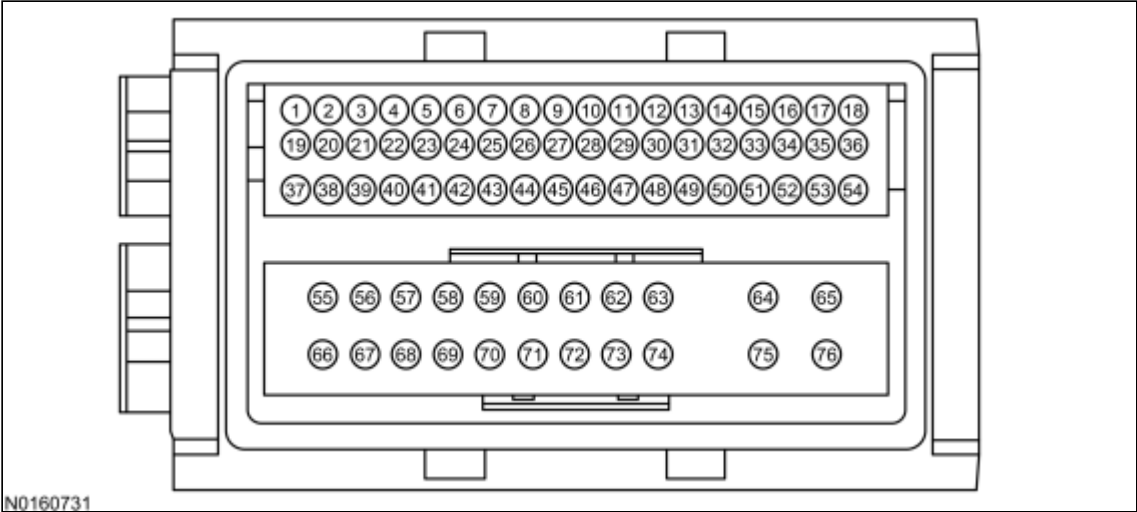


B



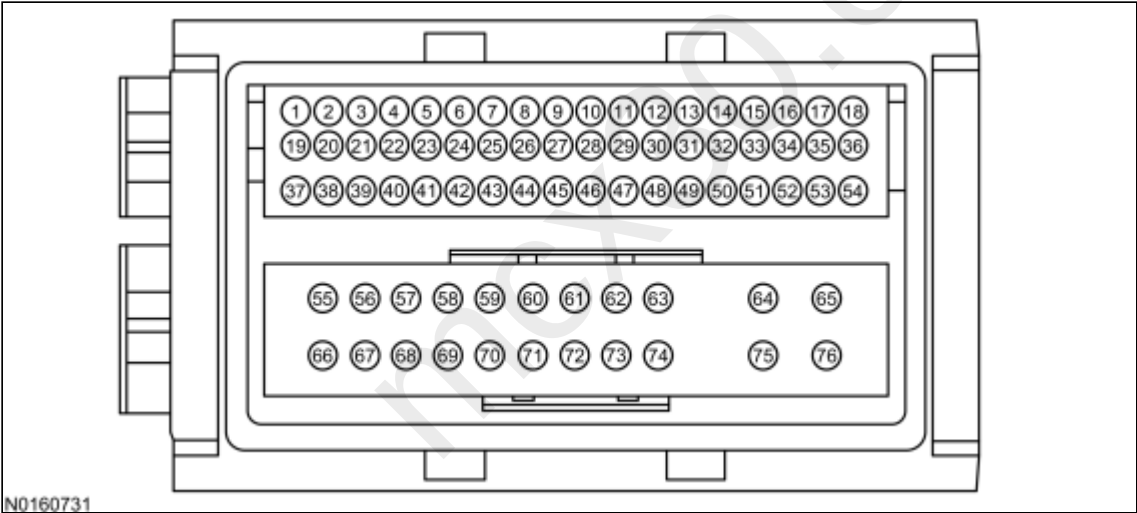
Vehicle	Connector	Pin	Circuit
F-650 / F-750	A	2	FPC
		5	FPPWR-A
		1, 3	B+
Transit	B	2	FP
		1, 3	B+
		5	VPWR Fuel

Body Control Module-C (BCM-C) Connector



Pin	Circuit
12	FP (Fuel Pump)

