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2003 MAZDA 6/Atenza Wagon OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
15	INSPECT RELATED PART CONDITION • Inspect the following: — Fuel quality (proper octane, contamination, winter/summer blend) — Air leakage from intake-air system — Vacuum leakage — Intake-air system restriction — Air cleaner element — Fuel leakage from fuel line — Engine mount loose — CKP sensor and intake CMP sensor • Installation condition (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Damaged trigger wheel (intake camshaft) — Exhaust CMP sensor • Installation condition (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Damaged trigger wheel (exhaust camshaft) • Is there any malfunction?	Yes	Service if necessary. • Repeat this step.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
25	**INSPECT FOR MALFUNCTION DUE TO DEVIATED VALVE TIMING** • Inspect the valve timing (timing chain installation condition). (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-G (WITH EGR COOLER)].) • Is the valve timing normal?	Yes	Inspect for the following engine internal parts: • Cylinder • Piston ring • Intake valve • Exhaust valve • Such as cylinder head gasket — If there is any malfunction: • Repair or replace the malfunctioning part according to the inspection results.
		No	Adjust the valve timing to the correct timing.
26	**INSPECT IGNITION SYSTEM OPERATION** • Perform the Spark Test. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is a 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.
27	**INSPECT EXHAUST SYSTEM FOR RESTRICTION** • Inspect for restriction in the exhaust system and the TWC. • Is there any restriction?	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
28	**INSPECT PCV VALVE** • Inspect the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Injector driver malfunction. • Replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) If the problem remains, overhaul the engine.
29	Verify the test results. • If normal, return to the diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • If the malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.		

12	LACK/LOSS OF POWER-ACCELERATION/CRUISE
	• PCV valve malfunction • Injector driver (built-into PCM) malfunction • ATX internal malfunction
POSSIBLE CAUSE	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. — Highly pressurized fuel may spray out if the fuel line is cut. Due to the following dangers occurring with a fuel spray, always complete the "Fuel Line Safety Procedure" to prevent the fuel from spraying. (See BEFORE SERVICE PRECAUTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Fuel may cause irritation if it comes in contact with skin and eyes. • If fuel ignites and causes a fire, it may lead to serious injury or death, and damage to property and facilities. — Fuel is highly flammable and dangerous. Fuel line spills and leakage can cause serious injury or death, and damage to equipment. Always refer to the "Quick Release Connector Removal/Installation (fuel system)" before performing the fuel hose installation, and execute the "Fuel Leakage Inspection" after installation. (See QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See AFTER SERVICE PRECAUTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) Caution • Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Caution

• Verify the malfunction symptom according to not only the PID value but also the symptom troubleshooting.

Related PIDs

Item (definition)	Unit/Condition	Definition	Condition/Specification (Reference)
APP1	%	APP sensor No.1	• Accelerator pedal released: Approx. 15% • Accelerator pedal depressed: Approx. 90.58%
	V		• Accelerator pedal released: Approx. 0.75 V • Accelerator pedal depressed: Approx. 4.52 V
APP2	%	APP sensor No.2	• Accelerator pedal released: Approx. 7.45% • Accelerator pedal depressed: Approx. 45.49%
	V		• Accelerator pedal released: Approx. 0.38 V • Accelerator pedal depressed: Approx. 2.26 V
ECT	°C, °F	Engine coolant temperature	• Displays ECT
	V		• ECT is 20 °C {68 °F}: Approx. 3.10 V • ECT is 40 °C {104 °F}: Approx. 2.16 V • ECT is 60 °C {140 °F}: Approx. 1.40 V • ECT is 80 °C {176 °F}: Approx. 0.87 V • ECT is 100 °C {212 °F}: Approx. 0.54 V

STEP	INSPECTION	RESULTS	ACTION
5	VERIFY CURRENT INPUT SIGNAL STATUS	Yes	Go to the next step.

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 PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

— APP1
— APP2
— ECT
— FUEL_PRES
— IAT
— MAF
— MAP
— MAP_V
— TP_REL
— O2S11
— O2S12
— SHRTFT1
— LONGFT1

• Do the PIDs indicate the correct values under the trouble condition? (See PCM INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

