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2002 MAZDA 6/Atenza Wagon OEM Service and Repair Workshop Manual

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17	LACK/LOSS OF POWER-ACCELERATION/CRUISE
POSSIBLE CAUSE	• The engine torque control is activated when the engine coolant temperature is high • PCM DTC is stored. • Erratic signal to PCM — IAT sensor No.1 or related circuit malfunction — MAF sensor or related circuit malfunction — MAP sensor No.2 or related circuit malfunction — Exhaust gas temperature sensor No.1 or related circuit malfunction — Exhaust gas pressure sensor No.1 or related circuit malfunction — BARO sensor (integrated in PCM) or related circuit malfunction — Refrigerant pressure sensor or related circuit malfunction — A/F sensor or related circuit malfunction — Intake shutter valve or related circuit malfunction — EGR opening angle signal — Regulating valve position sensor or related circuit malfunction • Brake dragging • ATX malfunction • Intake air system malfunction (air suction, leakage, perforation) • Air cleaner malfunction — Air cleaner restricted or dirty — Blocking of air cleaner intake port due to hood weatherstrip removal — Non-genuine part installed • Turbocharger malfunction • A/C relay malfunction • Fuel injection system malfunction — Fuel leakage from fuel system — Common rail malfunction — Supply pump malfunction — Suction control valve malfunction — Fuel injector malfunction — Fuel pressure relief valve malfunction — Fuel check valve or fuel feed valve malfunction — Jet pump malfunction (AWD) • Poor fuel quality • Mechanical (engine) malfunction — Large mechanical resistance — Improper engine compression — Improper valve timing — Engine oil malfunction (oil working up or down) **Warning** **• The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:** **— Always keep sparks and flames away from fuel. Fuel can be easily ignited which could cause serious injury or death, and damage to equipment.** **— Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death, and damage to property and facilities. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTION". (See BEFORE SERVICE PRECAUTION [SKYACTIV-D 2.2].)** **— Fuel is highly flammable and dangerous. Fuel line spills and leakage can cause serious injury or death, and damage to equipment. When installing the fuel hose, always refer to the "AFTER SERVICE PRECAUTION" and perform the "Fuel Hose Installation Procedure". (See AFTER SERVICE PRECAUTION [SKYACTIV-D 2.2].)**