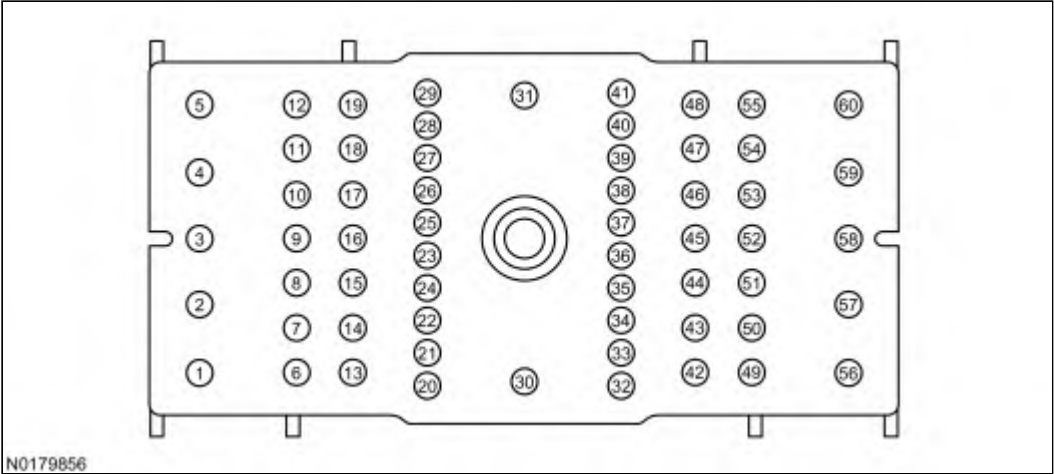
Body Control Module-F (BCM-F) Connector



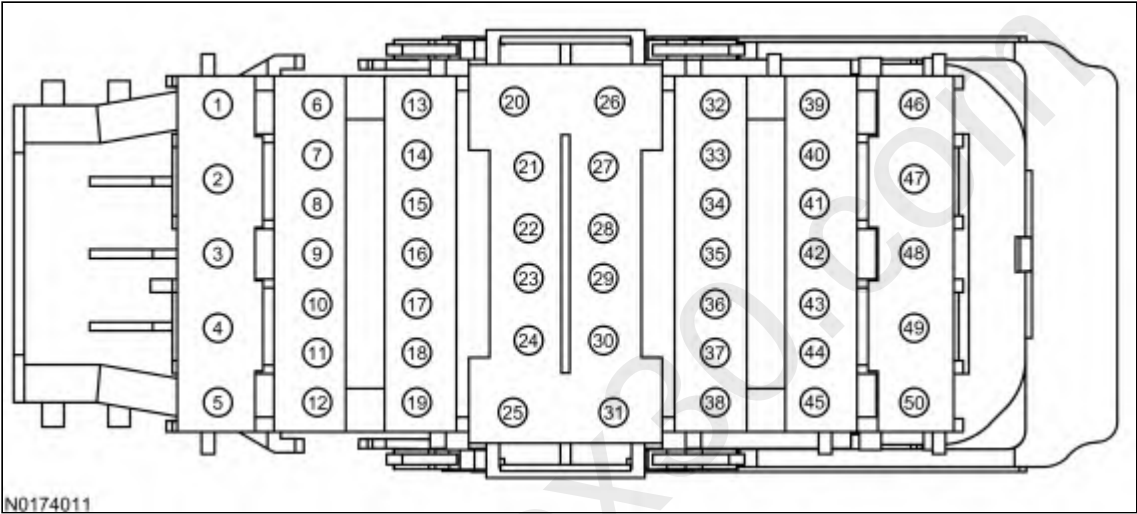
Pin	Circuit
13	IES (Impact Event Signal)

Battery Junction Box-A (BJB-A) Connector

A

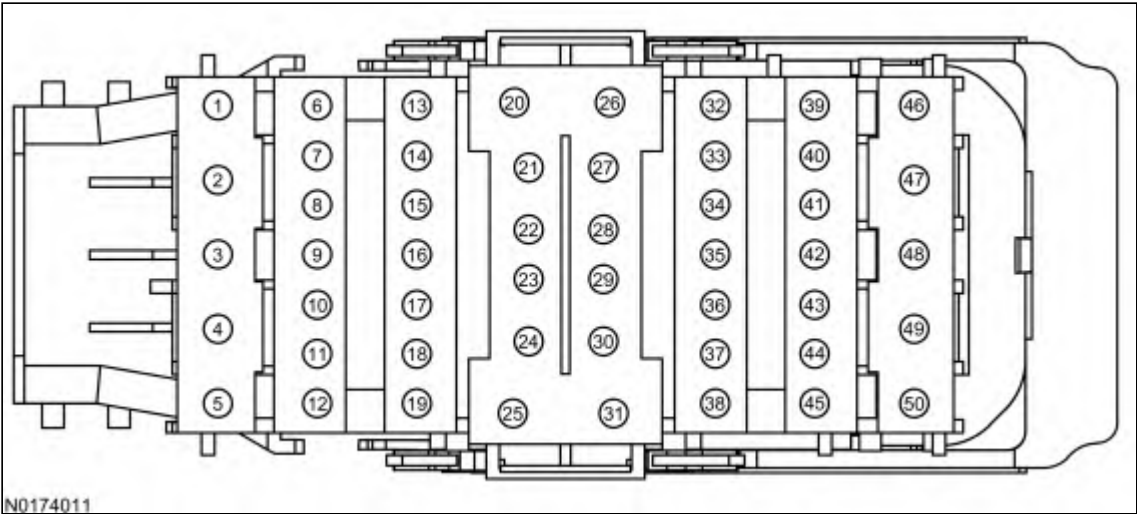


B



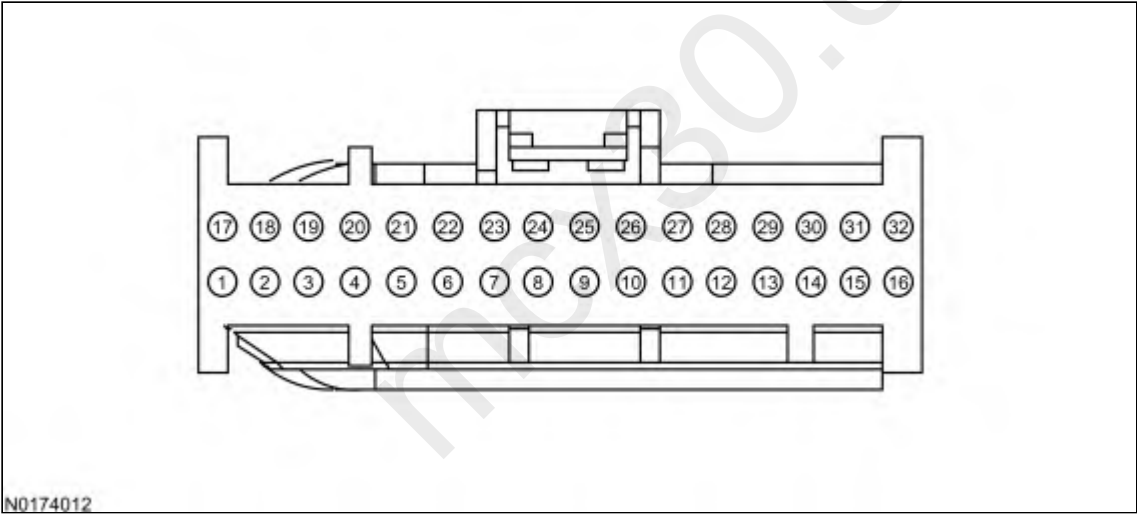
Vehicle	Connector	Pin	Circuit
F-Series Super Duty	A	26 19	FP VPWR Fuel
Transit Connect	B	6	FP

