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VEHICLE DATA

VEHICLE IDENTIFICATION NUMBER

DESCRIPTION

The Vehicle Identification Number (VIN) plate is located on the lower windshield fence near the left A-pillar. The VIN contains 17 characters that provide data concerning the vehicle. Refer to the VIN decoding chart to determine the identification of a vehicle.

The Vehicle Identification Number is also imprinted on the:

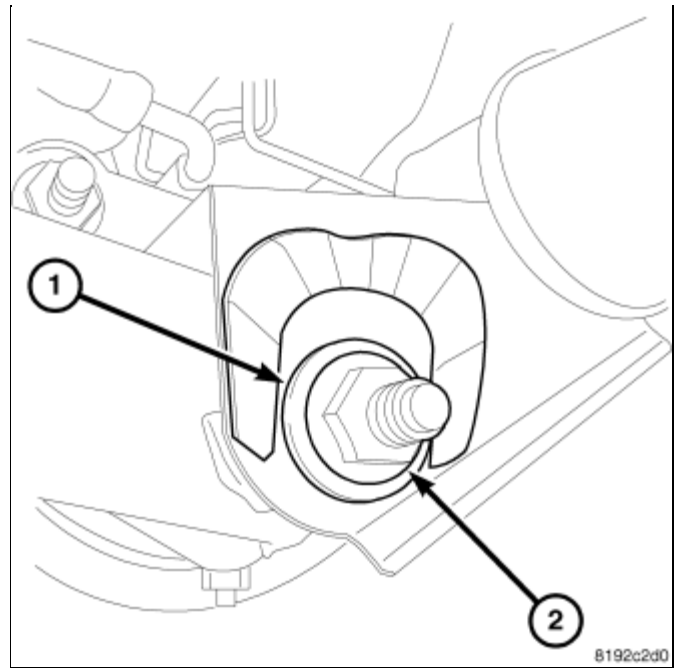
- Vehicle Safety Certification Label.
- Frame rail.

To protect the consumer from theft and possible fraud the manufacturer is required to include a Check Digit at the ninth position of the Vehicle Identification Number. The check digit is used by the manufacturer and government agencies to verify the authenticity of the vehicle and official documentation. The formula to use the check digit is not released to the general public.

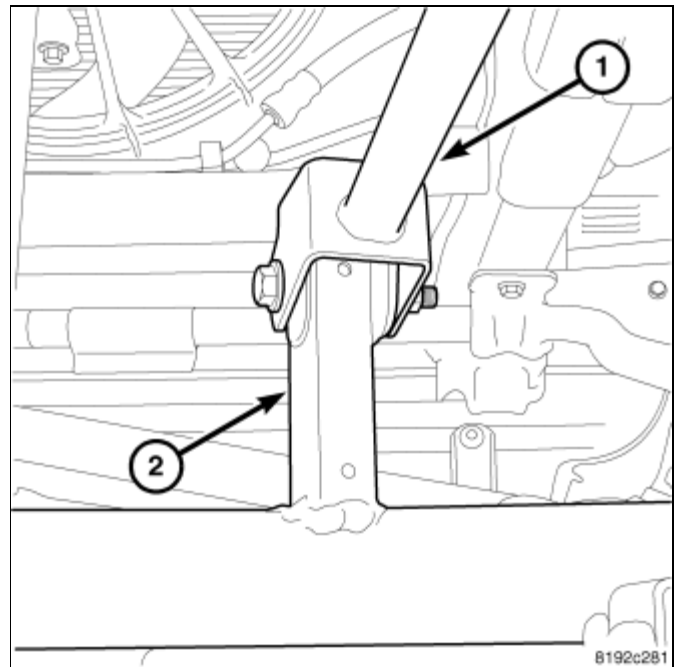
VEHICLE IDENTIFICATION NUMBER DECODING CHART

