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2002 MAZDA 2 / Demio OEM Service and Repair Workshop Manual

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Troubleshooting item		Mechanical						
		Blow-by heater		Engine oil solenoid valve				Belts for engine accessories
		Always on	Always off	Open circuit in drive circuit	Short circuit in drive circuit	Valve stuck open	Valve stuck close	Slippage
20	Emission compliance	–	–	–	–	–	–	–
21	High oil consumption/leakage	–	–	–	–	–	–	–
22	Cooling system concerns-overheating	–	–	–	–	–	–	–
23	Cooling system concerns-runs cold	–	–	–	–	–	–	–
24	Excessive black smoke	–	–	–	–	–	–	–
25	Fuel odor (in engine compartment)	–	–	–	–	–	–	–
26	Engine noise	–	–	–	–	–	–	×
27	Vibration concerns (engine)	–	–	–	–	–	–	–
28	Sulphuric odor	–	–	–	–	–	–	–
29	Ammonia odor	–	–	–	–	–	–	–
30	SCR system warning indication turned on or flashes/message related to SCR system indicated in display	–	–	–	–	–	–	–
31	SCR system warning indication turned on/[Overfilled DEF] indicated in display	–	–	–	–	–	–	–

×: Applicable–: Not applicable

Troubleshooting item		Lubrication system	Cooling system					Charging sys
		Engine oil	Engine coolant passage		Thermostat		Cooling fan motor	Battery
		Improper level	Restricted or clogged	Leakage	Always open	Always close	Improper operation	Does not charge
16	Engine stalls/quits, engine runs rough, misses, buck/jerk, hesitation/stumble, surges	–	–	–	–	–	–	–
17	Lack/loss of power-acceleration/cruise	–	–	–	–	–	–	–
18	Knocking/pinging-acceleration/cruise	–	–	–	–	–	–	–
19	Poor fuel economy	–	–	–	–	–	–	–
20	Emission compliance	–	–	–	×	–	–	–
21	High oil consumption/leakage	–	–	–	–	–	–	–
22	Cooling system concerns-overheating	–	×	×	–	×	×	–
23	Cooling system concerns-runs cold	–	–	–	×	–	–	–
24	Excessive black smoke	–	–	–	–	–	–	–
25	Fuel odor (in engine compartment)	–	–	–	–	–	–	–
26	Engine noise	–	–	–	–	–	–	–
27	Vibration concerns (engine)	–	–	–	–	–	–	–
28	Sulphuric odor	–	–	–	–	–	–	–
29	Ammonia odor	–	–	–	–	–	–	–

Troubleshooting item		Charging system					Emission system	
		Generator	Starter		Glow plug		Catalytic converter (diesel particulate filter)	
		High power generation	Open/short circuit in drive circuit	Internal malfunction	Always off	Always on	Deterioration or loss	Degradation
7	Charging system warning light illuminated/ message related to charging system malfunction indicated in display	×	–	–	–	–	–	–
8	Engine oil warning light illuminated/ message related to engine hydraulic pressure indicated in display	–	–	–	–	–	–	–
9	Will not crank	–	×	×	–	–	–	–
10	Hard to start/long crank/erratic start/erratic crank	–	–	–	–	–	–	–
11	Engine stalls-after start/at idle	–	–	–	–	–	–	–
12	Cranks normally but will not start	–	–	–	–	–	–	–
13	Engine runs rough/rolling idle	–	–	–	–	–	–	–
14	Fast idle/runs on	–	–	–	–	–	–	–
15	Low idle/stalls during deceleration	–	–	–	–	–	–	–

Troubleshooting item		ATX	Other					
		Automatic transaxle	Engine mount	Instrument cluster	Brake	Tire	Vehicle electric devices	
		Abnormal shift point	Looseness	Improper operation	Drag	Low air pressure	Remote transmitter left in vehicle cabin	Large amount of parasitic draw
3	Diesel particulate filter indicator light illuminated frequently/ message related to accumulation condition in diesel particulate filter indicated in display	–	–	–	–	–	–	–
4	Diesel particulate filter indicator light flashes/message related diesel particulate filter malfunction indicated in display	–	–	–	–	–	–	–
5	Wrench indicator light illuminated/ message related to sedimentor indicated in display	–	–	–	–	–	–	–
6	Master warning light illuminated/ message related to vehicle system malfunction indicated in display	–	–	–	–	–	–	–

