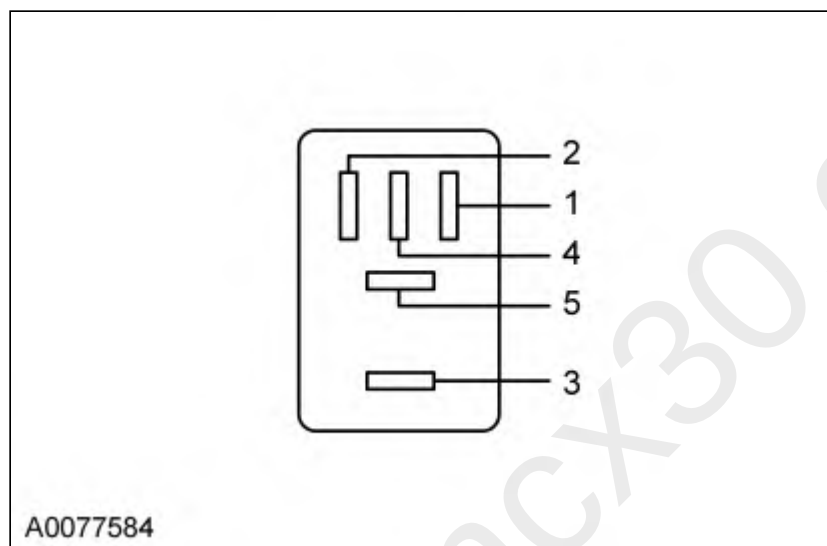
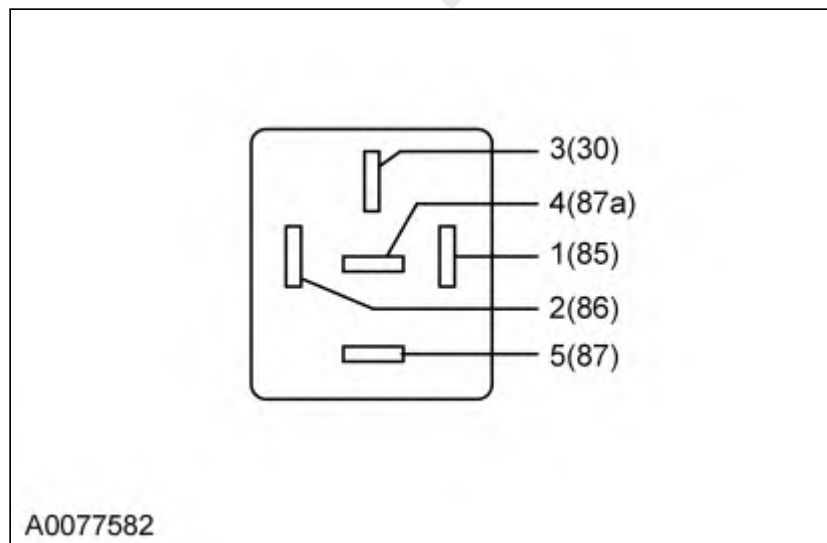


AJ: Powertrain Control Module (PCM) Power Relay

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:

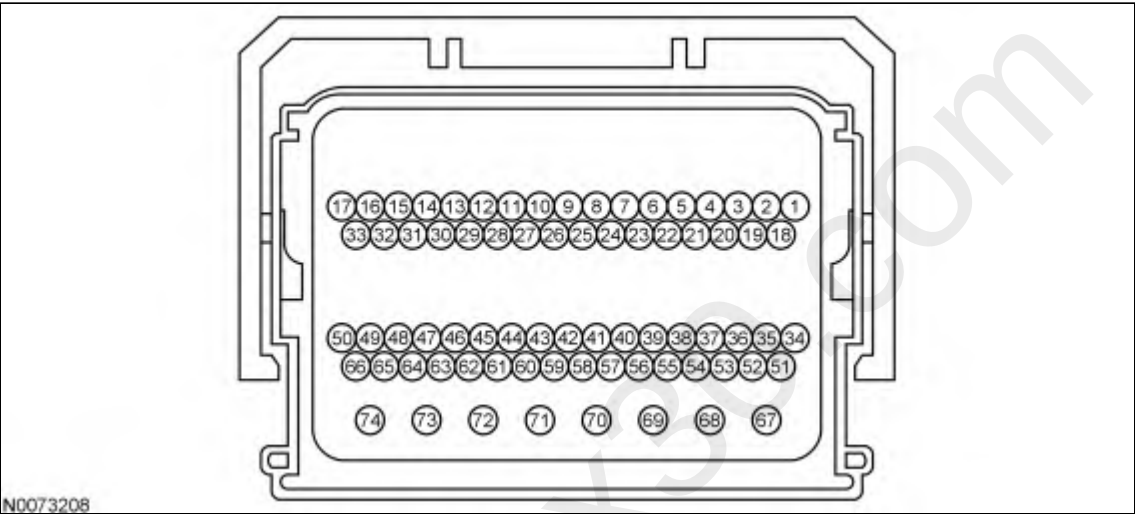
- harness circuits: B+, ISP-R, PCMR, VPWR and PWRGND
- PCM power relay (12A646)
- PCM (12A650)