STEP	INSPECTION	RESULTS	ACTION
14	**INSPECT FOR FUEL LEAKAGE FROM FUEL SYSTEM** • Visually inspect the following: — Fuel leakage from the fuel tank, fuel pump, hose, pipe, fuel injector, supply pump, common rail — Cracking and damage in fuel hose and pipe — Clamp installation condition for each hose and pipe — Fuel pipe securing condition due to deterioration such as rubber of clamp • Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 22.
15	**INSPECT FUEL INJECTION RELATED PARTS** • Inspect the following parts: — Common rail (See COMMON RAIL INSPECTION [SKYACTIV-D 2.2].) — Supply pump (See SUPPLY PUMP INSPECTION [SKYACTIV-D 2.2].) — Suction control valve (See SUCTION CONTROL VALVE INSPECTION [SKYACTIV-D 2.2].) — Fuel injector (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2].) — Fuel pressure relief valve (See FUEL PRESSURE RELIEF VALVE INSPECTION [SKYACTIV-D 2.2].) — Jet pump (AWD) (See JET PUMP INSPECTION [SKYACTIV-D 2.2].) • Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 22.
16	**INSPECT FOR MALFUNCTION DUE TO POOR FUEL** • Replace the fuel. (See FUEL DRAINING PROCEDURE [SKYACTIV-D 2.2].) • Does the symptom disappear?	Yes	Advise the customer as to the change in the fuel used.
		No	Remove the accumulated matter in the cylinder head using the following procedure, then go to the next step. • Carbon remover • Overhauling
17	**DETERMINE IF MALFUNCTION IS DUE TO EXCESSIVE ENGINE SPEED RESISTANCE** • Rotate the crankshaft pulley lock bolt clockwise using a wrench. (See FRONT OIL SEAL REPLACEMENT [SKYACTIV-D 2.2].) • Can bolts be rotated?	Yes	Go to Step 19.
		No	Go to the next step.
18	**INSPECT FOR MALFUNCTION DUE TO EXCESSIVE MECHANICAL RESISTANCE OF ENGINE ACCESSORIES** • Remove all drive belts from engine accessories. (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) • Can the crankshaft be rotated?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 22. (Large mechanical resistance in engine accessories.)
		No	Overhaul the engine because it is possible that there is a problem in the engine, then go to Step 22.
19	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See COMPRESSION INSPECTION [SKYACTIV-D 2.2].) • Are compression pressures within specification?	Yes	Go to Step 22.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
3	**INSPECT FOR FUEL LEAKAGE FROM FUEL SYSTEM** • Visually inspect the following: — Fuel leakage from the fuel tank, fuel pump, hose, pipe, fuel injector, supply pump, common rail — Cracking and damage in fuel hose and pipe — Clamp installation condition for each hose and pipe — Fuel pipe securing condition due to deterioration such as rubber of clamp • Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 11.
4	**INSPECT FUEL INJECTION RELATED PARTS** • Inspect the following parts: — Common rail (See COMMON RAIL INSPECTION [SKYACTIV-D 2.2].) — Supply pump (See SUPPLY PUMP INSPECTION [SKYACTIV-D 2.2].) — Suction control valve (See SUCTION CONTROL VALVE INSPECTION [SKYACTIV-D 2.2].) — Fuel injector (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2].) — Fuel pressure relief valve (See FUEL PRESSURE RELIEF VALVE INSPECTION [SKYACTIV-D 2.2].) — Jet pump (AWD) (See JET PUMP INSPECTION [SKYACTIV-D 2.2].) • Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 11.
5	**INSPECT FOR MALFUNCTION DUE TO POOR FUEL** • Replace the fuel. (See FUEL DRAINING PROCEDURE [SKYACTIV-D 2.2].) • Does the symptom disappear?	Yes	Advise the customer as to the change in the fuel used.
		No	Remove the accumulated matter in the cylinder head using the following procedure, then go to the next step. • Carbon remover • Overhauling
6	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See COMPRESSION INSPECTION [SKYACTIV-D 2.2].) • Are compression pressures within specification?	Yes	Go to the next step.
		No	Go to Step 11.
7	**DETERMINE IF MALFUNCTION IS DUE TO EXCESSIVE ENGINE SPEED RESISTANCE** • Rotate the crankshaft pulley lock bolt clockwise using a wrench. (See FRONT OIL SEAL REPLACEMENT [SKYACTIV-D 2.2].) • Can bolts be rotated?	Yes	Go to Step 11.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
2	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 PID using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) — O2S11 • Do the PID indicate the correct values under the trouble condition? (See PCM INSPECTION [SKYACTIV-D 2.2].)	Yes	Inspect the related sensor and circuit. • 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 the next step.
		No	Go to the next step.
3	INSPECT FOR FUEL LEAKAGE FROM FUEL SYSTEM • Visually inspect the following: — Fuel leakage from the fuel tank, fuel pump, hose, pipe, fuel injector, supply pump, common rail — Cracking and damage in fuel hose and pipe — Clamp installation condition for each hose and pipe — Fuel pipe securing condition due to deterioration such as rubber of clamp • Are all items normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 18.
4	INSPECT A/C RELAY • Switch the ignition off. • Remove the A/C relay. • Inspect the A/C relay. (See RELAY INSPECTION.) • Is the A/C relay normal?	Yes	Go to the next step.
		No	Replace the A/C relay, then go to Step 18.
5	INSPECT FAN CONTROL MODULE NO.1 • Inspect the fan control module No.1. (See FAN CONTROL MODULE INSPECTION [SKYACTIV-D 2.2].) • Is the fan control module No.1 normal?	Yes	Go to the next step.
		No	Replace the fan control module No.1, then go to Step 18. (See COOLING FAN MOTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
6	INSPECT FAN CONTROL MODULE NO.2 • Inspect the fan control module No.2. (See FAN CONTROL MODULE INSPECTION [SKYACTIV-D 2.2].) • Is the fan control module No.2 normal?	Yes	Go to the next step.
		No	Replace the fan control module No.2, then go to Step 18. (See COOLING FAN MOTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
7	VERIFY ATX RELATED DTC • Retrieve TCM DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (GW6A-EL, GW6AX-EL)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [TCM (GW6A-EL, GW6AX-EL)].)
		No	Go to the next step.
8	VERIFY MALFUNCTION SYMPTOM RELATED TO ATX • Verify the malfunction symptom related to the ATX. (See SYMPTOM TROUBLESHOOTING ITEM TABLE [GW6A-EL, GW6AX-EL].) • Is a malfunction occurring which is applicable to the symptom diagnostic index?	Yes	Go to the applicable symptom troubleshooting. (See SYMPTOM TROUBLESHOOTING ITEM TABLE [GW6A-EL, GW6AX-EL].)
		No	Go to the next step.