POSITION	INTERPRETATION	CODE = DESCRIPTION
1	Country of Origin	1 = Manufactured By DaimlerChrysler Corporation
2	Make	J = Jeep
3	Vehicle Type	4 = Multipurpose Passenger Vehicle Less Side Air Bags 8 = Multipurpose Passenger Vehicle With Side Air Bags
4	Gross Vehicle Weight Rating	F = 4001 - 5000 lbs. (1815 - 2267 kg) G = 5001 - 6000 lbs. (2268 - 2721 kg)
5	Vehicle Line	A = Wrangler Left Hand Drive (4x4) B = Wrangler Left Hand Drive (4x2) E = Wrangler Right Hand Drive (4x4)
6	Series/Transmission	2 = L (Low Line) 3 = M (Medium) 5 = P (Premium) 6 = S (Sport) B = 4 Speed Automatic VLP - Sales Code (DGV) C = 6 Speed Manual - Sales Code (DEH) E = 5 Speed Automatic - Sales Code (DGQ)
7	Body Style	4 = Open Body (JK 72) 9 = Extended Open Body (JK 74)

install nuts (2).
4. Install coil springs on axle and raise axle into position.



5. Install upper control arms (1) on axle brackets (2) and loosely install bolts and nuts.



6. Install track bar (2) in axle bracket and loosely install bolt (1).

2. CHECK CONNECTOR/TERMINAL FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector, Right Rear WSS, and Right Rear WSS harness connector.

Is the Right Rear WSS or any of the connectors/terminals damaged?

Yes

- Repair as necessary.
- Perform ABS VERIFICATION TEST. (Refer to 5 - BRAKES - STANDARD PROCEDURE).

No

- Go To [3](#)

3. CHECK (B2) RIGHT REAR WSS 12 VOLT SUPPLY CIRCUIT VOLTAGE

Disconnect the Right Rear WSS harness connector.

Turn the ignition on.

Measure the voltage of the (B2) Right Rear WSS 12 Volt Supply circuit.

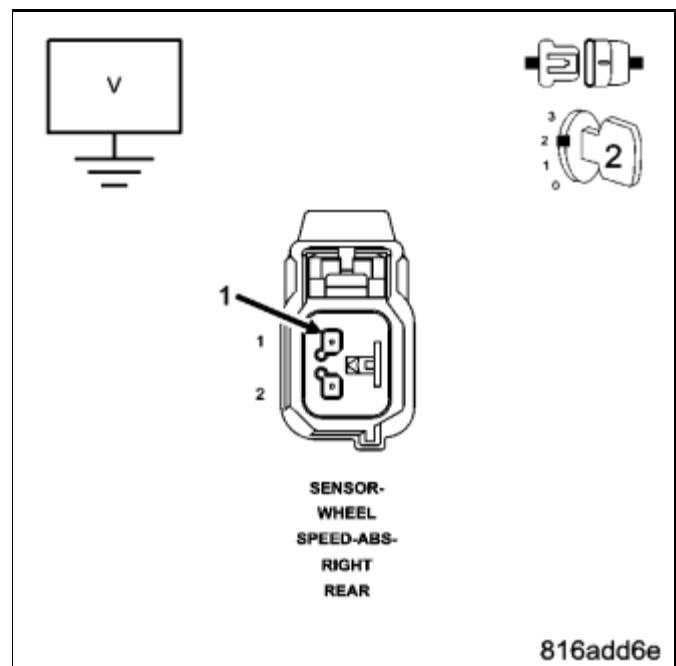
Is the voltage above 10.0 volts?

