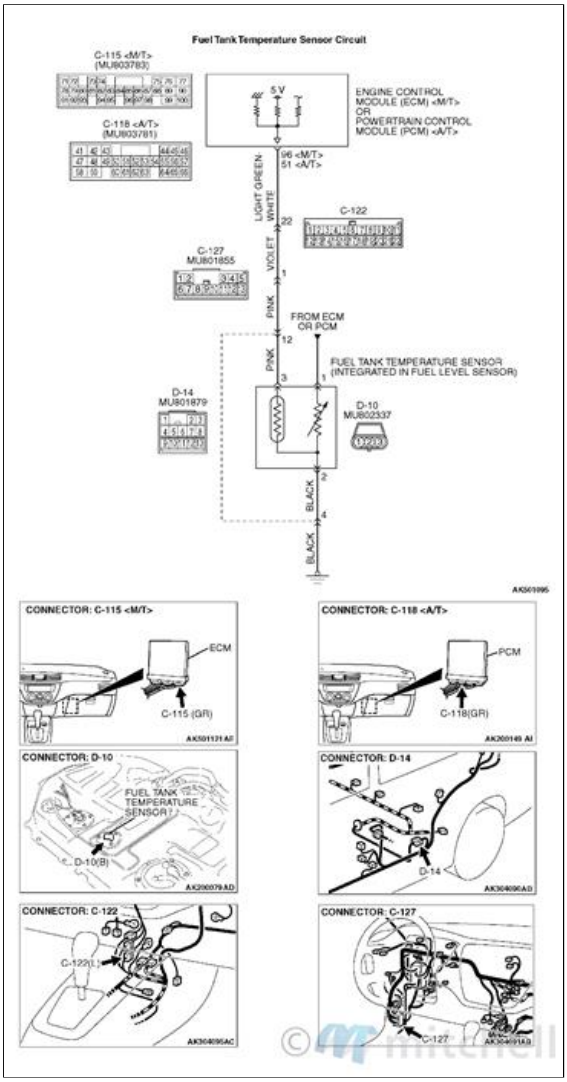
Mitchell RepairCenter™ TechAdvisor

2006 Mitsubishi Lancer Evolution

Powertrain Diagnostics & Repair / Engine Performance / Testing & Diagnostics / MULTIPORT FUEL INJECTION (MFI) - LANCER 2.0L

DTC P0181: Fuel Tank Temperature Sensor Circuit Range/Performance

Fig. 542: Fuel Tank Temperature Sensor Circuit Diagram



CIRCUIT OPERATION

- 5-volt voltage is applied to the fuel tank temperature sensor output terminal (terminal No. 3) from the ECM (terminal No. 96) < M/T > or PCM (terminal No. 51) < A/T > via the resistor in the ECM < M/T > or PCM < A/T >.
- The fuel tank temperature sensor output voltage increases when the resistance increases and decreases when the resistance decreases. The ground terminal (terminal No. 2) is grounded to the vehicle body.

TECHNICAL DESCRIPTION

- The fuel tank temperature sensor converts the fuel tank temperature to a voltage.
- The ECM < M/T > or PCM< A/T > detects the fuel tank temperature in the fuel tank with this output voltage.

DESCRIPTIONS OF MONITOR METHODS

- If the fuel tank temperature is found to be higher than the engine coolant temperature by a prescribed value, through a comparison between the engine coolant temperature and the fuel tank temperature when the engine is started cold, a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

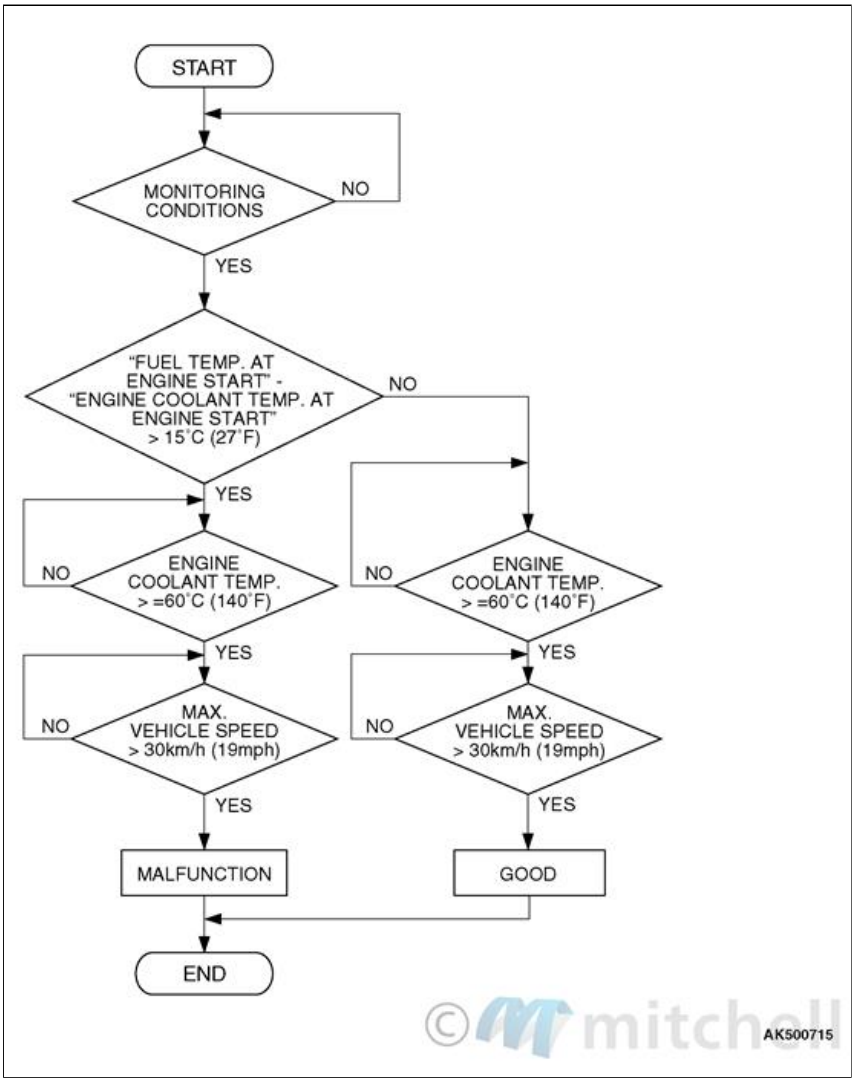
Sensor (The sensor below is determined to be normal)

- Intake air temperature sensor
- Engine coolant temperature sensor

DTC SET CONDITIONS

Logic Flow Chart

Fig. 543: DTC Set Logic Flow Chart



Check Conditions

- The engine coolant temperature - intake air temperature is 5°C (9°F) or less when the engine is started.
- The engine coolant temperature is between - 10°C (14°F) and 36°C (96.8°F) when the engine is started.
- Engine coolant temperature is higher than 60°C (140°F).

- Maximum vehicle speed is higher than 30 km/h (19 mph) after the starting sequence has been completed.

Judgement Criterion

- The fuel tank temperature - engine coolant temperature is 15° C (27° F) or more when the engine is started.

OBD-II DRIVE CYCLE PATTERN

Refer to DIAGNOSTIC FUNCTION - OBD-II DRIVE CYCLE - PATTERN 13 .

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Fuel tank temperature sensor failed.
- Open or shorted fuel tank temperature sensor circuit, or connector damage.
- ECM failed. < M/T >
- PCM failed. < A/T >

NOTE:	A diagnostic trouble code (DTC) could be output if the engine coolant is changed as indicated below. Because this is not a failure, the DTC must be erased. Make sure to test drive the vehicle in accordance with the drive cycle pattern in order to verify that a DTC will not be output.

- The engine and the radiator have been flushed repeatedly when the engine coolant temperature was high (or the fuel tank temperature was high).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: USB Cable
  - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, check data list item 4A: Fuel Tank Temperature Sensor.

CAUTION:	To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

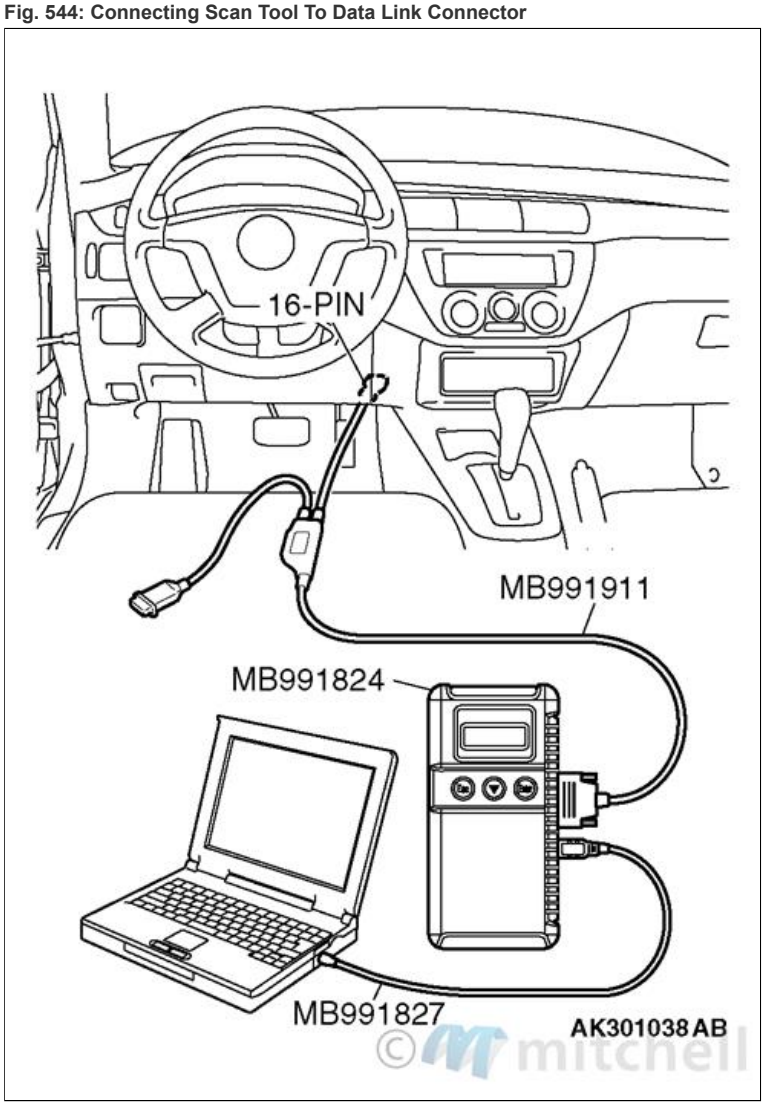
1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Set scan tool MB991958 to the data reading mode for item 4A, Fuel Tank Temperature Sensor.
   - With the engine cool, the fuel tank temperature should be approximately the same as ambient air temperature.
4. Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to HOW TO COPE WITH INTERMITTENT MALFUNCTIONS .