PCM Power Relay Connector**A****B**

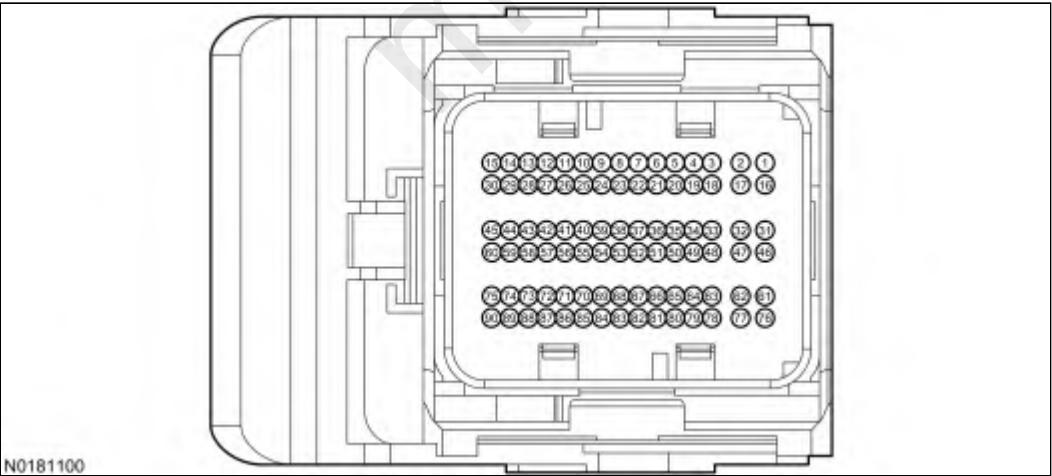
Vehicle	Connector	Pin	Circuit
F-150, Transit Connect	A	5 2 1, 3	VPWR PCMRC B+
All other vehicles	B	5 2 1, 3	VPWR PCMRC B+

