

NO.7 LIMITED i-stop FUNCTION OPERATION TIME [SKYACTIV-D 2.2]

id1103a2001200

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

Diagnostic Procedure

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

STEP	INSPECTION	RESULTS	ACTION
2	VERIFY DTC <ul style="list-style-type: none"> 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-D 2.2].) (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [GW6A-EL, GW6AX-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].) Are any DTCs present? 	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 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	VERIFY BATTERY CONDITION <ul style="list-style-type: none"> Inspect the battery. (See BATTERY INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	Yes	Go to the next step.
		No	Go to Step 5.
4	DETERMINE IF MALFUNCTION CAUSE IS BATTERY OR GENERATOR <ul style="list-style-type: none"> Recharge the battery. (See BATTERY RECHARGING [SKYACTIV-D 2.2].) Inspect the battery again. (See BATTERY INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	Yes	Replace the battery. (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
5	INSPECT GENERATOR <ul style="list-style-type: none"> Inspect the generator. (See GENERATOR INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	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	DETERMINE IF MALFUNCTION IS CAUSED BY STEERING ANGLE (ESTIMATED ABSOLUTE ANGLE) SIGNAL ERROR <ul style="list-style-type: none"> Start the engine and idle it. Using the M-MDS, display EPS control module PID STR_ANG. (See ELECTRIC POWER STEERING (EPS) ON-BOARD DIAGNOSIS.) Are the monitoring values normal? 	Yes	Go to Step 9.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
7	INSPECT EPS CONTROL MODULE FOR MALFUNCTION <ul style="list-style-type: none"> Inspect the EPS control module. (See EPS CONTROL MODULE INSPECTION.) Is the EPS control module normal? 	Yes	Perform the following procedure: <ol style="list-style-type: none"> Switch the ignition off, and after 2 min or more have elapsed, switch the ignition ON. Start the engine and drive the vehicle 10 m {33 ft} or more in a straight line at a speed of 10 km/h {6.2 mph} or more. Stop the vehicle with the wheels in the straight-ahead position. Using the M-MDS, display EPS control module PID STR_ANG. <ul style="list-style-type: none"> If the STR_ANG value is normal, go to Step 18. (Because the steering angle (estimated absolute angle) has returned to normal) If the STR_ANG value is not normal, replace the EPS control module, then go to Step 18. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
		No	Replace the EPS control module, then go to Step 18. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
8	INSPECT STEERING ANGLE SENSOR CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT <ul style="list-style-type: none"> Inspect for an open or short circuit between the following terminals (wiring harness-side): <ul style="list-style-type: none"> Steering angle sensor terminal A—Start stop unit terminal 1U Steering angle sensor terminal B—Start stop unit terminal 1T Steering angle sensor terminal C—Start stop unit terminal 1W Steering angle sensor terminal D—Start stop unit terminal 1S Is there any malfunction? 	Yes	Repair or replace the suspected wiring harness.
		No	Replace the EPS control module.
9	DETERMINE IF MALFUNCTION CAUSE IS POWER BRAKE UNIT VACUUM SENSOR SIGNAL OR OTHER <ul style="list-style-type: none"> Put the vehicle in an i-stop condition (engine stopped). Access the PCM PID BBP using the M-MDS with the brake pedal depressed and the engine stopped. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) Does the BBP PID value remain less than -43 kPa {-0.44 kgf/cm², -6.2 psi}? 	Yes	ATX: <ul style="list-style-type: none"> Go to Step 13. MTX: <ul style="list-style-type: none"> Go to Step 16.
		No	Go to the next step.
