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1996 MAZDA 626 (Mk.5) Sedan OEM Service and Repair Workshop Manual

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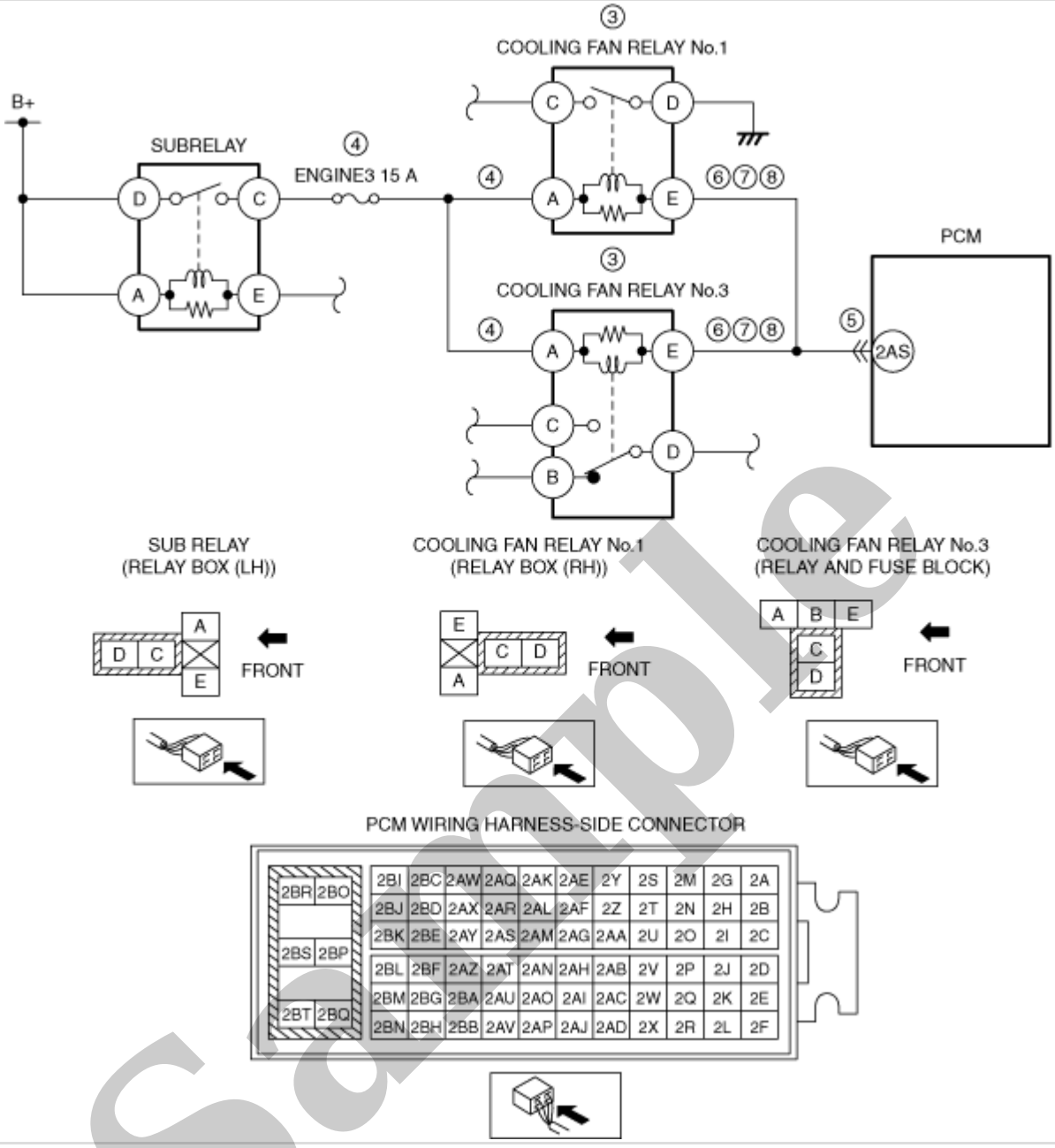
STEP	INSPECTION	RESULTS	ACTION
6	**INSPECT COOLING FAN RELAY No.2 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that cooling fan relay No.2 is removed. • Verify that the PCM connector is disconnected. • Switch the ignition off. • Inspect for continuity between cooling fan relay No.2 terminal E (wiring 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 cooling fan relay No.2 terminal E and PCM terminal 2AM. **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. Go to Step 9.
		No	Go to the next step.
7	**INSPECT COOLING FAN RELAY No.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that cooling fan relay No.2 is removed. • Verify that the PCM connector is disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the cooling fan relay No.2 terminal E (wiring harness-side). • Is the voltage 0 V?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between cooling fan relay No.2 terminal E and PCM terminal 2AM. **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 power supply. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to power supply. Go to Step 9.
8	**INSPECT COOLING FAN RELAY No.2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Verify that cooling fan relay No.2 is removed. • Verify that the PCM connector is disconnected. • Switch the ignition off. • Inspect for continuity between cooling fan relay No.2 terminal E (wiring harness-side) and PCM terminal 2AM (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 cooling fan relay No.2 terminal E and PCM terminal 2AM. **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. Go to the next step.
9	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.

