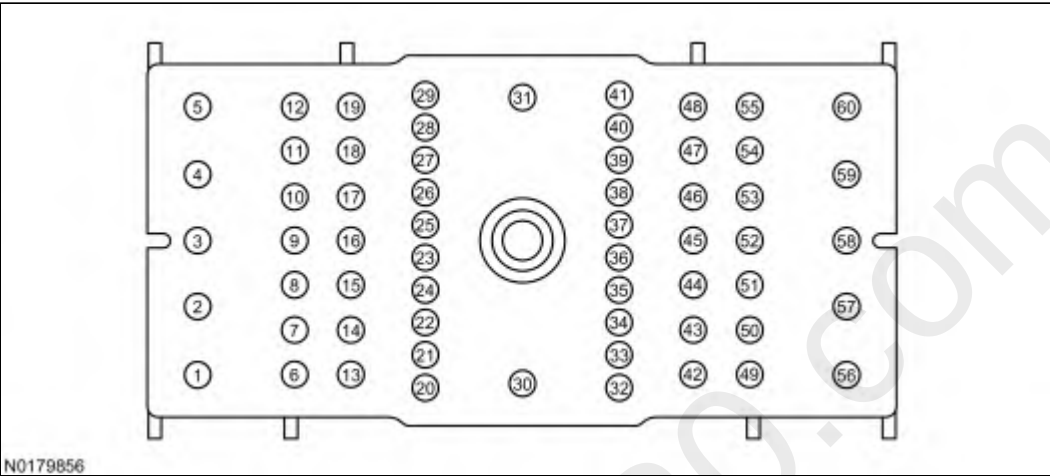


B: Powertrain Control Module (PCM) Power Relay

This pinpoint test is intended to diagnose the following:

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

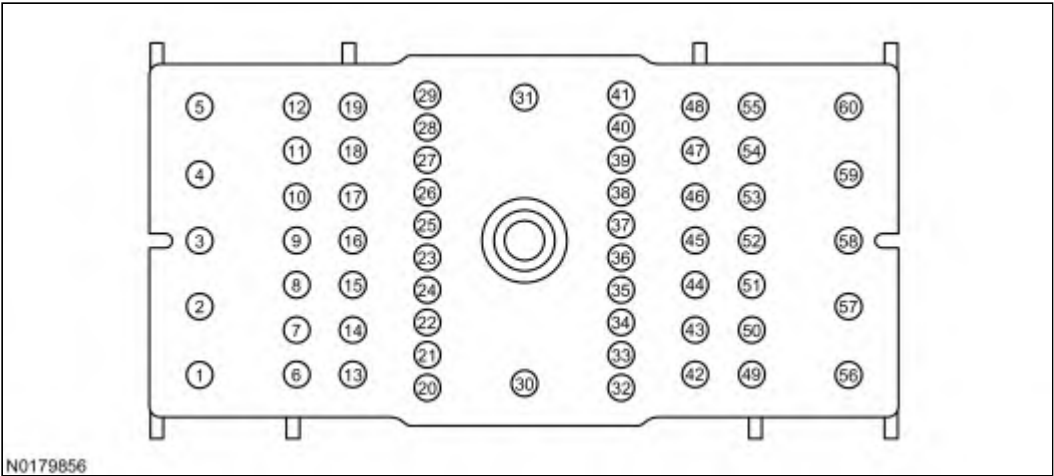
Battery Junction Box-A (BJB-A) Connector



