

## NO.7 LIMITED i-stop FUNCTION OPERATION TIME [SKYACTIV-G 2.0, SKYACTIV-G 2.5]

id1103a5001200

7	LIMITED i-stop FUNCTION OPERATION TIME
DESCRIPTION	<ul style="list-style-type: none"> <li>Frequency of which i-stop function operates is low.</li> <li>Frequent occurrence of engine restarting other than for driving vehicle from stop.</li> </ul>
POSSIBLE CAUSE	<p><b>Note</b></p> <ul style="list-style-type: none"> <li>To ensure electric vehicle system reliability, restart the engine regardless of the vehicle condition after <b>120 s</b> have elapsed since the i-stop function operated.</li> </ul> <p><b>Battery voltage low during i-stop function operation</b></p> <ul style="list-style-type: none"> <li>Battery deterioration</li> <li>Insufficient battery recharge while engine is running <ul style="list-style-type: none"> <li>Low recharge effect <ul style="list-style-type: none"> <li>Generator malfunction (part, system, control malfunction)</li> <li>Large amount of vehicle power consumption</li> </ul> </li> </ul> </li> <li>High electrical load from aftermarket electrical accessories</li> </ul> <p><b>False detection of engine starting conditions</b></p> <ul style="list-style-type: none"> <li>False detection of battery voltage</li> <li>False detection of low power brake unit load <ul style="list-style-type: none"> <li>Power brake unit vacuum sensor malfunction</li> <li>Short or open circuit in wiring harness between the following terminals: <ul style="list-style-type: none"> <li>Power brake unit vacuum sensor terminal C—PCM terminal 2BG</li> <li>Power brake unit vacuum sensor terminal B—PCM terminal 2Q</li> <li>Power brake unit vacuum sensor terminal A—PCM terminal 2AH</li> </ul> </li> <li>Power brake unit malfunction (air tightness malfunction)</li> <li>Malfunction in vacuum hose to power brake unit (damage, bad check valve)</li> </ul> </li> </ul> <p><b>False recognition of driver performing engine start operation</b></p> <ul style="list-style-type: none"> <li>False detection of depressed clutch pedal (MTX) <ul style="list-style-type: none"> <li>Clutch stroke sensor malfunction</li> <li>Short to power supply in wiring harness between clutch stroke sensor terminal B and PCM terminal 2M</li> </ul> </li> <li>False detection of released brake pedal (ATX) <ul style="list-style-type: none"> <li>Brake fluid pressure sensor (built-into DSC HU/CM) malfunction</li> </ul> </li> <li>False detection of steering wheel operation (ATX) <ul style="list-style-type: none"> <li>Steering angle sensor initialization malfunction</li> <li>Steering angle sensor malfunction</li> <li>Short or open circuit in wiring harness between steering angle sensor and start stop unit terminals 1U, 1T, 1W or 1S</li> </ul> </li> </ul>

### Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	<b>INSPECT EFFECT OF NON-GENUINE ELECTRICAL ACCESSORY FOR CAUSE OF MALFUNCTION</b> <ul style="list-style-type: none"> <li>Remove any non-genuine electrical accessory.</li> <li>Verify the malfunction symptom.</li> <li>Is the frequency of the engine restarting from the i-stop off condition the same as that of another vehicle of the same model?</li> </ul>	Yes	<p>The system is normal.</p> <ul style="list-style-type: none"> <li>Explain to the customer that the frequency of the engine restarting increases due to the effect of the non-genuine electrical accessory installed.</li> </ul>
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
2	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Retrieve the PCM, TCM, rear body control module (RBCM), DSC HU/CM, instrument cluster and climate control unit DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [FW6A-EL, FW6AX-EL].) (See DTC INSPECTION [REAR BODY CONTROL MODULE (RBCM)].) (See ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].) (See DTC INSPECTION [INSTRUMENT CLUSTER].) (See DTC DISPLAY [FULL-AUTO AIR CONDITIONER].)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [FW6A-EL, FW6AX-EL].) (See DTC TABLE [REAR BODY CONTROL MODULE (RBCM)].) (See ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].) (See DTC TABLE [INSTRUMENT CLUSTER].) (See DTC TABLE [FULL-AUTO AIR CONDITIONER].)
		No	Go to the next step.
3	<b>VERIFY BATTERY CONDITION</b> <ul style="list-style-type: none"> <li>Inspect the battery. (See BATTERY INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Is there any malfunction?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 5.
4	<b>DETERMINE IF MALFUNCTION CAUSE IS BATTERY OR GENERATOR</b> <ul style="list-style-type: none"> <li>Recharge the battery. (See BATTERY RECHARGING [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Inspect the battery again. (See BATTERY INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the battery. (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
		No	Go to the next step.
5	<b>INSPECT GENERATOR</b> <ul style="list-style-type: none"> <li>Inspect the generator. (See GENERATOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	ATX: • Go to the next step. MTX: • Go to Step 9.
6	<b>DETERMINE IF MALFUNCTION IS CAUSED BY STEERING ANGLE (ESTIMATED ABSOLUTE ANGLE) SIGNAL ERROR</b> <ul style="list-style-type: none"> <li>Start the engine and idle it.</li> <li>Using the M-MDS, display EPS control module PID STR_ANG. (See ELECTRIC POWER STEERING (EPS) ON-BOARD DIAGNOSIS.)</li> <li>Are the monitoring values normal?</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
7	<b>INSPECT EPS CONTROL MODULE FOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect the EPS control module. (See EPS CONTROL MODULE INSPECTION.)</li> <li>Is the EPS control module normal?</li> </ul>	Yes	Perform the following procedure: <ol style="list-style-type: none"> <li>Switch the ignition off, and after <b>2 min or more</b> have elapsed, switch the ignition ON.</li> <li>Start the engine and drive the vehicle <b>10 m {33 ft} or more</b> in a straight line at a speed of <b>10 km/h {6.2 mph} or more</b>.</li> <li>Stop the vehicle with the wheels in the straight-ahead position.</li> <li>Using the M-MDS, display EPS control module PID STR_ANG.               <ul style="list-style-type: none"> <li>If the STR_ANG value is normal, go to Step 16. (Because the steering angle (estimated absolute angle) has returned to normal)</li> <li>If the STR_ANG value is not normal, replace the EPS control module, then go to Step 16. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)</li> </ul> </li> </ol>
		No	Replace the EPS control module, then go to Step 16. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
8	<b>INSPECT STEERING ANGLE SENSOR CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for an open or short circuit between the following terminals (wiring harness-side):               <ul style="list-style-type: none"> <li>Steering angle sensor terminal A—Start stop unit terminal 1U</li> <li>Steering angle sensor terminal B—Start stop unit terminal 1T</li> <li>Steering angle sensor terminal C—Start stop unit terminal 1W</li> <li>Steering angle sensor terminal D—Start stop unit terminal 1S</li> </ul> </li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the suspected wiring harness.
		No	Replace the EPS control module. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
9	<b>DETERMINE IF MALFUNCTION CAUSE IS POWER BRAKE UNIT VACUUM SENSOR SIGNAL OR OTHER</b> <ul style="list-style-type: none"> <li>Put the vehicle in an i-stop condition (engine stopped).</li> <li>Access the PCM PID BBP using the M-MDS with the brake pedal depressed and the engine stopped. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Does the BBP PID value remain <b>less than -43 kPa {-0.44 kgf/cm<sup>2</sup>, -6.2 psi}</b>?</li> </ul>	Yes	ATX: <ul style="list-style-type: none"> <li>Go to Step 13.</li> </ul> MTX: <ul style="list-style-type: none"> <li>Go to Step 14.</li> </ul>
		No	Go to the next step.
10	<b>INSPECT POWER BRAKE UNIT VACUUM SENSOR FOR AIR TIGHTNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Perform the vacuum function inspection for the power brake unit and the vacuum loss inspection. (See POWER BRAKE UNIT INSPECTION.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
11	<b>INSPECT POWER BRAKE UNIT VACUUM SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the power brake unit vacuum sensor. (See POWER BRAKE UNIT INSPECTION.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the power brake unit vacuum sensor. (See POWER BRAKE UNIT VACUUM SENSOR REMOVAL/INSTALLATION.)
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
12	<b>INSPECT POWER BRAKE UNIT VACUUM SENSOR CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for an open or short circuit between the following terminals (wiring harness-side): <ul style="list-style-type: none"> <li>Power brake unit vacuum sensor terminal C—PCM terminal 2BG</li> <li>Power brake unit vacuum sensor terminal B—PCM terminal 2Q</li> <li>Power brake unit vacuum sensor terminal A—PCM terminal 2AH</li> </ul> </li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the suspected wiring harness.
		No	Replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
13	<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 DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].)</li> <li>Does the monitoring value change?</li> </ul>	Yes	Repeat the inspection from Step 1. <ul style="list-style-type: none"> <li>If the malfunction is not resolved, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> </ul> Go to Step 16.
		No	Brake fluid pressure sensor malfunction. <ul style="list-style-type: none"> <li>Replace the DSC HU/CM. (See DSC HU/CM REMOVAL/INSTALLATION.)</li> </ul>
14*	<b>DETERMINE IF MALFUNCTION CAUSE IS CLUTCH STROKE SENSOR SIGNAL OR OTHER</b> <ul style="list-style-type: none"> <li>Switch the ignition ON (engine off).</li> <li>Access the PCM PID CPP using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Does the CPP PID value change according to the amount the clutch pedal is depressed?</li> </ul>	Yes	Repeat the inspection from Step 1. <ul style="list-style-type: none"> <li>If the malfunction is not resolved, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> </ul> Go to Step 16.
		No	Go to the next step.
15	<b>INSPECT CLUTCH STROKE SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the clutch stroke sensor. (See CLUTCH STROKE SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the clutch master cylinder. (See CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION [C66M-R, C66MX-R].)
		No	Inspect for a short to power supply between clutch stroke sensor terminal B and PCM terminal 2M. <ul style="list-style-type: none"> <li>If there is any malfunction: <ul style="list-style-type: none"> <li>Repair or replace the wiring harness for a possible short to power supply.</li> </ul> </li> <li>If there is no malfunction: <ul style="list-style-type: none"> <li>Replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> </ul> </li> </ul>
16	Verify the test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>If a malfunction remains, inspect the related Service Information and perform the repair or diagnosis. <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting is completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> </ul> </li> </ul>		