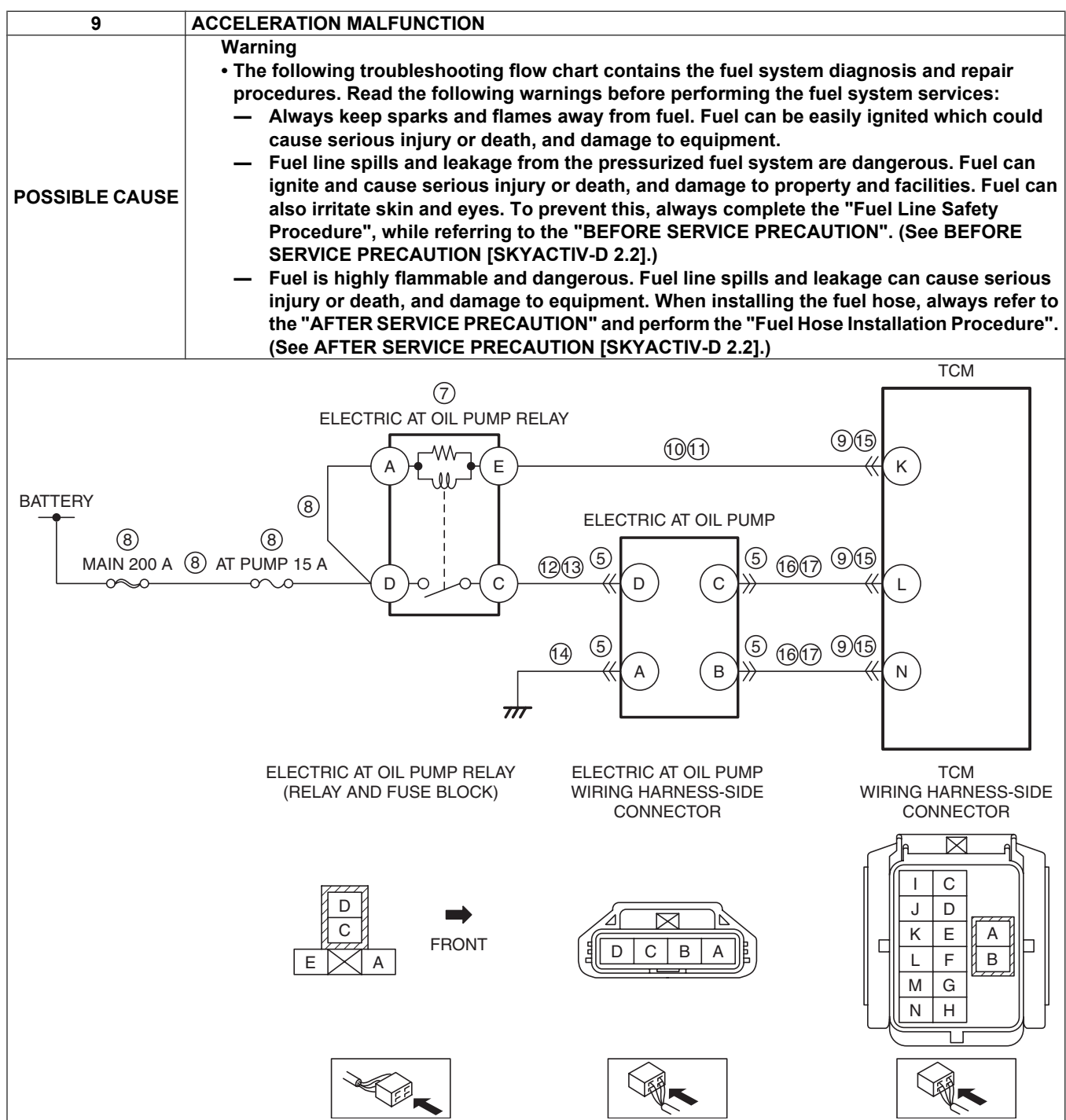


## NO.9 ACCELERATION MALFUNCTION [SKYACTIV-D 2.2]

id1103a2001400

9	ACCELERATION MALFUNCTION
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Acceleration from i-stop is not smooth.</li> <li>• Suppresses (shock) when accelerating vehicle from i-stop.</li> <li>• Engine vibration increases when engine is restarted.</li> </ul>
<b>POSSIBLE CAUSE</b>	<p><b>Note</b></p> <ul style="list-style-type: none"> <li>• MT vehicles are not included because the driver releases the brake pedal and depresses the clutch pedal to accelerate.</li> </ul> <p><b>A/C system malfunction</b></p> <ul style="list-style-type: none"> <li>• Improper A/C system operation <ul style="list-style-type: none"> <li>— A/C compressor malfunction</li> </ul> </li> </ul> <p><b>ATX system malfunction</b></p> <ul style="list-style-type: none"> <li>• Electric AT oil pump malfunction (operation malfunction, insufficient pressure) <ul style="list-style-type: none"> <li>— Electric AT oil pump connector or terminals malfunction</li> <li>— TCM connector or terminals malfunction</li> <li>— Short or open circuit in wiring harness between battery positive terminal and electric AT oil pump relay terminal A</li> <li>— Short or open circuit in wiring harness between battery positive terminal and electric AT oil pump relay terminal D</li> <li>— MAIN 200 A fuse malfunction</li> <li>— AT PUMP 15 A fuse malfunction</li> <li>— Short or open circuit in wiring harness between electric AT oil pump relay terminal C and electric AT oil pump terminal D</li> <li>— Open circuit in wiring harness between electric AT oil pump terminal A and body ground</li> <li>— Short or open circuit in wiring harness between electric AT oil pump relay terminal E and TCM terminal K</li> <li>— Short or open circuit in wiring harness between electric AT oil pump terminal C and TCM terminal L</li> <li>— Short or open circuit in wiring harness between electric AT oil pump terminal B and TCM terminal N</li> <li>— Electric AT oil pump relay malfunction (stuck open)</li> <li>— Electric AT oil pump malfunction</li> <li>— TCM malfunction</li> </ul> </li> <li>• ATX malfunction</li> <li>• Lack of ATF</li> </ul> <p><b>Hill launch assist function system (DSC) malfunction</b></p> <ul style="list-style-type: none"> <li>• False detection of inclination angle (cannot calculate correct road slope) <ul style="list-style-type: none"> <li>— Low-G (XY) sensor (built-into SAS control module) malfunction (In this case, the SAS control module records DTCs C0061:29 and C0062:29.)