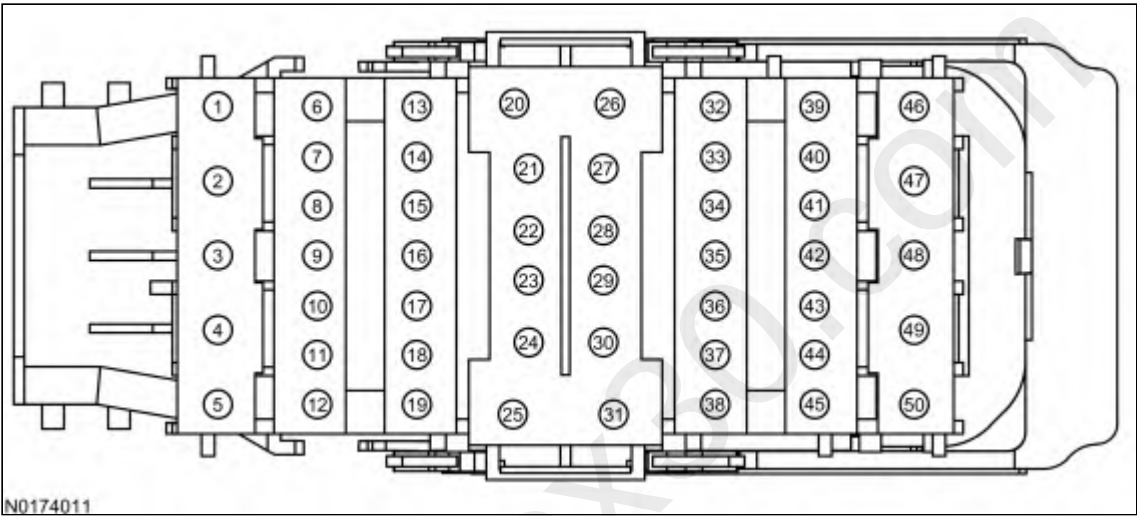
Pin	Circuit
42	VPWR (Vehicle Power)
33	PCMRC (PCM Relay Control)

Battery Junction Box-B (BJB-B) Connector

A

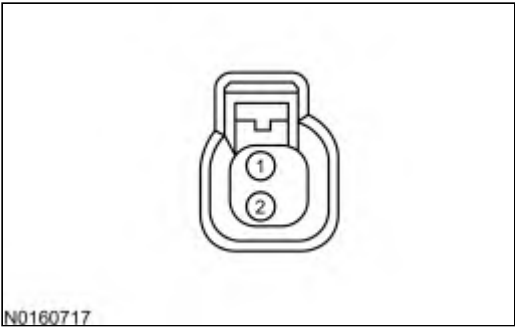


B



Vehicle	Connector	Pin	Circuit
Aviator, Explorer	A	50 32	VPWR PCMRC
Corsair, Escape/Kuga	B	39 44	VPWR PCMRC
Transit Connect	B	39 14	VPWR PCMRC

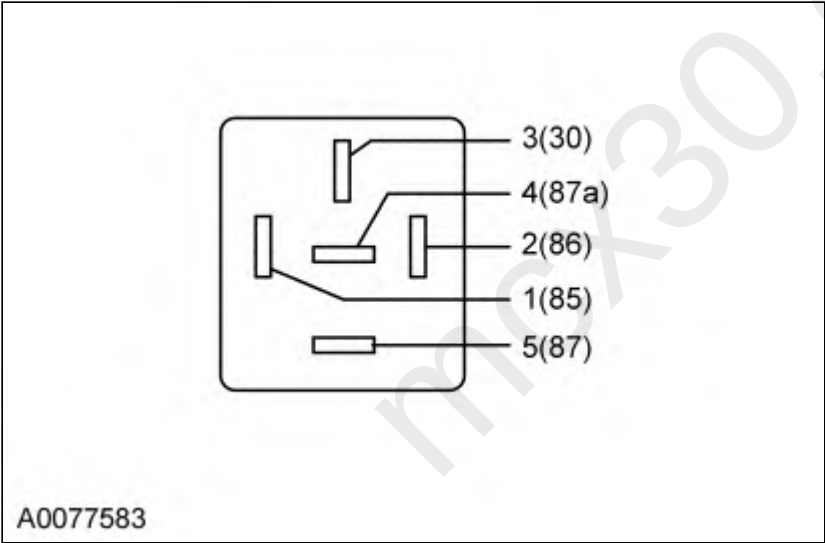
Injector (INJ) Connector



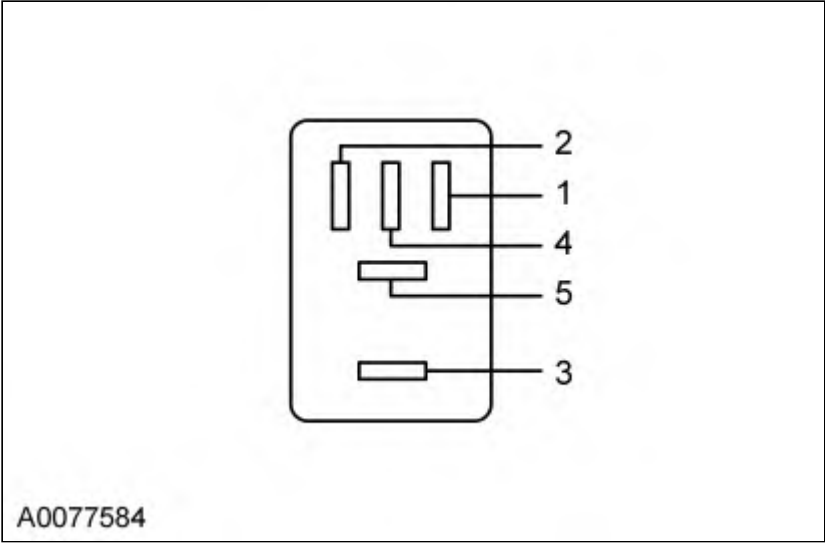
Vehicle	Connector	Pin	Circuit
EcoSport, KA	A	1	VPWR
All other vehicles	A	2	VPWR

