

2012 - Mazda6 - Engine

NO.12 LACK/ LOSS OF POWER-ACCELERATION/ CRUISE [MZI 3.7 V6]

12	LACK/LOSS OF POWER—ACCELERATION/CRUISE
DESCRIPTION	• Performance is poor under load (such as power down when climbing hills).
POSSIBLE CAUSE	• Vacuum leakage • Restriction in intake-air system • Air leakage from intake-air system parts • Poor fuel quality • PCM DTC is stored. • Engine overheating • Intake air temperature too hot • Erratic signal to PCM ▪ APP sensor or related circuit malfunction ▪ MAF sensor or related circuit malfunction ▪ TP sensor or related circuit malfunction ▪ IAT sensor or related circuit malfunction ▪ CKP sensor or related circuit malfunction ▪ VSS or related circuit malfunction • Erratic signal from CKP sensor • Fuel leakage from fuel injector • Fuel injector clogging • Throttle body restriction or clogged • Improper operation of drive-by-wire control system • Restriction in exhaust system • Inadequate fuel pressure ▪ Open or short in fuel pump related circuit ▪ Fuel pump mechanical malfunction ▪ Fuel line restriction or clogging ▪ Pressure regulator malfunction (built-in fuel pump unit) • Improper A/C system operation • Improper A/C cut-off operation • PCV valve malfunction • Purge control solenoid malfunction • Erratic signal or no signal from CMP sensor • Improper variable valve timing control operation

- Low engine compression
- Improper valve timing due to jumping out of timing chain
- ATX malfunction
- Brake dragging

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 • Verify the following: ▪ Vacuum connection ▪ Restriction in intake-air system (such as air cleaner element, fresh air duct) ▪ No air leakage from intake-air system ▪ No restriction of intake-air system ▪ Proper sealing of intake manifold and components attached to intake manifold ▪ Fuel quality (such as proper octane, contamination, winter/summer blend) • 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).	Yes	DTC is displayed: • Go to the appropriate DTC inspection.

	- Retrieve any DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].) - Are there any DTCs displayed?		(See DTC TABLE [MZI 3.7 V6] .)
		No	No DTC is displayed: Go to the next step.
3	VERIFY IF MALFUNCTION CAUSE IS OVERHEATING Is the engine overheating?	Yes	Go to the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING". (See NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZI 3.7 V6] .)
		No	Go to the next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS CAUTION: - While performing this step, always operate the vehicle in a safe and lawful manner. - When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later. - Access the following PCM PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].) - APP1 - APP2 - RPM - MAF - TP1 - TP2 - IAT - VSS - Do the PIDs indicate the correct values under trouble condition? (See PCM INSPECTION [MZI 3.7 V6].)	Yes	Go to the next step.
		No	APP1 or APP2 PID is not specified: - Inspect if output signal from APP sensor changes smoothly. RPM PID is not specified: - Inspect the CKP sensor and related wiring harness for vibration or intermittent open/short circuit. MAF PID is not specified: - Inspect for intermittent open circuit of MAF sensor and related wiring harness. TP1 or TP2 PID is not specified: - Inspect if output signal from TP sensor changes smoothly. IAT PID is not specified: - Inspect for air suction in intake-air system. - If normal, inspect intermittent short circuit of IAT sensor and related wiring harnesses. VSS PID is not specified: - Inspect for open circuit of VSS and related wiring harness intermittently. Repair or replace the malfunctioning part according to the inspection results.
5	INSPECT CKP SENSOR - Inspect the CKP sensor. (See CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [MZI 3.7 V6].) - Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
6	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION Perform the drive-by-wire control system operation inspection.	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.

	(See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) Does the drive-by-wire control system function properly?		
7	INSPECT CMP SENSOR - Inspect the CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [MZI 3.7 V6].) - Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
8	VISUALLY INSPECT THROTTLE BODY - Visually inspect the throttle valve. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZI 3.7 V6].) - Are any foreign materials adhere to around throttle valve?	Yes	Clean the throttle valve.
		No	Go to the next step.
9	VERIFY SPARK PLUG CONDITION - Verify the spark plug conditions. - Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: - Inspect for fuel leakage from fuel injector. Spark plug is grayish white: - Inspect the fuel injector for clogging. Repair or replace the malfunctioning part according to the inspection results.
		No	Install the spark plugs on original cylinders. Go to the next step.
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 FUEL LINE PRESSURE - Install the fuel pressure gauge between the fuel pipe and fuel distributor. - Measure the fuel line pressure. (See FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6].) - Is the fuel line pressure correct?	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].)
12	DETERMINE IF MALFUNCTION CAUSE IS A/ C SYSTEM OR OTHER NOTE: - The following test is for engine running at rough idle with A/C on. If other symptoms exist, go to the next step. - Connect the pressure gauge to A/C low and high pressure side lines. - Start the engine and idle it. - Turn the A/C switch on. - Measure low side and high side pressures. (See REFRIGERANT PRESSURE CHECK.) - Are pressures within specifications?	Yes	Go to the next step.
		No	If the A/C is always on: - 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].) For other symptoms: - Inspect the following: - Refrigerant charging amount - Condenser fan operation - Repair or replace the malfunctioning part according to the inspection results.
13	INSPECT A/ C CUT-OFF CONTROL SYSTEM OPERATION - Inspect for A/C cut-off operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Does the A/C cut-off function properly?	Yes	Go to the next step.
		No	Inspect the A/C cut-off system components. Repair or replace the malfunctioning part according to the inspection results.
14	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	Go to the next step.
15	DETERMINE IF MALFUNCTION CAUSE IS EVAP CONTROL SYSTEM OR OTHER CAUTION: - While performing this step, always operate the vehicle in a safe and lawful manner. - Disconnect the vacuum hose	Yes	Inspect the following: - Purge solenoid valve is stuck open. - EVAP control system Repair or replace the malfunctioning part according to the inspection results.