</li> <li>— Low-G (XY) sensor (built-into SAS control module) initialization malfunction</li> </ul> </li> <li>• False detection of brake fluid pressure <ul style="list-style-type: none"> <li>— Brake fluid pressure sensor (built-into DSC HU/CM) malfunction</li> </ul> </li> <li>• Cannot maintain brake fluid pressure <ul style="list-style-type: none"> <li>— DSC HU/CM malfunction</li> </ul> </li> </ul> <p><b>Brake system malfunction</b></p> <ul style="list-style-type: none"> <li>• Brake dragging</li> </ul> <p><b>Engine system malfunction</b></p> <ul style="list-style-type: none"> <li>• Generator drive belt shear, deviation, or wear</li> <li>• Fuel injection system malfunction <ul style="list-style-type: none"> <li>— Fuel leakage from fuel system</li> <li>— Common rail malfunction</li> <li>— Supply pump malfunction</li> <li>— Suction control valve malfunction</li> <li>— Fuel injector malfunction</li> <li>— Fuel pressure relief valve malfunction</li> <li>— Fuel check valve or fuel feed valve malfunction</li> </ul> </li> <li>• Jet pump malfunction (4WD)</li> <li>• Poor fuel quality</li> <li>• Mechanical (engine) malfunction <ul style="list-style-type: none"> <li>— Low engine compression</li> <li>— Improper valve timing</li> <li>— Large mechanical resistance</li> </ul> </li> </ul>



### Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	<b>DETERMINE IF MALFUNCTION CAUSED BY A/C SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>• Verify the A/C system operation.</li> <li>• Is the A/C system operation normal?</li> </ul>	Yes	Go to the next step.
		No	Perform the symptom troubleshooting "NO.28 A/C DOES NOT WORK SUFFICIENTLY" and "NO.29 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY". (See NO.28 A/C DOES NOT WORK SUFFICIENTLY [SKYACTIV-D 2.2].) (See NO.29 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY [SKYACTIV-D 2.2].)

STEP	INSPECTION	RESULTS	ACTION
2	<b>DETERMINE IF MALFUNCTION CAUSED BY ATX BODY</b> <ul style="list-style-type: none"> <li>Compare the malfunction symptom with the i-stop system stop condition.</li> <li>Is there any shock or slippage during acceleration with the i-stop system disabled?</li> </ul>	Yes	Perform the applicable symptom troubleshooting procedure. (See SYMPTOM TROUBLESHOOTING ITEM TABLE [GW6A-EL, GW6AX-EL].)
