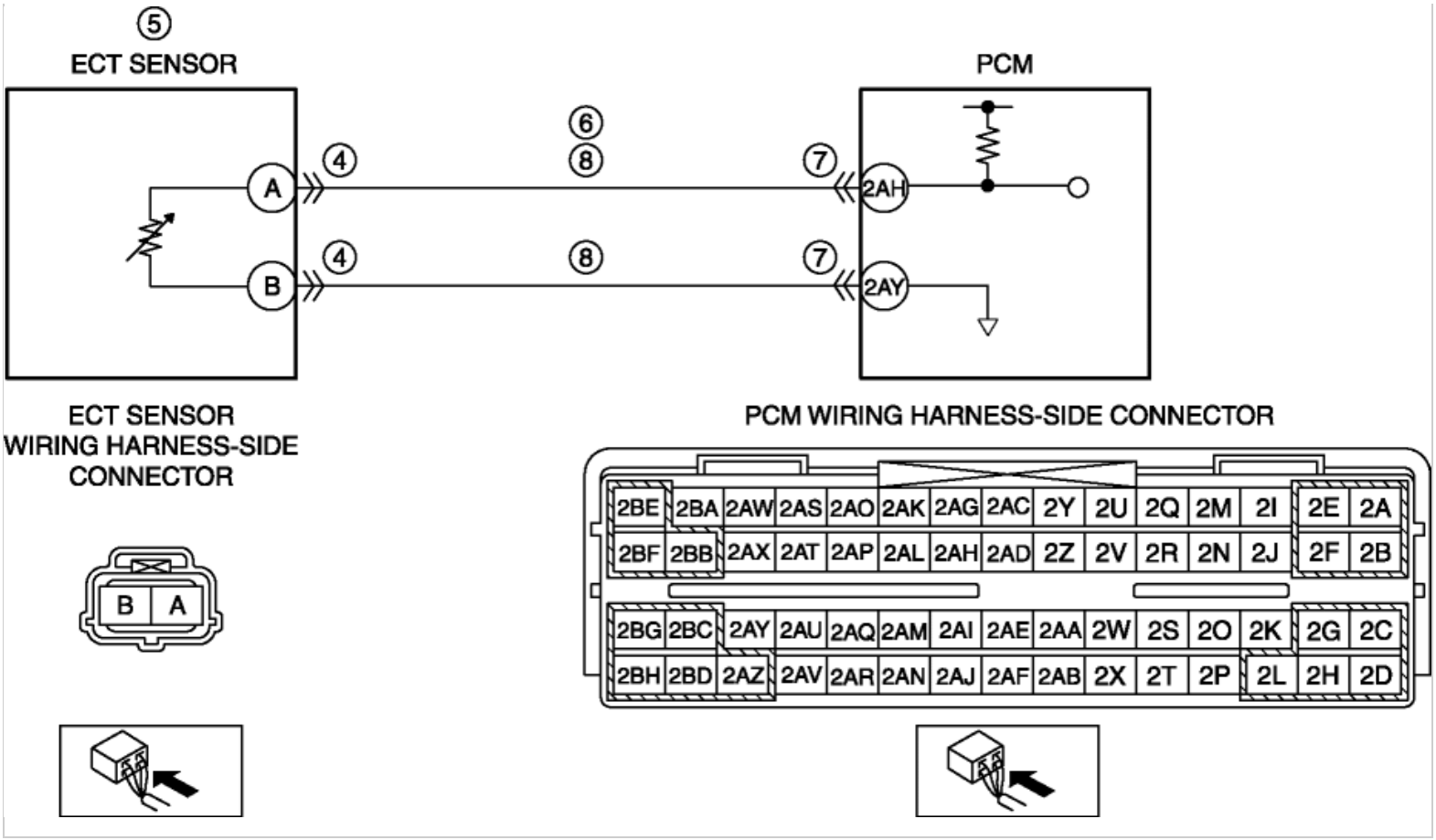
2012 - Mazda6 - Engine

DTC P0117:00 [MZR 2.5]