NO : Go to Step 2.

Fig. 544: Connecting Scan Tool To Data Link Connector



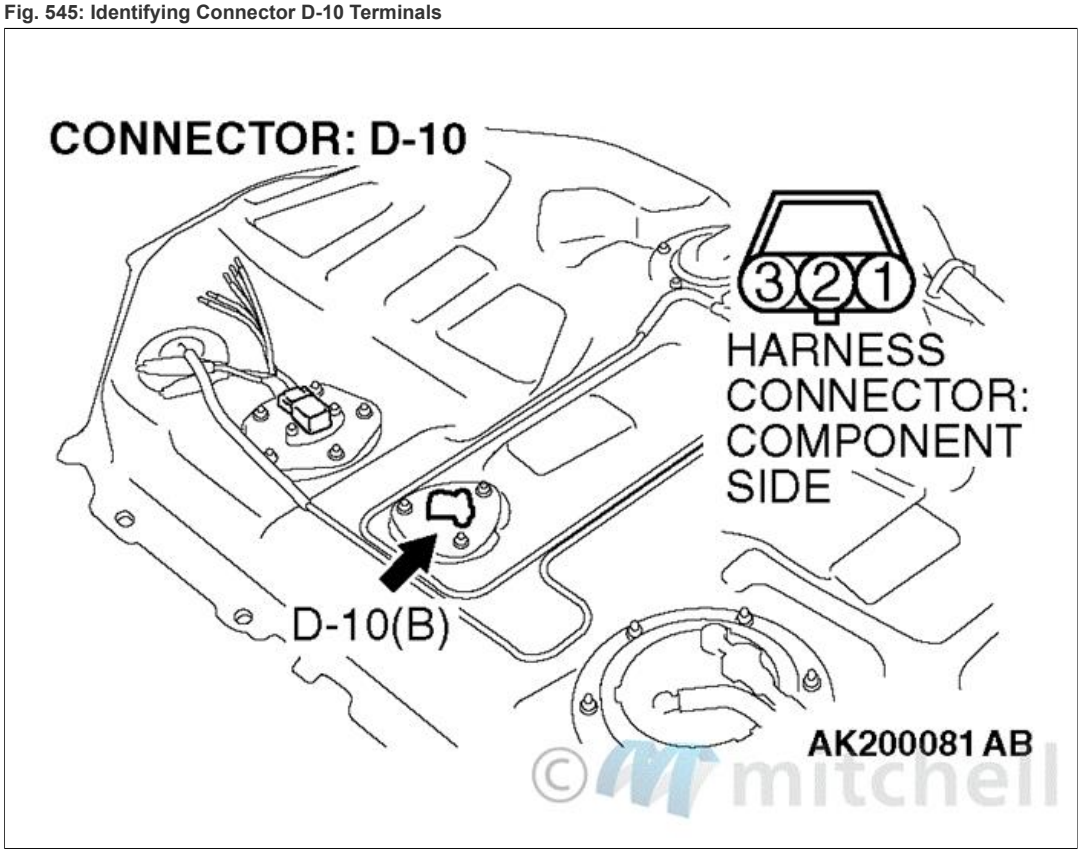
STEP 2. Check connector D-10 at the fuel tank temperature sensor for damage.

Q: Is the connector in good condition?

YES : Go to Step 3.

NO : Repair or replace it. Refer to HARNESS CONNECTOR INSPECTION . Then go to Step 12.

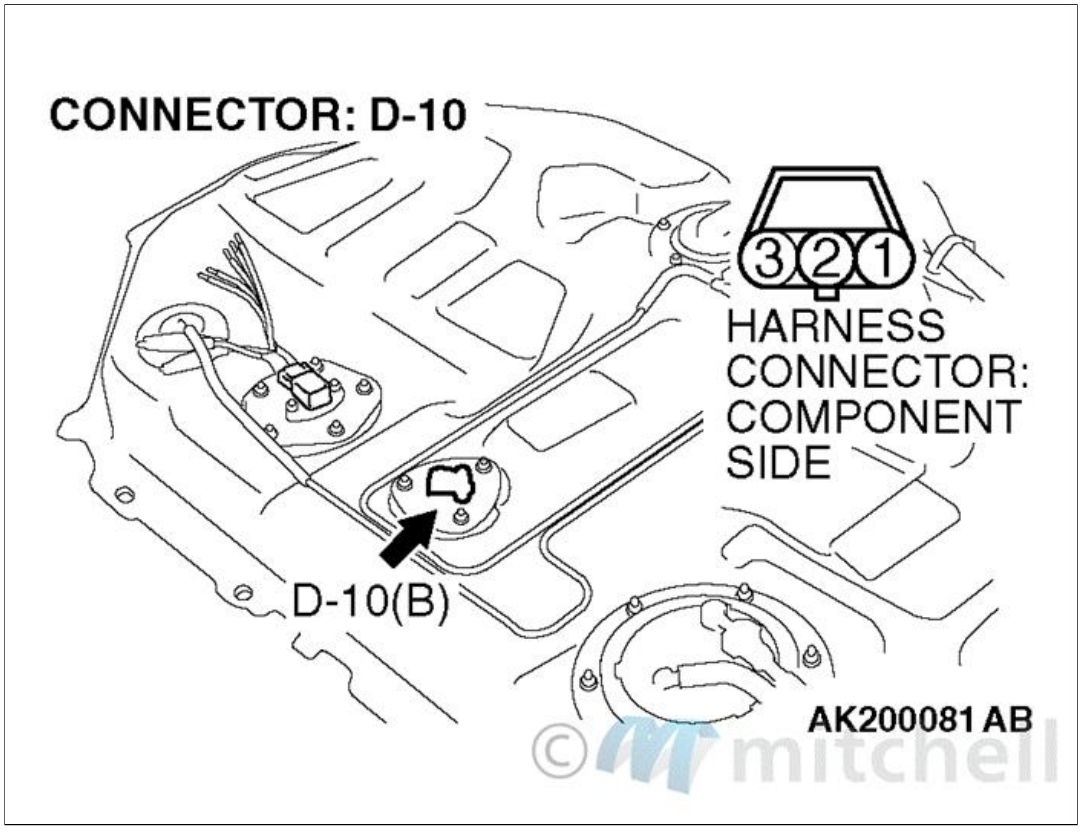
Fig. 545: Identifying Connector D-10 Terminals



STEP 3. Check the fuel tank temperature sensor.

1. Disconnect the fuel tank temperature sensor connector D-10.

Fig. 546: Identifying Connector D-10 Terminals



2. Measure the resistance between terminal No. 2 and No. 3 of the fuel tank temperature sensor.

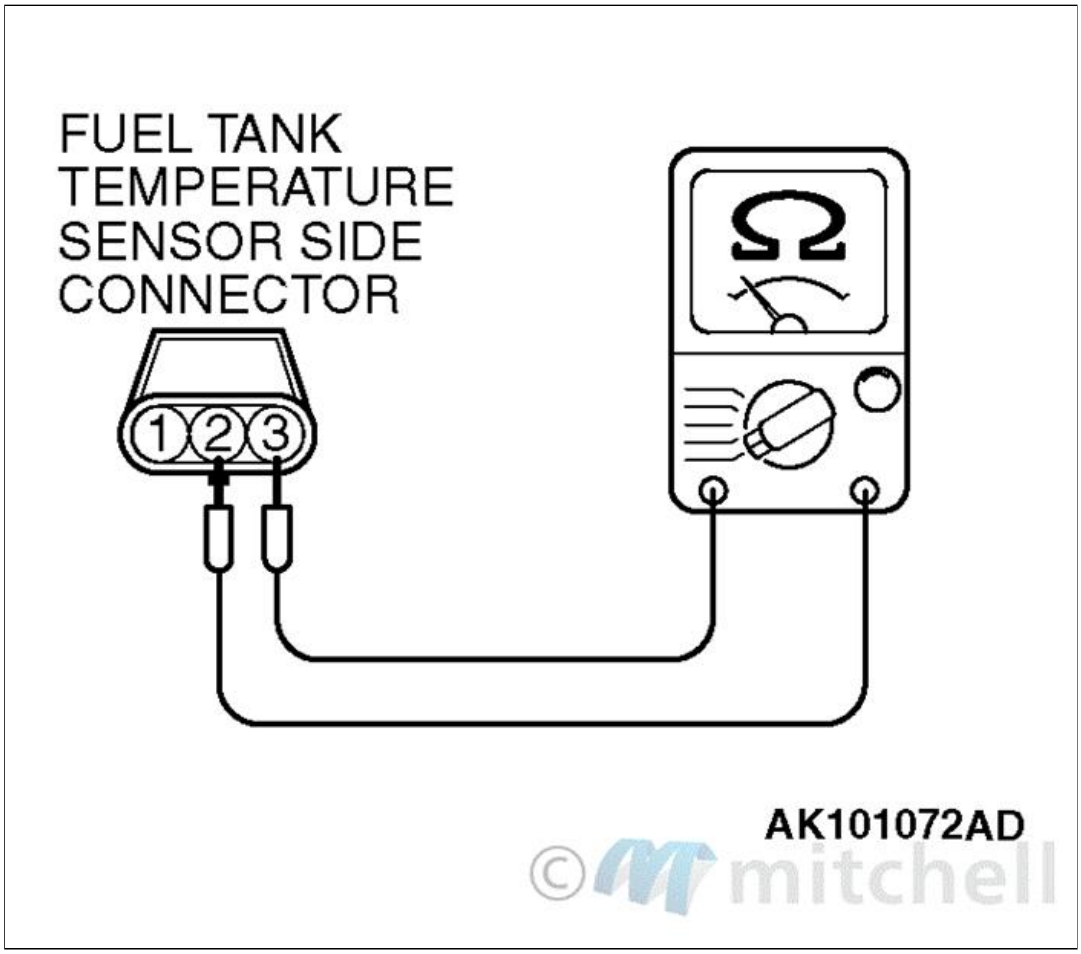
   Standard value: 0.5 - 12.0 kΩ

Q: Is the measured resistance between 0.5 and 12.0 kΩ?

YES : Go to Step 4.

NO : Replace the tank fuel tank temperature sensor. Then go to Step 12.

