2012 - Mazda6 - Engine

DTC P0126:00, P0128:00 [MZR 2.5]

DTC P0126:00 DTC P0128:00	Thermostat stuck open
DETECTION CONDITION	**P0126:00** • If the ECT signal never exceeds threshold (depend on minimum IAT) after engine start for specified period, the PCM determines that the thermostat is stuck open. **MONITORING CONDITIONS** ▪ IAT: **above −10 °C {14 °F}** ▪ Vehicle speed: **above 10 km/h {6.2 mph}** ▪ Absolute load: **above 14 %** **P0128:00** • The PCM monitors MAF, IAT, VSS and ECT signals and calculate radiator's heat radiation ratio while following monitoring conditions are met. If calculated value exceeds threshold, the PCM determines that the thermostat is stuck open. **MONITORING CONDITIONS** ▪ IAT: **above −10 °C {14 °F}** ▪ ECT at engine start: **below 52 °C {126 °F}** ▪ Vehicle speed: **above 40 km/h {24.8 mph}** **Diagnostic support note** • This is an intermittent monitor (engine cooling system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available.

	• The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Thermostat malfunction • ECT sensor malfunction • Cooling system malfunction • 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 RELATED PENDING OR STORED DTC** • Switch the ignition to off, then to the ON (engine off). • Verify the pending code or stored DTCs using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Are any other DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	Go to the next step.
4	**INSPECT THERMOSTAT** • Inspect the thermostat. (See **THERMOSTAT INSPECTION [MZR 2.5]**.) • Is there any malfunction?	Yes	Replace the thermostat, then go to Step 6. (See **THERMOSTAT REMOVAL/ INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
5	**INSPECT ECT SENSOR**	Yes	Replace the ECT sensor, then go to the

	• Inspect the ECT sensor. (See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [MZR 2.5]**.) • Is there any malfunction?		next step. (See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
6	**VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION** • Make sure to reconnect all disconnected connectors. • Cool down the engine. **NOTE:** • If workshop inside and outside temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine out of workshop. • Switch the ignition to ON (engine off). • Clear the DTC from the PCM memory using the M-MDS. (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Access the ECT and IAT PIDs using the M-MDS under the following conditions: (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) **P0126:00** ▪ IAT: **above −10 °C {14 °F}** **P0128:00** ▪ IAT: **above −10 °C {14 °F}** ▪ ECT: **below 36 °C {97 °F}** ▪ Difference between ECT and IAT: **below 6 °C {10.8 °F}** • Is there any PID that out of the	Yes	Take corrective action (e.g. cool down engine). Repeat this step.
		No	P0126:00 • Go to the next step. P0128:00 • Go to Step 8.

	specification?		
7	**VERIFY TROUBLESHOOTING OF DTC P0126:00 COMPLETED** • Start engine and turn off the electrical load and A/C. • Access and monitor the PIDs TH_M (Temp unit) and TH_M_MIN (Temp unit) using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) **NOTE:** • This test requires actual driving. Chassis roller cannot be used for this test. • During the test drive, constant speed should be maintained, although 2 or 3 stops during every **5 min** of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Test period depends on ECT at engine start. (e.g. if ECT is **−10 °C {14 °F}**, monitoring period is **38 min** and ECT is **30 °C {86 °F}**, monitoring period is **8 min**) • Verify the PIDs TH_M and TH_M_MIN values. • Is the TH_M value above TH_M_MIN value?	Yes	Go to Step 9.
		No	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.
8	**VERIFY TROUBLESHOOTING OF DTC P0128:00 COMPLETED** • Start engine and turn off the electrical load and A/C. • Access and monitor the PIDs TH_M (Temp and Num units), TH_M_MAX (Num unit) and TH_M_MIN (Temp unit) using the M-MDS.	Yes	Go to the next step.
		No	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See **PCM**

	(See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) **NOTE:** • This test requires actual driving. Chassis roller cannot be used for this test. • During the test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Verify the PIDs TH_M, TH_M_MAX and TH_M_MIN values. • Are TH_M value of Num unit below TH_M_MAX value and TH_M value of Temp unit above TH_M_MIN value?		**REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to the next step.
9	**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 P0126:00 DTC P0128:00	Thermostat stuck open
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	• The DTC is stored in the PCM memory.
POSSIBLE CAUSE	• Thermostat malfunction • ECT sensor malfunction • Cooling system malfunction • 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 RELATED PENDING OR STORED DTC** • Switch the ignition to off, then to the ON (engine off). • Verify the pending code or stored DTCs using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Are any other DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	Go to the next step.
4	**INSPECT THERMOSTAT** • Inspect the thermostat. (See **THERMOSTAT INSPECTION [MZR 2.5]**.) • Is there any malfunction?	Yes	Replace the thermostat, then go to Step 6. (See **THERMOSTAT REMOVAL/ INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
5	**INSPECT ECT SENSOR**	Yes	Replace the ECT sensor, then go to the

	• Inspect the ECT sensor. (See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [MZR 2.5]**.) • Is there any malfunction?		next step. (See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
6	**VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION** • Make sure to reconnect all disconnected connectors. • Cool down the engine. **NOTE:** • If workshop inside and outside temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to cool down engine out of workshop. • Switch the ignition to ON (engine off). • Clear the DTC from the PCM memory using the M-MDS. (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Access the ECT and IAT PIDs using the M-MDS under the following conditions: (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) **P0126:00** ▪ IAT: **above −10 °C {14 °F}** **P0128:00** ▪ IAT: **above −10 °C {14 °F}** ▪ ECT: **below 36 °C {97 °F}** ▪ Difference between ECT and IAT: **below 6 °C {10.8 °F}** • Is there any PID that out of the	Yes	Take corrective action (e.g. cool down engine). Repeat this step.
		No	P0126:00 • Go to the next step. P0128:00 • Go to Step 8.

	specification?		
7	**VERIFY TROUBLESHOOTING OF DTC P0126:00 COMPLETED** • Start engine and turn off the electrical load and A/C. • Access and monitor the PIDs TH_M (Temp unit) and TH_M_MIN (Temp unit) using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) **NOTE:** • This test requires actual driving. Chassis roller cannot be used for this test. • During the test drive, constant speed should be maintained, although 2 or 3 stops during every **5 min** of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Test period depends on ECT at engine start. (e.g. if ECT is **−10 °C {14 °F}**, monitoring period is **38 min** and ECT is **30 °C {86 °F}**, monitoring period is **8 min**) • Verify the PIDs TH_M and TH_M_MIN values. • Is the TH_M value above TH_M_MIN value?	Yes	Go to Step 9.
		No	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.
8	**VERIFY TROUBLESHOOTING OF DTC P0128:00 COMPLETED** • Start engine and turn off the electrical load and A/C. • Access and monitor the PIDs TH_M (Temp and Num units), TH_M_MAX (Num unit) and TH_M_MIN (Temp unit) using the M-MDS.	Yes	Go to the next step.
		No	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See **PCM**

	(See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) **NOTE:** • This test requires actual driving. Chassis roller cannot be used for this test. • During the test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period. • Verify the PIDs TH_M, TH_M_MAX and TH_M_MIN values. • Are TH_M value of Num unit below TH_M_MAX value and TH_M value of Temp unit above TH_M_MIN value?		**REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to the next step.
9	**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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