DTC P0117:00	ECT sensor circuit low input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal. If the PCM detects that the ECT sensor voltage is **below 0.2 V** for **5 s**, the PCM determines that the ECT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Engine overheating (cooling system malfunction) • ECT sensor connector or terminal malfunction • ECT sensor malfunction • Short to ground in wiring harness between ECT sensor terminal A and PCM terminal 2AH • PCM connector or terminal malfunction • Short circuit in ECT sensor signal circuit and ground circuit each other • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY ENGINE CONDITION** • Is the engine overheating?	Yes	Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING". (See **NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZR 2.5]**.)
		No	Go to the next step.
4	**INSPECT ECT SENSOR CONNECTOR CONDITION** • Switch the ignition to off.	Yes	Repair or replace the terminal and/or connector, then go to Step 9.

	• Disconnect the ECT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
5	**CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • ECT sensor connector is disconnected. • Access the ECT PID using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Verify and compare the ECT PID values when disconnecting and connecting ECT sensor connector. • Does the ECT value change?	Yes	Replace the ECT sensor, then go to Step 9. (See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/ INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
6	**INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Switch the ignition to off. • Disconnect the ECT sensor connector. • Inspect for continuity between ECT sensor terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	If the short to ground circuit could be detected: • Repair or replace the wiring harness for a possible short to ground. If the short to ground circuit could not be detected: • Replace the PCM (short to ground in PCM internal circuit). (See **PCM REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to Step 9.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal and/or connector, then go to Step 9.
		No	Go to the next step.
8	**INSPECT ECT SENSOR SIGNAL AND GROUND CIRCUITS FOR SHORT EACH OTHER** • ECT sensor and PCM connectors are disconnected. • Inspect for continuity between ECT sensor terminals A and B (wiring harness-side). • Is there continuity?	Yes	Repair or replace the malfunctioning wiring harness, then go to the next step.
		No	Go to the next step.
9	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Perform the KOEO or KOER self test. (See **KOEO/ KOER SELF TEST [MZR 2.5]**.)	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See **PCM REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to the next step.
		No	Go to the next step.

	• Is the same DTC present?		
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	DTC troubleshooting completed.

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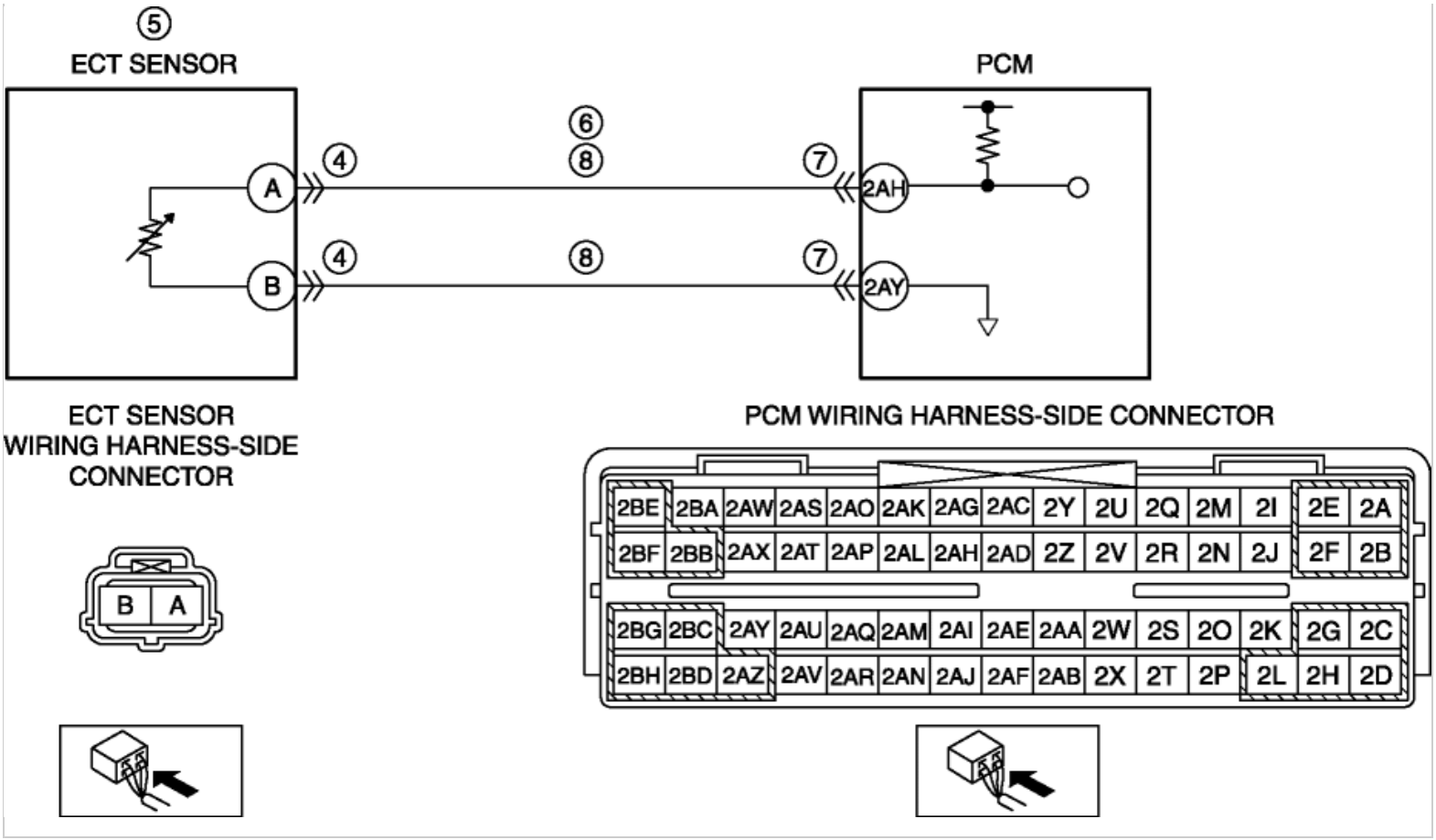
DTC P0117:00 [MZR 2.5]

