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1999 MAZDA B Series / Bravo Freestyle Cab OEM Service and Repair Workshop Manual

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Sample

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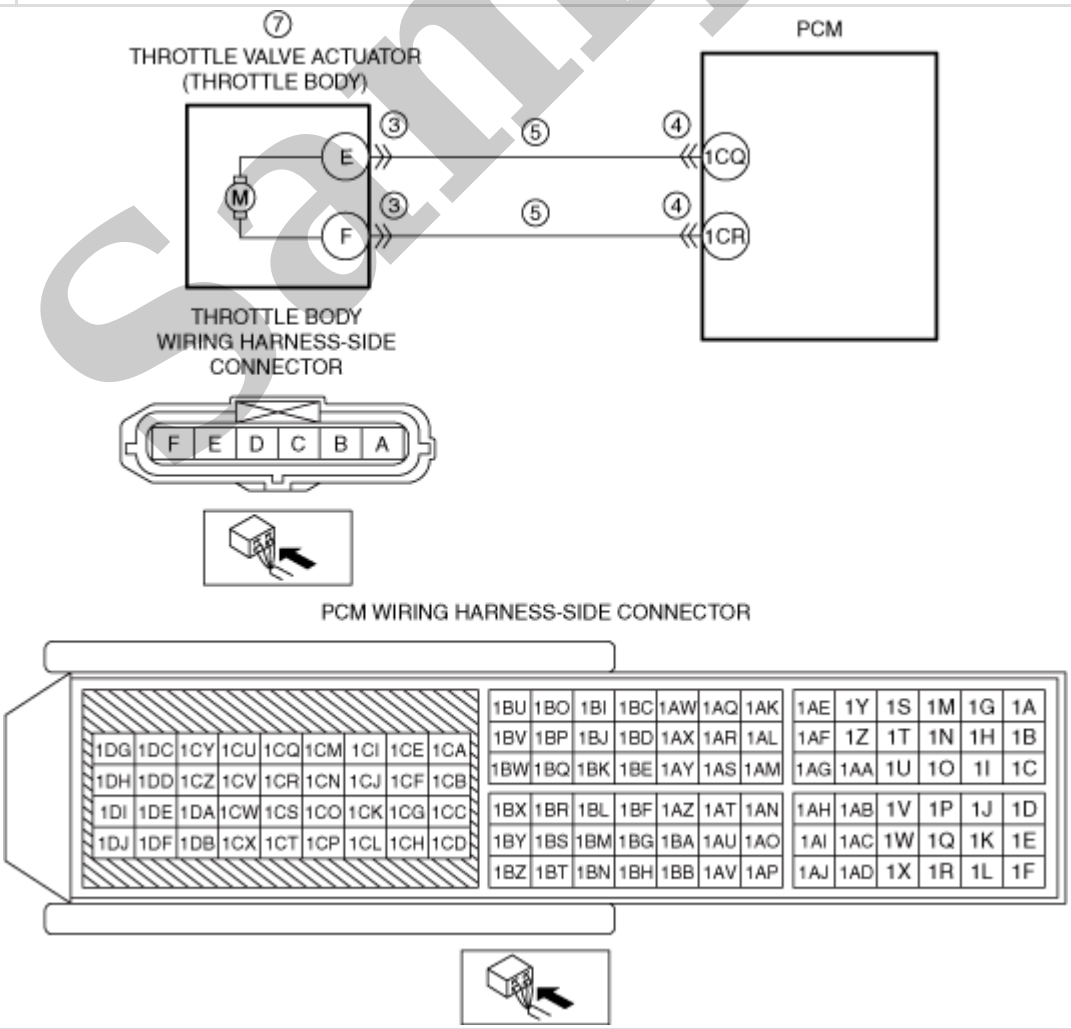
DTC P2112:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2896976

id0102t370810

DTC P2112:00	Throttle valve actuator motor current range/performance problem
DETECTION CONDITION	• The throttle valve actuator control duty ratio is 95 % or more with the ignition switched ON (engine on). Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Restricts the upper limit of the engine speed. • Stops the drive-by-wire control (throttle valve is open at approx. 8 ° by return spring force).
POSSIBLE CAUSE	• Throttle body connector or terminals malfunction • PCM connector or terminals malfunction • Open circuit in wiring harness between the following terminals: — Throttle body terminal E—PCM terminal 1CQ — Throttle body terminal F—PCM terminal 1CR • Throttle valve malfunction • Throttle valve actuator malfunction • PCM malfunction — Throttle valve actuator control module malfunction (built-into PCM)