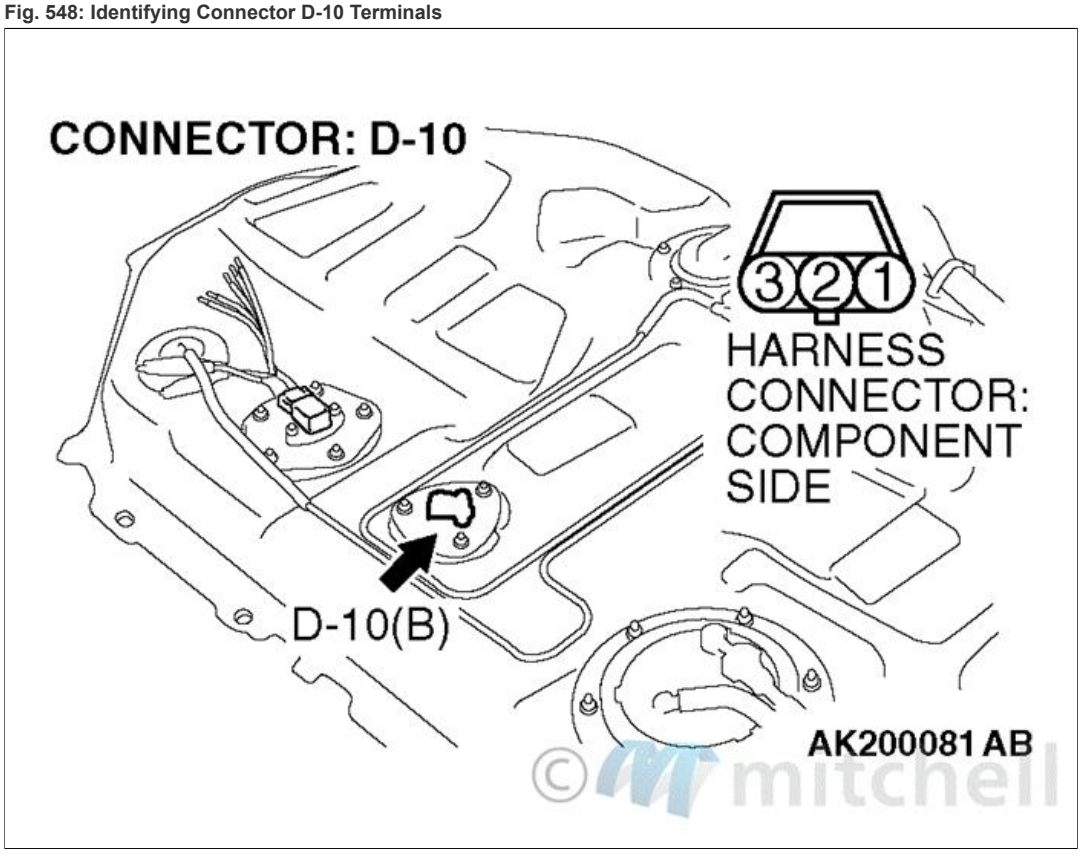
Fig. 547: Measuring Resistance Between Terminal No. 2 And No. 3 Of Fuel Tank Temperature Sensor



STEP 4. Check for continuity at fuel tank temperature sensor harness side connector D-10.

1. Disconnect connector D-10 and measure at the harness side.

Fig. 548: Identifying Connector D-10 Terminals



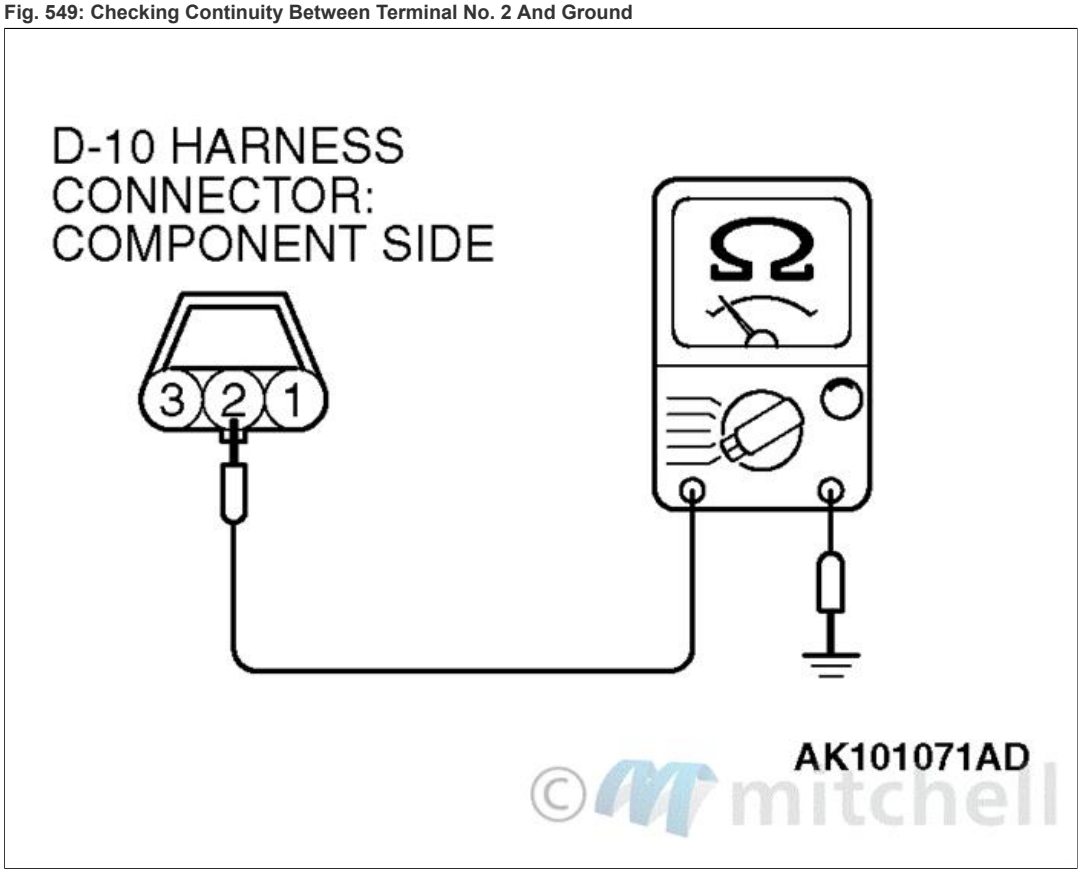
2. Check for the continuity between terminal No. 2 and ground.
    - Should be less than 2 ohms.

Q: Does continuity exist?

YES : Go to Step 5.

NO : Check connector D-14 at intermediate connector for damage, and repair or replace as required. Refer to HARNESS CONNECTOR INSPECTION . If intermediate connector is in good condition, repair harness wire between fuel tank temperature sensor connector D-10 (terminal No. 2) and ground because of open circuit or harness damage. Then go to Step 12.

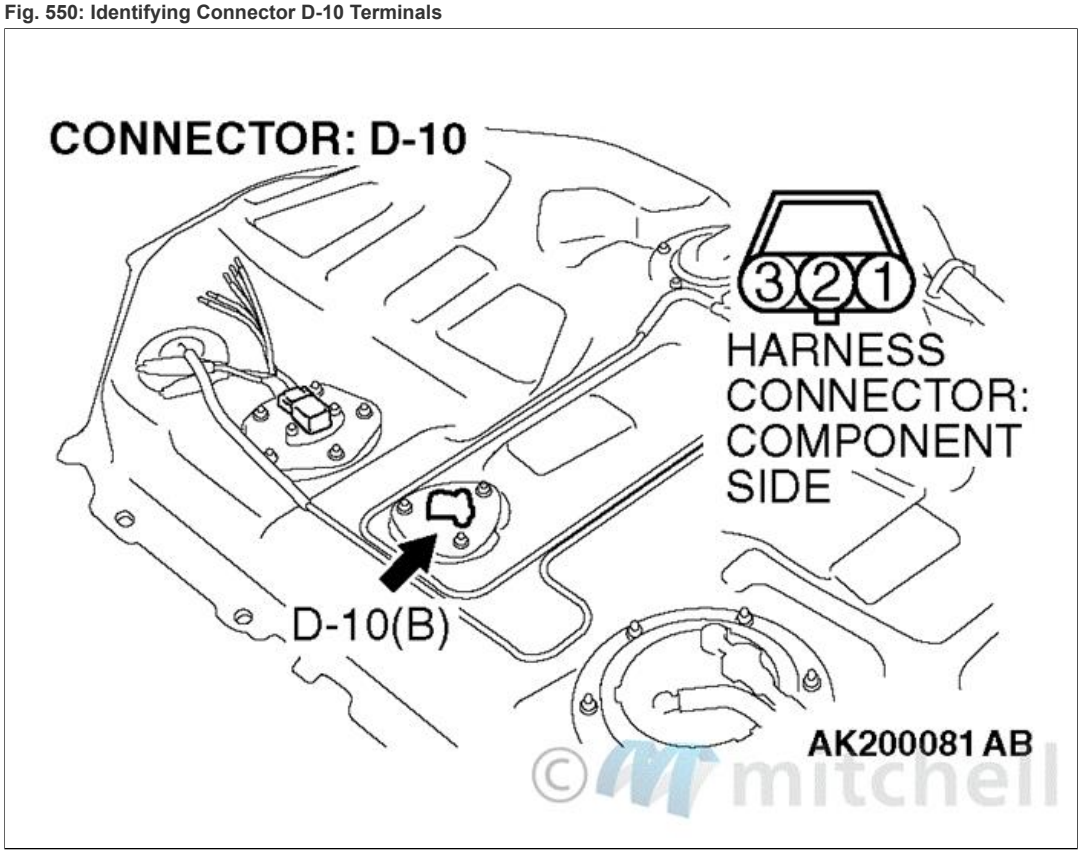
Fig. 549: Checking Continuity Between Terminal No. 2 And Ground



STEP 5. Measure the sensor supply voltage at fuel tank temperature sensor harness side connector D-10.

1. Disconnect connector D-10 and measure at the harness side.
2. Turn the ignition switch to the "ON" position.

Fig. 550: Identifying Connector D-10 Terminals



3. Measure the voltage between terminal No. 3 and ground.

- Voltage should be between 4.5 and 4.9 volts.