NO.20 EMISSION COMPLIANCE [SKYACTIV-D 2.2]

SM2897066

id0103g189870

20	EMISSION COMPLIANCE
DESCRIPTION	• Fails emissions test.

STEP	INSPECTION	RESULTS	ACTION
7	**INSPECT FOR MALFUNCTION DUE TO POOR FUEL** • Replace the fuel. (See FUEL DRAINING PROCEDURE [SKYACTIV-D 2.2].) • Does the symptom disappear?	Yes	Advise the customer as to the change in the fuel used.
		No	Remove the accumulated matter in the cylinder head using the following procedure, then go to the next step. • Carbon remover • Overhauling
8	**INSPECT EGR COOLER AND EGR PIPE** • Inspect for clogging in the EGR cooler and EGR pipe. • Are the EGR cooler and EGR pipe normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 15.
9	**DETERMINE IF MALFUNCTION IS DUE TO EXCESSIVE ENGINE SPEED RESISTANCE** • Rotate the crankshaft pulley lock bolt clockwise using a wrench. (See FRONT OIL SEAL REPLACEMENT [SKYACTIV-D 2.2].) • Can bolts be rotated?	Yes	Go to Step 11.
		No	Go to the next step.
10	**INSPECT FOR MALFUNCTION DUE TO EXCESSIVE MECHANICAL RESISTANCE OF ENGINE ACCESSORIES** • Remove all drive belts from engine accessories. (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) **Caution** **• Do not run the engine for long periods with the drive belts of engine accessories removed. Otherwise the engine could be damaged from overheating.** • Start the engine. • Is cranking possible? (Does the engine start?)	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 15. (Large mechanical resistance in engine accessories.)
		No	Go to the next step.
11	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See COMPRESSION INSPECTION [SKYACTIV-D 2.2].) • Are compression pressures within specification? **Specification:** • Compression — Standard: 2255 kPa {22.99 kgf/cm^2, 327.1 psi} (180 rpm) — Minimum: 1804 kPa {18.40 kgf/cm^2, 261.6 psi} (180 rpm) — Maximum difference between cylinders: 147 kPa {1.50 kgf/cm^2, 21.3 psi} (180 rpm)	Yes	Go to Step 14.
		No	Go to the next step.
12	**INSPECT FOR MALFUNCTION DUE TO DEVIATED VALVE TIMING** • Inspect the valve timing (timing chain installation condition). (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) • Is the valve timing normal?	Yes	Go to the next step.
		No	Adjust the valve timing to the correct timing, then go to Step 15.

STEP	INSPECTION	RESULTS	ACTION
5	Verify the test results. • If normal, return to the diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [SKYACTIV-D 2.2].) • 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.		

STEP	INSPECTION	RESULTS	ACTION
11	Verify the test results. • If normal, return to the diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [SKYACTIV-D 2.2].) • 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.		

NO.24 EXCESSIVE BLACK SMOKE [SKYACTIV-D 2.2]

SM2897070

id0103g189910

24	EXCESSIVE BLACK SMOKE
DESCRIPTION	• Compared to previously, black smoke in the exhaust gas abnormally high.
POSSIBLE CAUSE	• PCM DTC is stored. • Diesel particulate filter (in catalytic converter) deficiency

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	VERIFY PCM DTC • Retrieve PCM DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
2	INSPECT DIESEL PARTICULATE FILTER (IN CATALYTIC CONVERTER) FOR MALFUNCTION DUE TO DEFICIENCY • Inspect the diesel particulate filter. (See DIESEL PARTICULATE FILTER INSPECTION [SKYACTIV-D 2.2].) • Is the diesel particulate filter normal?	Yes	Go to the next step.
		No	Diesel particulate filter deficiency in the catalytic converter can be considered. Replace the catalytic converter, then go to the next step. (See EXHAUST SYSTEM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
3	Verify the test results. • If normal, return to the diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [SKYACTIV-D 2.2].) • 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.		