Battery Junction Box-B (BJB-B) Connector



Pin	Circuit
50	VPWR Fuel

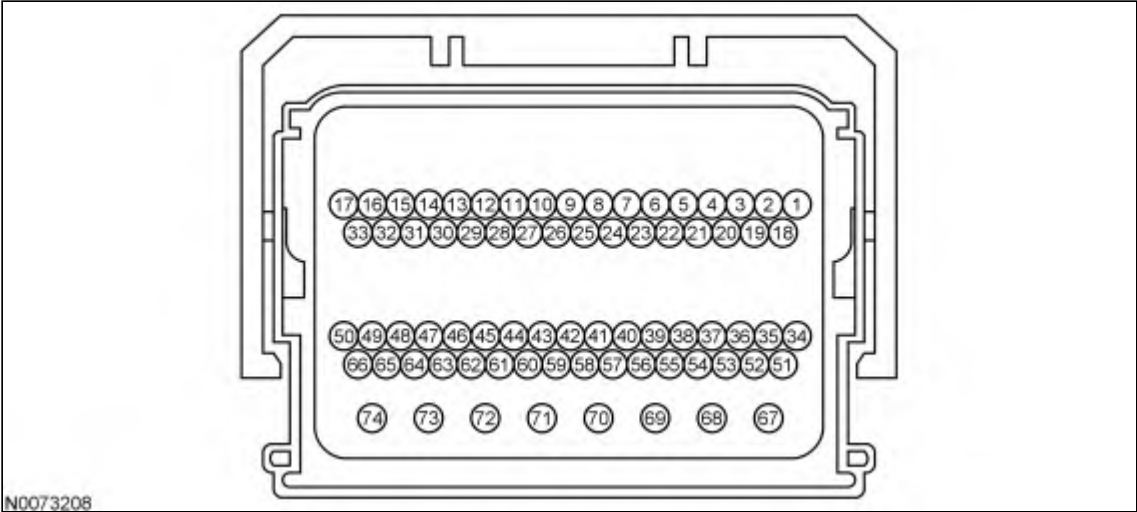
Battery Junction Box-C (BJB-C) Connector



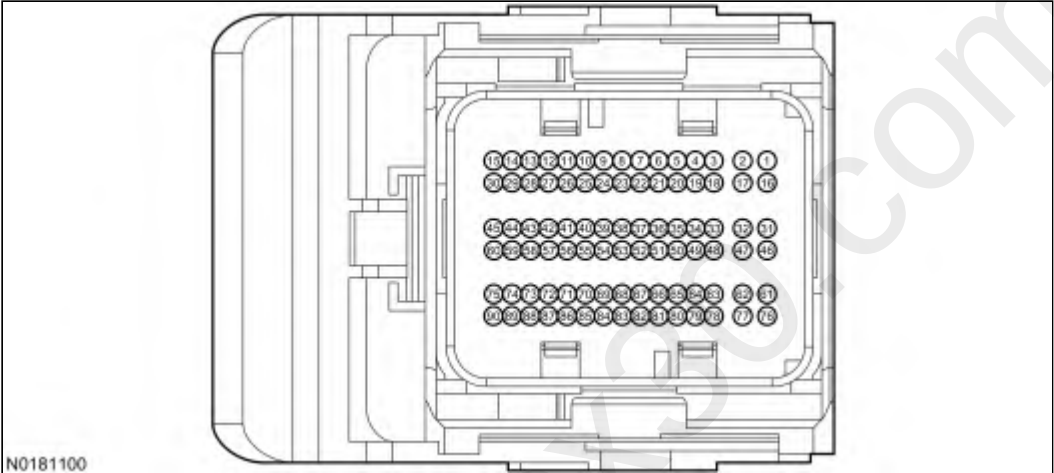
Pin	Circuit
3	FP (Fuel Pump)