Yes

- Go To [6](#)

No

- Go To [4](#)



4. CHECK (B2) RIGHT REAR WSS 12 VOLT SUPPLY CIRCUIT FOR A SHORT TO GROUND

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes
(X201) AMPLIFIED LEFT FRONT I/P SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X291) AMPLIFIED LEFT FRONT I/P SPEAKER (-) CIRCUIT SHORTED TO GROUND
LEFT FRONT I/P SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.
With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1461-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

- Go To [2](#)

No

- The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.
- Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

2. CHECK THE (X201) AMPLIFIED LEFT FRONT I/P SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND

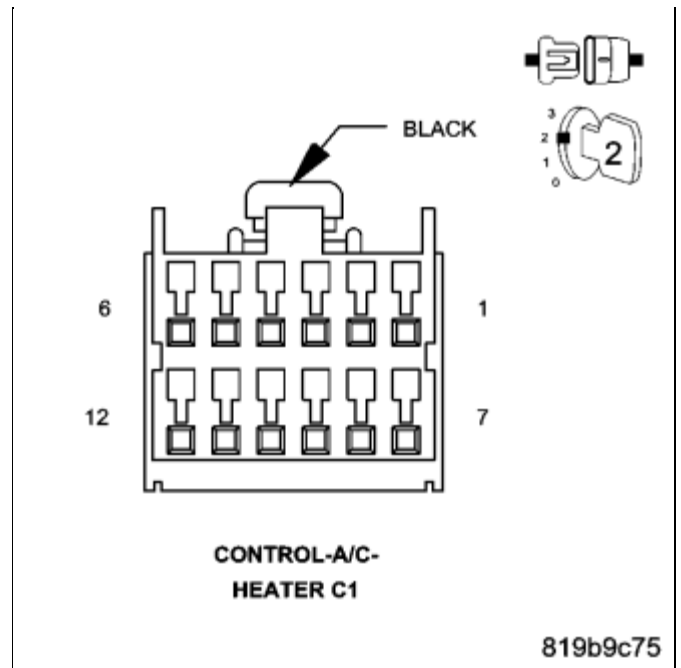
Turn the ignition off.
Disconnect the Amplifier C2 harness connector.
Disconnect the Left I/P Speaker harness connector.

Yes

- Go To [3](#)

No

- Replace A/C Heater Control in accordance with the service information.
- Perform the BODY VERIFICATION TEST – VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE).



3. CHECK THE (C215) REAR WINDOW DEFOGGER SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND

Disconnect the Instrument Cluster (CCN) C3 harness connector.

Using an ohm meter measure the resistance from the (C215) Rear Window Defogger Switch Signal circuit to ground.

Does the ohm meter read open circuit?