Troubleshooting item		ATX	Other					
		Automatic transaxle	Engine mount	Instrument cluster	Brake	Tire	Vehicle electric devices	
		Abnormal shift point	Looseness	Improper operation	Drag	Low air pressure	Remote transmitter left in vehicle cabin	Large amount of parasitic draw
30	SCR system warning indication turned on or flashes/message related to SCR system indicated in display	–	–	×	–	–	–	–
31	SCR system warning indication turned on/[Overfilled DEF] indicated in display	–	–	×	–	–	–	–

×: Applicable–: Not applicable

Troubleshooting item		Other			SCR system			
		Advanced keyless entry system	Climate control unit	Magnetic clutch	SCR system malfunction	Exhaust gas temperature sensor No.5 malfunction	Nox sensor No.1/No.2 malfunction	Diesel Exhaust Fluid (DEF) malfunction
		Improper operation	Improper operation	Improper operation				
1	Blown fuses	–	–	–	–	–	–	–
2	Check engine light illuminates	–	–	–	–	–	–	–
3	Diesel particulate filter indicator light illuminated frequently/message related to accumulation condition in diesel particulate filter indicated in display	–	–	–	–	–	–	–

Troubleshooting item		Other			SCR system			
		Advanced keyless entry system	Climate control unit	Magnetic clutch	SCR system malfunction	Exhaust gas temperature sensor No.5 malfunction	Nox sensor No.1/No.2 malfunction	Diesel Exhaust Fluid (DEF) malfunction
		Improper operation	Improper operation	Improper operation				
24	Excessive black smoke	–	–	–	–	–	–	–
25	Fuel odor (in engine compartment)	–	–	–	–	–	–	–
26	Engine noise	–	–	–	–	–	–	–
27	Vibration concerns (engine)	–	–	–	–	–	–	–
28	Sulphuric odor	–	–	–	–	–	–	–
29	Ammonia odor	–	–	–	×	×	×	–
30	SCR system warning indication turned on or flashes/message related to SCR system indicated in display	–	–	–	×	×	×	×
31	SCR system warning indication turned on/[Overfilled DEF] indicated in display	–	–	–	–	–	–	×

Item	MAIN RELAY CONTROL	IDLE SPEED CONTROL	TWO-STAGE TURBO CONTROL	FUEL INJECTION AMOUNT CONTROL	MULTIPLE FUEL INJECTION CONTROL	FUEL INJECTION TIMING CONTROL	FUEL PRESSURE CONTROL	INTAKE SHUTTER VALVE CONTROL	GLO CON
Fuel pressure relief valve							×		
Main relay	×								
Regulating solenoid valve			×						
Wastegate solenoid valve			×						
Compressor bypass solenoid valve			×						
A/F sensor heater									
Starter relay									
Generator (Field coil)		×							
A/C relay *3									
Cooling fan relay No.1									
Cooling fan relay No.2									
Engine oil solenoid valve									
Suction control valve							×		
Fuel injector No.1 −No.4		×		×	×	×			
Blow-by heater relay									
OCV									
DC-DC converter									
Instrument cluster									
Glow plug No.1− No.4									

*1:Intake stroke EGR using double exhaust valve actuation system

*2:TCM, DSC HU/CM, front body control module (FBCM), rear body control module (RBCM), instrument cluster, start stop unit, EPS control module

