

2012 - Mazda6 - Engine

NO.14 POOR FUEL ECONOMY [MZR 2.5]

14	POOR FUEL ECONOMY
DESCRIPTION	Fuel economy is unsatisfactory.
POSSIBLE CAUSE	- Contaminated air cleaner element - Improper ATF level (ATX) - Brake dragging - Clutch slippage (MTX) - Low tire pressure - Improper coolant level - Poor fuel quality - PCM DTC is stored. - Engine cooling system malfunction - Improper operation of cooling fan control system - Ignition system malfunction - Excessive or insufficient fuel pressure - Fuel pump relay or fuel pump circuit malfunction - Restriction in fuel line - Pressure regulator malfunction (built-into fuel pump unit) - Fuel pump malfunction - Improper operation of variable tumble control - Improper operation of variable valve timing control system - Improper operation of variable valve intake air control - Exhaust system clogging - Contaminated MAF sensor - Low engine compression - Improper valve timing - PCV valve malfunction WARNING: The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: - 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 [MZR 2.5].) (See AFTER SERVICE PRECAUTION [MZR 2.5].)

CAUTION:

- **Disconnecting/ connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and the quick release connector. Always clean the 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 (ATX) ▪ Fuel quality ▪ Coolant level ▪ Brake dragging ▪ Clutch slippage (MTX) ▪ Tire pressure • Are all the 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	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" or "NO.18 COOLING SYSTEM CONCERNS-RUNS COLD". (See NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZR 2.5] .) (See NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [MZR 2.5] .)
		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 [MZR 2.5].) • 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 IGNITION SYSTEM OPERATION • Perform the Spark Test.	Yes	Go to the next step.

	(See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) Is a strong blue spark visible at each cylinder?	No	Repair or replace the malfunctioning part according to the inspection results.
6	INSPECT FUEL LINE PRESSURE - Inspect the fuel line pressure. (See FUEL LINE PRESSURE INSPECTION [MZR 2.5].) - Is the fuel line pressure correct?	Yes	Go to the next step.
		No	Zero or low: - Inspect the following: - Fuel pump relay - Fuel pump circuit - Fuel line for clogging - If there is no malfunction, replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].) High: - Replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].)
7	INSPECT VARIABLE TUMBLE CONTROL OPERATION - Perform the variable tumble control operation inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - Does the variable tumble control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
8	INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION - Inspect the variable valve timing control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - Does the variable valve timing control system operate properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
9	INSPECT VARIABLE INTAKE AIR CONTROL OPERATION - Perform the variable intake air control operation inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - Does the variable intake air control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.

10	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.
11	INSPECT MAF SENSOR FOR CONTAMINATION - Inspect the MAF sensor for contamination. - Is there any contamination?	Yes	Replace the MAF/IAT sensor. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
12	INSPECT ENGINE COMPRESSION Is the engine compression correct? (See COMPRESSION INSPECTION [MZR 2.5] .)	Yes	Go to the next step.
		No	Inspect for cause. Repair or replace the malfunctioning part according to the inspection results.
13	INSPECT IF MALFUNCTION CAUSE IS PCV VALVE OR VALVE TIMING Inspect the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZR 2.5] .)	Yes	Inspect the valve timing. Repair or replace the malfunctioning part according to the inspection results.
		No	Replace the PCV valve and the oil separator as a single unit, then go to the next step. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/ INSTALLATION [MZR 2.5] .)
14	- 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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CAUTION:

- **Disconnecting/ connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and the quick release connector. Always clean the 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 (ATX) ▪ Fuel quality ▪ Coolant level ▪ Brake dragging ▪ Clutch slippage (MTX) ▪ Tire pressure • Are all the 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	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" or "NO.18 COOLING SYSTEM CONCERNS-RUNS COLD". (See NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZR 2.5] .) (See NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [MZR 2.5] .)
		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 [MZR 2.5].) • 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 IGNITION SYSTEM OPERATION • Perform the Spark Test.	Yes	Go to the next step.

	(See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) Is a strong blue spark visible at each cylinder?	No	Repair or replace the malfunctioning part according to the inspection results.
6	INSPECT FUEL LINE PRESSURE - Inspect the fuel line pressure. (See FUEL LINE PRESSURE INSPECTION [MZR 2.5].) - Is the fuel line pressure correct?	Yes	Go to the next step.
		No	Zero or low: - Inspect the following: - Fuel pump relay - Fuel pump circuit - Fuel line for clogging - If there is no malfunction, replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].) High: - Replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZR 2.5].)
7	INSPECT VARIABLE TUMBLE CONTROL OPERATION - Perform the variable tumble control operation inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - Does the variable tumble control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
8	INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION - Inspect the variable valve timing control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - Does the variable valve timing control system operate properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
9	INSPECT VARIABLE INTAKE AIR CONTROL OPERATION - Perform the variable intake air control operation inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZR 2.5].) - Does the variable intake air control function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.

10	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.
11	INSPECT MAF SENSOR FOR CONTAMINATION - Inspect the MAF sensor for contamination. - Is there any contamination?	Yes	Replace the MAF/IAT sensor. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZR 2.5] .)
		No	Go to the next step.
12	INSPECT ENGINE COMPRESSION Is the engine compression correct? (See COMPRESSION INSPECTION [MZR 2.5] .)	Yes	Go to the next step.
		No	Inspect for cause. Repair or replace the malfunctioning part according to the inspection results.
13	INSPECT IF MALFUNCTION CAUSE IS PCV VALVE OR VALVE TIMING Inspect the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZR 2.5] .)	Yes	Inspect the valve timing. Repair or replace the malfunctioning part according to the inspection results.
		No	Replace the PCV valve and the oil separator as a single unit, then go to the next step. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/ INSTALLATION [MZR 2.5] .)
14	- 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.		