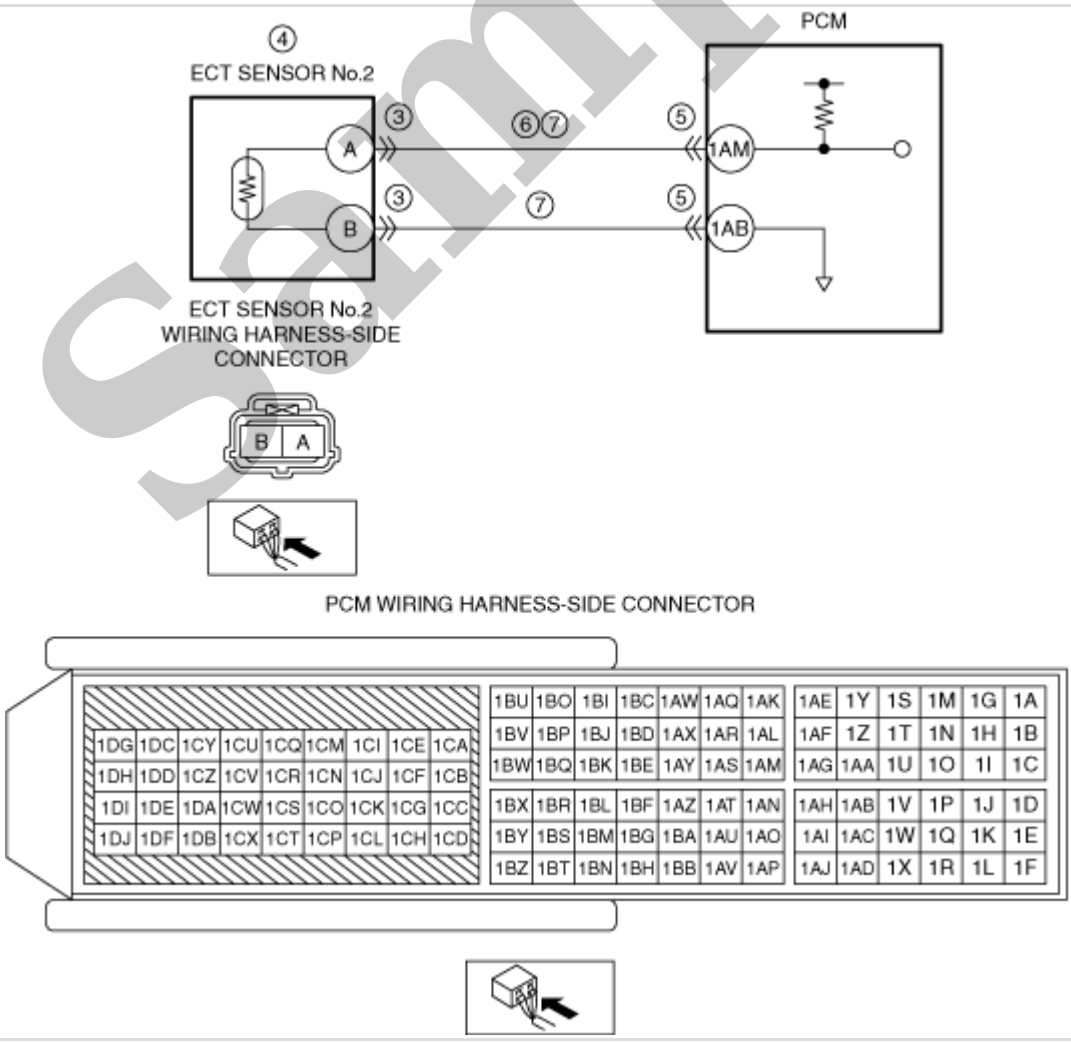
Sample

DTC P2185:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2897036

id0102t397510

DTC P2185:00	ECT sensor No.2 circuit high input
DETECTION CONDITION	• The PCM monitors the ECT sensor No.2 signal. If the PCM detects that the ECT sensor No.2 voltage at the PCM terminal 1AM is above 4.94 V for 5 s, the PCM determines that the ECT sensor No.2 circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (engine cooling system). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• ECT sensor No.2 connector or terminals malfunction • ECT sensor No.2 malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between ECT sensor No.2 terminal A and PCM terminal 1AM • Open circuit in wiring harness between the following terminals: — ECT sensor No.2 terminal A—PCM terminal 1AM — ECT sensor No.2 terminal B—PCM terminal 1AB • PCM malfunction