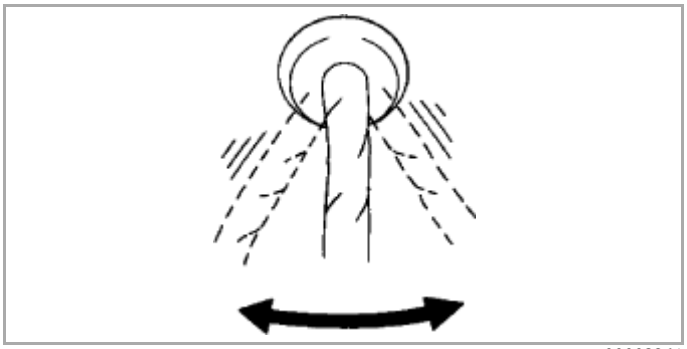
*3:With air conditioner

Dosing control unit

×: Applicable

Item	SCR CONTROL
Input device	
NOx sensor No.1, No.2	×

STEP	INSPECTION	RESULTS	ACTION
3	**VERIFY PM ACCUMULATION AMOUNT IN DIESEL PARTICULATE FILTER** • Access the following PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) — PM_ACC_DSD — PM_GEN • Start the engine and race it at 3,000 rpm until the PM_ACC_DSD monitored value stabilizes. • Is the PM_ACC_DSD monitored value twice that of the PM_GEN monitored value or more?	Yes	Go to the next step.
		No	Go to Step 5.
4	**INSPECT EXHAUST GAS PRESSURE SENSOR NO.2** • Inspect the exhaust gas pressure sensor No.2. (See EXHAUST GAS PRESSURE SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is the exhaust gas pressure sensor No.2 normal?	Yes	Go to the next step.
		No	Replace the exhaust gas pressure sensor No.2, then go to Step 10. (See EXHAUST GAS PRESSURE SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
5	**INSPECT DIESEL PARTICULATE FILTER FOR CLOGGING** • Perform the "COMPULSORY DIESEL PARTICULATE FILTER REGENERATION". (See COMPULSORY DIESEL PARTICULATE FILTER REGENERATION [SKYACTIV-D 2.2].) • Access the PM_ACC_DSD PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the PM_ACC_DSD PID value approx. 0?	Yes	Go to Step 7.
		No	Go to the next step.
6	**INSPECT DIESEL PARTICULATE FILTER** • Verify all accessory loads are off. • Access the following PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) — PM_ACC_DSD — PM_GEN • Start the engine and race it for several minutes. • Is the increase in the PM_ACC_DSD and the PM_GEN monitored values the same?	Yes	Go to the next step.
		No	Replace the catalytic converter, then go to Step 10. (See EXHAUST SYSTEM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
7	**INSPECT INSTRUMENT CLUSTER** • Inspect the instrument cluster. (See INSTRUMENT CLUSTER INSPECTION.) • Is the instrument cluster normal?	Yes	Go to the next step.
		No	Replace the instrument cluster, then go to Step 10. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
8	**INSPECT FOR MALFUNCTION DUE TO POOR ENGINE OIL** • Replace the engine oil. (See ENGINE OIL REPLACEMENT [SKYACTIV-D 2.2].) • Does the symptom disappear?	Yes	Advise the customer to have the engine oil replaced periodically. Perform the "ENGINE OIL DATA RESET". (See ENGINE OIL DATA RESET [SKYACTIV-D 2.2].)
		No	Perform the "ENGINE OIL DATA RESET", then go to the next step. (See ENGINE OIL DATA RESET [SKYACTIV-D 2.2].)
9	**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



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Inspection Method for Sensor Connectors or Wires

1.Connect the M-MDS to the DLC-2.

2.Switch the ignition ON (engine off).

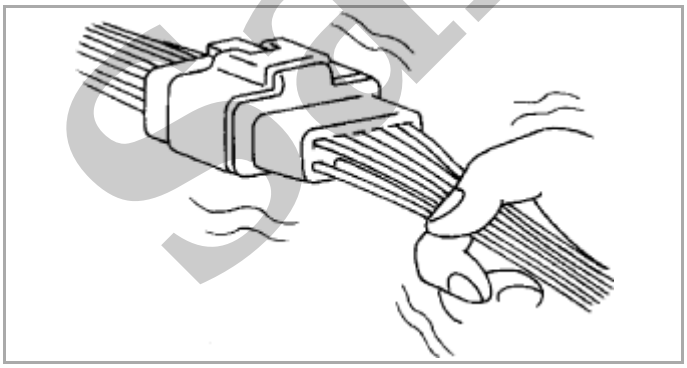
Note

- **If the engine starts and runs, perform the following steps during idling.**

3.Access the PIDs for the switch you are inspecting.

4.Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.

- If the PID value is unstable, check for poor connection.



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Inspection Method for Sensors

1.Connect the M-MDS to the DLC-2.

2.Switch the ignition ON (engine off).