10	INSPECT POWER BRAKE UNIT VACUUM SENSOR FOR AIR TIGHTNESS MALFUNCTION <ul style="list-style-type: none"> Perform the vacuum function inspection for the power brake unit and the vacuum loss inspection. (See POWER BRAKE UNIT INSPECTION.) Is there any malfunction? 	Yes	Repair or replace the malfunctioning part according to the inspection results.
		No	Go to the next step.
11	INSPECT POWER BRAKE UNIT VACUUM SENSOR <ul style="list-style-type: none"> Inspect the power brake unit vacuum sensor. (See POWER BRAKE UNIT VACUUM SENSOR INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	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	INSPECT POWER BRAKE UNIT VACUUM SENSOR CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT <ul style="list-style-type: none"> Inspect for an open or short circuit between the following terminals (wiring harness-side): <ul style="list-style-type: none"> Power brake unit vacuum sensor terminal C—PCM terminal 2BB Power brake unit vacuum sensor terminal B—PCM terminal 2BC Power brake unit vacuum sensor terminal A—PCM terminal 2BD Is there any malfunction? 	Yes	Repair or replace the suspected wiring harness.
		No	Replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
13	DETERMINE IF MALFUNCTION CAUSE IS DRIVER-SIDE AIR MIX ACTUATOR SIGNAL OR OTHER <ul style="list-style-type: none"> Measure the voltage at the following terminal (wiring harness-side) when the driver-side temperature setting is MAX HOT and MAX COLD. <ul style="list-style-type: none"> Climate control unit terminal 1N (L.H.D.) Climate control unit terminal 1P (R.H.D.) Is the voltage normal? (See CLIMATE CONTROL UNIT INSPECTION [FULL-AUTO AIR CONDITIONER].) 	Yes	Go to Step 15.
		No	Go to the next step.
14	INSPECT DRIVER-SIDE AIR MIX ACTUATOR <ul style="list-style-type: none"> Inspect the driver-side air mix actuator. (See AIR MIX ACTUATOR INSPECTION [FULL-AUTO AIR CONDITIONER].) Is there any malfunction? 	Yes	Replace the driver-side air mix actuator. (See AIR MIX ACTUATOR REMOVAL/INSTALLATION [FULL-AUTO AIR CONDITIONER].)
		No	Inspect the air mix actuator and linkage for sticking. (See A/C UNIT DISASSEMBLY/ASSEMBLY.) • If there is any malfunction: <ul style="list-style-type: none"> Repair or replace the malfunctioning part according to the inspection results.
15	DETERMINE IF MALFUNCTION CAUSE IS BRAKE FLUID PRESSURE SENSOR SIGNAL OR OTHER <ul style="list-style-type: none"> Put the vehicle in an i-stop condition (engine stopped). 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)].) Does the monitoring value change? 	Yes	Repeat the inspection from Step 1. • If the malfunction is not resolved, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to Step 18.
		No	Brake fluid pressure sensor malfunction. • Replace the DSC HU/CM. (See DSC HU/CM REMOVAL/INSTALLATION.)
16*	DETERMINE IF MALFUNCTION CAUSE IS CLUTCH STROKE SENSOR SIGNAL OR OTHER <ul style="list-style-type: none"> Switch the ignition ON (engine off). Access the PCM PID CPP using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) Does the CPP PID value change according to the amount the clutch pedal is depressed? 	Yes	Repeat the inspection from Step 1. • If the malfunction is not resolved, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to Step 18.
		No	Go to the next step.
17	INSPECT CLUTCH STROKE SENSOR <ul style="list-style-type: none"> Inspect the clutch stroke sensor. (See CLUTCH STROKE SENSOR INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	Yes	Replace the clutch master cylinder. (See CLUTCH STROKE SENSOR REMOVAL/INSTALLATION [D66M-R, D66MX-R].)
		No	Inspect for a short to power supply between clutch stroke sensor terminal B and PCM terminal 2AJ. • If there is any malfunction: <ul style="list-style-type: none"> Repair or replace the wiring harness for a possible short to power supply. • If there is no malfunction: <ul style="list-style-type: none"> Replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)

STEP	INSPECTION	RESULTS	ACTION
18	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].)		