Powertrain Control Module-B (PCM-B) Connector

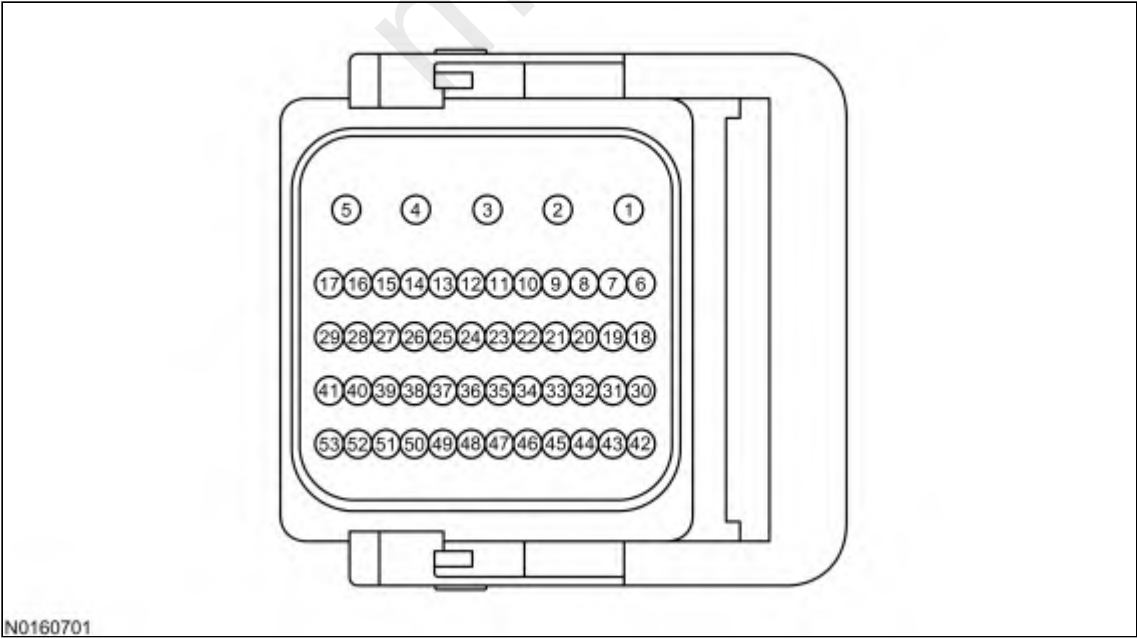
A



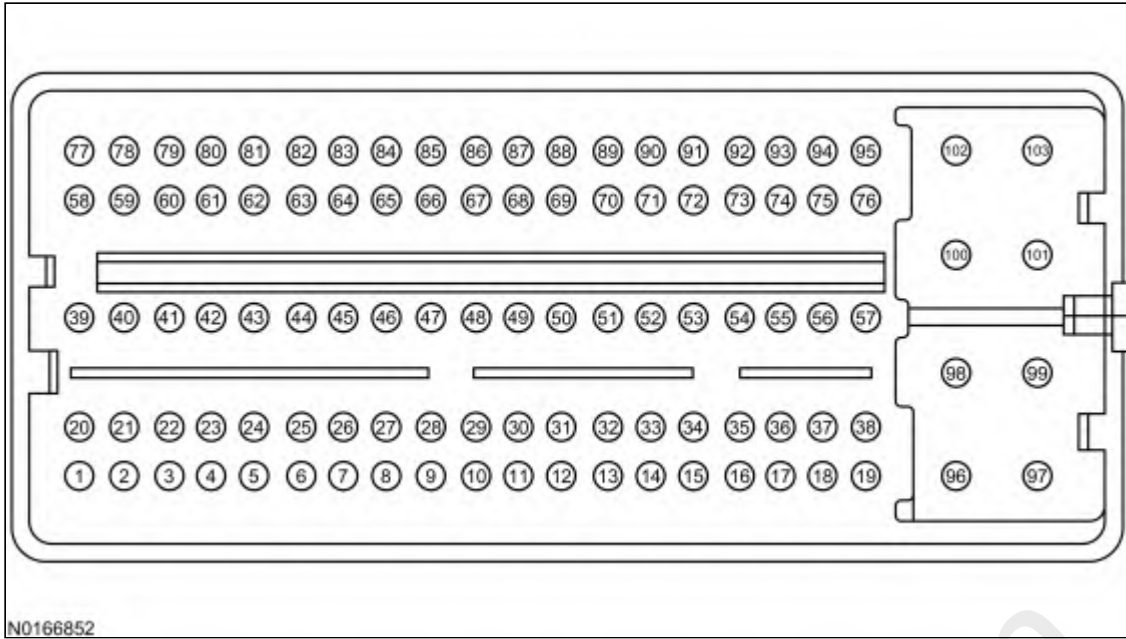
B



C

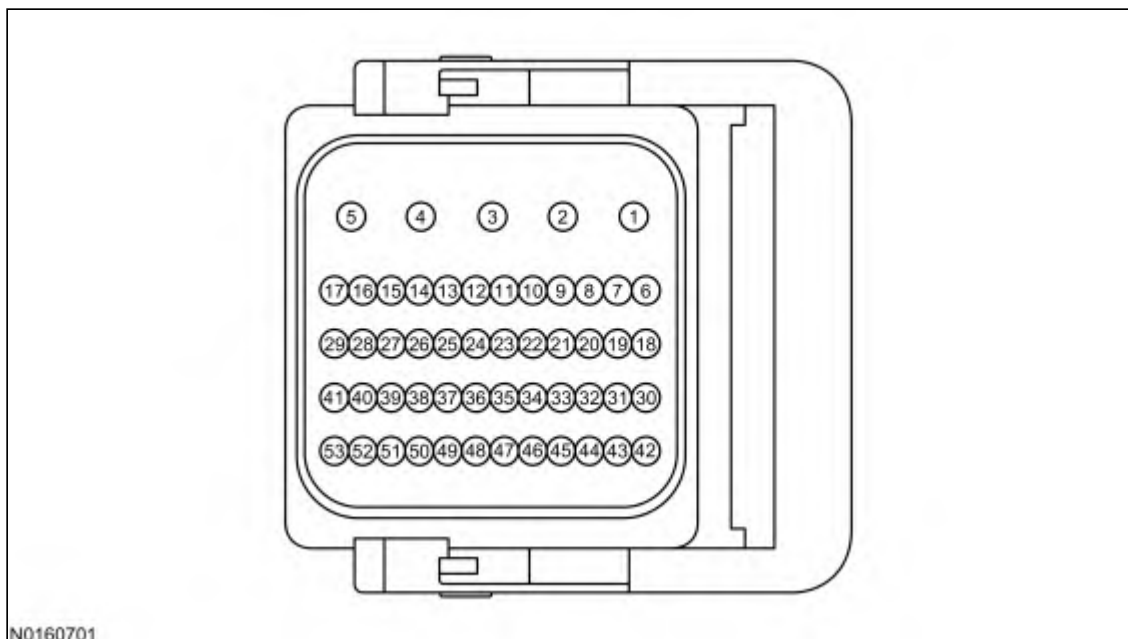


D



Vehicle	Connector	Pin	Circuit
F-650 / F-750	A	32 19	FPM FPC
F-Series Super Duty	B	19 34 78	FP FPM FPC
Transit	C	14	FPC
Transit Connect	D	44 60 46 40	IES FP FPM FPC
All other vehicles	A	18 32 19	FP FPM FPC

Powertrain Control Module-T (PCM-T) Connector



Pin	Circuit
31	FPM (Fuel Pump Monitor)

MA1 PRELIMINARY DIAGNOSIS

Note: For F-150, F-650 / F-750 and F-Series Super Duty, diagnose DTC P008A before diagnosing P0087.

Are DTCs P0087, P008A, P0230, P0231, P0232, P025A, P025C, P025D, P027A, P0627, P0628, P0629, P062A, P166A, P1671, P2291, or U0109 present?

Yes	For Transit with DTCs P0087 or P008A, GO to MA8 . For F-150, F-650 / F-750, F-Series Super Duty, and Transit Connect with DTCs P0087 or P008A, GO to MA2 . For DTC P027A, GO to MA12 . For DTC P166A, GO to MA36 . For all others, GO to MA11 .
No	For Transit with symptoms without DTCs, GO to MA8 . For all others with symptoms without DTCs, GO to MA2 . For all others, RETURN to Section 3, Symptom Charts for further direction.

MA2 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 MA3 .
No	REPAIR the open VPWR circuit. Clear the PCM DTCs. REPEAT the self-test.

MA3 CHECK THE LOW PRESSURE FUEL SYSTEM

Note: On some vehicles, the FP(PRESS) 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 PID 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 PID ON then OFF.

Is the PID value greater than 414 kPa (61 psi) (F-150) or 379 kPa (55 psi) (all others)?

Yes	For DTCs P0087 or P008A, GO to MA4 . For all others, CARRY OUT the Sufficient Clean Fuel Test. REFER to Section 4, Diagnostic Procedures . Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA4 .

MA4 CHECK THE LOW PRESSURE FUEL SYSTEM PRESSURE AFTER THE SECONDARY FUEL FILTER

Note: The fuel pump will run for 30 seconds then shut off at ignition ON, engine OFF.

- Ignition OFF.
- Connect the low pressure fuel supply line to the secondary fuel filter.