DTC P0481:00	Cooling fan relay No.1 and No.3 control circuit malfunction



Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the snapshot data on the repair order.	–	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
6	**INSPECT COOLING FAN RELAY No.1 AND No.3 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Cooling fan relay No.1 and No.3 are removed. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — Cooling fan relay No.1 terminal E — Cooling fan relay No.3 terminal E • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Cooling fan relay No.1 terminal E—PCM terminal 2AS • Cooling fan relay No.3 terminal E—PCM terminal 2AS **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. Go to Step 9.
		No	Go to the next step.
7	**INSPECT COOLING FAN RELAY No.1 AND No.3 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Cooling fan relay No.1 and No.3 are removed. • Verify that the PCM connector is disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the following terminals (wiring harness-side): — Cooling fan relay No.1 terminal E — Cooling fan relay No.3 terminal E • Is the voltage 0 V?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Cooling fan relay No.1 terminal E—PCM terminal 2AS • Cooling fan relay No.3 terminal E—PCM terminal 2AS **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 power supply. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to power supply. Go to Step 9.
8	**INSPECT COOLING FAN RELAY No.1 AND No.3 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Cooling fan relay No.1 and No.3 are removed. • Verify that the PCM connector is disconnected. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side): — Cooling fan relay No.1 terminal E—PCM terminal 2AS — Cooling fan relay No.3 terminal E—PCM terminal 2AS • 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 the following terminals: • Cooling fan relay No.1 terminal E—PCM terminal 2AS • Cooling fan relay No.3 terminal E—PCM terminal 2AS **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. Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
4	VERIFY DTC TROUBLESHOOTING COMPLETED • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Access the RPM and LOAD PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) **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.** • Drive the vehicle under the following conditions for 14 s. — Shift position: except P or N position — Absolute load: above 40 % — Engine speed: above 2,000 rpm — Brake switch: OFF • Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE for this DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
5	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896818

id0102s986540

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

2.After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

(1)Select “Self Test”.

(2)Select “Modules”.

(3)Select “PCM”.

3.Then, select the “Retrieve CMDTCs” and perform procedures according to the directions on the M-MDS screen.

4.Verify the DTC according to the directions on the M-MDS screen.

5.Press the clear button on the DTC screen to clear the DTC.

6.Verify that no DTCs are displayed.

7.Switch the ignition off.

DESCRIPTION	P0442:00 • Evaporative gas leakage (leakage amount: low) P0455:00 • Evaporative gas leakage (leakage amount: large) P0456:00 • Evaporative gas leakage (leakage amount: extremely low)	
	Malfunction determination period	• 75 s period
	Drive cycle	• 2
	Self test type	• CMDTC self test
	Sensor used	• Fuel tank pressure sensor
FAIL-SAFE FUNCTION	• Not applicable	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light. • Heating is ineffective after engine is started	
POSSIBLE CAUSE	• Missing or loose fuel filler cap • Fuel filler cap malfunction • Fuel tank pressure sensor malfunction • CV solenoid valve malfunction • Purge solenoid valve malfunction • Evaporative gas passage malfunction — Improper connection of evaporative hose — Evaporative hose damaged • Charcoal canister malfunction • Catch tank malfunction • Fuel pump unit loose • Fuel tank malfunction • PCM malfunction	

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The pressure change of the evaporative gas passage is measured using barometric pressure and intake manifold vacuum to detect evaporative gas leakage. The PCM introduces barometric pressure or intake manifold vacuum into the evaporative gas passage by opening/closing the purge solenoid valve and CV solenoid valve, and measures the pressure change using the fuel tank pressure sensor.