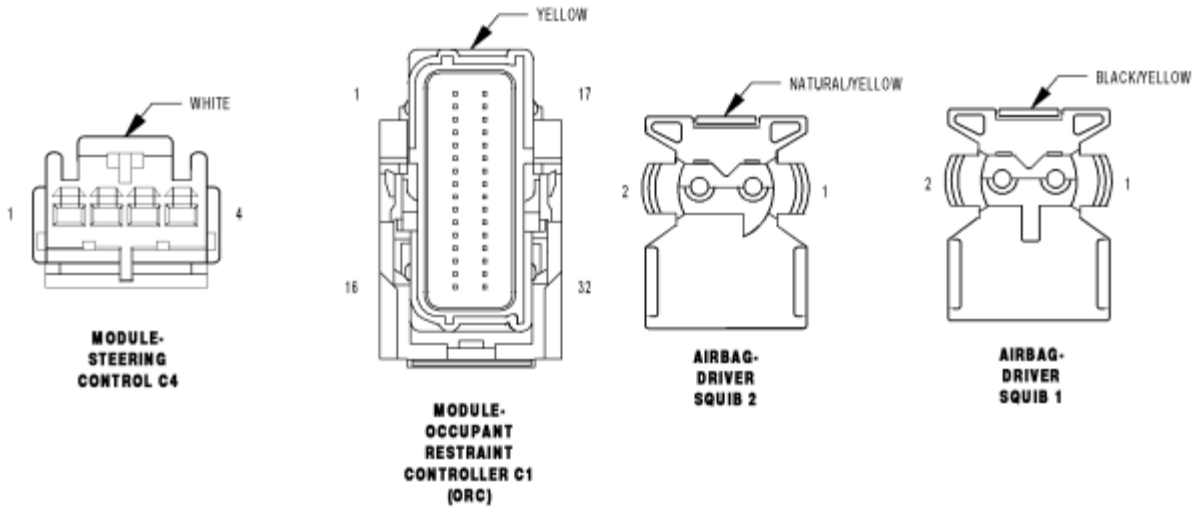
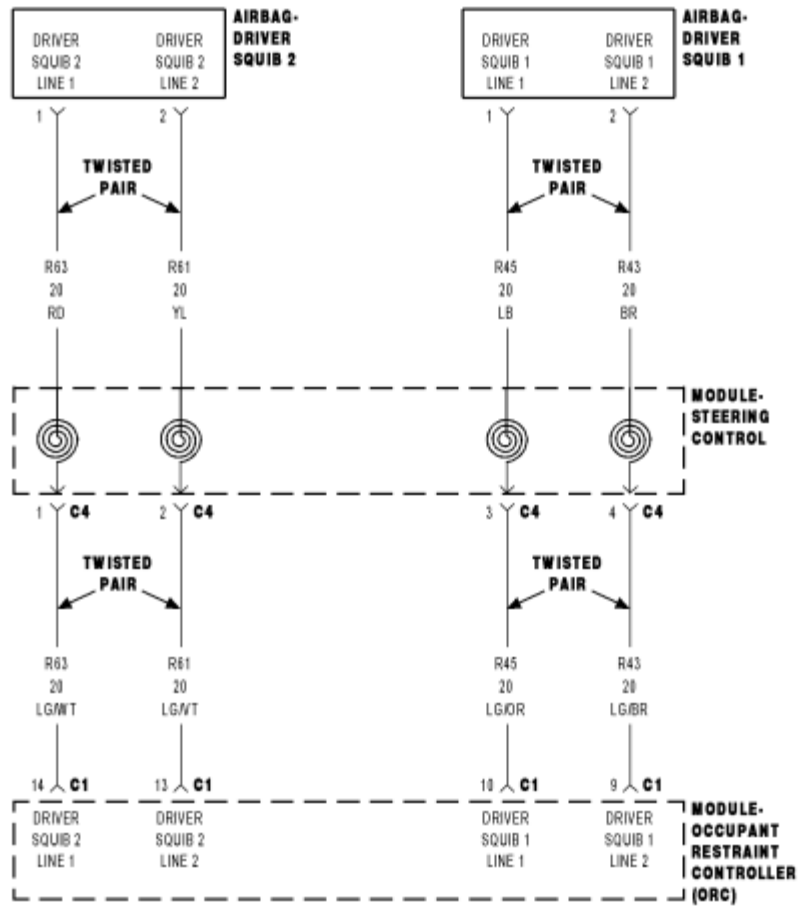
Yes

- Replace the Instrument Cluster (CCN) in accordance with the service information.
- Perform the BODY VERIFICATION TEST – VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE).

No

- Repair short to ground on the (C215) Rear Window Defogger Switch Signal circuit.
- Perform the BODY VERIFICATION TEST – VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE).

B10C2 – REAR DEFROST SWITCH



01991591

For a complete wiring diagram Refer to Section 8W.

o **When Monitored:**

The engine coolant temperature sensor is a negative temperature coefficient thermistor-type sensor whose resistance varies inversely with temperature. At cold temperatures the sensor resistance is high so the voltage is high. As the coolant temperature increases the resistance decreases and the voltage becomes low.

- **When Monitored:**

With the ignition on. Battery voltage greater than 10.4 volts.

- **Set Condition:**

The PCM detects that the Engine Coolant Temperature Sensor input voltage is below the minimum acceptable value. One Trip Fault. Three good trips to clear the MIL. The MIL and ETC light will illuminate if equipped.

Possible Causes
(K2) ECT SIGNAL CIRCUIT SHORTED TO GROUND
(K2) ECT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT
EXCESSIVE RESISTANCE IN THE (K2) ECT SIGNAL CIRCUIT
ECT SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 9 - ENGINE - DIAGNOSIS AND TESTING).

