

2012 - Mazda6 - Engine

NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZR 2.5]

17	COOLING SYSTEM CONCERNS—OVERHEATING
DESCRIPTION	• Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Radiator hoses damage • Coolant leakage ▪ Leakage around heater unit ▪ Leakage at coolant hoses and/or radiator • Improper coolant level • Fans reverse rotation • Fuse malfunction • Coolant overflow system malfunction • Poor radiator condition • Improper or damaged radiator cap • Improper water/anti-freeze mixture • PCM DTC is stored. • Improper operation of A/C system (always on) ▪ Climate control unit malfunction (A/C switch malfunction or climate control unit does not determine A/C request or transmit the A/C request signal.) ▪ Instrument cluster malfunction (Does not receive A/C request signal from climate control unit or transmit it to PCM.) ▪ Communication error between PCM and instrument cluster ▪ Communication error between instrument cluster and climate control unit (Full-auto air conditioner) ▪ Short to ground circuit between instrument cluster terminal 1A and climate control unit terminal 1L (Manual air conditioner)

- Improper operation of cooling fan control system
- Improper tension of drive belt
- Improper indication of water temperature gauge
 - ECT sensor malfunction
 - Instrument cluster (water temperature gauge) malfunction
- Thermostat malfunction

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 • Retrieve any DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) • Are there any DTCs displayed?	Yes	Go to the appropriate DTC inspection. (See DTC TABLE [MZR 2.5] .)
		No	Go to the next step.

3	DETERMINE IF MALFUNCTION CAUSE IS A/ C SYSTEM OR OTHER - Start the engine and idle it. - Verify state of the A/C compressor while turning on and off the air conditioner by switching the control panel. - Does the A/C compressor engage and disengage according to air control panel switching?	Yes	Go to the next step.
		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 [MZR 2.5].) 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 [MZR 2.5].)
4	INSPECT COOLING FAN CONTROL SYSTEM OPERATION - Inspect the cooling fan control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - 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 DRIVE BELT Is the drive belt normal? (See DRIVE BELT INSPECTION [MZR 2.5].)	Yes	Go to the next step.
		No	Replace the drive belt. (See DRIVE BELT REMOVAL/ INSTALLATION [MZR 2.5].)
6	INSPECT COOLANT LEAKAGE AT HEATER UNIT Is there leakage around the climate control unit in the passenger compartment?	Yes	Inspect the heater for leakage. Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
7	INSPECT COOLANT LEAKAGE AT COOLING	Yes	Repair or replace the malfunctioning part

	SYSTEM PART Is there leakage at the coolant hoses and/or radiator?		according to the inspection results.
		No	Go to the next step.
8	INSPECT ECT SENSOR SIGNAL - Access the PCM PID ECT using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) - Compare the ECT PID and the water temperature gauge on the instrument cluster reading. - Is the ECT PID same as water temperature gauge reading?	Yes	Go to the next step.
		No	Inspect the water temperature gauge. (See INSTRUMENT CLUSTER INSPECTION .) Repair or replace the malfunctioning part according to the inspection results. - If the water temperature gauge is normal, inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [MZR 2.5].) - Repair or replace the malfunctioning part according to the inspection results.
9	INSPECT IF MALFUNCTION CAUSE IS THERMOSTAT OR CYLINDER BLOCK - Cool down the engine. - Remove thermostat and inspect operation. (See THERMOSTAT REMOVAL/ INSTALLATION [MZR 2.5].) (See THERMOSTAT INSPECTION [MZR 2.5].) - Is the thermostat normal?	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 [MZR 2.5] .)
10	- Verify test results. - If normal, return to diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [MZR 2.5].) - 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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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 • Retrieve any DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5] .)	Yes	Go to the appropriate DTC inspection. (See DTC TABLE [MZR 2.5] .)
		No	Go to the next step.
	• Are there any DTCs displayed?		

3	DETERMINE IF MALFUNCTION CAUSE IS A/ C SYSTEM OR OTHER - Start the engine and idle it. - Verify state of the A/C compressor while turning on and off the air conditioner by switching the control panel. - Does the A/C compressor engage and disengage according to air control panel switching?	Yes	Go to the next step.
		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 [MZR 2.5].) 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 [MZR 2.5].)
4	INSPECT COOLING FAN CONTROL SYSTEM OPERATION - Inspect the cooling fan control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - 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 DRIVE BELT Is the drive belt normal? (See DRIVE BELT INSPECTION [MZR 2.5].)	Yes	Go to the next step.
		No	Replace the drive belt. (See DRIVE BELT REMOVAL/ INSTALLATION [MZR 2.5].)
6	INSPECT COOLANT LEAKAGE AT HEATER UNIT Is there leakage around the climate control unit in the passenger compartment?	Yes	Inspect the heater for leakage. Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
7	INSPECT COOLANT LEAKAGE AT COOLING	Yes	Repair or replace the malfunctioning part

	SYSTEM PART Is there leakage at the coolant hoses and/or radiator?		according to the inspection results.
		No	Go to the next step.
8	INSPECT ECT SENSOR SIGNAL - Access the PCM PID ECT using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZR 2.5].) - Compare the ECT PID and the water temperature gauge on the instrument cluster reading. - Is the ECT PID same as water temperature gauge reading?	Yes	Go to the next step.
		No	Inspect the water temperature gauge. (See INSTRUMENT CLUSTER INSPECTION .) Repair or replace the malfunctioning part according to the inspection results. - If the water temperature gauge is normal, inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [MZR 2.5].) - Repair or replace the malfunctioning part according to the inspection results.
9	INSPECT IF MALFUNCTION CAUSE IS THERMOSTAT OR CYLINDER BLOCK - Cool down the engine. - Remove thermostat and inspect operation. (See THERMOSTAT REMOVAL/ INSTALLATION [MZR 2.5].) (See THERMOSTAT INSPECTION [MZR 2.5].) - Is the thermostat normal?	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 [MZR 2.5] .)
10	- Verify test results. - If normal, return to diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [MZR 2.5].) - 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		

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