		No	Go to the next step.
3	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Retrieve the PCM, TCM, DSC HU/CM, SAS control module DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [GW6A-EL, GW6AX-EL].) (See ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].) (See DTC INSPECTION.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-D 2.2].) (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [GW6A-EL, GW6AX-EL].) (See ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].) (See DTC TABLE.)
		No	Go to the next step.
4	<b>DETERMINE IF MALFUNCTION CAUSE IS BRAKE FLUID PRESSURE SENSOR SIGNAL OR OTHER</b> <ul style="list-style-type: none"> <li>Put the vehicle in an i-stop condition (engine stopped).</li> <li>Monitor the PCM PID BFP using the M-MDS while the brake is depressed and held with the i-stop function operating. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].)</li> <li>Does the monitoring value change?</li> </ul>	Yes	Brake fluid pressure sensor (built-into DSC HU/CM) or DSC HU/CM brake pressure hold function malfunction. • Replace the DSC HU/CM. (See DSC HU/CM REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	<b>INSPECT ELECTRIC AT OIL PUMP CONNECTOR CONDITION</b> <ul style="list-style-type: none"> <li>Switch the ignition off.</li> <li>Disconnect the electric AT oil pump connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the connector and/or terminals.
		No	Go to the next step.
6	<b>DETERMINE IF MALFUNCTION CAUSE ELECTRIC AT OIL PUMP POWER SUPPLY CIRCUIT OR OTHER</b> <ul style="list-style-type: none"> <li>Verify that the electric AT oil pump connector is disconnected.</li> <li>Measure the voltage at the electric AT oil pump terminal D (wiring harness-side) while the engine stop with i-stop function operating.</li> <li>Is the voltage B+?</li> </ul>	Yes	Go to Step 14.
		No	Go to the next step.
7	<b>INSPECT ELECTRIC AT OIL PUMP RELAY</b> <ul style="list-style-type: none"> <li>Switch the ignition off.</li> <li>Remove the electric AT oil pump relay.</li> <li>Inspect the electric AT oil pump relay. (See RELAY INSPECTION.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the electric AT oil pump relay.
		No	Go to the next step.
8	<b>INSPECT ELECTRIC AT OIL PUMP RELAY POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Verify that the electric AT oil pump relay is removed.</li> <li>Verify that the electric AT oil pump connector is disconnected.</li> <li>Measure the voltage at the following terminals (wiring harness-side): <ul style="list-style-type: none"> <li>Electric AT oil pump relay terminal A</li> <li>Electric AT oil pump relay terminal D</li> </ul> </li> <li>Is the voltage B+?</li> </ul>	Yes	Go to the next step.
		No	Inspect the MAIN 200 A fuse and AT PUMP 15 A fuse. <ul style="list-style-type: none"> <li>If the fuse is blown: <ul style="list-style-type: none"> <li>Repair or replace the wiring harness for a possible short to ground.</li> <li>Replace the malfunctioning fuse.</li> </ul> </li> <li>If the fuse is deteriorated: <ul style="list-style-type: none"> <li>Replace the malfunctioning fuse.</li> </ul> </li> <li>If all fuses are normal: <ul style="list-style-type: none"> <li>Repair or replace the wiring harness for a possible open circuit.</li> </ul> </li> </ul>

STEP	INSPECTION	RESULTS	ACTION
9	<b>INSPECT TCM CONNECTOR CONDITION</b> <ul style="list-style-type: none"> <li>• Disconnect the TCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the connector and/or terminals.
		No	Go to the next step.
10	<b>INSPECT ELECTRIC AT OIL PUMP RELAY CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Verify that the electric AT oil pump relay is removed.</li> <li>• Verify that the electric AT oil pump and TCM connectors are disconnected.</li> <li>• Inspect for continuity between electric AT oil pump relay terminal E (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to ground.
		No	Go to the next step.
11	<b>INSPECT ELECTRIC AT OIL PUMP RELAY CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Verify that the electric AT oil pump relay is removed.</li> <li>• Verify that the electric AT oil pump and TCM connectors are disconnected.</li> <li>• Inspect for continuity between electric AT oil pump relay terminal E (wiring harness-side) and TCM terminal K (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit.