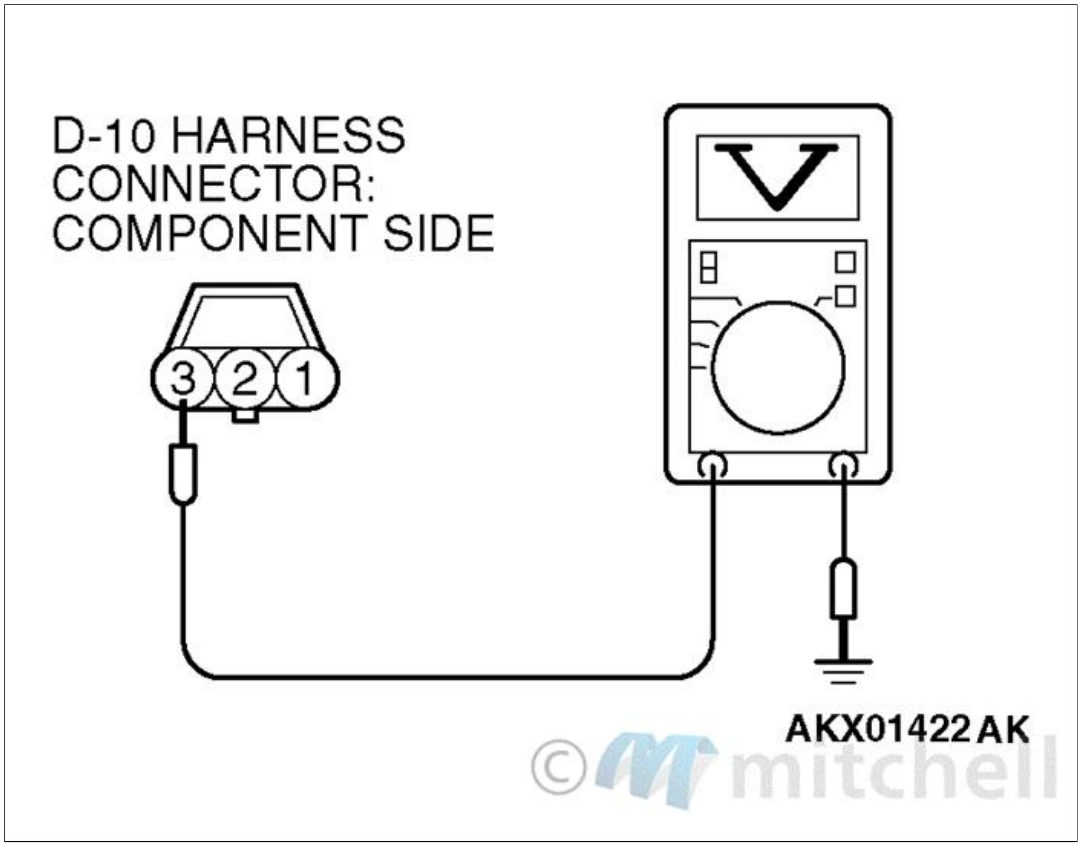
4. Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.5 and 4.9 volts?

YES : Go to Step 6.

NO : Go to Step 10.

Fig. 551: Measuring Voltage Between Terminal No. 3 And Ground



STEP 6. Measure the sensor supply voltage at ECM connector C-115 < M/T > or PCM connector C-118 < A/T > by backprobing.

1. Do not disconnect the ECM connector C-115 < M/T > or PCM connector C-118 < A/T >.
2. Turn the ignition switch to the "ON" position.

Fig. 552: Identifying Connector C-115 Terminals (M/T)

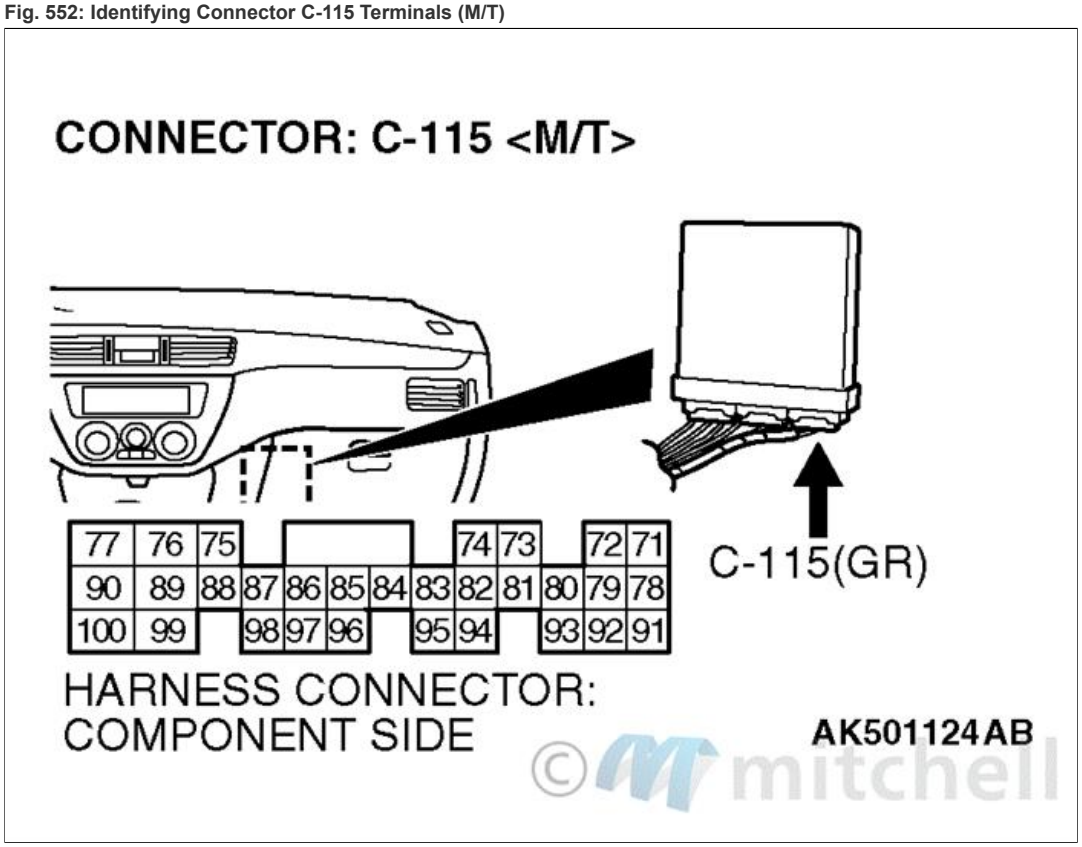
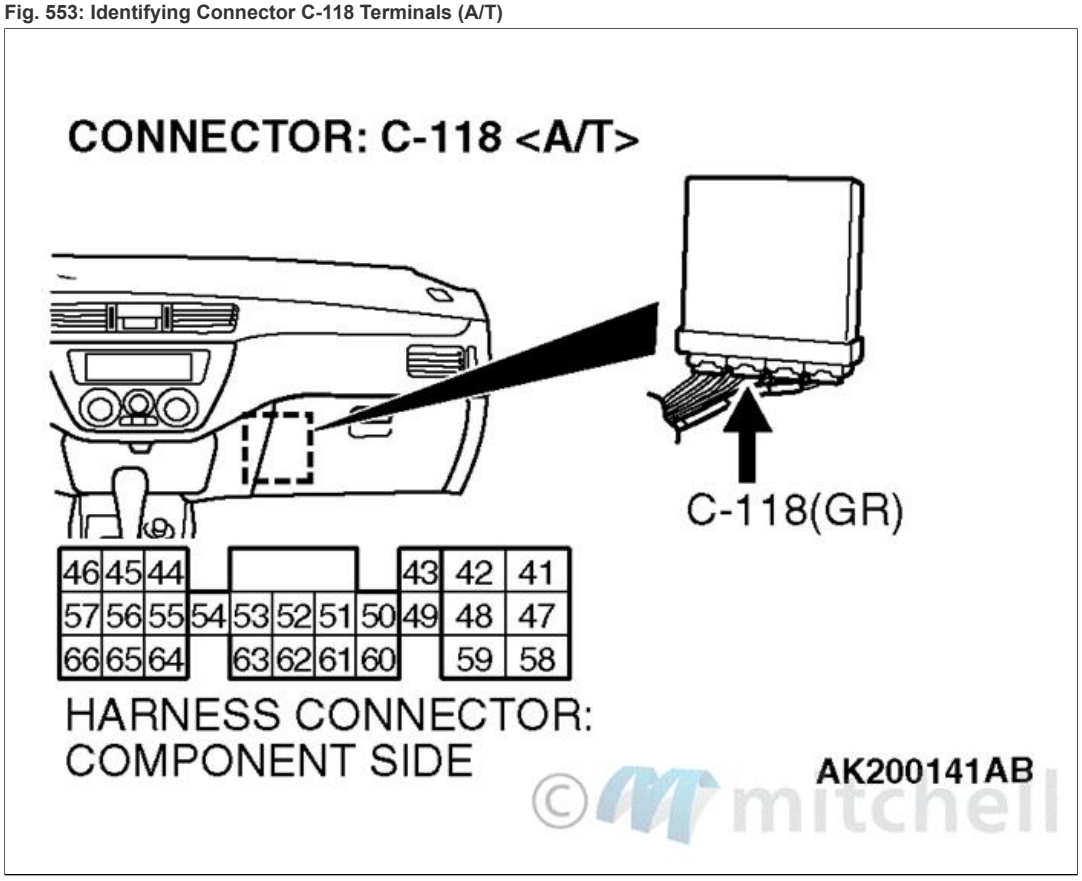


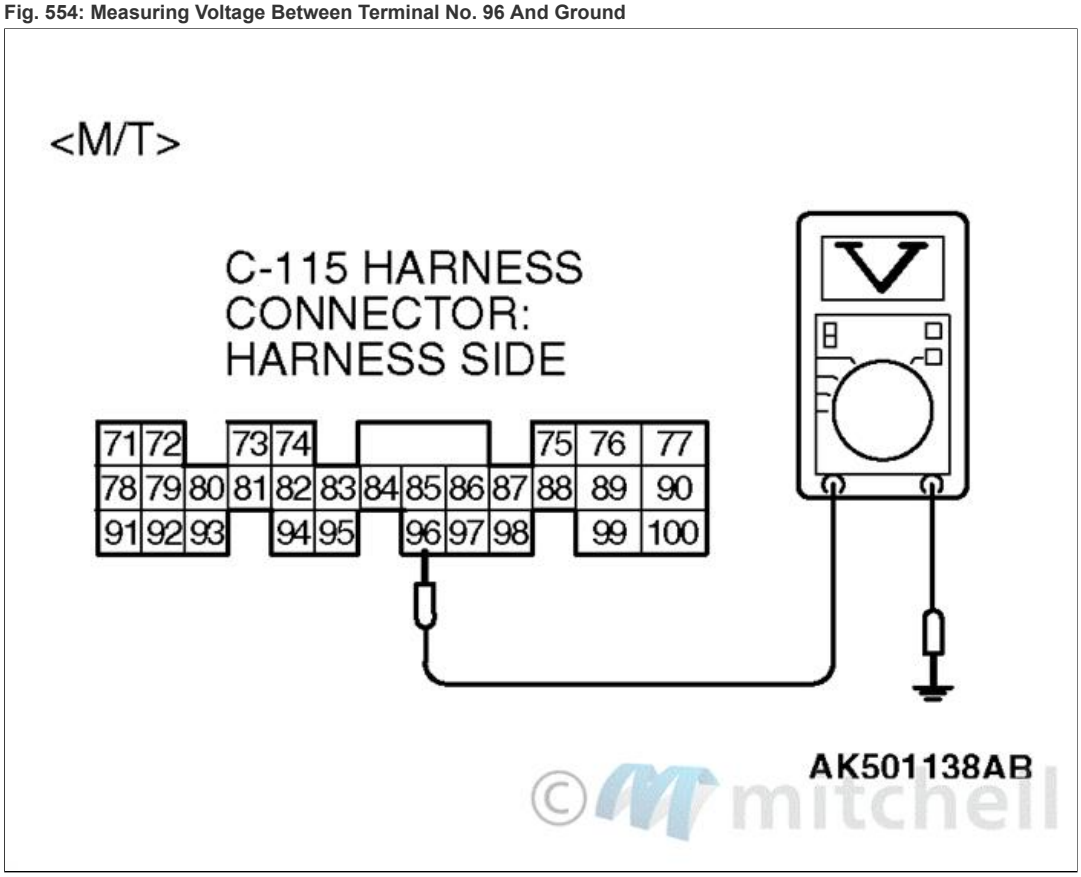
Fig. 553: Identifying Connector C-118 Terminals (A/T)



3. Measure the voltage between terminal No. 96 < M/T > or terminal No. 51 < A/T > and ground by backprobing.
    - When fuel tank temperature is 0°C (32°F), voltage should be 2.7 and 3.1 volts.
    - When fuel tank temperature is 20°C (68°F), voltage should be 2.1 and 2.5 volts.
    - When fuel tank temperature is 40°C (104°F), voltage should be 1.6 and 2.0 volts.
    - When fuel tank temperature is 80°C (176°F), voltage should be 0.8 and 1.2 volts.