Powertrain Control Module Power (PCM Power) Relay Connector

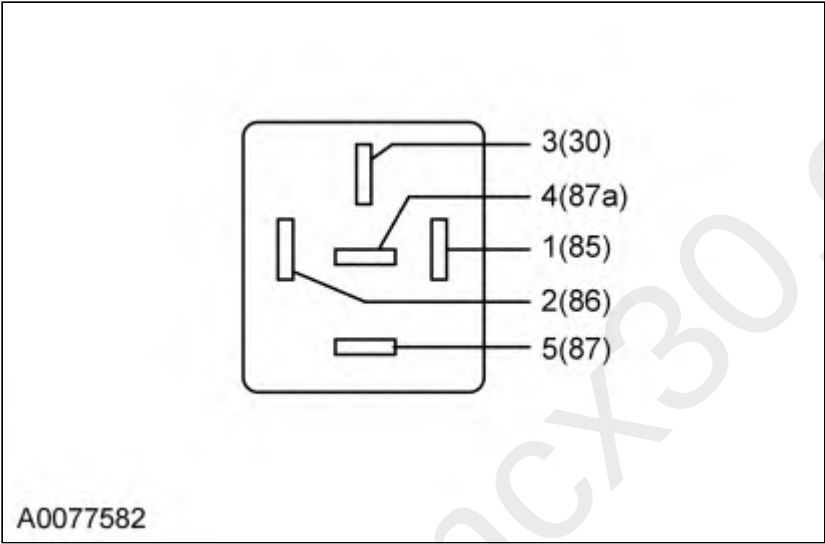
A



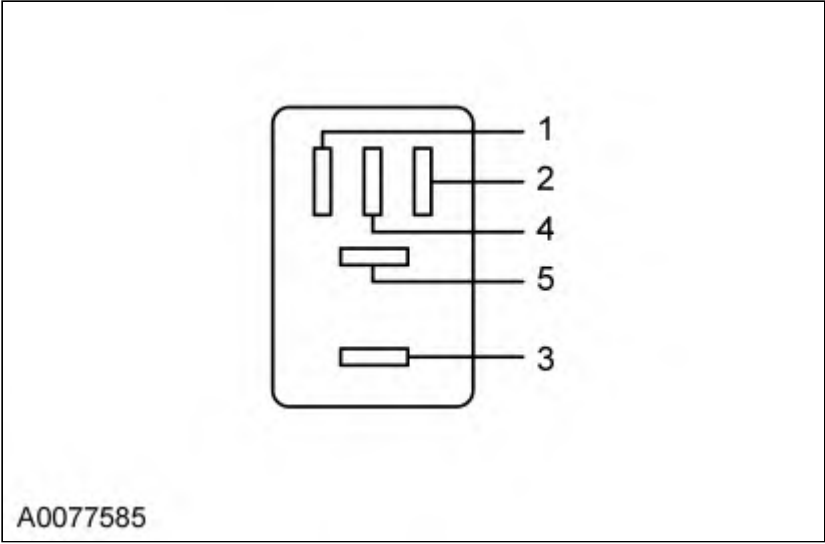
B



C



D



Vehicle	Connector	Pin	Circuit
Continental 2.0L, Continental 2.7L, Continental 3.0L, KA	A	5 2 1, 3	VPWR PCMRC B+
Continental 3.7L	A	5 1 2, 3	VPWR PCMRC B+
E-Series, Edge, Flex, Ford GT	B	5 2 1, 3	VPWR PCMRC B+
EcoSport, F-Series Super Duty	C	5 2 1, 3	VPWR PCMRC B+
F-650 / F-750, Motorhome / Stripped Chassis / Step Van, Ranger	C	5 1 2, 3	VPWR PCMRC B+
Mustang	D	3 2 1, 5	VPWR PCMRC B+
All other vehicles	B	5 1 2, 3	VPWR PCMRC B+