Diagnostic Test

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage DTCs before continuing with this test.

Disconnect the C2 PCM harness connector.
Disconnect the C4 TIPM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Sensor Signal circuit from the Sensor harness connector to the appropriate terminal of special tool #8815 for the ECT Sensor and IAT Sensor. Measure the resistance of the (G31) AAT Sensor Signal circuit from the Sensor harness connector to the C4 TIPM harness connector.

Is the resistance above 5.0 ohms.

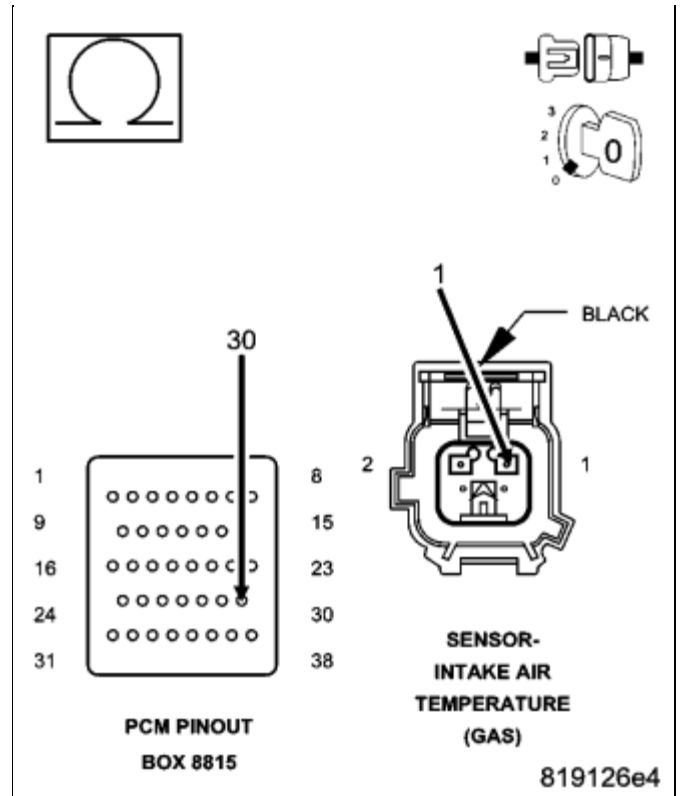
Yes

- Repair the excessive resistance in the Temperature Sensor Signal circuit.
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 9 - ENGINE - STANDARD PROCEDURE.)

No

- Go To [5](#)

5. EXCESSIVE RESISTANCE IN THE SENSOR GROUND CIRCUIT



2. (K79) O2 1/1 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.
 Disconnect the Oxygen Sensor harness connector.
 Disconnect the Engine Control Module (ECM) harness connector.
 Remove the ASD Relay from the TIPM.
 Connect a jumper wire between cavity 30 and cavity 87 of the ASD Relay Connector.
 Turn the ignition on.
 Measure the voltage of the (K79) O2 1/1 Heater Control circuit in the Oxygen Sensor harness connector.

Is there any voltage present?

Yes

- Repair the (K79) O2 1/1 Heater Control circuit for a short to voltage.
- Perform the ECM Verification Test Ver. 1. (Refer to 9 - ENGINE - STANDARD PROCEDURE)

No

- Go to [3](#)

3. (K79) O2 1/1 HEATER CONTROL CIRCUIT SHORTED TO GROUND

Turn the ignition off.
 Remove the jumper wire and install the ASD Relay
 Measure the resistance between ground and the (K79) O2 1/1 Heater Control circuit in the Oxygen Sensor harness connector.

