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2002 MAZDA Tribute OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
2	INSPECT INSTRUMENT CLUSTER • Inspect the instrument cluster. (See INSTRUMENT CLUSTER INSPECTION.) • Is there any malfunction?	Yes	Replace the instrument cluster. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
		No	Inspect for a short or open circuit between the following terminals: • Instrument cluster terminal B—Active driving display terminal J • Instrument cluster terminal D—Active driving display terminal L • Active driving display terminal I—Front body control module (FBCM) terminal 2K • Active driving display terminal K—Front body control module (FBCM) terminal 2I • Front body control module (FBCM) terminal 2P—PCM terminal 2AK • Front body control module (FBCM) terminal 2N—PCM terminal 2AL Repair or replace the wiring harness if necessary.
3	Verify the test results. • If normal, return to the diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [SKYACTIV-G 2.5T].) • 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.		

Repair order form and malfunction symptom check sheet

	Repair order	Check with customer	Diagnosis	Repair	Explanation to customer
Date/time					
In-charge					

Customer statement (When? What? What time(s)? Where it occurs. Warning light illumination? Can anyone replicate problem?)

Vehicle body number:	Registration date:	Date of malfunction occurrence:	Odometer reading km {mile}
Engine (SOHC/DOHC/RE/DE) (Cab /EGI/ Turbo/ Miller cycle/ LPG/Direct injection)		Transmission (MT/HAT/EC-AT/CVT)	

Environmental conditions					Driving conditions									
Weather	Ambient temp.	Drive scenario	Grade	Occurrence frequency	Fuel	Warm-up condition	Driving operation	Driving posture	Load	Accelerator opening angle	Shift position	Eng RPM	Vehicle speed	Pattern of use
Sunny Cloudy Rain Snow High wind Wind gusts N/A Other	-10°C {14°F} or less -10— 0°C {14—32°F} 0—10°C {32—50°F} 10—15°C {50—59°F} 15—20°C {59—68°F} 20—25°C {68—77°F} 25—30°C {77—86°F} 30—35°C {86—95°F} 35—40°C {95—104°F} 40—45°C {104—113°F} 45°C {113°F} or more N/A Other	Depart/arrive Traffic jam (city) Standard city street Suburbs Highway Uneven road Dry road surface Wet road surface Snow bound road Icy road Other	Flat Upgrade Down grade N/A Other	Once/day 2-3 times/day 4-5 times/day Many times/day Once/week 2-3 times/week 4-5 times/week Once/month 2-3 times/month 4-5 times/month Other	Regular High Oct. Diesel LPG Other Fuel gauge F E	Cold Half-warmed Fully warmed N/A Other Water temp. gauge H C	When starting After starting Re-starting (min. after stopped) Idling Racing Accel. from stop Normal driving Deceleration Braking Soft braking Clutch disengage Sudden accel. Light accel. Shifting (km/h (mph) → km/h (mph)) Other	Vehicle stopped Straight-on driving Reversing Right turn Left turn Other	Headlights on Exterior lights on A/C on AUTO °C(°F) Blower: 1 step Blower: 2 steps Blower: 3 steps Blower: 4 steps Power steering lock to lock Rear defrost on Wipers on Audio on Other	0/8 1/8 2/8 3/8 4/8 5/8 6/8 7/8 8/8	MT: 1, 2, 3, 4, 5, 6, N, R AT: P, R, N, D, S, L, Hold, M, (km/h (mph))	Idle Less than 1,000 Less than 1,500 Less than 2,000 Less than 2,500 Less than 3,000 Less than 4,000 Less than 4,500 Less than 5,000 Less than 5,500 Less than 6,000 Less than 6,500 7,000 or more	5 km/h {3 mph} 10 km/h {6.2 mph} 20 km/h {12 mph} 30 km/h {19 mph} 40 km/h {25 mph} 50 km/h {31 mph} 60 km/h {37 mph} 70 km/h {43 mph} 80 km/h {50 mph} 90 km/h {56 mph} 100 km/h {62.1 mph} 110 km/h {68.4 mph} 120 km/h {74.6 mph} 130 km/h {80.8 mph} 140 km/h {87 mph} 150 km/h {93.2 mph} 160 km/h {99.4 mph}	Work____% Minor use____% Trips____% Other____% Between ENG. start→Stop: Distance, time Approx km (mile) Approx Hrs. No. of occupants: Load condition kg Other

DTC, measured data (fuel pressure, intake manifold vacuum, throttle sensor electromotive force, air flow electromotive force, other), maintenance, repair, accident history, installation of commercial devices

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INTERMITTENT CONCERN TROUBLESHOOTING [SKYACTIV-G 2.5T]

SM2897079

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Vibration Method

• If a malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the steps below.