Powertrain Control Module-B (PCM-B) Connector

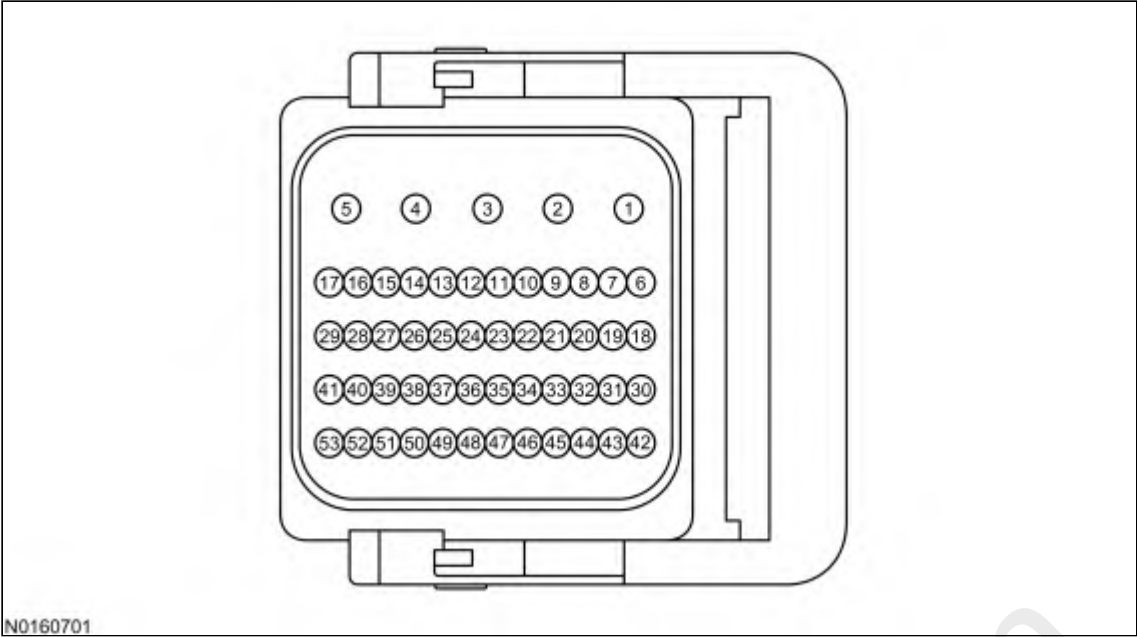
A



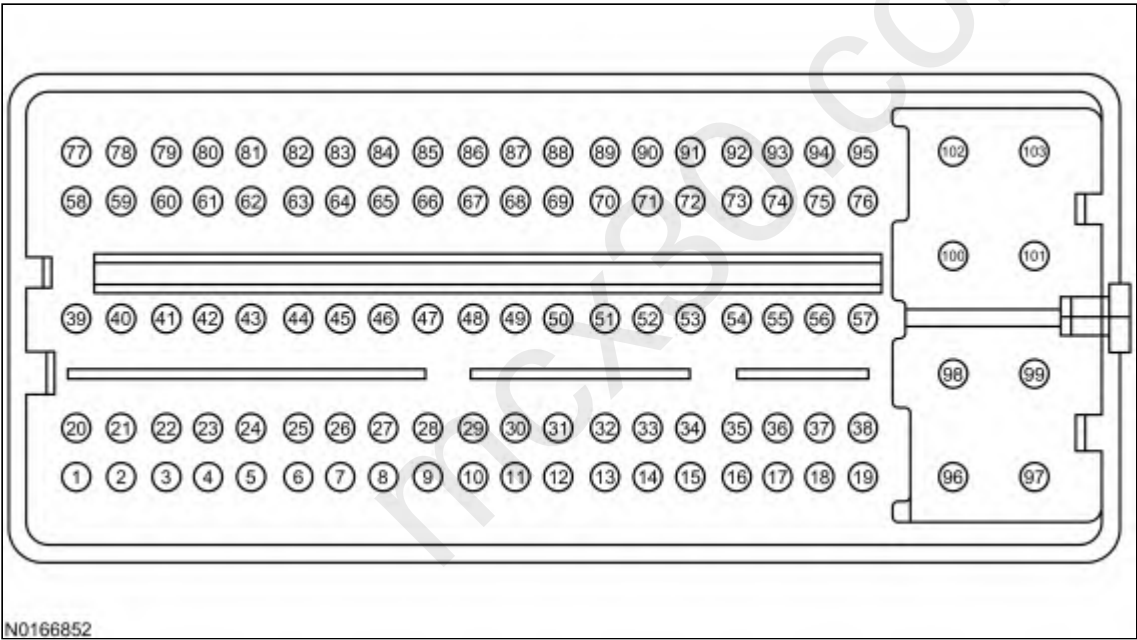
B



C



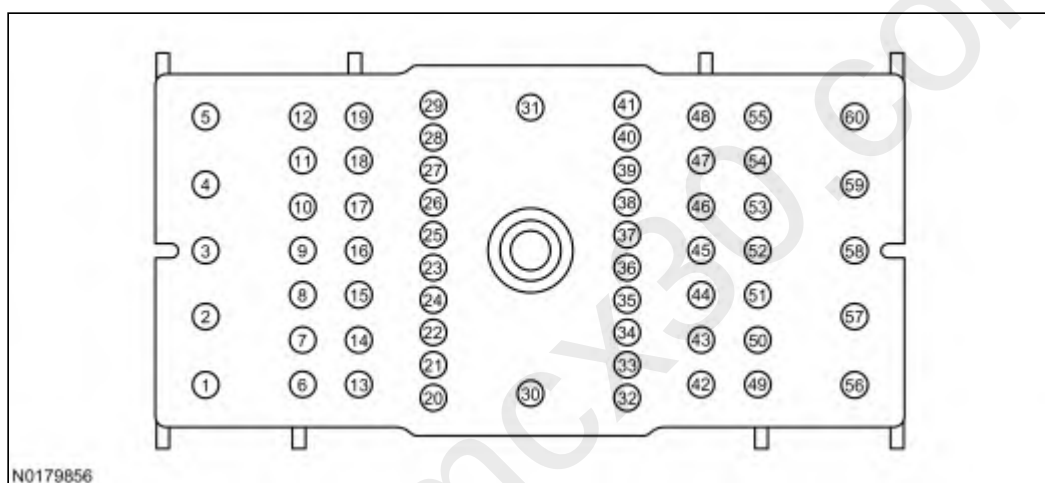
D



Vehicle	Connector	Pin	Circuit
F-650 / F-750	A	70, 71, 72, 73, 74 67, 68, 69 42 38	PWRGND VPWR ISP-R PCMRC
F-Series Super Duty	B	47, 61, 62, 76, 77 1, 16, 17, 2 21 50	PWRGND VPWR ISP-R PCMRC