- Disconnect the injection pump fuel supply tube from the fuel filter to fuel injection pump supply tube quick connect coupling.
- Install the Fuel Line Adapter 310-D252 or equivalent and the DSL ENG Pressure Test Kit 014-00761 or equivalent to the fuel filter to fuel injection pump supply tube quick connect coupling at the fuel injection pump supply tube.
- For vehicles that start,
- Road test the vehicle while accelerating under load while monitoring the fuel pressure gauge.
- For F-650 / F-750 vehicles that do not start,
- Ignition ON, engine OFF.
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the PID ON.
- For all other vehicles that do not start,
- Ignition ON, engine OFF.
- Access the PCM and control the FP (MODE) PID.
- Command the PID ON.

Is the low pressure fuel system pressure greater than 414 kPa (61 psi) (F-150) or 379 kPa (55 psi) (all others)?

Yes	For DTC P0087, GO to Pinpoint Test M . For DTC P008A, GO to Pinpoint Test MD . For all others, CARRY OUT the Sufficient Clean Fuel Test. REFER to Section 4, Diagnostic Procedures . Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA5 .

MA5 REPLACE THE FUEL FILTERS

- Install new primary and secondary fuel filters. Refer to the Workshop Manual Section 310-01, Fuel Tank and Lines.
- For vehicles that start,
- Road test the vehicle and accelerate under load while monitoring the fuel pressure gauge.

- For F-650 / F-750 vehicles that do not start,
- Ignition ON, engine OFF.
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the PID ON.
- For all other vehicles that do not start,
- Ignition ON, engine OFF.
- Access the PCM and control the FP (MODE) PID.
- Command the PID ON.

Is the low pressure fuel system pressure greater than 414 kPa (61 psi) (F-150) or 379 kPa (55 psi) (all others)?

Yes	CARRY OUT the Sufficient Clean Fuel Test. REFER to Section 4, Diagnostic Procedures . Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA6 .

MA6 CARRY OUT THE FP PRESSURE TEST

Note: The FP will run for 30 seconds then shut off at ignition ON, engine OFF.