4. Turn the ignition switch to the "LOCK" (OFF) position.

Fig. 554: Measuring Voltage Between Terminal No. 96 And Ground

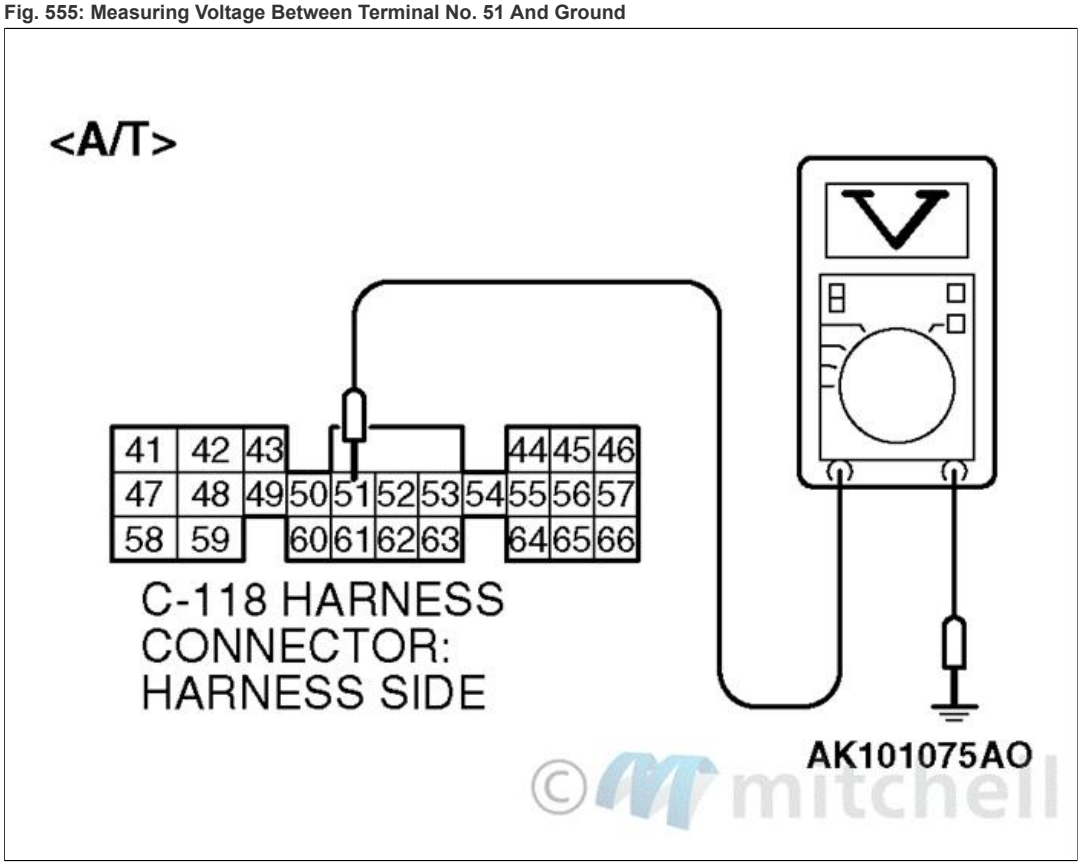


Q: Is the measured voltage within the specified range?

YES : Go to Step 7.

NO : Go to Step 8.

Fig. 555: Measuring Voltage Between Terminal No. 51 And Ground



STEP 7. Check harness connector C-115 at ECM < M/T > or harness connector C-118 at PCM < A/T > for damage.

Q: Is the harness connector in good condition?

YES : Check connector C-122, C-127 and D-14 at intermediate connector for damage, and repair or replace as required. Refer to HARNESS CONNECTOR INSPECTION . If intermediate connector are in good condition, repair harness wire between fuel tank temperature sensor connector D-10 (terminal No. 3) and ECM connector C-115 (terminal No. 96) < M/T > or PCM connector C-118 (terminal No. 51) < A/T > because of open circuit. Then go to Step 12.

NO : Repair or replace it. Refer to HARNESS CONNECTOR INSPECTION . Then go to Step 12.

Fig. 556: Identifying Connector C-115 Terminals (M/T)

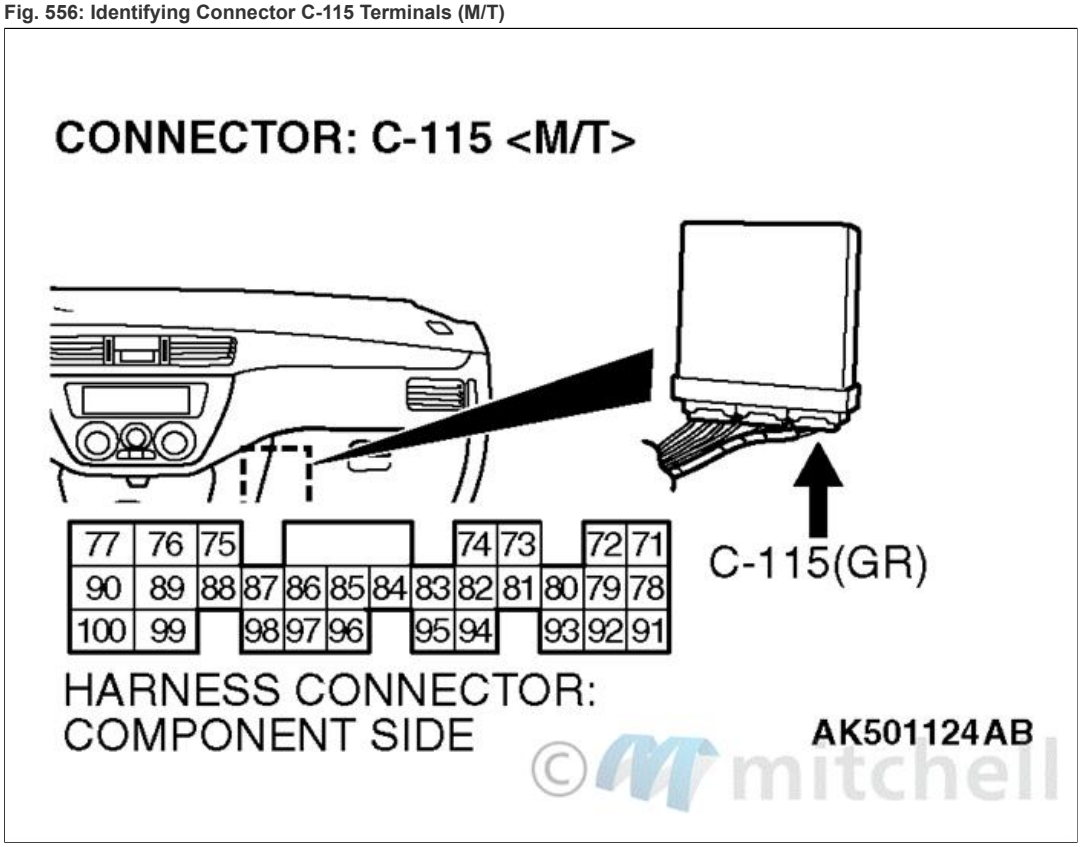
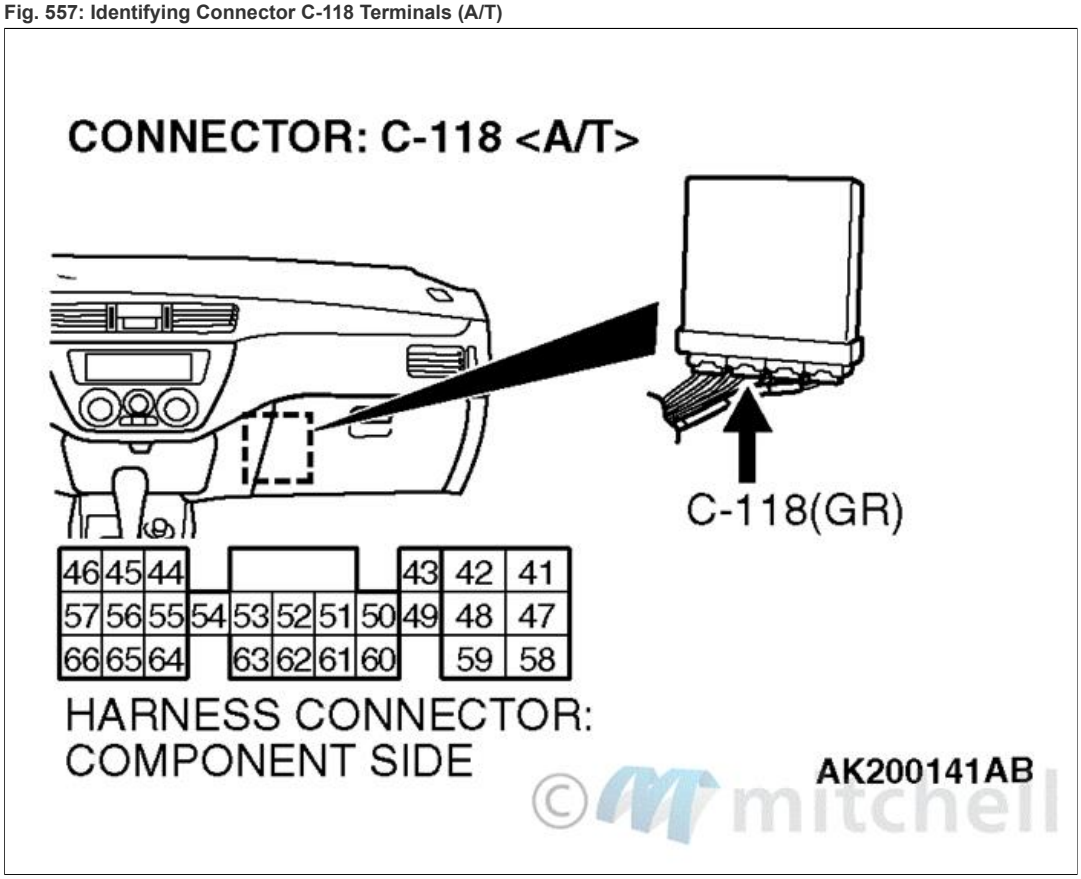


Fig. 557: Identifying Connector C-118 Terminals (A/T)



STEP 8. Check harness connector C-115 at ECM < M/T > or harness connector C-118 at PCM < A/T > for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 9.

