

BATTERY INSPECTION

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Warning

- Because battery acid is toxic, be careful when handling the battery.
- Because battery acid is highly corrosive, be careful not to allow it to contact clothing or the vehicle.
- If battery acid contacts skin, eyes, or clothing, flush it immediately with running water. If the acid gets in the eyes, flush with water for more than 15 min and get prompt medical attention.

Electrolyte Specific Gravity (With i-stop)

Purpose	Step	Inspection	Results	Action
Battery examination (verification of dendrite short)	1	Using a hydrometer, measure the electrolyte gravity of all the cells and identify the one with the lowest electrolyte gravity value.	1.25 or more	Battery is normal.
			1.17—1.25	Recharge the battery. (See BATTERY RECHARGING.)
			Less than 1.17	Replace the battery because it can be determined as a dendrite short. (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-G 2.0].) (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-D 1.5].)

Electrolyte Specific Gravity (Without i-stop)

1. Measure the electrolyte specific gravity using a hydrometer.
 - If it is less than the specification, recharge the battery. (See BATTERY RECHARGING.)

Battery electrolyte specific gravity (Without i-stop)

1.22—1.29 [20 °C {68 °F}]

Battery Voltage (Without i-stop)

1. Inspect the battery as follows:

Step	Inspection	Results	Action
1	Measure the battery positive voltage.	12 V or more	Go to Step 3.
		Less than 12 V	Go to the next step.
2	Quick charge for 30 min and recheck voltage.	12 V or more	Go to the next step.
		Less than 12 V	Replace the battery. (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
3	Using the battery load tester, apply load current (see battery load test current) and record battery voltage after 15 s . Is voltage more than the specification?	Yes	Normal
		No	Replace the battery. (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)

Battery load test current

55D23L (60 A·h/20HR): 180 A

GR35 (60 A·h/20HR): 180 A

N-55 (50 A·h/20HR): 130 A

Standard specification

Battery temperature (°C {°F})	Minimum voltage (V)
4 {39}	9.3
10 {50}	9.4
16 {61}	9.5
21 {70}	9.6

Parasitic Draw

Without i-ELOOP

Caution

- Operating electrical loads while the parasitic draw is being measured can damage the tester.

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- Because the “BATT_SOC” value before disconnecting the negative battery cable is required for the battery condition initial setting (i-stop setting), always verify the “BATT_SOC” value before disconnecting the negative battery cable. (With i-stop only)

1. Verify that the ignition is switched off and all doors, the bonnet and trunk/liftgate are closed.
2. Disconnect the negative battery cable. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION.)
3. Connect the tester between the negative battery terminal and negative battery cable.

Note

- If the battery is not left undisturbed for **10 min or more**, the tester will indicate a high value (**approx. 300 mA**).
 - If the push button start or any electrical accessory is operated after the tester is connected, the battery must be left undisturbed for **10 min or more** from that point.
 - For vehicles with the immobilizer system, the system periodically shifts synchronization of the security indicator light flashing. Therefore, **65 mA (0.1 s)** current is supplied when the security indicator light is illuminated, and **40 mA (2 s)** current is supplied when the security indicator light is not illuminated. In addition, the measuring instrument, which shows the average value, indicates around **55 mA**.
4. Leave the vehicle electrical system undisturbed for **10 min or more**, and then measure the parasitic draw.
 - If not within specification, measure the parasitic draw while removing the fuses one by one from the inside of the relay and fuse block and the inside of the fuse block.
 - Inspect and repair wiring harnesses and connectors of the fuse where the current draw has decreased.

Battery parasitic draw (When the ignition is off, all doors and the bonnet are closed.)
10—30 mA

Note

- If the battery is left for **30 min or more**, a battery parasitic draw value of **25—45 mA** is indicated.

With i-ELOOP

Caution

- There is the possibility of charge current flowing from the i-ELOOP capacitor to the battery. Therefore, to prevent damage to the tester or wiring harness, connect the wiring harness after 30 min have elapsed since the ignition was switched off.
 - Operating electrical loads while the parasitic draw is being measured can damage the tester.
 - Because the “BATT_SOC” value before disconnecting the negative battery cable is required for the battery condition initial setting (i-stop setting), always verify the “BATT_SOC” value before disconnecting the negative battery cable. (With i-stop only)
1. Verify that the ignition is switched off and all doors, the bonnet and trunk/liftgate are closed.
 2. Disconnect the negative battery cable after **30 min** have elapsed since the ignition was switched off. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION.)
 3. Connect the tester between the negative battery terminal and negative battery cable.

Note

- If the push button start or any electrical accessory is operated after the tester is connected, the battery must be left undisturbed for **10 min or more** from that point.
 - For vehicles with the immobilizer system, the system periodically shifts synchronization of the security indicator light flashing. Therefore, **65 mA (0.1 s)** current is supplied when the security indicator light is illuminated, and **40 mA (2 s)** current is supplied when the security indicator light is not illuminated. In addition, the measuring instrument, which shows the average value, indicates around **55 mA**.
4. Measure the parasitic draw.
 - If not within specification, measure the parasitic draw while removing the fuses one by one from the inside of the relay and fuse block and the inside of the fuse block.
 - Inspect and repair wiring harnesses and connectors of the fuse where the current draw has decreased.

Battery parasitic draw (When the ignition is off, all doors and the bonnet are closed.)
25—45 mA

Battery Inspection When i-stop Warning Light (Amber) Is Flashing (With i-stop)

1. Inspect the battery as follows:

Step	Inspection	Results	Action
1	Verify that the pending code for DTC P0A8F:00 or DTC P0A8F:00 is detected using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 1.5].)	DTC P0A8F:00 is detected.	Replace the battery. (See BATTERY REMOVAL/ INSTALLATION [SKYACTIV-G 2.0].) (See BATTERY REMOVAL/ INSTALLATION [SKYACTIV-D 1.5].)
		Pending code for DTC P0A8F:00 is detected.	Go to the next step.
2	Was the vehicle engine not started for 5 days or more ? (Ask the customer)	Yes	Go to the next step.
		No	Go to Step 4.
3	After starting the engine, verify that the DTC P0A8F:00 is detected. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 1.5].) Is DTC P0A8F:00 detected?	Yes	Replace the battery. (See BATTERY REMOVAL/ INSTALLATION [SKYACTIV-G 2.0].) (See BATTERY REMOVAL/ INSTALLATION [SKYACTIV-D 1.5].)
		No	Go to the next step.
4	Using a hydrometer, measure the electrolyte gravity of all the cells and identify the one with the lowest electrolyte gravity value.	1.25 or more	Battery is normal.
		1.17—1.25	Recharge the battery. (See BATTERY RECHARGING.)
		Less than 1.17	Replace the battery because it can be determined as a dendrite short. (See BATTERY REMOVAL/ INSTALLATION [SKYACTIV-G 2.0].) (See BATTERY REMOVAL/ INSTALLATION [SKYACTIV-D 1.5].)
5	After performing any of the following work, verify that the i-stop warning light (amber) turns off. • Battery cable is disconnected and ignition is switched ON (engine off) after reconnection. • Ignition is switched ON (engine off) after 12 hours or more have elapsed with ignition switched off.		