Vehicle	Connector	Pin	Circuit
Transit	C	2, 3, 42, 53, 7 17, 29, 5 39 48	PWRGND VPWR ISP-R PCMRC
Transit Connect	D	96, 97, 98 101, 102, 103 82 42	PWRGND VPWR ISP-R PCMRC
All other vehicles	A	73, 72, 71, 70 69, 68, 67 42 38	PWRGND VPWR ISP-R PCMRC

Battery Junction Box-A (BJB-A) Connector



Pin	Circuit
51	VPWR (Vehicle Power)
39	PCMRC (PCM Relay Control)

AJ1 CHECK FOR DTCS

Are DTCs P0685, P068A, P068B, P2507 or P2508 present?

Yes	GO to AJ2 .
No	For symptoms without DTCs, GO to AJ3 . For all others, RETURN to Section 3, Symptom Charts for further direction.

AJ2 CHECK THE BATTERY AND CHARGING SYSTEM

- Check the battery and charging system voltages. Refer to the Workshop Manual Section 414-00, Charging System, Inspection and Verification.

Are the battery and charging system voltages within specifications?

Yes	For F-Series Super Duty, GO to AJ5 . For all others, GO to AJ3 .
No	REPAIR as necessary. REFER to the Workshop Manual Section 414-00, Charging System, Symptom Chart to diagnose the system voltage low or battery is discharged symptom or the system voltage high symptom. Clear the PCM DTCs. REPEAT the self-test.

AJ3 CHECK THE PCM POWER RELAY

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

Did the PCM power relay pass the component test?

Yes	GO to AJ4 .
No	INSTALL a new PCM Power Relay. Clear the PCM DTCs. REPEAT the self-test.

AJ4 CHECK THE B+ CIRCUITS FOR VOLTAGE

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

(+) PCM Power Relay Connector, Harness Side	(-)
B+	Ground

Is the voltage greater than 10.5 V?

Yes	GO to AJ5 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AJ5 CHECK THE PCMRC CIRCUIT FOR AN OPEN

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

(+) BJB-A Connector, Harness Side	(-) PCM-B Connector, Harness Side
PCMRC - Pin 39	PCMRC

- For all others,
- Measure the resistance between:

(+) PCM-B Connector, Harness Side	(-) PCM Power Relay Connector, Harness Side
PCMRC	PCMRC

Is the resistance less than 5 ohms?

Yes	GO to AJ6 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AJ6 CHECK THE PCMRC CIRCUIT FOR A SHORT TO GROUND

- Measure the resistance between:

(+) PCM-B Connector, Harness Side	(-)
PCMRC	Ground

Is the resistance greater than 10K ohms?

Yes	GO to AJ7 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

AJ7 CHECK THE PCMRC CIRCUIT FOR A SHORT TO VOLTAGE

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

(+) PCM-B Connector, Harness Side	(-)
PCMRC	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to AJ8 .

AJ8 CHECK THE ISP-R CIRCUIT FOR VOLTAGE

- For F-Series Super Duty,
- Ignition OFF.
- BJB-B connector connected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) PCM-B Connector, Harness Side	(-)
ISP-R	Ground

- For all others,
- Ignition OFF.
- PCM Power Relay connector connected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) PCM-B Connector, Harness Side	(-)
ISP-R	Ground

Is the voltage greater than 10.5 V?

Yes	GO to AJ9 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AJ9 CHECK THE ISP-R CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Measure the voltage between:

(+) PCM-B Connector, Harness Side	(-)
ISP-R	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to AJ10 .

AJ10 CHECK THE VPWR CIRCUIT FOR AN OPEN

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

(+) PCM-B Connector, Harness Side	(-) BJB-A Connector, Harness Side
VPWR	VPWR - Pin 51

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

(+) PCM-B Connector, Harness Side	(-) PCM Power Relay Connector, Harness Side
VPWR	VPWR

Are the resistances less than 5 ohms?

Yes	GO to AJ11 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AJ11 CHECK THE PWRGND CIRCUITS FOR AN OPEN

- Measure the resistance between:

(+) PCM-B Connector, Harness Side	(-)
PWRGND	Ground

Are the resistances less than 5 ohms?

Yes	For F-Series Super Duty, . GO to AJ12 . For all others, GO to AJ13 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AJ12 CHECK THE BJB

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

Point A BJB-A Connector, Component Side	Point B
PCMRC - Pin 39	Ground

- Measure the voltage between:

(+) BJB-A Connector, Harness Side	(-)
VPWR - Pin 51	Ground

Is the voltage greater than 10.5 V?

Yes	GO to AJ13 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AJ13 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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