

2012 - Mazda6 - Engine

NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZI 3.7 V6]

17	COOLING SYSTEM CONCERNS—OVERHEATING
DESCRIPTION	• Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Improper coolant level • Coolant leakage • Improper water/anti-freeze mixture • Poor radiator condition • Radiator hoses damage • Improper or damaged radiator cap • Coolant overflow system malfunction • Fans reverse rotation • Blown cooling fan control related fuses • PCM DTC is stored. • A/C system operation is improper. • Cooling fan is inoperative. • Improper tension of drive belt • Drive belt damage • Coolant leakage from climate control unit • Improper water temperature gauge operation ▪ CHT sensor malfunction ▪ Instrument cluster malfunction • Thermostat malfunction • Cylinder block or cylinder head malfunction (cracked, coolant restriction)

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	INSPECT RELATED PART CONDITION - Inspect the following: - Engine coolant level - Coolant leakage - Water and anti-freeze mixture - Radiator condition - Collapsed or restricted radiator hoses - Radiator pressure cap - Overflow system - Fan rotational direction - Fuses - Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results. Repeat Step 1.
2	VERIFY PCM DTC - Switch the ignition to ON (Engine off). - Retrieve any DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6] .) - Are there any DTCs displayed?	Yes	DTC is displayed: Go to the appropriate DTC inspection. (See DTC TABLE [MZI 3.7 V6] .)
		No	No DTC is displayed: Go to the next step.
3	DETERMINE IF MALFUNCTION CAUSE IS A/ C SYSTEM OR OTHER	Yes	Go to Step 5.

	- Start the engine and idle it. - Turn the A/C switch on and set blower fan to any speed by switching the control panel. - Does the A/C compressor engage according to control panel switching?	No	If the A/C compressor is not engaged always: - Go to the symptom troubleshooting "NO.23 A/C DOES NOT WORK SUFFICIENTLY". (See NO.23 A/ C DOES NOT WORK SUFFICIENTLY [MZI 3.7 V6].) If the A/C compressor is engaged always: - Go to the symptom troubleshooting "NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY". (See NO.24 A/ C IS ALWAYS ON OR A/ C COMPRESSOR RUNS CONTINUOUSLY [MZI 3.7 V6].)
4	INSPECT COOLING FAN CONTROL SYSTEM OPERATION - Inspect the cooling fan control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Does the cooling fan control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
5	INSPECT COOLANT LEAKAGE AT CLIMATE CONTROL UNIT Is there leakage around the climate control unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to the next step.
6	INSPECT COOLANT LEAKAGE AT COOLING SYSTEM PART Is there leakage at the coolant hoses and/or radiator?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
7	INSPECT ECT SENSOR SIGNAL Access and monitor PCM PID ECT using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].)	Yes	Go to the next step.
		No	Inspect the water temperature gauge. (See INSTRUMENT CLUSTER INSPECTION.) If the water temperature gauge

	- Compare the ECT PID and water temperature gauge on instrument cluster reading. - Is the ECT PID reading is same as water temperature gauge reading?		is normal, inspect the CHT sensor. (See CYLINDER HEAD TEMPERATURE (CHT) SENSOR INSPECTION [MZI 3.7 V6] .) Repair or replace the malfunctioning part according to the inspection results.
8	INSPECT IF MALFUNCTION CAUSE IS THERMOSTAT OR CYLINDER BLOCK - Cool down the engine. - Remove the thermostat and inspect the operation. (See THERMOSTAT REMOVAL/ INSTALLATION [MZI 3.7 V6] .) (See THERMOSTAT INSPECTION [MZI 3.7 V6] .) - Is there any malfunction?	Yes	Engine coolant temperature and thermostat are normal, inspect the engine block for leakage or blockage. Repair or replace the malfunctioning part according to the inspection results.
		No	Replace the thermostat. (See THERMOSTAT REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
9	Verify test results. - If normal, return to diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [MZI 3.7 V6] .) - If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. - If vehicle is repaired, troubleshooting completed. - If vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

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1	INSPECT RELATED PART CONDITION - Inspect the following: - Engine coolant level - Coolant leakage - Water and anti-freeze mixture - Radiator condition - Collapsed or restricted radiator hoses - Radiator pressure cap - Overflow system - Fan rotational direction - Fuses - Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results. Repeat Step 1.
2	VERIFY PCM DTC - Switch the ignition to ON (Engine off). - Retrieve any DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6] .) - Are there any DTCs displayed?	Yes	DTC is displayed: Go to the appropriate DTC inspection. (See DTC TABLE [MZI 3.7 V6] .)
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		No	Repair or replace the malfunctioning part according to the inspection results.
5	INSPECT COOLANT LEAKAGE AT CLIMATE CONTROL UNIT Is there leakage around the climate control unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to the next step.
6	INSPECT COOLANT LEAKAGE AT COOLING SYSTEM PART Is there leakage at the coolant hoses and/or radiator?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
7	INSPECT ECT SENSOR SIGNAL Access and monitor PCM PID ECT using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].)	Yes	Go to the next step.
		No	Inspect the water temperature gauge. (See INSTRUMENT CLUSTER INSPECTION.) If the water temperature gauge

	- Compare the ECT PID and water temperature gauge on instrument cluster reading. - Is the ECT PID reading is same as water temperature gauge reading?		is normal, inspect the CHT sensor. (See CYLINDER HEAD TEMPERATURE (CHT) SENSOR INSPECTION [MZI 3.7 V6] .) Repair or replace the malfunctioning part according to the inspection results.
8	INSPECT IF MALFUNCTION CAUSE IS THERMOSTAT OR CYLINDER BLOCK - Cool down the engine. - Remove the thermostat and inspect the operation. (See THERMOSTAT REMOVAL/ INSTALLATION [MZI 3.7 V6] .) (See THERMOSTAT INSPECTION [MZI 3.7 V6] .) - Is there any malfunction?	Yes	Engine coolant temperature and thermostat are normal, inspect the engine block for leakage or blockage. Repair or replace the malfunctioning part according to the inspection results.
		No	Replace the thermostat. (See THERMOSTAT REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
9	Verify test results. - If normal, return to diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [MZI 3.7 V6] .) - If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. - If vehicle is repaired, troubleshooting completed. - If vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		