DTC P0117:00	ECT sensor circuit low input
DETECTION CONDITION	• The PCM monitors the ECT sensor signal. If the PCM detects that the ECT sensor voltage is **below 0.2 V** for **5 s**, the PCM determines that the ECT sensor circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Engine overheating (cooling system malfunction) • ECT sensor connector or terminal malfunction • ECT sensor malfunction • Short to ground in wiring harness between ECT sensor terminal A and PCM terminal 2AH • PCM connector or terminal malfunction • Short circuit in ECT sensor signal circuit and ground circuit each other • PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (engine cooling system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY ENGINE CONDITION** • Is the engine overheating?	Yes	Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING". (See **NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZR 2.5]**.)
		No	Go to the next step.
4	**INSPECT ECT SENSOR CONNECTOR CONDITION** • Switch the ignition to off.	Yes	Repair or replace the terminal and/or connector, then go to Step 9.

	• Disconnect the ECT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
5	**CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION** • ECT sensor connector is disconnected. • Access the ECT PID using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Verify and compare the ECT PID values when disconnecting and connecting ECT sensor connector. • Does the ECT value change?	Yes	Replace the ECT sensor, then go to Step 9. (See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/ INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
6	**INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND** • Switch the ignition to off. • Disconnect the ECT sensor connector. • Inspect for continuity between ECT sensor terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	If the short to ground circuit could be detected: • Repair or replace the wiring harness for a possible short to ground. If the short to ground circuit could not be detected: • Replace the PCM (short to ground in PCM internal circuit). (See **PCM REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to Step 9.
		No	Go to the next step.
7	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal and/or connector, then go to Step 9.
		No	Go to the next step.
8	**INSPECT ECT SENSOR SIGNAL AND GROUND CIRCUITS FOR SHORT EACH OTHER** • ECT sensor and PCM connectors are disconnected. • Inspect for continuity between ECT sensor terminals A and B (wiring harness-side). • Is there continuity?	Yes	Repair or replace the malfunctioning wiring harness, then go to the next step.
		No	Go to the next step.
9	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Perform the KOEO or KOER self test. (See **KOEO/ KOER SELF TEST [MZR 2.5]**.)	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See **PCM REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to the next step.
		No	Go to the next step.

	• Is the same DTC present?		
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	DTC troubleshooting completed.

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