STEP	INSPECTION	RESULTS	ACTION
11	INSPECT FUEL PRESSURE (HIGH-SIDE) • Start the engine and warm it up completely. • Access the FUEL_PRES PID using the M-MDS at idle. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the FUEL_PRES PID value approx. 10 MPa {102 kgf/cm^2, 1,450 psi}?	Yes	Go to Step 13.
		No	Lower than 10 MPa {102 kgf/cm^2, 1,450 psi}: • Inspect the following: — Fuel leakage at the fuel line and fuel injector — Fuel pump • Perform the Fuel Pump (Low-pressure Side) Operation Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) — Fuel pressure sensor (See FUEL PRESSURE SENSOR INSPECTION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See HIGH FUEL PRESSURE SENSOR INSPECTION [SKYACTIV-G (WITH EGR COOLER)].) — High pressure fuel pump (See HIGH PRESSURE FUEL PUMP INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • If there is any malfunction: — Repair or replace the malfunctioning part according to the inspection results. • If there is no malfunction: — Go to the next step. Higher than 10 MPa {102 kgf/cm^2, 1,450 psi}: • Go to the next step.
12	INSPECT SPILL VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND • Switch the ignition off. • Disconnect the high pressure fuel pump and PCM connectors. • Inspect for continuity between high pressure fuel pump terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between high pressure fuel pump terminal A and PCM terminal 1DI. If there is a common connector: • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground. • Repair or replace the malfunctioning part. If there is no common connector: • Repair or replace the wiring harness which has a short to ground. If the malfunction remains: • Replace the PCM. (damage to driver in PCM) (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Replace the high pressure fuel pump. (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G (WITH EGR COOLER)].)

NO.14 POOR FUEL ECONOMY [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)]

SM2897125

id0103q580200

14	POOR FUEL ECONOMY
DESCRIPTION	• Fuel economy is unsatisfactory.
POSSIBLE CAUSE	**Note** **• The perceived poor fuel economy condition has two causes; the vehicle conditions and how the driver uses the vehicle. Especially, it relies heavily on how the driver uses the vehicle.** • Engine oil malfunction — Improper engine oil level — Engine oil contamination — Improper engine oil viscosity • Improper engine compression • Ignition system malfunction • Improper engine coolant level • Improper tire air pressure • Improper tires, wheels (large size, irregular size) • Improper ATF level • Brake dragging • Engine operation time is longer than traveled distance — Vehicle is driven in congested traffic frequently — Vehicle left idling for long periods • Amount of fuel injection increases — Vehicle is carrying excess items (luggage) — Frequent acceleration/deceleration — Frequently driving uphill — Travel distances are short (engine does not warm up)

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	**VERIFY ALL SYSTEM DTCs** **Note** **• Display the DTCs of all the modules using the M-MDS.** • Retrieve the DTCs of all the modules using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection.
		No	Go to the next step.

NO.15 EMISSION COMPLIANCE [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)]

SM2897126

id0103q580210

15	EMISSION COMPLIANCE
DESCRIPTION	• Fails emissions test.

STEP	INSPECTION	RESULTS	ACTION
6	**VERIFY IF MALFUNCTION CAUSED BY IGNITION TIMING MALFUNCTION** • Inspect the ignition timing. (See ENGINE TUNE-UP [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Inspect the following: • Spark plug (See SPARK PLUG INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Ignition coil/ion sensor No.1 (See IGNITION COIL INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Ignition coil/ion sensor No.2 • Ignition coil/ion sensor No.3 • Ignition coil/ion sensor No.4 • CMP sensor (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • CKP sensor (See CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) — If there is any malfunction: • Repair or replace the malfunctioning part according to the inspection results, then go to Step 18. — If there is no malfunction: • Go to Step 18.
		No	Go to the next step.
7	**INSPECT PURGE CONTROL SYSTEM OPERATION** • Perform the Purge Control System Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Does the purge solenoid valve work properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 18.

NO.16 HIGH OIL CONSUMPTION/LEAKAGE [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)]

SM2897127

id0103q580220

16	HIGH OIL CONSUMPTION/LEAKAGE
DESCRIPTION	• Oil consumption is excessive.
POSSIBLE CAUSE	• Improper oil level gauge • Improper engine oil viscosity • Oil leakage • PCV valve malfunction • Engine internal parts malfunction

Diagnostic Procedure

Step	Inspection	Results	Action
1	ADD ENGINE OIL Note • Add engine oil to the MAX position because the validity of the engine oil consumption is determined. • Visually verify the engine oil level. • Is the engine oil level at the MAX position?	Yes	Go to the next step.
		No	Add engine oil to the MAX position, then go to the next step.
2	DETERMINE IF ENGINE OIL CONSUMPTION IS REASONABLE • Record the current traveled distance. • Have the customer drive the vehicle 1,931 km {1,200 mile}. • Is the engine oil level appropriate?	Yes	Complete the symptom troubleshooting. (Explain to the customer that it is normal for the engine oil level to decrease from MAX to MIN after driving the vehicle 1,931 km {1,200 mile}.)
		No	Go to the next step.
3	INSPECT ENGINE OIL VISCOSITY • Inspect the engine oil viscosity. • Is the engine oil viscosity appropriate?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning location, then go to Step 6.
4	INSPECT FOR ENGINE OIL LEAKAGE • Inspect for engine oil leakage from the outside of the engine. • Is there engine oil leakage?	Yes	Repair or replace the malfunctioning location, then go to Step 6.
		No	Go to the next step.