- Connect the injection pump fuel supply tube to the fuel filter to fuel injection pump supply tube quick connect coupling.
- Disconnect the low pressure fuel supply line from the outlet of the FP.
- Install the Fuel Line Adapter 310-D252 or equivalent and the DSL ENG Pressure Test Kit 014-00761 or equivalent between the low pressure fuel supply line and the outlet of the FP.
- For F-650 / F-750,
- Ignition ON, engine OFF.
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the PID ON.
- For all others,
- Ignition ON, engine OFF.
- Access the PCM and control the FP (MODE) PID.
- Command the PID ON.

Is the low pressure fuel system pressure greater than 414 kPa (61 psi) (F-150) or 379 kPa (55 psi) (all others)?

Yes	For vehicles equipped with auxiliary fuel tank, INSPECT the fuel transfer lines between the primary fuel tank and the auxiliary fuel tank for any leaks or restrictions. INSPECT the low pressure fuel supply line between the FP and the secondary fuel filter for any restrictions. REPAIR as necessary. VERIFY the repair. REFER to the Workshop Manual Section 310-01, Fuel Tank and Lines. Clear the PCM DTCs. REPEAT the self-test. For all others, INSPECT the low pressure fuel supply line between the FP and the secondary fuel filter for any leaks or restrictions. REPAIR as necessary. VERIFY the repair. REFER to the Workshop Manual Section 310-01, Fuel Tank and Lines. Clear the PCM DTCs. REPEAT the self-test.
No	For F-150, F-650/F-750, and F-Series Super Duty, GO to MA11 . For all others, GO to MA7 .

MA7 CARRY OUT THE FP INLET RESTRICTION TEST

Note: The FP will run for 30 seconds then shut off at ignition ON, engine OFF.

- Connect the low pressure fuel supply line at the outlet of the FP.
- Disconnect the low pressure fuel supply line from the inlet of the FP.
- Install the Fuel Line Adapter 310-159 or equivalent and the vacuum gauge of the DSL ENG Pressure Test Kit 014-00761 or equivalent between the low pressure fuel supply line and the inlet of the FP.
- Ignition ON, engine OFF.
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the PID ON.

Does the vacuum gauge indicate 10.2 kPa (3.0 In-Hg) or greater?

Yes	INSPECT the low pressure fuel supply line between the fuel tank and the FP for any restrictions. REPAIR as necessary. VERIFY the repair. REFER to the Workshop Manual Section 310-01, Fuel Tank and Lines. Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA11 .

MA8 CHECK THE LOW PRESSURE FUEL SYSTEM

- Ignition ON, engine OFF.
- Access the PCM and monitor the LP_FUEL_SW (MODE) PID.
- Access the PCM and control the FP (MODE) PID.
- Command the PID ON then OFF.

Does the LP_FUEL_SW PID state cycle from Low to Not Low?

Yes	For DTCs P0087 or P008A, GO to MA9 . For all others, CARRY OUT the Sufficient Clean Fuel Test. REFER to Section 4, Diagnostic Procedures . Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA9 .

MA9 CHECK THE LOW PRESSURE FUEL SYSTEM PRESSURE

- Ignition OFF.
- Connect the DSL ENG Pressure Test Kit 014-00761 or equivalent to the Schrader valve on the high pressure fuel injection pump supply line.
- For vehicles that start,
- Road test the vehicle while accelerating under load while monitoring the fuel pressure gauge.
- For vehicles that do not start,
- Ignition ON, engine OFF.
- Access the PCM and control the FP (MODE) PID.
- Command the PID ON.

Is the low pressure fuel system pressure greater than 30 kPa (4.4 psi)?

Yes	For DTC P0087, GO to Pinpoint Test M . For all others, GO to Pinpoint Test MD .
No	GO to MA10 .

MA10 REPLACE THE FUEL FILTER

- Install a new fuel filter. Refer to the Workshop Manual Section 310-01, Fuel Tank and Lines.
- For vehicles that start,
- Road test the vehicle while accelerating under load while monitoring the fuel pressure gauge.
- For vehicles that do not start,
- Ignition ON, engine OFF.
- Access the PCM and control the FP (MODE) PID.
- Command the PID ON.

Is the low pressure fuel system pressure greater than 30 kPa (4.4 psi)?

Yes	CARRY OUT the Sufficient Clean Fuel Test. REFER to Section 4, Diagnostic Procedures . Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA11 .

MA11 CHECK THE FP FOR VOLTAGE

- Ignition OFF.
- FP Assembly connector disconnected.
- Ignition ON, engine OFF.
- For F-650 / F-750,
- Access the PCM and control the FPL_CMD (MODE) PID.
- Command the PID ON.
- Connect a non-powered test lamp between:

Point A FP Assembly Connector, Harness Side	Point B FP Assembly Connector, Harness Side
FPPWR-B	FPGND

- For all others,
- Access the PCM and control the FP (MODE) PID.
- Command the PID ON.
- Connect a non-powered test lamp between:

Point A FP Assembly Connector, Harness Side	Point B FP Assembly Connector, Harness Side
FPPWR	FPRTN

Does the test lamp illuminate?

Yes	INSTALL a new FP assembly. REFER to the Workshop Manual Section 310-01, Fuel Tank and Lines. Clear the PCM DTCs. REPEAT the self-test.
No	For F-650 / F-750, GO to MA29 . For all others, GO to MA12 .

MA12 CHECK THE VOLTAGE TO THE FUEL PUMP CONTROL MODULE

- Ignition OFF.
- Fuel Pump Control Module connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Fuel Pump Control Module Connector, Harness Side	(-)
VPWR Fuel - Pin 1	Ground

Is the voltage greater than 10.5 V?

Yes	GO to MA13 .
No	GO to MA17 .