NO : Repair or replace it. Refer to HARNESS CONNECTOR INSPECTION . Then go to Step 12.

Fig. 558: Identifying Connector C-115 Terminals (M/T)

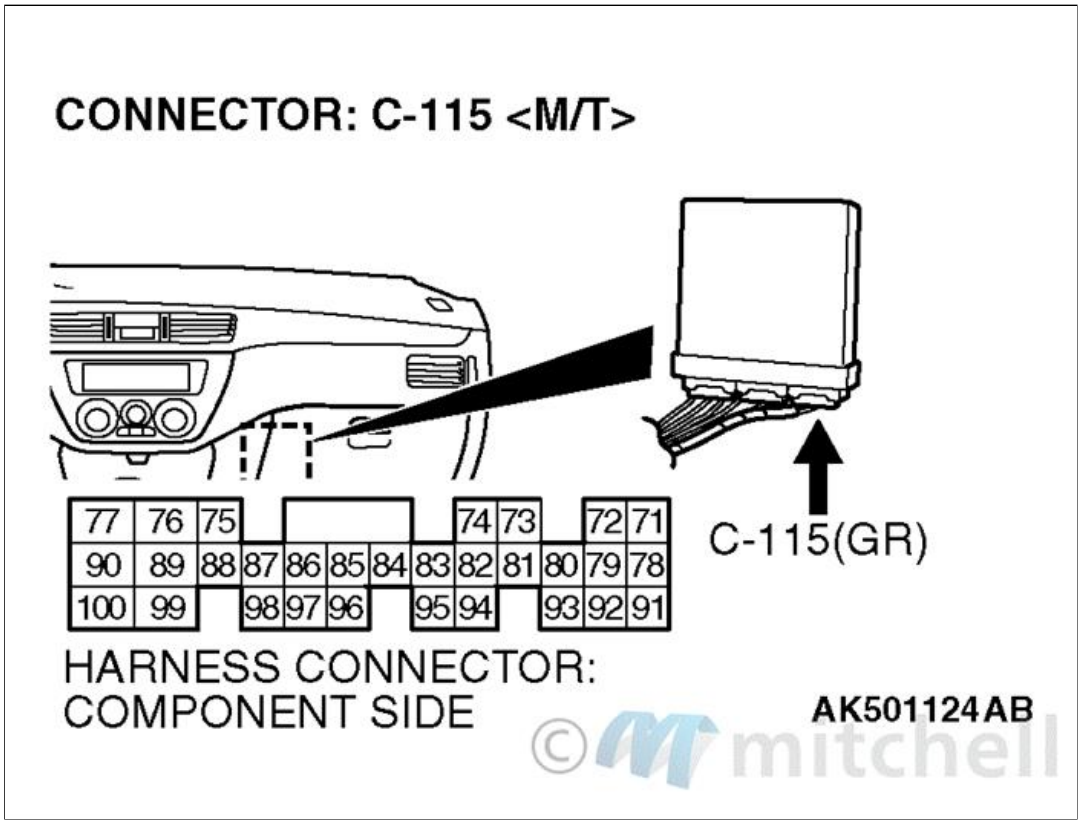
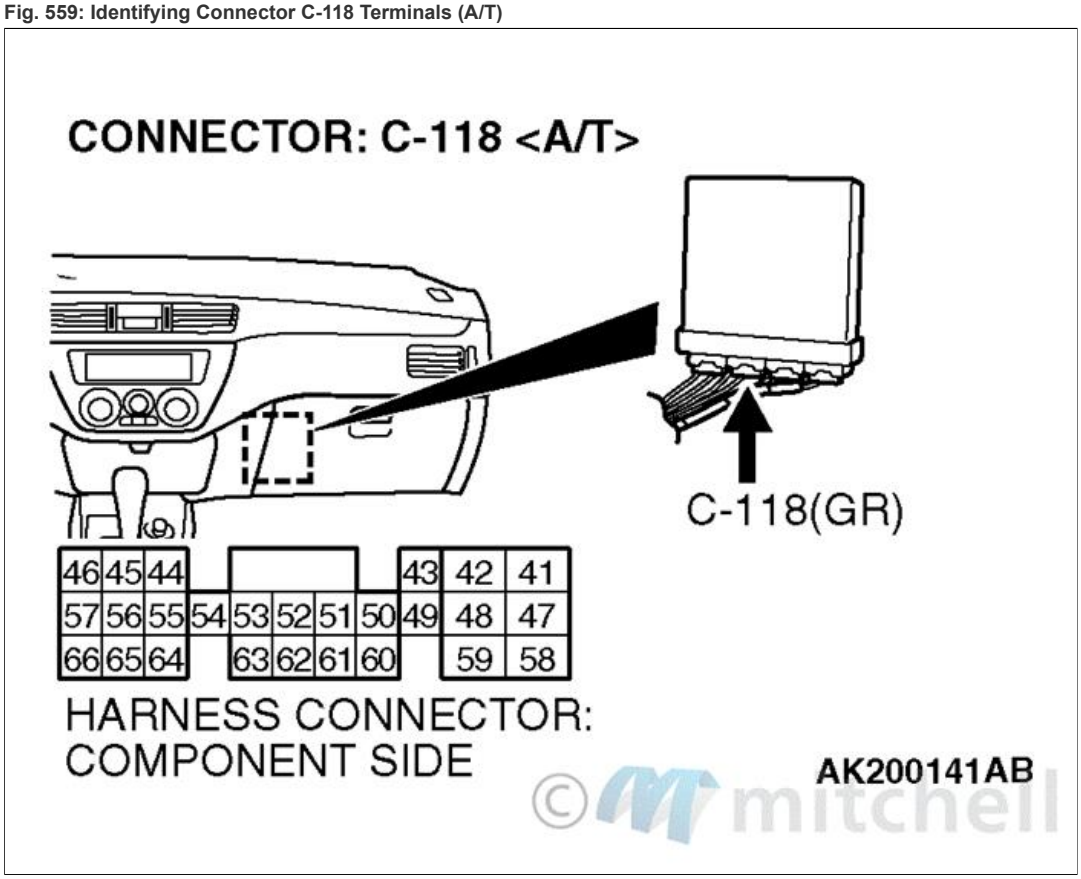


Fig. 559: Identifying Connector C-118 Terminals (A/T)



STEP 9. Check for short circuit to ground between fuel tank temperature sensor connector D-10 (terminal No. 3) and ECM connector C-115 (terminal No. 96) < M/T > or PCM connector C-118 (terminal No. 51) < A/T >.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

NO : Repair it. Then go to Step 12.

Fig. 560: Identifying Connector D-10 Terminals

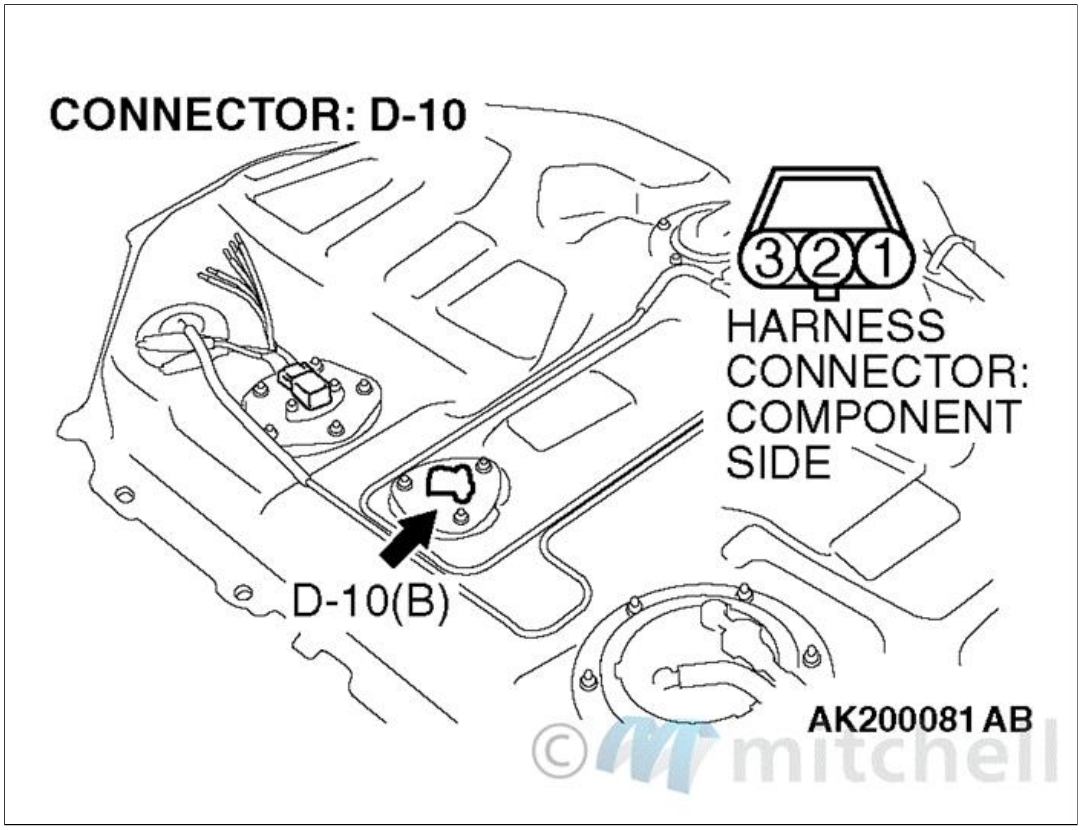


Fig. 561: Identifying Connector C-115 Terminals (M/T)