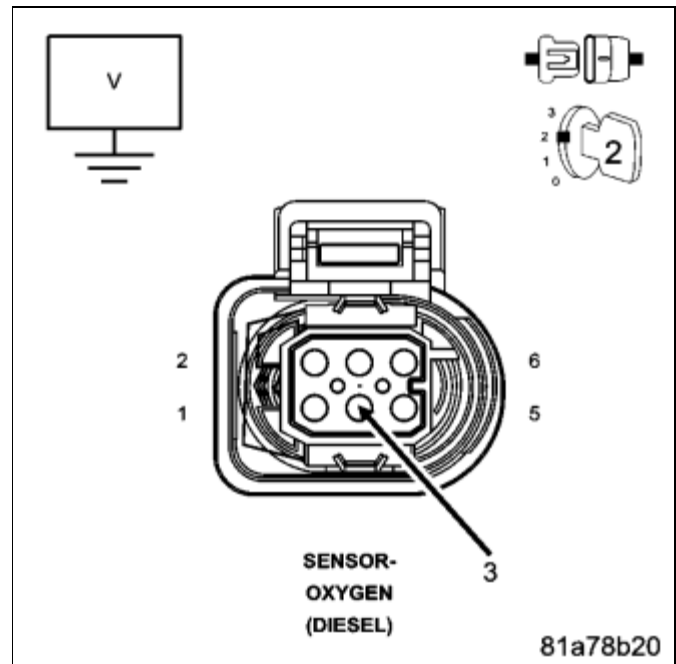
Is the resistance above 1000 ohms?

Yes

- Go to [4](#)

No

- Repair the (K79) O2 1/1 Heater Control circuit for a short to ground.
- Perform the ECM Verification Test Ver. 1. (Refer to 9 - ENGINE - STANDARD PROCEDURE)



With the ignition on.

- **Set Condition:**

A Cabin Heater (PTC) #2 error message has been received over the CAN bus from the Totally Integrated Power Module (TIPM).

Possible Causes
INTERMITTENT DTC
DTC SET IN TOTALLY INTEGRATED POWER MODULE (TIPM)
ENGINE CONTROL MODULE (ECM)

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 9 - ENGINE - DIAGNOSIS AND TESTING)

Diagnostic Test

1. DTC IS ACTIVE

NOTE: This DTC will set if the Engine Control Module (ECM) receives a message from the Totally Integrated Power Module indicating that a PTC Heater Relay DTC is present.

Ignition on, engine not running.

With the scan tool, Clear DTCs in the Engine Control Module (ECM).

With the scan tool, actuate the PTC Heater Relay 2.

With the scan tool, select View DTCs.

Is the status Active for this DTC?

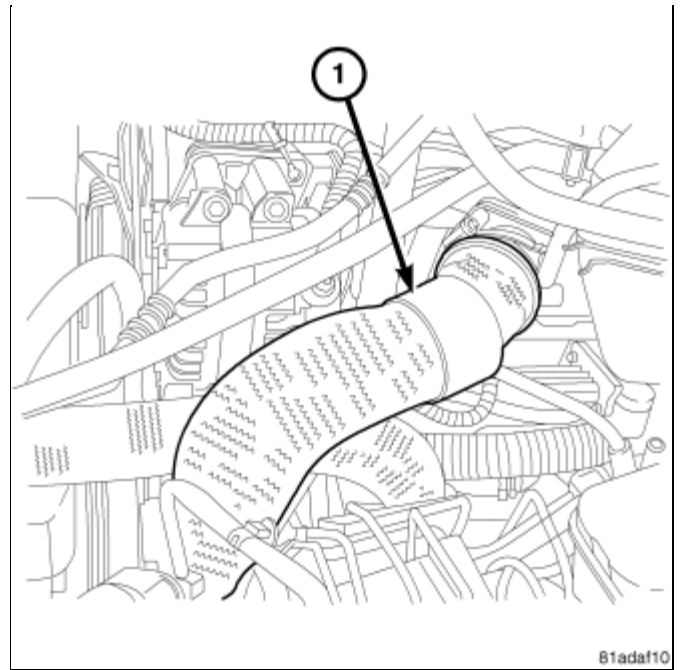
Yes

- Go To [2](#)