Note

• There are several reasons why the vehicle or engine vibration could cause an electrical malfunction. Check the following:

— Connectors are not fully seated.
— Wiring harnesses do not have full play.
— Wires laying across brackets or moving parts.
— Wires routed too close to hot parts.

• An improperly routed, improperly clamped, or loose harness can cause a wiring harness to become pinched between parts.
• The connector joints, points of vibration, and places where the wiring harnesses pass through the firewall and body panels are the major areas to be checked.

Inspection Method for Switch Connectors or Wires

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

2.Switch the ignition ON (engine off).

Note

• If engine starts and runs, perform the following steps during idle.

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

4.Turn the switch on manually.

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

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

• Indirectly change the temperature and humidity by spraying water onto the front of the radiator.
• If a vehicle is subject to water leakage, the leakage may damage the control module. When testing a vehicle with a water leakage problem, special caution must be used.

1.Connect the M-MDS to the DLC-2 if you are inspecting sensors or switches.

2.Switch the ignition ON (engine off).

Note

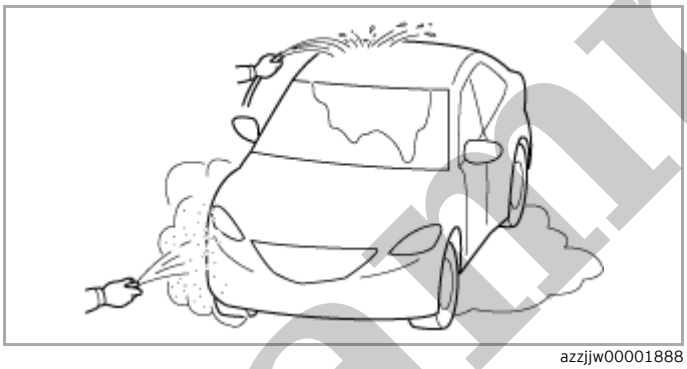
• If the engine starts and runs, perform the following steps at idle.

3.Access the PIDs for the sensor or the switch if you are inspecting sensors or switches.

4.If you are inspecting the switch, turn it on manually.

5.Spray water onto the vehicle or run it through a car wash.

• If the PID value is unstable or a malfunction occurs, repair or replace parts if necessary.



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QUICK DIAGNOSTIC CHART [SKYACTIV-G 2.5T]

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X: Applied

	Troubleshooting item		Possible factor: Starter motor malfunction (mechanical or electrical)	Starter circuit including ignition switch is open	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper oil level gauge	Base engine malfunction	Drive plate is seized	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture is improper	Cooling system malfunction (such as radiator, hoses,overflow system, thermostat)	Cooling fan system malfunction
1	Blown fuses															
2	Check engine light illuminates															
3	Will not crank		X	X		X				X	X					
4	Hard to start/long crank/erratic start/erratic crank		X					X								
5	Engine stalls	After start/at idle						X								
6	Cranks normally but will not start							X								
7	Engine oil warning light illuminated/ message related to engine hydraulic pressure malfunction indicated in display				X					X						
8	Engine runs rough/rolling idle							X								
9	Fast idle/runs on														X	
10	Low idle/stalls during deceleration						X	X								
11	Engine stalls/quits	Acceleration/cruise						X								
	Engine runs rough	Acceleration/cruise						X								
	Misses	Acceleration/cruise						X								
	Buck/jerk	Acceleration/cruise/deceleration						X								
	Hesitation/stumble	Acceleration						X								
	Surges	Acceleration/cruise						X								
12	Lack/loss of power	Acceleration/cruise						X								
13	Knocking/pinging	Acceleration/cruise													X	
14	Poor fuel economy							X					X		X	X
15	Emission compliance							X					X		X	
16	High oil consumption/leakage								X	X						
17	Cooling system concerns	Overheating					X					X	X	X	X	X
18	Cooling system concerns	Runs cold													X	X
19	Exhaust smoke							X							X	
20	Fuel odor (in engine compartment)															
21	Engine noise						X			X		X				
22	Vibration concerns (engine)															
23	Sulfuric smell occurs															
24	Fuel refill concerns															
25	Fuel filling shut off concerns															
26	Spark plug condition							X								