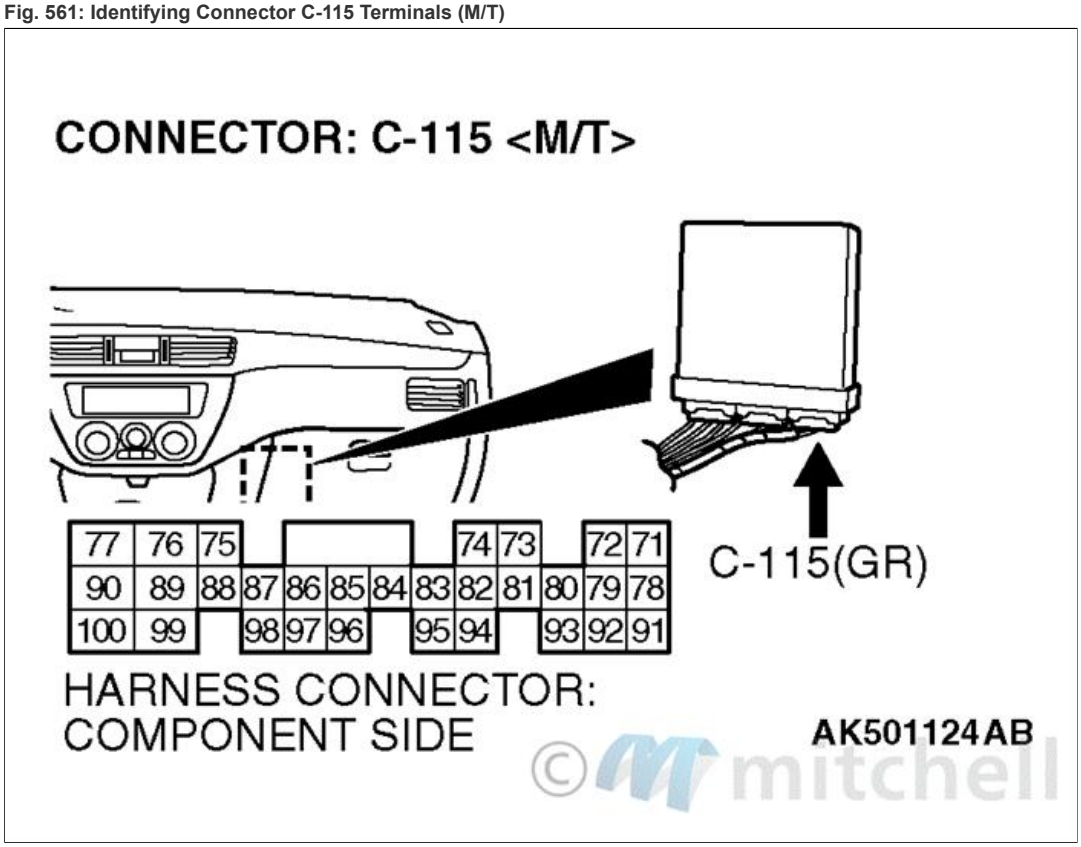
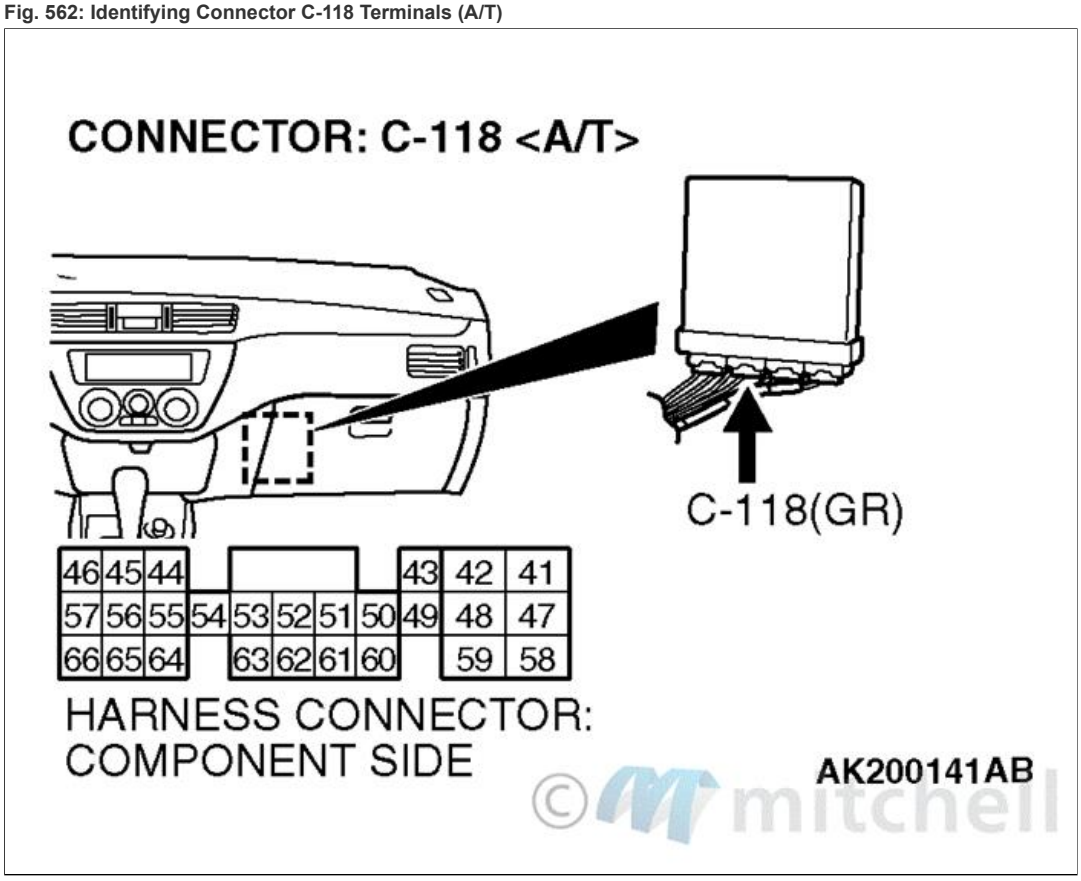


Fig. 562: Identifying Connector C-118 Terminals (A/T)



STEP 10. Check harness connector C-115 at ECM < M/T > or harness connector C-118 at PCM < A/T > for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 11.

NO : Repair or replace it. Refer to HARNESS CONNECTOR INSPECTION . Then go to Step 12.

Fig. 563: Identifying Connector C-115 Terminals (M/T)

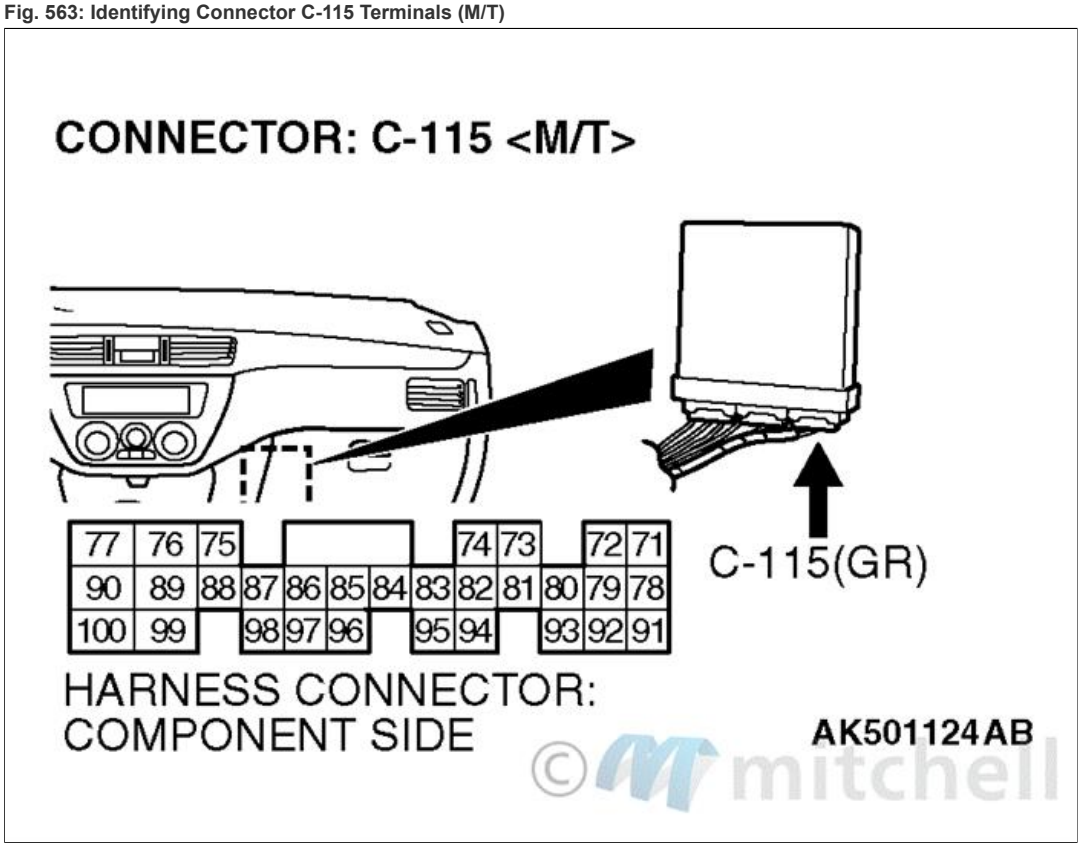
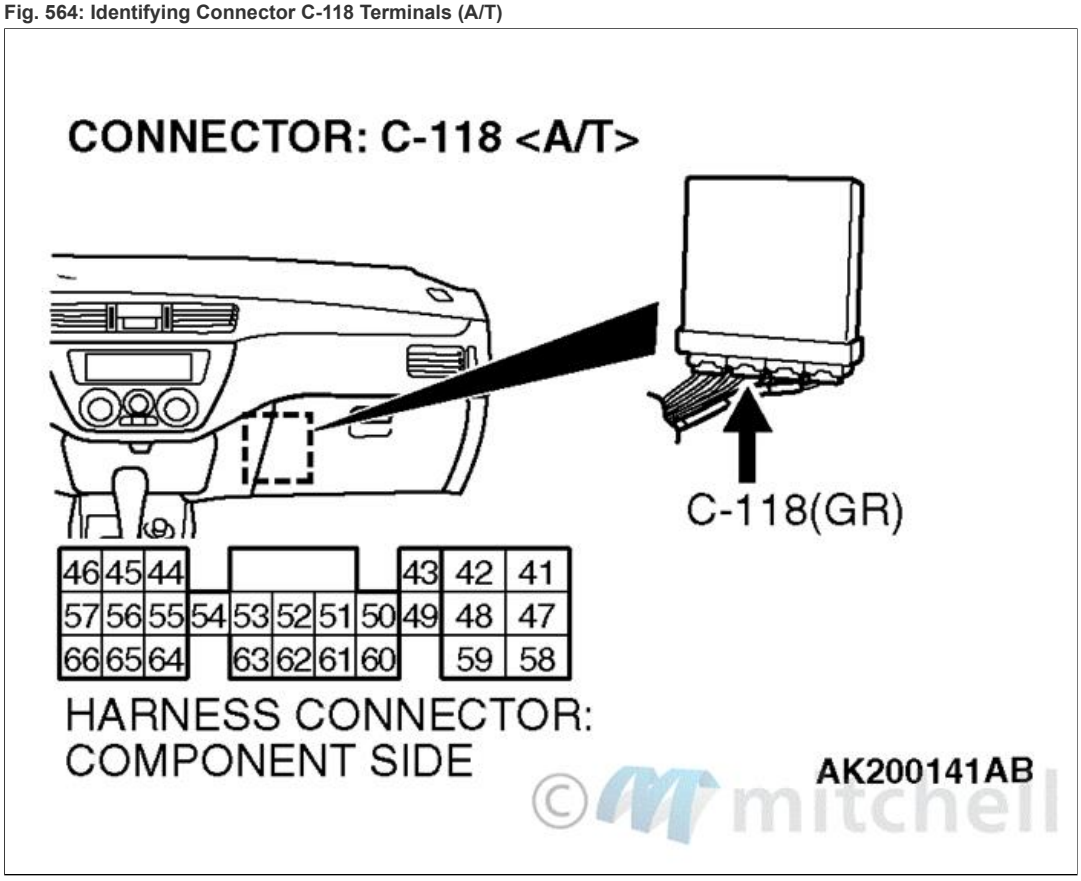


Fig. 564: Identifying Connector C-118 Terminals (A/T)



STEP 11. Check for harness damage between fuel tank temperature sensor connector D-10 (terminal No. 3) and ECM connector C-115 (terminal No. 96) < M/T > or PCM connector C-118 (terminal No. 51) < A/T >.