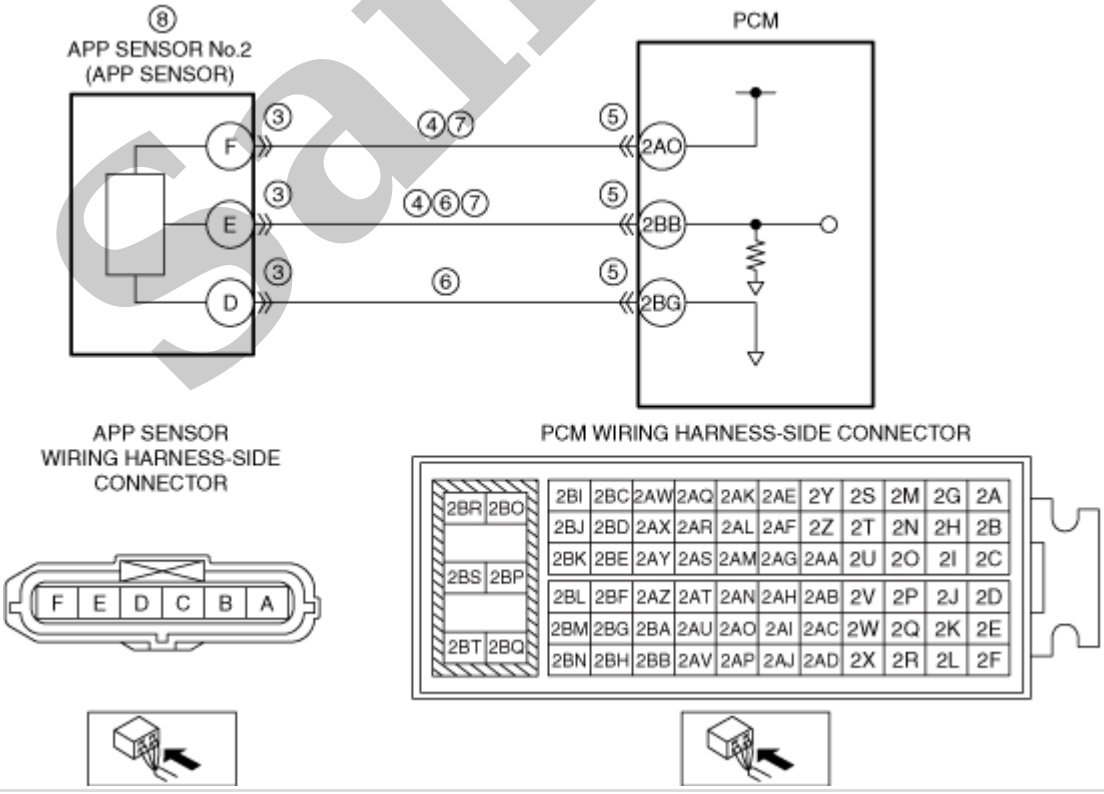
Sample

DTC P2127:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2896980

id0102t370850

DTC P2127:00	APP sensor No.2 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.2. If the input voltage at the PCM terminal 2BB is less than 0.1 V, the PCM determines that the APP sensor No.2 circuit has a malfunction. Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Regulates the upper limit of the APP sensor output.
POSSIBLE CAUSE	• APP sensor connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — APP sensor terminal F—PCM terminal 2AO — APP sensor terminal E—PCM terminal 2BB • PCM connector or terminals malfunction • APP sensor No.2 signal circuit and ground circuit are shorted to each other • Open circuit in wiring harness between the following terminals: — APP sensor terminal F—PCM terminal 2AO — APP sensor terminal E—PCM terminal 2BB • APP sensor No.2 malfunction • PCM malfunction



Caution

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

Sample

STEP	INSPECTION	RESULTS	ACTION
7	**INSPECT APP SENSOR No.2 CIRCUIT FOR OPEN CIRCUIT** • Verify that the APP sensor and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — APP sensor terminal F–PCM terminal 2AO — APP sensor terminal E–PCM terminal 2BB • 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: • APP sensor terminal F–PCM terminal 2AO • APP sensor terminal E–PCM terminal 2BB **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 Step 9.
8	**INSPECT APP SENSOR No.2** • Reconnect all disconnected connectors. • Inspect the APP sensor No.2. (See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the accelerator pedal, then go to the next step. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	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 (WITHOUT CYLINDER DEACTIVATION))].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITHOUT 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 (WITHOUT CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

