

2012 - Mazda6 - Engine

NO.14 POOR FUEL ECONOMY [MZI 3.7 V6]

14	POOR FUEL ECONOMY
DESCRIPTION	Fuel economy is unsatisfactory.
POSSIBLE CAUSE	- Contaminated air cleaner element - Improper ATF level - Poor fuel quality - Improper coolant level - Brake dragging - Improper tire pressure - PCM DTC is stored. - Engine cooling system malfunction - Weak spark - Ignition system malfunction (ignition coil, ignition coil related circuit or spark plug malfunction) - Inadequate fuel pressure - Intermittent open or short circuit in fuel pump circuit - Fuel pump mechanical malfunction - Fuel line restriction or clogging - Pressure regulator malfunction (built-in fuel pump unit) - Improper variable valve timing control system operation - Exhaust system clogging - Contaminated MAF sensor - Improper engine compression - PCV valve malfunction - Improper valve timing due to jumping out of timing chain WARNING: - The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION " described in this manual. (See BEFORE SERVICE PRECAUTION [MZI 3.7 V6] .) (See AFTER SERVICE PRECAUTION [MZI 3.7 V6] .) CAUTION: - Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe

and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	INSPECT RELATED PART CONDITION - Inspect for the following: - Air cleaner element for contamination - ATF level - Fuel quality - Coolant level - Brake dragging - Low tire pressure - 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	INSPECT COOLING SYSTEM FOR MALFUNCTION Is any cooling system concern (overheating, runs cold) present?	Yes	Go to the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING" and "NO.18 COOLING SYSTEM CONCERNS-RUNS COLD". (See NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZI 3.7 V6].) (See NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [MZI 3.7 V6].)
		No	Go to the next step.
4	INSPECT COOLING FAN CONTROL SYSTEM OPERATION - Perform the Cooling Fan Control System Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Does the cooling fan control system operate properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
5	INSPECT COOLING SYSTEM FOR MALFUNCTION CAUTION: While performing this step, always operate the vehicle in a safe and lawful manner.	Yes	Go to the next step.
		No	Inspect for following: - Coolant leakage - Cooling fans operation

	- Access the PCM PID ECT using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].) - Drive the vehicle while monitoring PID. - Is the PID within specification?		Thermostat operation Repair or replace the malfunctioning part according to the inspection results.
6	INSPECT IGNITION SYSTEM OPERATION - Perform the spark test. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
7	INSPECT FUEL LINE PRESSURE - Install the fuel pressure gauge between the fuel pipe and fuel distributor. - Start the engine and idle it. - Measure the fuel line pressure during idle. (See FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6].) - Is the fuel line pressure correct during idle?	Yes	Go to the next step.
		No	Zero or low: - Inspect for the following: - Fuel pump relay - Fuel pump circuit - Fuel line for clogging - If there is no malfunction, replace the fuel pump unit. (Fuel pump or pressure regulator malfunction) (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6].) High: - Replace the fuel pump unit. (Pressure regulator malfunction) (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6].)
8	INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION - Inspect the variable valve timing control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Does the variable valve timing control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
9	INSPECT DEFORMED IN EXHAUST SYSTEM - Visually inspect the exhaust system part. - Is there any deformed exhaust system part?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
	INSPECT MAF SENSOR FOR		

10	CONTAMINATION - Inspect the MAF sensor for contamination. - Is there any contamination?	Yes	Replace the MAF sensor. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
		No	Go to the next step.
11	INSPECT ENGINE COMPRESSION Is the engine compression correct?	Yes	Go to the next step.
		No	Inspect for cause. Repair or replace the malfunctioning part according to the inspection results.
12	INSPECT PCV VALVE NOTE: - The PCV valve cannot be reassembled once it is removed because the tabs will have been broken. Inspect the PCV valve without removing it from the vehicle. - Inspect the PCV valve with it installed. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZI 3.7 V6].) - Is there any malfunction?	Yes	Replace the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
		No	Inspect the valve timing. Repair or replace the malfunctioning part according to the inspection results.
13	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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		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	Go to the next step.
4	INSPECT COOLING FAN CONTROL SYSTEM OPERATION - Perform the Cooling Fan Control System Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Does the cooling fan control system operate properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
5	INSPECT COOLING SYSTEM FOR MALFUNCTION CAUTION: While performing this step, always operate the vehicle in a safe and lawful manner.	Yes	Go to the next step.
		No	Inspect for following: - Coolant leakage - Cooling fans operation

	- Access the PCM PID ECT using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].) - Drive the vehicle while monitoring PID. - Is the PID within specification?		Thermostat operation Repair or replace the malfunctioning part according to the inspection results.
6	INSPECT IGNITION SYSTEM OPERATION - Perform the spark test. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
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		No	Repair or replace the malfunctioning part according to the inspection results.
9	INSPECT DEFORMED IN EXHAUST SYSTEM - Visually inspect the exhaust system part. - Is there any deformed exhaust system part?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
	INSPECT MAF SENSOR FOR		

10	CONTAMINATION - Inspect the MAF sensor for contamination. - Is there any contamination?	Yes	Replace the MAF sensor. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
		No	Go to the next step.
11	INSPECT ENGINE COMPRESSION Is the engine compression correct?	Yes	Go to the next step.
		No	Inspect for cause. Repair or replace the malfunctioning part according to the inspection results.
12	INSPECT PCV VALVE NOTE: - The PCV valve cannot be reassembled once it is removed because the tabs will have been broken. Inspect the PCV valve without removing it from the vehicle. - Inspect the PCV valve with it installed. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZI 3.7 V6].) - Is there any malfunction?	Yes	Replace the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
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