12	<b>INSPECT FOR SHORT TO GROUND CIRCUIT IN SECONDARY OF ELECTRIC AT OIL PUMP RELAY</b> <ul style="list-style-type: none"> <li>• Verify that the electric AT oil pump relay is removed.</li> <li>• Verify that the electric AT oil pump and TCM connectors are disconnected.</li> <li>• Inspect for continuity between electric AT oil pump relay terminal C (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to ground.
		No	Go to the next step.
13	<b>INSPECT FOR OPEN CIRCUIT IN SECONDARY OF ELECTRIC AT OIL PUMP RELAY</b> <ul style="list-style-type: none"> <li>• Verify that the electric AT oil pump relay is removed.</li> <li>• Verify that the electric AT oil pump and TCM connectors are disconnected.</li> <li>• Inspect for continuity between electric AT oil pump relay terminal C (wiring harness-side) and electric AT oil pump terminal D (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to Step 29.
		No	Repair or replace the wiring harness for a possible open circuit.
14	<b>INSPECT ELECTRIC AT OIL PUMP GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Verify that the electric AT oil pump connector is disconnected.</li> <li>• Inspect for continuity between electric AT oil pump terminal A (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Inspect for the following: <ul style="list-style-type: none"> <li>• Open circuit between electric AT oil pump and body ground</li> <li>• Loose or lifting ground point               <ul style="list-style-type: none"> <li>— If there is any malfunction:                   <ul style="list-style-type: none"> <li>• Repair or replace the malfunctioning part according to the inspection results.</li> </ul> </li> </ul> </li> </ul>
15	<b>INSPECT TCM CONNECTOR CONDITION</b> <ul style="list-style-type: none"> <li>• Switch the ignition off.</li> <li>• Disconnect the TCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the connector and/or terminals.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
16	<b>INSPECT ELECTRIC AT OIL PUMP CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Verify that the electric AT oil pump and TCM connectors are disconnected.</li> <li>• Inspect for continuity between the following terminals (wiring harness-side) and body ground: <ul style="list-style-type: none"> <li>— Electric AT oil pump terminal C</li> <li>— Electric AT oil pump terminal B</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to ground.
		No	Go to the next step.
17	<b>INSPECT ELECTRIC AT OIL PUMP CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Verify that the electric AT oil pump and TCM connectors are disconnected.</li> <li>• Inspect for continuity between the following terminals (wiring harness-side): <ul style="list-style-type: none"> <li>— Electric AT oil pump terminal C and TCM terminal L</li> <li>— Electric AT oil pump terminal B and TCM terminal N</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit.
18	<b>INSPECT RELATED PART CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect the following: <ul style="list-style-type: none"> <li>— Lack of ATF</li> <li>— Brake dragging</li> </ul> </li> <li>• Are all items normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
19	<b>INSPECT GENERATOR DRIVE BELT</b> <ul style="list-style-type: none"> <li>• Inspect the generator drive belt. (See DRIVE BELT INSPECTION [SKYACTIV-D 2.2].)</li> <li>• Is the indicator mark on the drive belt auto tensioner within the normal range?</li> </ul>	Yes	Go to the next step.
		No	Replace the generator drive belt. (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
20	<b>INSPECT FOR FUEL LEAKAGE FROM FUEL SYSTEM</b> <ul style="list-style-type: none"> <li>• Visually inspect the following: <ul style="list-style-type: none"> <li>— Fuel leakage from the fuel tank, fuel pump, hose, pipe, fuel injector, supply pump, common rail</li> <li>— Cracking and damage in fuel hose and pipe</li> <li>— Clamp installation condition for each hose and pipe</li> <li>— Fuel pipe securing condition due to deterioration such as rubber of clamp</li> </ul> </li> <li>• Are all items normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.
21	<b>INSPECT FUEL INJECTION SYSTEM RELATED PARTS</b> <ul style="list-style-type: none"> <li>• Inspect the following parts: <ul style="list-style-type: none"> <li>— Common rail (See COMMON RAIL INSPECTION [SKYACTIV-D 2.2].)</li> <li>— Supply pump (See SUPPLY PUMP INSPECTION [SKYACTIV-D 2.2].)</li> <li>— Suction control valve (See SUCTION CONTROL VALVE INSPECTION [SKYACTIV-D 2.2].)</li> <li>— Fuel injector (See FUEL INJECTOR INSPECTION [SKYACTIV-D 2.2].)</li> <li>— Fuel pressure relief valve (See FUEL PRESSURE RELIEF VALVE INSPECTION [SKYACTIV-D 2.2].)</li> </ul> </li> <li>• Are all items normal?</li> </ul>	Yes	2WD: • Go to Step 23. 4WD: • Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results.