P0455:00

• The PCM closes the CV solenoid valve while the vehicle is being driven, and seals the fuel tank. The PCM introduces intake manifold vacuum into the fuel tank and measures the pressure change of the fuel tank using the fuel tank pressure sensor by opening the purge solenoid valve after sealing the fuel tank. If the pressure of the fuel tank does not reach the target value after the specified time has elapsed since the pressure was measured, the PCM determines that there is an evaporative gas leakage. If the PCM determines that refueling is not performed before the engine starts according to the result of the refuel determination, DTC P0455:00 is stored (if the PCM determines that refueling is performed, DTC P0457:00 is stored).

• If the fuel tank level increases after the engine starts, the PCM determines that refueling was performed by comparing the fuel tank level before one drive cycle with the fuel tank level after engine start.

P0442:00

• The PCM closes the purge solenoid valve after diagnosing (normal) DTC P0455:00, and seals the fuel tank. The pressure change of the fuel tank is measured by the fuel tank pressure sensor after the fuel tank is sealed. The PCM determines a temporary malfunction if the pressure change is the specified value or more after the specified time has elapsed since the pressure was measured. If the CV solenoid valve is open after determining a temporary malfunction and the pressure change (increase) of the fuel tank is the specified value or less, the PCM determines that there is an evaporative gas leakage and a DTC is stored.

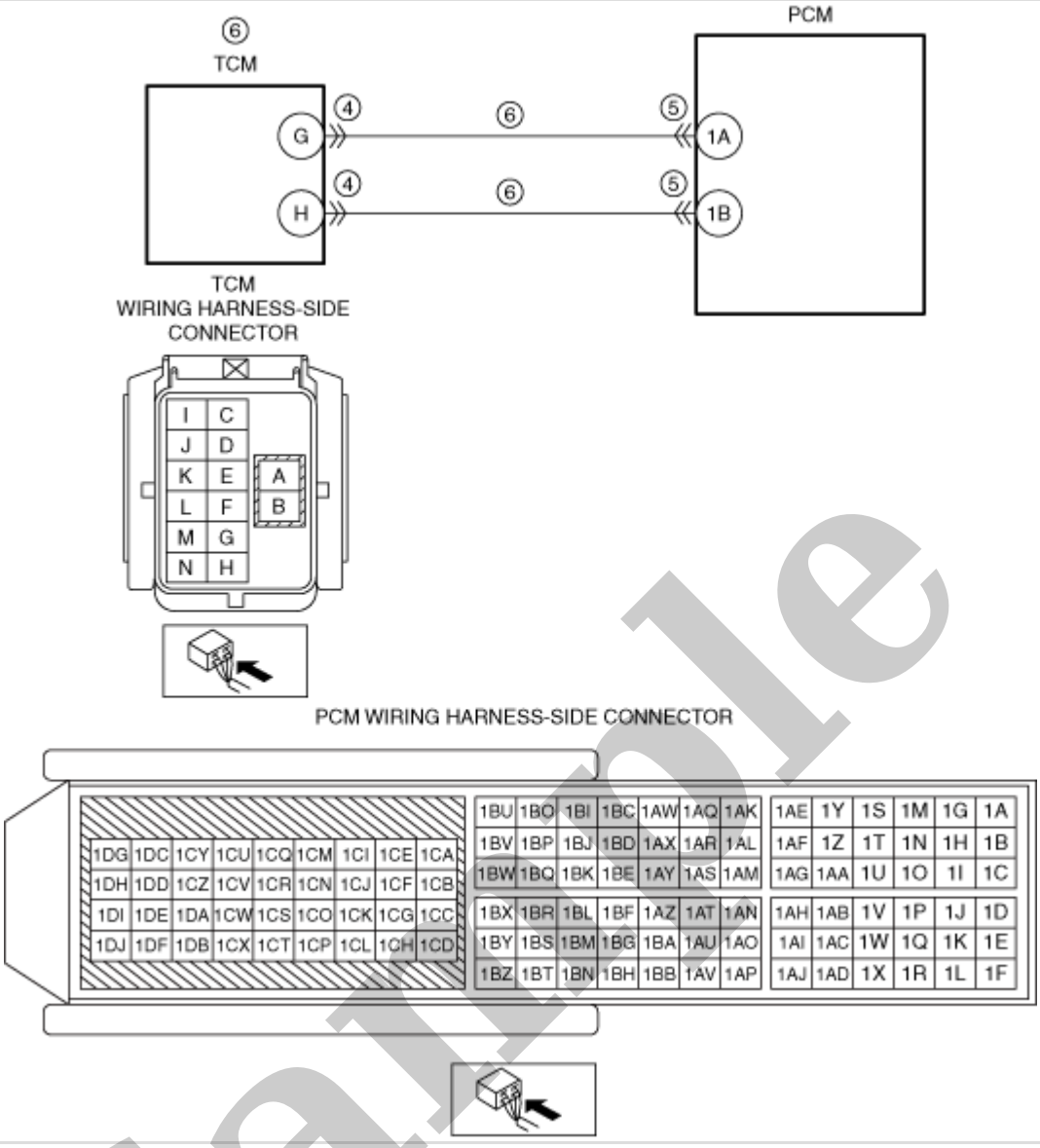
Item	Definition	Unit	Condition/Specification
FTP	Fuel tank pressure input from fuel tank	Pa {KPA}, mBar {BAR}, psi, in H20	• Ignition switched ON (engine off): Approx. −23 Pa {−2.3 kgf/m ^{2}, −0.0033 psi} • Idle (after warm up): −282− −46 Pa {−28.7− −4.7 kgf/m ^{2}, −0.0409− −0.0067 psi} • Racing (Engine speed 2,000 rpm): −1.47− −0.869 kPa {−0.0149− −0.0089 kgf/cm ^{2}, −0.213− −0.127 psi} • Racing (Engine speed 4,000 rpm): −1.69− −1.07 kPa {−0.0172− −0.0110 kgf/cm ^{2}, −0.245− −0.156 psi}
	Fuel tank pressure sensor voltage	V	• Ignition switched ON (engine off): Approx. 2.6 V • Idle (after warm up): 2.2−2.62 V • Racing (Engine speed 2,000 rpm): 1.9−1.91 V • Racing (Engine speed 4,000 rpm): 1.73−1.76 V