MA13 CHECK THE GND CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-)
GND - Pin 4	Ground

Is the resistance less than 5 ohms?

Yes	GO to MA14 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA14 CHECK THE FPC AND FPM CIRCUITS FOR AN OPEN

- For Transit,
- PCM-B connector disconnected.
- PCM-T connector disconnected.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) PCM-B Connector, Harness Side
FPC - Pin 3	FPC

- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) PCM-T Connector, Harness Side
FPM - Pin 7	FPM - Pin 31

- For all others,
- PCM-B connector disconnected.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) PCM-B Connector, Harness Side
FPC - Pin 3	FPC
FPM - Pin 7	FPM

Are the resistances less than 5 ohms?

Yes	GO to MA15 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA15 CHECK THE FPC AND FPM CIRCUITS FOR A SHORT TO GROUND

- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-)
FPC - Pin 3	Ground
FPM - Pin 7	Ground

Are the resistances greater than 10K ohms?

Yes	GO to MA16 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

MA16 CHECK THE FPC AND FPM CIRCUITS FOR A SHORT TO VOLTAGE

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

(+) Fuel Pump Control Module Connector, Harness Side	(-)
FPC - Pin 3	Ground
FPM - Pin 7	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	For DTC P027A, INSTALL a new Fuel Pump Control Module. Clear the PCM DTCs. REPEAT the self-test. For all others, GO to MA18 .

MA17 CHECK THE VPWR FUEL CIRCUIT FOR AN OPEN

- Ignition OFF.
- For F-150 and Transit Connect,
- BJB-B connector disconnected.
- Measure the resistance between:

(+) BJB-B Connector, Harness Side	(-) Fuel Pump Control Module Connector, Harness Side
VPWR Fuel - Pin 50	VPWR Fuel - Pin 1

- For F-Series Super Duty,
- BJB-A connector disconnected.
- Measure the resistance between:

(+) BJB-A Connector, Harness Side	(-) Fuel Pump Control Module Connector, Harness Side
VPWR Fuel	VPWR Fuel - Pin 1

- For all others,
- FP Relay connector disconnected.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) FP Relay Connector, Harness Side
VPWR Fuel - Pin 1	VPWR Fuel

Is the resistance less than 5 ohms?

Yes	For F-150 and F-Series Super Duty, GO to MA28 . For all others, GO to MA26 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA18 CHECK THE FPPWR CIRCUIT AND THE FPRTN CIRCUIT AND THE INTERNAL FUEL PUMP RESISTANCE

- Ignition OFF.
- FP Assembly connector connected.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) Fuel Pump Control Module Connector, Harness Side
FPPWR - Pin 5	FPRTN - Pin 8

Is the resistance less than 10 ohms?

Yes	GO to MA21 .
No	GO to MA19 .

MA19 CHECK THE FPPWR AND FPRTN CIRCUITS FOR AN OPEN

- FP Assembly connector disconnected.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) FP Assembly Connector, Harness Side
FPPWR - Pin 5	FPPWR
FPRTN - Pin 8	FPRTN

Are the resistances less than 5 ohms?

Yes	GO to MA20 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA20 CHECK THE FP FOR AN OPEN

- Measure the resistance between:

(+) FP Assembly Connector, Component Side	(-) FP Assembly Connector, Component Side
FPPWR	FPRTN

Is the resistance less than 10 ohms?

Yes	GO to MA21 .

No	INSTALL a new FP assembly. REFER to the Workshop Manual Section 310-01, Fuel Tank and Lines. Clear the PCM DTCs. REPEAT the self-test.
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MA21 CHECK THE FPPWR AND FPRTN CIRCUITS FOR A SHORT TO GROUND

- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-)
FPPWR - Pin 5	Ground
FPRTN - Pin 8	Ground

Are the resistances greater than 10K ohms?

Yes	GO to MA22 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

MA22 CHECK FOR FPPWR AND FPRTN CIRCUITS SHORTED TOGETHER

- FP Assembly connector disconnected.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) Fuel Pump Control Module Connector, Harness Side
FPPWR - Pin 5	FPRTN - Pin 8

Is the resistance greater than 10K ohms?

Yes	GO to MA23 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

MA23 CHECK THE FPPWR AND FPRTN CIRCUITS FOR A SHORT TO VOLTAGE

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

(+) Fuel Pump Control Module Connector, Harness Side	(-)
FPPWR - Pin 5	Ground
FPRTN - Pin 8	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA24 .

MA24 INTERMITTENT CHECK

- Ignition OFF.
- Measure the resistance between:

(+) Fuel Pump Control Module Connector, Harness Side	(-) FP Assembly Connector, Harness Side
FPPWR - Pin 5	FPPWR
FPRTN - Pin 8	FPRTN

- While monitoring the resistance measurement, wiggle, shake, and bend small sections of the wiring harness while working from the FP to the fuel pump control module.

Is a concern present?

Yes	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA25 .

MA25 CHECK THE FUEL PUMP CONTROL MODULE FOR CORRECT OPERATION

- Fuel Pump Control Module connector connected.
- PCM-B connector connected.
- PCM-T connector connected.
- Measure the voltage between:

(+) FP Assembly Connector, Harness Side	(-) FP Assembly Connector, Harness Side
FPPWR	FPRTN

- Access the PCM and control the FP (MODE) PID.
- Command the PID ON.

Does the voltage increase with the PID commanded ON?

Yes	INSTALL a new FP assembly. REFER to the Workshop Manual Section 310-01, Fuel Tank and Lines. Clear the PCM DTCs. REPEAT the self-test.
No	INSTALL a new Fuel Pump Control Module. REFER to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. REPEAT the self-test.