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X: Applied

Troubleshooting item			Fuel injector malfunction (inoperative)	Fuel filler cap malfunction	Fuel filters restricted or clogged	Relief valve malfunction (built-into high pressure fuel pump)	Spill valve control solenoid valve malfunction (built-into high pressure fuel pump)	Fuel leakage at fuel line	High pressure fuel pump malfunction	Incorrect fuel injection timing or amount	Improper air/fuel ratio mixture control	Exhaust system or catalytic converter restriction	Exhaust gas leakage	Catalytic converter malfunction	PCV valve malfunction	Fuel tank vent system malfunction	Charcoal canister malfunction
Possible factor																	
1	Blown fuses																
2	Check engine light illuminates																
3	Will not crank																
4	Hard to start/long crank/erratic start/erratic crank		X		X	X	X	X	X	X	X	X			X		
5	Engine stalls	After start/at idle	X		X	X	X	X	X	X	X	X			X		
6	Cranks normally but will not start		X		X	X	X	X	X	X	X	X			X		
7	Engine oil warning light illuminated/ message related to engine hydraulic pressure malfunction indicated in display																
8	Engine runs rough/rolling idle		X		X	X	X	X	X	X		X			X		
9	Fast idle/runs on		X				X										
10	Low idle/stalls during deceleration		X		X	X	X	X	X	X							
11	Engine stalls/quits	Acceleration/cruise	X			X	X	X	X	X	X	X	X		X		
	Engine runs rough	Acceleration/cruise	X			X	X	X	X	X	X	X	X		X		
	Misses	Acceleration/cruise	X			X	X	X	X	X	X	X	X		X		
	Buck/jerk	Acceleration/cruise/deceleration	X			X	X	X	X	X	X	X	X		X		
	Hesitation/stumble	Acceleration	X			X	X	X	X	X	X	X	X		X		
	Surges	Acceleration/cruise	X			X	X	X	X	X	X	X	X		X		
12	Lack/loss of power	Acceleration/cruise	X			X	X	X	X	X		X			X		
13	Knocking/pinging	Acceleration/cruise															
14	Poor fuel economy		X			X	X	X	X	X		X			X		
15	Emission compliance					X	X	X	X	X	X	X	X	X	X		
16	High oil consumption/leakage														X		
17	Cooling system concerns	Overheating															
18	Cooling system concerns	Runs cold															
19	Exhaust smoke					X	X		X	X			X		X		
20	Fuel odor (in engine compartment)			X				X									
21	Engine noise		X						X								
22	Vibration concerns (engine)																
23	Sulfuric smell occurs																
24	Fuel refill concerns																
25	Fuel filling shut off concerns																
26	Spark plug condition									X		X					

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X: Applied

	Troubleshooting item		Possible factor	A/C system improper operation	Improper refrigerant charging amount	A/C relay (A/C control signal circuit) malfunction	A/C compressor magnetic clutch malfunction	ATX related parts malfunction	Improper ATF level	Brake dragging	Loose parts	Improper balance of wheels and tires	Drive line malfunction	Suspension malfunction	Immobilizer system operating properly	Immobilizer system or related circuit malfunction	Advanced keyless entry system malfunction
1	Blown fuses																
2	Check engine light illuminates																
3	Will not crank															X	
4	Hard to start/long crank/erratic start/erratic crank																
5	Engine stalls	After start/at idle		X		X											
6	Cranks normally but will not start																
7	Engine oil warning light illuminated/ message related to engine hydraulic pressure malfunction indicated in display																
8	Engine runs rough/rolling idle			X		X											
9	Fast idle/runs on			X		X		X									
10	Low idle/stalls during deceleration						X	X			X						
11	Engine stalls/quits	Acceleration/cruise		X				X			X						
	Engine runs rough	Acceleration/cruise		X				X			X						
	Misses	Acceleration/cruise		X				X			X						
	Buck/jerk	Acceleration/cruise/deceleration		X				X			X						
	Hesitation/stumble	Acceleration		X				X			X						
	Surges	Acceleration/cruise		X				X			X						
12	Lack/loss of power	Acceleration/cruise		X		X		X		X							
13	Knocking/pinging	Acceleration/cruise															
14	Poor fuel economy			X					X	X		X					
15	Emission compliance																
16	High oil consumption/leakage																
17	Cooling system concerns	Overheating		X	X												
18	Cooling system concerns	Runs cold															
19	Exhaust smoke																
20	Fuel odor (in engine compartment)																
21	Engine noise			X			X										
22	Vibration concerns (engine)										X	X	X	X			
23	Sulfuric smell occurs																
24	Fuel refill concerns																
25	Fuel filling shut off concerns																
26	Spark plug condition																