Powertrain Control Module (PCM) Connector

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

Vehicle	Connector	Pin	Circuit
Continental 2.0L, Continental 2.7L, Continental 3.0L, EcoSport 1.0L, EcoSport 2.0L, Flex GTDI 3.5L, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, MKZ	198 PIN	B101, B102, B103 B48 B58	VPWR ISP-R PCMRC

Vehicle	Connector	Pin	Circuit
Continental 3.7L, E-Series, F-650 / F-750	198 PIN	B97, B99 B64 B20	VPWR ISP-R PCMRC
Corsair 2.0L, Corsair 2.3L, Edge 2.0L, Escape/Kuga 1.5L, Escape/Kuga 2.0L, Explorer 2.3L, Mustang 2.3L, Ranger 2.3L	198 PIN	B100, B101, B102 B64 B25	VPWR ISP-R PCMRC
Corsair 2.5L, Escape/Kuga 2.5L, Transit Connect 2.5L	198 PIN	B97, B99 B41 B20	VPWR ISP-R PCMRC
EcoSport 1.5L Automatic Transmission	198 PIN	E18 B97, B99 B41 B20	INJPWRM VPWR ISP-R PCMRC
EcoSport 1.5L Manual Transmission	112 PIN	E22 B55, B56 B43 B25	INJPWRM VPWR ISP-R PCMRC
Expedition, Navigator	198 PIN	B101, B102, B103 B48 B25	VPWR ISP-R PCMRC
F-150 3.5L High Output	198 PIN	B101, B102, B103 B83 B25	VPWR ISP-R PCMRC
F-150 3.5L	306 PIN	B13 B60	ISP-R PCMRC
F-Series Super Duty, Motorhome / Stripped Chassis / Step Van	306 PIN	B14 B1, B16, B2 B13 B60	INJPWRM VPWR ISP-R PCMRC
Flex TiVCT 3.5L	198 PIN	B21 B97, B99 B64 B20	INJPWRM VPWR ISP-R PCMRC
Ford GT	198 PIN	B95 B101, B102, B103 B48 B58	INJPWRM VPWR ISP-R PCMRC

Vehicle	Connector	Pin	Circuit
Fusion 2.5L	198 PIN	B21 B97, B99 B41 B20	INJPWRM VPWR ISP-R PCMRC
KA 1.0L	128 PIN	E29 B36, E24 B45 B37	INJPWRM VPWR ISP-R PCMRC
KA 1.2L, KA 1.5L Manual Transmission	112 PIN	B55, B56 B43 B25	VPWR ISP-R PCMRC
KA 1.5L Automatic Transmission	198 PIN	B97, B99 B43 B20	VPWR ISP-R PCMRC
Mustang 5.2L Supercharged	306 PIN	B1, B16, B2 B64 B20	VPWR ISP-R PCMRC
Mustang TiVCT 5.2L	198 PIN	B1, B16, B2 B64 B20	VPWR ISP-R PCMRC
Nautilus 2.0L	198 PIN	B100, B101, B102 B64 B58	VPWR ISP-R PCMRC
Ranger 2.5L	128 PIN	B11, B12 B8 B1	VPWR ISP-R PCMRC
Transit GTDI 3.5L	306 PIN	B101, B102, B103 B13 B60	VPWR ISP-R PCMRC
Transit Connect 1.0L, Transit Connect 2.0L	198 PIN	B100, B101, B102 B25	VPWR PCMRC
All other vehicles	306 PIN	B1, B16, B2 B13 B60	VPWR ISP-R PCMRC

B1 CHECK FOR DTCS

Note: If DTC P0607, P068A or P06B8 is retrieved after a PCM reprogramming, turn the ignition OFF and allow the PCM to complete a normal power down sequence. Clear the PCM DTCS and repeat the PCM self-test. If DTC P0607, P068A or P06B8 is retrieved again, continue with this pinpoint test.

Are DTCS P0685, P0686, P0687, P0689, P068A, P0690, P1793, P2510, or U300C present?

Yes	For DTC P068A, GO to B2 . For DTCS P0689 or P2510, GO to B7 .
------------	--

	For all others, GO to B9 .
No	GO to B4 .

B2 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 specification?

Yes	For Aviator, Corsair, Escape/Kuga, Explorer, Transit, and Transit Connect, GO to B5 . For all others, GO to B3 .
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.