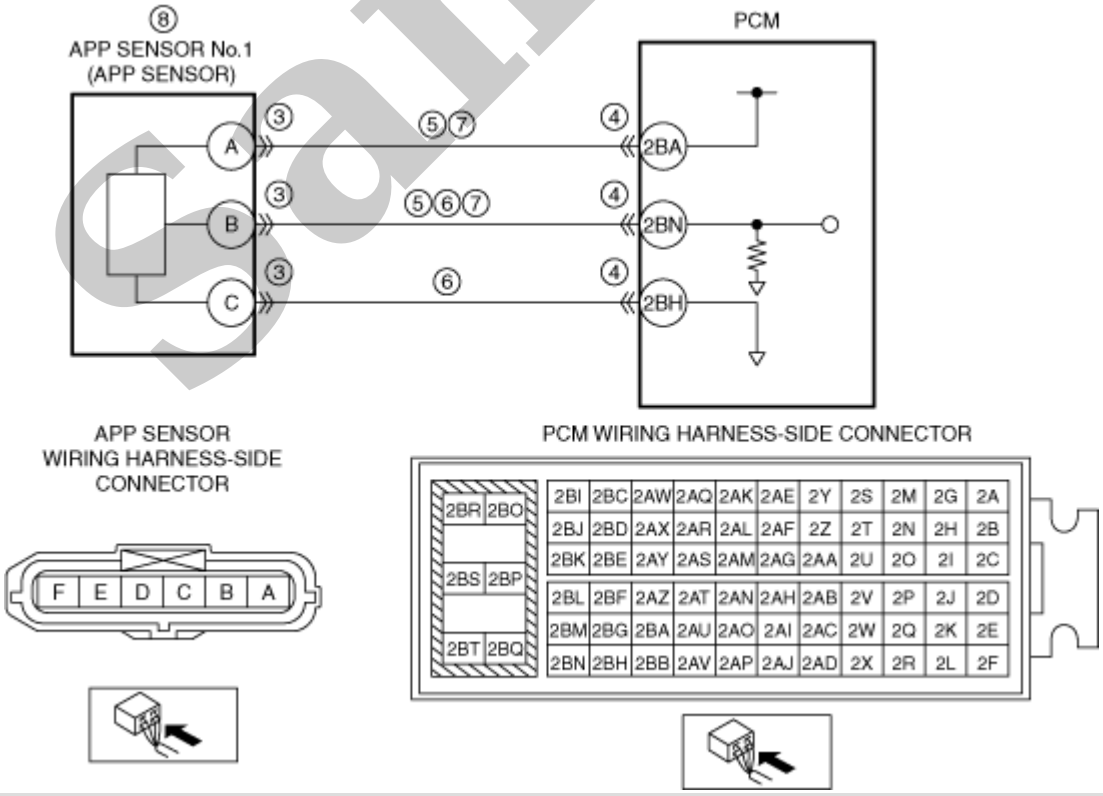
Simple

DTC P2122:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2896978

id0102t370830

DTC P2122:00	APP sensor No.1 circuit low input
DETECTION CONDITION	• The PCM monitors the input voltage from APP sensor No.1. If the input voltage at the PCM terminal 2BN is less than 0.1 V, the PCM determines that the APP sensor No.1 circuit input voltage is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Regulates the upper limit of the APP sensor output.
POSSIBLE CAUSE	• APP sensor connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — APP sensor terminal A—PCM terminal 2BA — APP sensor terminal B—PCM terminal 2BN • APP sensor No.1 signal circuit and ground circuit are shorted to each other • Open circuit in wiring harness between the following terminals: — APP sensor terminal A—PCM terminal 2BA — APP sensor terminal B—PCM terminal 2BN • APP sensor No.1 malfunction • PCM malfunction



Diagnostic Procedure

Sample

DTC P2251:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2897013

id0102t385130

Note

• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

Details On DTCs

DESCRIPTION	**Open circuit between A/F sensor terminal D and PCM terminal 1S**	
DETECTION CONDITION	Determination conditions	• The following conditions are met: A/F sensor element impedance is specified value or more A/F sensor terminal F voltage (B+ terminal) is less than specified value or unstable.
	Preconditions	• Battery voltage: 11−18 V *1 • A/F sensor is activated. • The following DTCs are not detected: A/F sensor terminal F voltage (B+ terminal) is less than specified value: • A/F sensor heater: P0031:00, P0032:00 A/F sensor terminal F voltage (B+ terminal) is unstable: • Internal PCM malfunction: P064D:00 *1: Standard can be verified by displaying PIDs using M-MDS
	Drive cycle	• 2
	Self test type	• CMDTC self test, KOER self test
	Sensor used	• A/F sensor
FAIL-SAFE FUNCTION	• Not applicable	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	
POSSIBLE CAUSE	• A/F sensor connector or terminals malfunction • PCM connector or terminals malfunction • Open circuit in wiring harness between A/F sensor terminal D and PCM terminal 1S • A/F sensor malfunction • PCM malfunction	