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3	WILL NOT CRANK
POSSIBLE CAUSE	• Battery malfunction • Fuse malfunction • Poor connection of push button start connector • Instrument cluster or related wiring harness malfunction • Immobilizer system malfunction • PCM continuous memory DTC is stored • Open circuit in wiring harness between the following terminals: — Main relay terminal E—PCM terminal 2K — Main relay terminal C—PCM terminal 1CK, 2S — DLC-2—PCM terminal 2AK, 2AL • Main relay malfunction (stuck open) • Open or poor ground circuit • Poor connection of vehicle body ground • Starter relay malfunction • Starter relay related wiring harness malfunction — Between starter relay terminal E and PCM terminal 2AU — Between starter relay terminal E and start stop unit terminal 1D — Between start stop unit terminal 2V and starter relay terminal A • Following circuit malfunction: — Between battery positive terminal and starter terminal 1A — Between battery positive terminal and starter relay terminal D — Between starter relay terminal C and starter terminal 2A • TCM and related wiring harness malfunction • Starting system malfunction • Following circuit and/or connector malfunction: — Between push button start terminal A and start stop unit terminal 1AC — Between push button start terminal B and start stop unit terminal 1AE — Between start stop unit terminal 2M—Front body control module (FBCM) terminal 2K — Between start stop unit terminal 2O—Front body control module (FBCM) terminal 2I — Between front body control module (FBCM) terminal 2P—PCM terminal 2AK — Between front body control module (FBCM) terminal 2N—PCM terminal 2AL • Seized engine, drive plate • Engine damage during compression due to liquid (such as water, fuel, or engine oil) penetration into cylinder **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 injury 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 [SKYACTIV-G 2.5T].) (See AFTER SERVICE PRECAUTION [SKYACTIV-G 2.5T].)** **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 matter.**

STEP	INSPECTION	RESULTS	ACTION
7	**DETERMINE IF MALFUNCTION CAUSE IS STARTER RELAY CONTROL SIGNAL CIRCUIT OR OTHER** • Switch the ignition ON (engine on). • Is a clicking sound heard from the starter relay?	Yes	Go to Step 17.
		No	Go to the next step.
8	**INSPECT TCM CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the TCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then repeat Step 7.
		No	Go to the next step.
9	**INSPECT TCM CIRCUIT FOR OPEN CIRCUIT** • Verify that the TCM connector is disconnected. • Inspect for continuity between TCM terminal J (wiring harness-side) and PCM terminal 2BD (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between TCM terminal J and PCM terminal 2BD. **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 an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Repeat Step 7.
10	**INSPECT STARTER RELAY** • Remove the starter relay. (See RELAY LOCATION.) • Inspect the starter relay. (See RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the starter relay. Repeat Step 7.
		No	Go to the next step.
11	**INSPECT START STOP UNIT CONNECTOR CONDITION** • Disconnect the start stop unit connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then repeat Step 7.
		No	Go to the next step.
12	**INSPECT STARTER RELAY CONTROL CIRCUIT FOR SHORT TO GROUND** • Verify that starter relay is removed. • Verify that the TCM connector is disconnected. • Verify that the start stop unit connector is disconnected. • Inspect for continuity between starter relay 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 starter relay terminal A and start stop unit terminal 2V. **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. Repeat Step 7.
		No	Go to the next step.