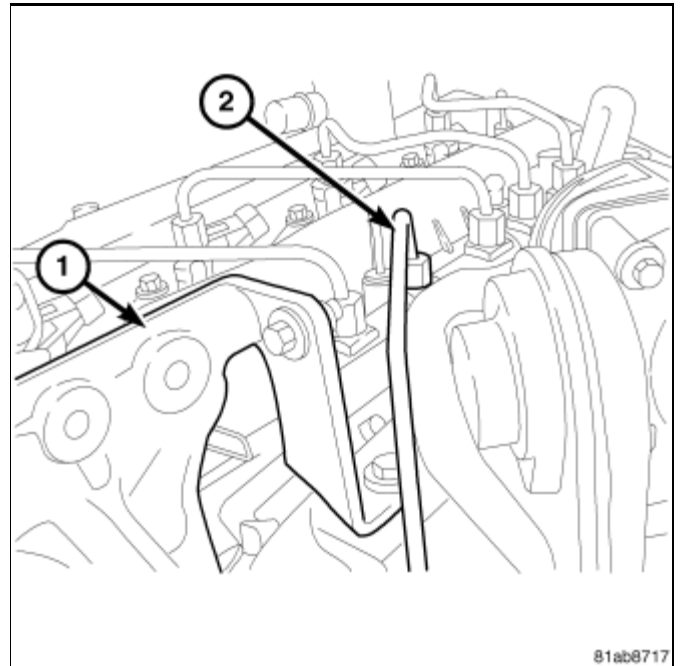
No

- Refer to the *CHECKING FOR AN INTERMITTENT DTC Diagnostic Procedure. (Refer to 9 - ENGINE - DIAGNOSIS AND TESTING)

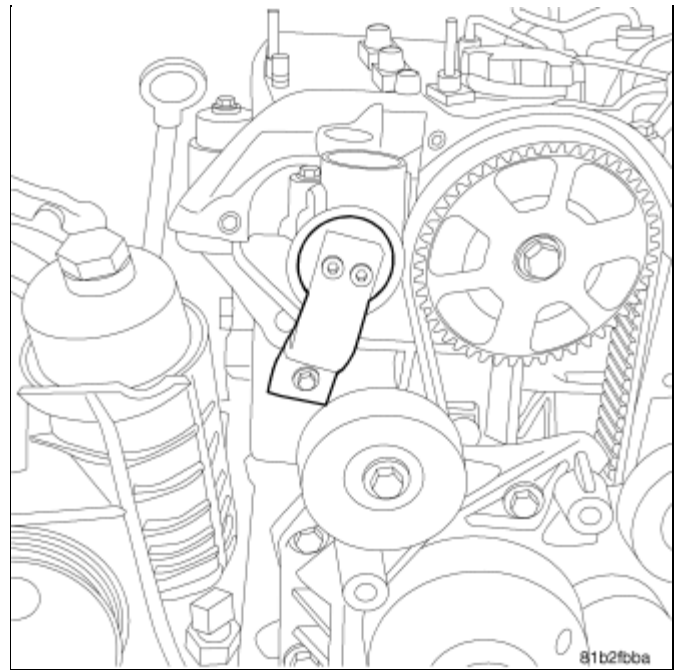
2. ENGINE CONTROL MODULE (ECM)



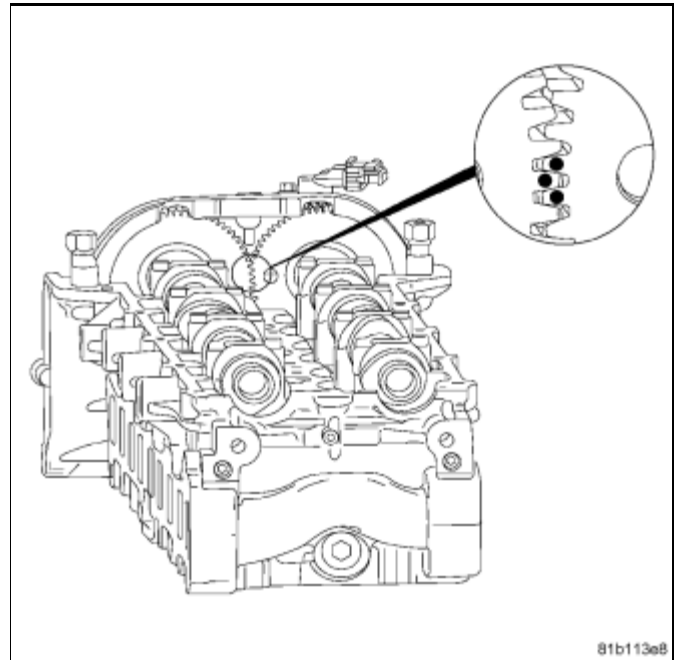
8. Remove the high pressure fuel feed line (2).
9. Remove the generator brace bolt (1).