Function Inspection Using M-MDS

STEP	INSPECTION	RESULTS	ACTION
1	**PURPOSE: VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**PURPOSE: RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS TO UTILIZE WITH REPEATABILITY VERIFICATION** **Note** **• Recording can be facilitated using the screen capture function of the PC.** • Record the FREEZE FRAME DATA/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) on the repair order.	−	Go to the next step.
3	**PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY MALFUNCTION OF CONTROL PART REQUIRED FOR DIAGNOSIS** • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE/DTC P0443:00, P0446:00, P0451:00, P0452:00 or P0453:00 also present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P0443:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0446:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0451:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0452:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0453:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
2	**PURPOSE: DETERMINE INTEGRITY OF FUEL FILLER CAP** • Inspect the fuel filler cap. • Is there any malfunction?	Yes	Replace the fuel filler cap, then go to Step 12. (See FUEL-FILLER PIPE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
3	**PURPOSE: INSPECTION OF EVAPORATIVE GAS LEAKAGE FROM EVAPORATIVE GAS PASSAGE** • Verify the hoses between the following parts, pipe connection condition, and that there is no cracking or damage. — Between fuel tank and charcoal canister • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 12.
		No	Go to the next step.
4	**PURPOSE: INSPECTION OF EVAPORATIVE GAS LEAKAGE CAUSED BY POOR INSTALLATION OF FUEL PUMP** • Verify the fuel pump unit installation condition (clearance between affixing surfaces, installation angle). (See FUEL PUMP UNIT REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is the fuel pump unit installed securely?	Yes	Go to the next step.
		No	Retighten the fuel pump unit, then go to Step 12. (See FUEL PUMP UNIT REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
5	**PURPOSE: DETERMINE INTEGRITY OF FUEL TANK** • Inspect the fuel tank. (See FUEL TANK PRESSURE SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the fuel tank, then go to Step 12. (See FUEL TANK REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
6	**PURPOSE: INSPECTION OF EVAPORATIVE GAS LEAKAGE FROM EVAPORATIVE GAS PASSAGE** • Verify the hoses between the following parts, pipe connection condition, and that there is no cracking or damage. — Between charcoal canister and catch tank — Between charcoal canister and CV solenoid valve — Between catch tank and purge solenoid valve — Between purge solenoid valve and intake manifold • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 12.
		No	Go to the next step.
7	**PURPOSE: DETERMINE INTEGRITY OF CHARCOAL CANISTER** • Inspect the charcoal canister. (See CHARCOAL CANISTER INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the charcoal canister, then go to Step 12. (See CHARCOAL CANISTER REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
8	**PURPOSE: DETERMINE INTEGRITY OF CATCH TANK** • Inspect the catch tank. (See CATCH TANK INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the catch tank, then go to Step 12. (See PURGE SOLENOID VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.

DTC U0302:00	TCM processor error



Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the FREEZE FRAME DATA/snapshot data on the repair order.	–	Go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.