B3 CHECK THE PCM POWER RELAY

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

Does the PCM power relay pass the component test?

Yes	GO to B4 .
No	INSTALL a new PCM Power Relay. Clear the PCM DTCs. REPEAT the self-test.

B4 CHECK THE B+ VOLTAGE TO PCM POWER RELAY

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

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

Is the voltage greater than 10.5 V?

Yes	GO to B5 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

B5 CHECK THE PCMRC CIRCUIT FOR AN OPEN

- Ignition OFF.
- PCM connector disconnected.
- For Aviator, Corsair, Escape/Kuga, Explorer, and Transit Connect,
- BJB-B connector disconnected.
- Measure the resistance between:

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

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

(+) BJB-A Connector, Harness Side	(-) PCM Connector, Harness Side
PCMRC - Pin 33	PCMRC

- For all others,
- Measure the resistance between:

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

Is the resistance less than 5 ohms?

Yes	GO to B6 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

B6 CHECK THE PCMRC CIRCUIT FOR A SHORT TO VOLTAGE

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

(+) PCM 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 B7 .

B7 CHECK THE ISP-R VOLTAGE AT THE PCM

- Ignition OFF.
- PCM connector disconnected.
- For Aviator, Corsair, Escape/Kuga, Explorer, and Transit Connect,
- BJB-B connector connected.
- For Transit,
- BJB-A connector connected.
- For all others,
- PCM Power Relay connector connected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) PCM Connector, Harness Side	(-)

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

Is the voltage greater than 10.5 V?

Yes	For DTCs P0689 or P2510, GO to B13 . For all others, GO to B8 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

B8 CHECK FOR AN OPEN VPWR CIRCUIT

- Ignition OFF.
- For Aviator, Corsair, Escape/Kuga, Explorer, and Transit Connect,
- BJB-B connector disconnected.
- Measure the resistance between:

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

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

(+) BJB-A Connector, Harness Side	(-) PCM Connector, Harness Side
VPWR - Pin 42	VPWR

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

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

Is the resistance less than 5 ohms?

Yes	For DTC P068A, GO to B13 . For Aviator, Corsair, Escape/Kuga, Explorer, and Transit Connect, INSTALL a new BJB. Clear the PCM DTCs. REPEAT the self-test. For all others, INSTALL a new PCM Power relay. Clear the PCM DTCs. REPEAT the self-test.
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

B9 CHECK THE PCMRC CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- PCM connector disconnected.

- For Aviator, Corsair, Escape/Kuga, Explorer, and Transit Connect,
- BJB-B connector disconnected.
- For Transit,
- BJB-A connector disconnected.
- For all others,
- PCM Power Relay connector disconnected.
- Measure the resistance between:

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

Is the resistance greater than 10K ohms?

Yes	GO to B10 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

B10 CHECK THE ISP-R CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Measure the voltage between:

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

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	For Aviator, Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair 2.0L, Corsair 2.3L, EcoSport 1.0L, EcoSport 2.0L, Edge, Escape/Kuga 1.5L, Escape/Kuga 2.0L, Expedition, Explorer, F-150, Flex 3.5L GTDI, Ford GT, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, MKZ,

Mustang 2.3L, Mustang 5.0L, Nautilus, Navigator, Ranger 2.3L, Transit, Transit Connect 1.0L, and Transit Connect 2.0L, GO to B12 . For all others, GO to B11 .
--

B11 CHECK THE INJPWRM CIRCUIT FOR AN OPEN

- INJ connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) INJ Connector, Harness Side
INJPWRM	VPWR

Is the resistance less than 5 ohms?

Yes	GO to B13 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

B12 CHECK THE INJPWR_M PID

- Ignition OFF.
- BJB-A connector connected.
- BJB-B connector connected.
- PCM Power Relay connector connected.
- PCM connector connected.
- Ignition ON, engine OFF.
- Access the PCM and monitor the INJPWR_M (VOLT) PID.
- Record the INJPWR_M PID value.
- Ignition OFF.
- Record the INJPWR_M PID value.

Is the INJPWR_M PID voltage reading above 10.5 V with ignition ON and 0 V with the ignition OFF?

Yes	GO to B13 .
No	REPAIR the circuit. Clear the PCM DTCs. REPEAT the self-test.

B13 CHECK FOR CORRECT PCM OPERATION

- Ignition OFF.
- 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.

mcx30.com