STEP	INSPECTION	RESULTS	ACTION
22	<b>INSPECT JET PUMP</b> <ul style="list-style-type: none"> <li>Inspect the jet pump. (See JET PUMP INSPECTION [SKYACTIV-D 2.2].)</li> <li>Is the jet pump normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the fuel gauge sender unit (main). (See FUEL GAUGE SENDER UNIT REMOVAL/ INSTALLATION [4WD].)
23	<b>INSPECT FOR MALFUNCTION DUE TO POOR FUEL</b> <ul style="list-style-type: none"> <li>Replace the fuel. (See FUEL DRAINING PROCEDURE [SKYACTIV-D 2.2].)</li> <li>Does the symptom disappear?</li> </ul>	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. <ul style="list-style-type: none"> <li>Carbon remover</li> <li>Overhauling</li> </ul>
24	<b>DETERMINE IF MALFUNCTION IS DUE TO EXCESSIVE ENGINE SPEED RESISTANCE</b> <ul style="list-style-type: none"> <li>Rotate the crankshaft pulley lock bolt clockwise using a wrench. (See FRONT OIL SEAL REPLACEMENT [SKYACTIV-D 2.2].)</li> <li>Can the bolt be rotated?</li> </ul>	Yes	Go to Step 26.
		No	Go to the next step.
25	<b>INSPECT FOR MALFUNCTION DUE TO EXCESSIVE MECHANICAL RESISTANCE OF ENGINE ACCESSORIES</b> <ul style="list-style-type: none"> <li>Remove all drive belts from engine accessories. (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)</li> </ul> <p><b>Caution</b></p> <ul style="list-style-type: none"> <li>Do not run the engine with the drive belts of engine accessories removed. Otherwise the engine could be damaged from overheating.</li> </ul> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Is cranking possible? (Does engine start?)</li> </ul>	Yes	Repair or replace the malfunctioning part according to the inspection results. (Mechanical resistance in engine accessories.)
		No	Go to the next step.
26	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect the engine compression. (See COMPRESSION INSPECTION [SKYACTIV-D 2.2].)</li> <li>Are compression pressures within specification?</li> </ul> <p><b>Specification:</b></p> <ul style="list-style-type: none"> <li>Compression <ul style="list-style-type: none"> <li>Standard: 2255 kPa {22.99 kgf/cm<sup>2</sup>, 327.1 psi} (180 rpm)</li> <li>Minimum: 1804 kPa {18.40 kgf/cm<sup>2</sup>, 261.6 psi} (180 rpm)</li> <li>Maximum difference between cylinders: 147 kPa {1.50 kgf/cm<sup>2</sup>, 21.3 psi} (180 rpm)</li> </ul> </li> </ul>	Yes	Go to Step 29.
		No	Go to the next step.
27	<b>INSPECT FOR MALFUNCTION DUE TO DEVIATED VALVE TIMING</b> <ul style="list-style-type: none"> <li>Inspect the valve timing (timing chain installation condition). (See TIMING CHAIN REMOVAL/ INSTALLATION [SKYACTIV-D 2.2].)</li> <li>Is the valve timing normal?</li> </ul>	Yes	Go to the next step.
		No	Adjust the valve timing to the correct timing.
28	<b>INSPECT FOR MALFUNCTION DUE TO INTERNAL ENGINE WEAR, DAMAGE</b> <ul style="list-style-type: none"> <li>Inspect for the following engine internal parts: <ul style="list-style-type: none"> <li>Cylinder</li> <li>Piston ring</li> <li>Intake valve</li> <li>Exhaust valve</li> <li>Such as cylinder head gasket</li> </ul> </li> <li>Are all items normal?</li> </ul>	Yes	Replace the lower case. (Fuel may not inject normally because there is a malfunction in the fuel check valve and fuel feed valve.) (See LOWER CASE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Repair or replace the malfunctioning part according to the inspection results.

STEP	INSPECTION	RESULTS	ACTION
29	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 a malfunction remains, inspect the related Service Information and perform the repair or diagnosis. — If the vehicle is repaired, troubleshooting is completed. — If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)		