10. Disconnect the fuel return lines (1) and (2).



NOTE: If it is suspected that the camshafts are not correctly timed to each other, the valve cover must be removed to allow the verification of camshaft timing. When the dots on the back of the camshafts are lined up, the camshafts are correctly timed to each other. The engine is NOT timed to 90° ATDC with the camshaft dots lined up. Use the camshaft timing tool to set the camshafts to 90° ATDC.



NOTE: When the camshafts are correctly timed to each other and turned to 90° ATDC, the camshaft marks are positioned as shown in the illustration to the right.

COVER(S)-TIMING BELT AND CHAIN

REMOVAL

REMOVAL - TIMING BELT INNER

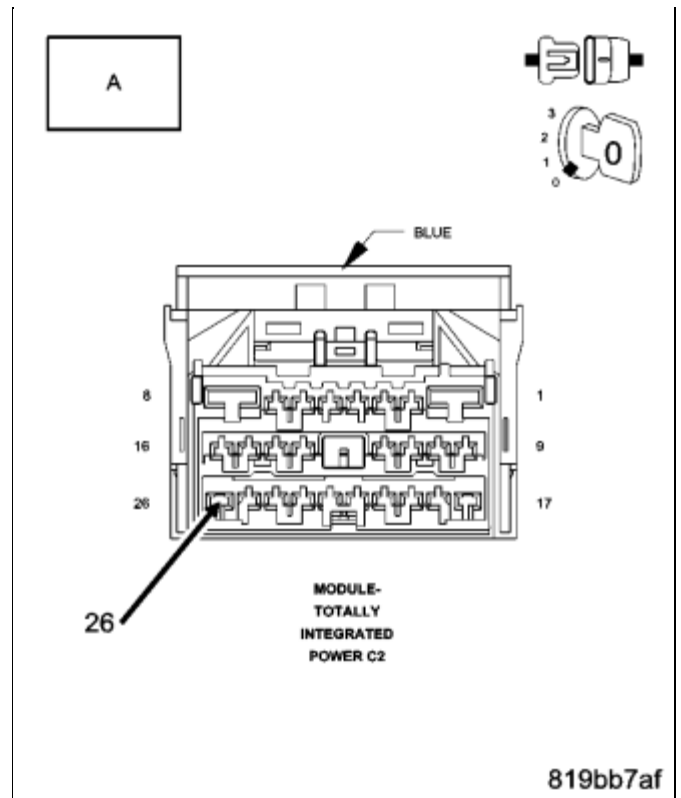
Does the amperage read below 2.0 amps?

Yes

- Go to [4](#)

No

- Go to [3](#)



3. CHECK THE PCM

Disconnect the ammeter from the TIPM C2 harness connector and battery positive.

Disconnect the PCM C4 harness connector.

Reconnect the positive probe of an ammeter to battery positive and connect the negative probe to the (T16) Transmission Control Output circuit in the TIPM C2 harness connector.

Read the amperage on the ammeter.

Does the amperage read below 2.0 amps?

Yes

- Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform Quick Learn
- Perform 545RFE TRANSMISSION VERIFICATION TEST. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 45RFE/545RFE - STANDARD PROCEDURE)