	between purge solenoid valve and intake manifold from purge solenoid side. • Plug opening end of vacuum hose. • Drive the vehicle. • Does the engine condition improve?	No	Go to the next step.
16	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.
17	INSPECT IF MALFUNCTION CAUSE IS PCV VALVE OR OTHER • Is the engine compression correct?	Yes	Inspect the following: • Valve timing • Internal transaxle components • Brake system for dragging Repair or replace the malfunctioning part according to the inspection results.
		No	Inspect for cause. Repair or replace the malfunctioning part according to the inspection results.
18	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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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
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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).	Yes	DTC is displayed: • Go to the appropriate DTC inspection.

	- Retrieve any DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].) - Are there any DTCs displayed?		(See DTC TABLE [MZI 3.7 V6] .)
		No	No DTC is displayed: Go to the next step.
3	VERIFY IF MALFUNCTION CAUSE IS OVERHEATING Is the engine overheating?	Yes	Go to the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING". (See NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZI 3.7 V6] .)
		No	Go to the next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS CAUTION: - While performing this step, always operate the vehicle in a safe and lawful manner. - When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later. - Access the following PCM PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6].) - APP1 - APP2 - RPM - MAF - TP1 - TP2 - IAT - VSS - Do the PIDs indicate the correct values under trouble condition? (See PCM INSPECTION [MZI 3.7 V6].)	Yes	Go to the next step.
		No	APP1 or APP2 PID is not specified: - Inspect if output signal from APP sensor changes smoothly. RPM PID is not specified: - Inspect the CKP sensor and related wiring harness for vibration or intermittent open/short circuit. MAF PID is not specified: - Inspect for intermittent open circuit of MAF sensor and related wiring harness. TP1 or TP2 PID is not specified: - Inspect if output signal from TP sensor changes smoothly. IAT PID is not specified: - Inspect for air suction in intake-air system. - If normal, inspect intermittent short circuit of IAT sensor and related wiring harnesses. VSS PID is not specified: - Inspect for open circuit of VSS and related wiring harness intermittently. Repair or replace the malfunctioning part according to the inspection results.
5	INSPECT CKP SENSOR - Inspect the CKP sensor. (See CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [MZI 3.7 V6].) - Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
6	INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION Perform the drive-by-wire control system operation inspection.	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.

	(See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) Does the drive-by-wire control system function properly?		
7	INSPECT CMP SENSOR - Inspect the CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [MZI 3.7 V6].) - Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
8	VISUALLY INSPECT THROTTLE BODY - Visually inspect the throttle valve. (See INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZI 3.7 V6].) - Are any foreign materials adhere to around throttle valve?	Yes	Clean the throttle valve.
		No	Go to the next step.
9	VERIFY SPARK PLUG CONDITION - Verify the spark plug conditions. - Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: - Inspect for fuel leakage from fuel injector. Spark plug is grayish white: - Inspect the fuel injector for clogging. Repair or replace the malfunctioning part according to the inspection results.
		No	Install the spark plugs on original cylinders. Go to the next step.
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 FUEL LINE PRESSURE - Install the fuel pressure gauge between the fuel pipe and fuel distributor. - Measure the fuel line pressure. (See FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6].) - Is the fuel line pressure correct?	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] .)
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14	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 Go to the next step.
15	DETERMINE IF MALFUNCTION CAUSE IS EVAP CONTROL SYSTEM OR OTHER CAUTION: - While performing this step, always operate the vehicle in a safe and lawful manner. - Disconnect the vacuum hose	Yes Inspect the following: - Purge solenoid valve is stuck open. - EVAP control system Repair or replace the malfunctioning part according to the inspection results.	

	between purge solenoid valve and intake manifold from purge solenoid side. • Plug opening end of vacuum hose. • Drive the vehicle. • Does the engine condition improve?	No	Go to the next step.
16	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.
17	INSPECT IF MALFUNCTION CAUSE IS PCV VALVE OR OTHER • Is the engine compression correct?	Yes	Inspect the following: • Valve timing • Internal transaxle components • Brake system for dragging Repair or replace the malfunctioning part according to the inspection results.
		No	Inspect for cause. Repair or replace the malfunctioning part according to the inspection results.
18	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.		