System Wiring Diagram

Sample

DTC P06B8:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))]

SM2896919

id0102t331620

DTC P06B8:00	Internal control module non-volatile RAM error
DETECTION CONDITION	• PCM internal EEPROM malfunction. Diagnostic support note • This is a continuous monitor (other). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. (The check engine light may be illuminated depending on the malfunction conditions.) • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• PCM connector or terminals malfunction • PCM internal EEPROM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

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.
3	INSPECT PCM CONNECTOR CONDITION • Switch the ignition off. • Disconnect the PCM 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 go to the next step.
		No	Go to the next step.
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 (WITHOUT CYLINDER DEACTIVATION))].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.

Sample

STEP	INSPECTION	RESULTS	ACTION
3	**VERIFY RELATED PENDING CODE AND/OR DTC** • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Is the PENDING CODE/DTC P0335:00, P059F:00, P05A0:00, P05A3:00, P05C0:00 or U0284:00 also present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P0335:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See DTC P059F:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See DTC P05A0:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See DTC P05A3:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See DTC P05C0:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See DTC U0284:00 [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	Go to the next step.
4	**INSPECT VEHICLE CONDITION FOR EFFECT ON MALFUNCTION** • Verify how the customer drives the vehicle by asking the customer the following: • Does the engine speed exceed 5,800 rpm for 6 min or more while driving in 5th gear or lower gear?	Yes	Explain to the customer that the vehicle is normal. (performs control to protect the engine due to continuous engine speed exceeding 5,800 rpm for 6 min or more while in 5th gear or lower gear) If there is a concern with customer's driving, provide the customer some pertinent advice (such as gear selection, how to use manual mode). Go to the next step.
		No	Go to the next step.
5	**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 (WITHOUT CYLINDER DEACTIVATION))].) • Start the engine and warm it up completely. • Drive the vehicle. • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT 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 (WITHOUT CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
6	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

Sample

STEP	INSPECTION	RESULTS	ACTION
4	**VERIFY VEHICLE USE CONDITION** • Verify the vehicle use condition. — The floor mat is doubled over — The floor mat is spread against the accelerator pedal — The accelerator and brake pedals are being depressed simultaneously • Are any of the conditions above applicable to the vehicle use condition?	Yes	**There is a malfunction in a related floor mat:** • Explain to the customer that the floor mat may prevent the accelerator pedal from springing back after release, then go to Step 12. **There is a malfunction in the pedal operation:** • Give the customer advice on how to depress the accelerator and brake pedals while driving the vehicle, then go to Step 12.
		No	Go to the next step.
5	**INSPECT ACCELERATOR PEDAL** • Is the condition of the accelerator pedal one of the following? — Accelerator pedal sticking has occurred when operated — There is evidence of accelerator pedal disassembly	Yes	Replace the accelerator pedal, then go to Step 12. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS OF APP SENSOR** • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) — IVS — APP1 — APP2 • Inspect the following: — Is the value for PID IVS Idle when the accelerator pedal is not depressed? — Does the value for PID APP1, APP2 change when the accelerator pedal is continually depressed? • Are all items normal?	Yes	Go to Step 8.
		No	Go to the next step.
7	**INSPECT APP SENSOR RELATED WIRING HARNESS AND CONNECTOR** • Inspect the wiring harness related to the APP sensor for connector disconnection, short circuit, and poor contact. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 12.
		No	APP sensor malfunction. • Replace the accelerator pedal, then go to Step 12. (See ACCELERATOR PEDAL REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
8	**VERIFY CURRENT INPUT SIGNAL STATUS OF BRAKE SWITCH** • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) — BOO — BPA • Are all PIDs normal? (See PCM INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)	Yes	Go to Step 11.
		No	Go to the next step.
9	**INSPECT BRAKE SWITCH** • Inspect the brake switch. (See BRAKE SWITCH INSPECTION.) • Is there any malfunction?	Yes	Replace the brake switch, then go to Step 12. (See BRAKE PEDAL REMOVAL/INSTALLATION.)
		No	Go to the next step.

Sample