Fig. 565: Identifying Connector D-10 Terminals

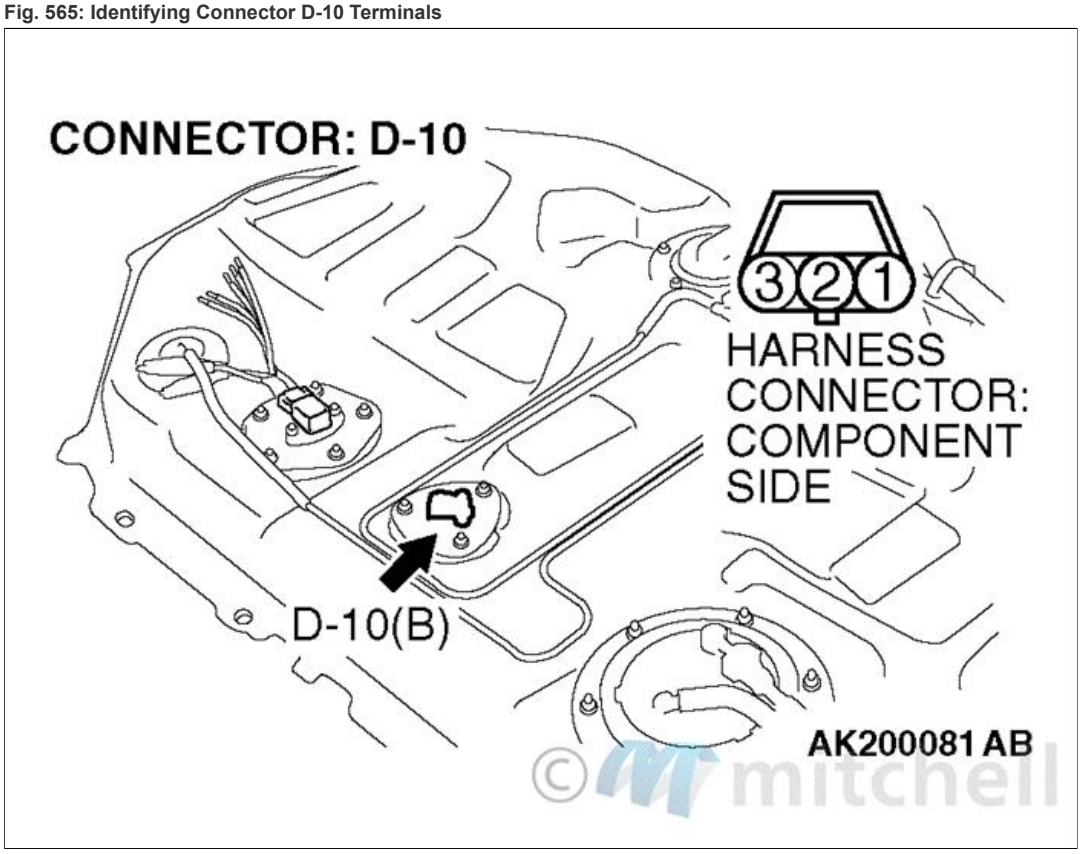


Fig. 566: Identifying Connector C-115 Terminals (M/T)

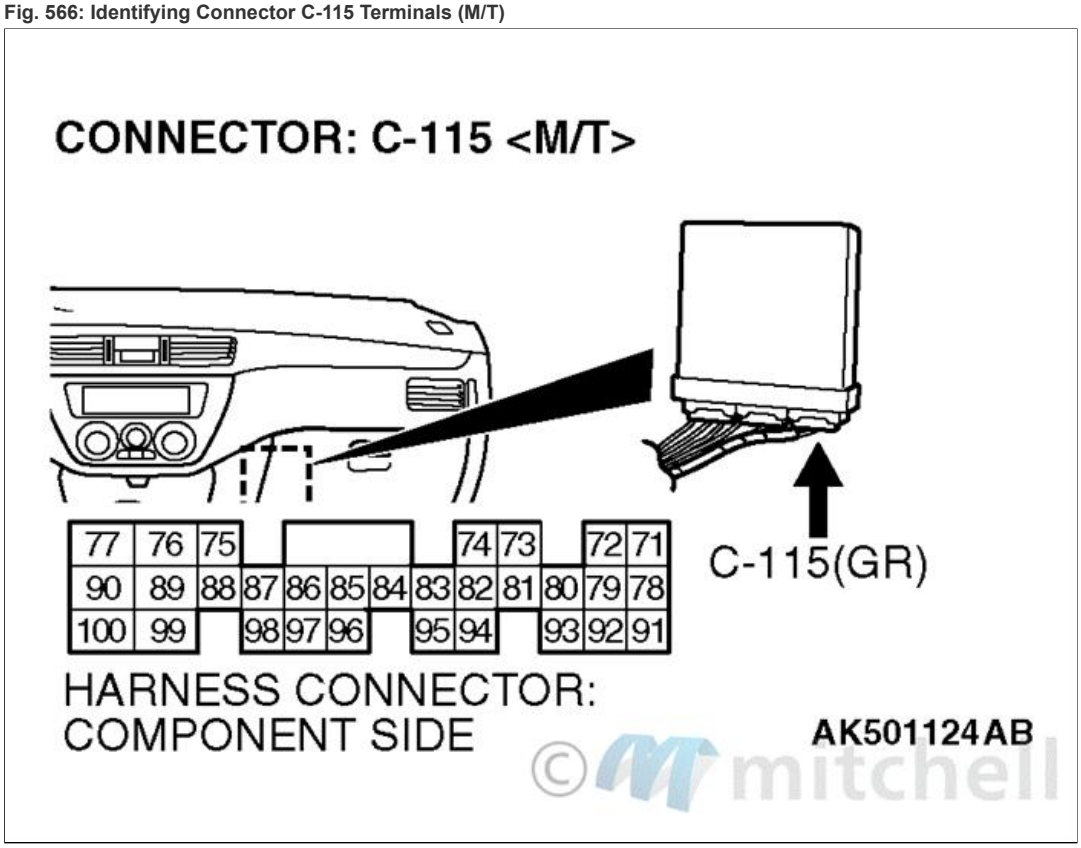
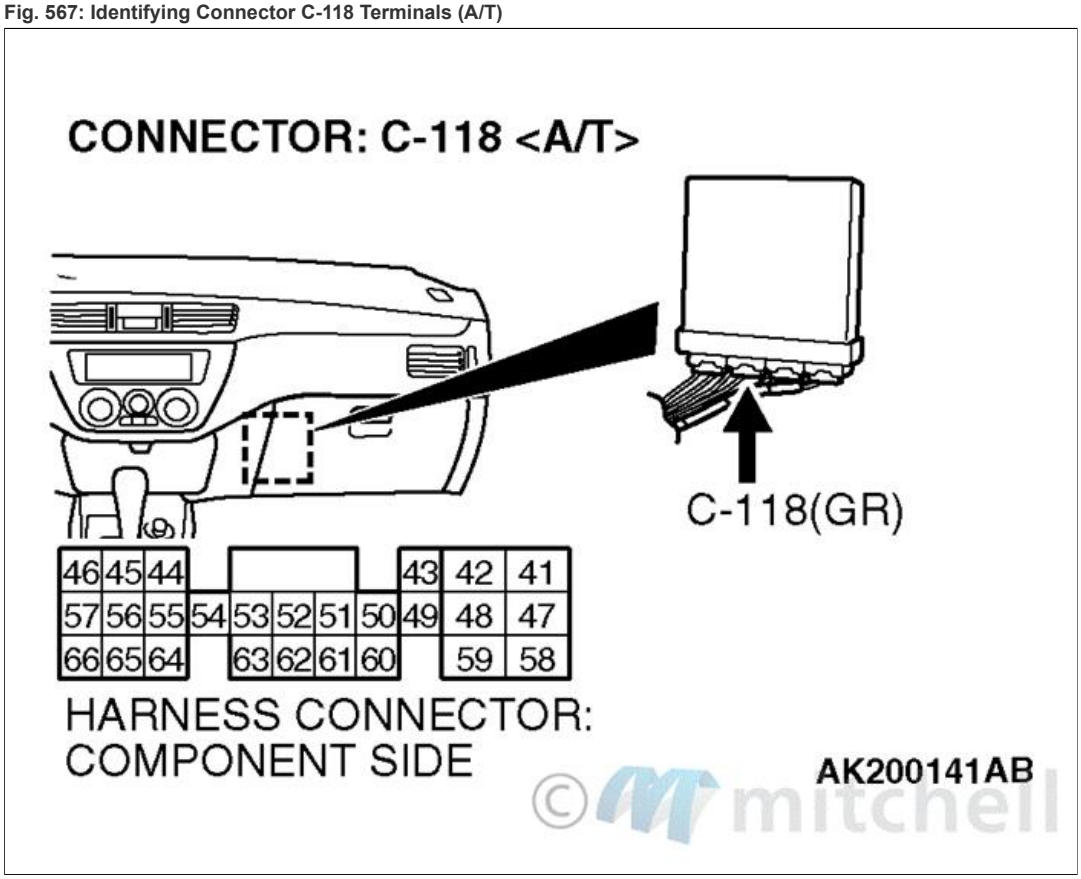


Fig. 567: Identifying Connector C-118 Terminals (A/T)



NOTE:	Check harness after checking intermediate connector C-122, C-127 and D-14. If intermediate connector are damaged, repair or replace it. Refer to HARNESS CONNECTOR INSPECTION . Then go to Step 12.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

NO : Repair it. Then go to Step 12.

STEP 12. Test the OBD-II drive cycle.

1. Carry out a test drive with the drive cycle pattern. Refer to DIAGNOSTIC FUNCTION - OBD-II DRIVE CYCLE - PATTERN 13 .
2. Check the diagnostic trouble code (DTC).

Q: Is DTC P0181 set?

YES : Retry the troubleshooting.

NO : The inspection is complete.

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