MA26 CHECK THE FUEL PUMP RELAY

- Carry out the fuel pump relay component test. Refer to the Wiring Diagrams Cell 149 Component Testing.

Is a concern present?

Yes	INSTALL a new FP relay. Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA27 .

MA27 CHECK THE B+ CIRCUITS FOR AN OPEN

- Measure the voltage between:

(+) FP Relay Connector, Harness Side	(-)
--	-------

(+) FP Relay Connector, Harness Side	(-)
B+	Ground

Is the voltage greater than 10.5 V?

Yes	GO to MA28 .
No	A B+ circuit concern is present. CHECK the condition of the related fuse/fuse links. If OK, REPAIR the open circuit. If the fuse/fuse link is damaged, CHECK the circuit for a short to ground before installing a new fuse/fuse link.

MA28 CHECK THE FP CIRCUIT FOR AN OPEN

- For F-150,
- BJB-C connector disconnected.
- PCM-B connector disconnected.
- Measure the resistance between:

(+) PCM-B Connector, Harness Side	(-) BJB-C Connector, Harness Side
FP	FP - Pin 3

- For F-Series Super Duty,
- PCM-B connector disconnected.
- Measure the resistance between:

(+) PCM-B Connector, Harness Side	(-) BJB-A Connector, Harness Side
FP	FP

- For Transit,
- BCM-C connector disconnected.
- Measure the resistance between:

(+) FP Relay Connector, Harness Side	(-) BCM-C Connector, Harness Side
FP	FP - Pin 12

- For Transit Connect,
- BJB-A connector disconnected.
- Measure the resistance between:

(+) BJB-A Connector, Harness Side	(-) PCM-B Connector, Harness Side
FP	FP

- For all others,
- PCM-B connector disconnected.
- Measure the resistance between:

(+) FP Relay Connector, Harness Side	(-) PCM-B Connector, Harness Side
FP	FP

Is the resistance less than 5 ohms?

Yes	For F-150, F-Series Super Duty, and Transit Connect, INSTALL a new BJB. REFER to the Workshop Manual Section 419-10, Multifunction Electronic Modules. Clear the PCM DTCs. REPEAT the self-test. For Transit, INSTALL a new BCM. REFER to the Workshop Manual Section 419-10, Multifunction Electronic Modules. Clear the PCM DTCs. REPEAT the self-test. For all others, GO to MA39 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA29 CHECK THE FPGND CIRCUIT

- Ignition OFF.
- Measure the resistance between:

(+) FP Assembly Connector, Harness Side	(-)
FPGND	Ground

Is the resistance less than 5 ohms?

Yes	GO to MA30 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA30 CHECK THE FPPWR CIRCUIT FOR AN OPEN

- FP Relay connector disconnected.
- Measure the resistance between:

(+) FP Relay Connector, Harness Side	(-) FP Assembly Connector, Harness Side
FPPWR-A	FPPWR-B

Is the resistance less than 5 ohms?

Yes	GO to MA31 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA31 CHECK THE FUEL PUMP RELAY

- Carry out the fuel pump relay component test. Refer to the Wiring Diagrams Cell 149 Component Testing.

Is a concern present?

Yes	INSTALL a new FP relay. Clear the PCM DTCs. REPEAT the self-test.
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No	GO to MA32 .
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MA32 CHECK FOR VOLTAGE AT THE FUEL PUMP RELAY

- Ignition OFF.
- FP Relay connector disconnected.
- Measure the voltage between:

(+) FP Relay Connector, Harness Side	(-)
B+	Ground

Is the voltage greater than 10 V?

Yes	GO to MA33 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA33 CHECK THE FPC CIRCUIT FOR AN OPEN

- PCM-B connector disconnected.
- Measure the resistance between:

(+) FP Relay Connector, Harness Side	(-) PCM-B Connector, Harness Side
FPC	FPC

Is the resistance less than 5 ohms?

Yes	GO to MA34 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA34 CHECK THE FPC CIRCUIT FOR A SHORT TO GROUND

- Measure the resistance between:

(+) FP Relay Connector, Harness Side	(-)
FPC	Ground

Is the resistance greater than 10K ohms?

Yes	GO to MA35 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

MA35 CHECK THE FPC CIRCUIT FOR A SHORT TO VOLTAGE

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

(+) FP Relay Connector, Harness Side	(-)
FPC	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to MA39 .

MA36 CHECK THE IES CIRCUIT FOR AN OPEN

- Ignition OFF.
- PCM-B connector disconnected.
- BCM-F connector disconnected.
- Measure the resistance between:

(+) BCM-F Connector, Harness Side	(-) PCM-B Connector, Harness Side
IES - Pin 13	IES

Is the resistance less than 5 ohms?

Yes	GO to MA37 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

MA37 CHECK THE IES CIRCUIT FOR A SHORT TO GROUND

- Measure the resistance between:

(+) BCM-F Connector, Harness Side	(-)
IES - Pin 13	Ground

Is the resistance greater than 10K ohms?

Yes	GO to MA38 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

MA38 CHECK THE IES CIRCUIT FOR A SHORT TO VOLTAGE

- Measure the voltage between:

(+) BCM-F Connector, Harness Side	(-)
IES - Pin 13	Ground

Is any voltage present?

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Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	INSTALL a new BCM. REFER to the Workshop Manual Section 419-10, Multifunction Electronic Modules. Clear the PCM DTCs. REPEAT the self-test.

MA39 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.

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