

CHARGING SYSTEM

PRECAUTION

NOTICE:

When disconnecting the negative (-) battery terminal, initialize the following systems after the terminal is reconnected.

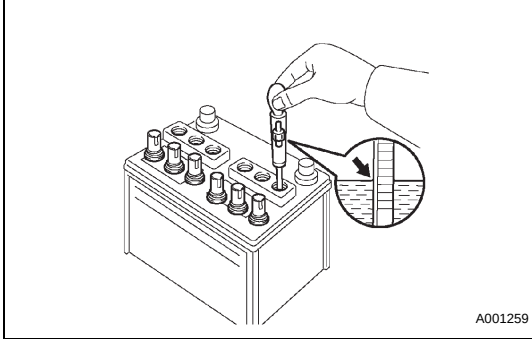
System Name	See procedure
Lighting System (Adaptive Front-Lighting System)	LI-17
Power Window Control System	WS-12
Power Back Door System	ED-33
Sliding Roof System	RF-4 and RF-22

1. Check that the battery cables are connected to the correct terminals.
2. Disconnect the battery cables when the battery is given a quick charge.
3. Do not perform tests with a high voltage insulation resistance tester.
4. Never disconnect the battery while the engine is running.
5. Check that the charging cable is tightened on terminal B of the generator and the fuse box.

ON-VEHICLE INSPECTION

1. CHECK BATTERY ELECTROLYTE LEVEL

- (a) Check the electrolyte quantity of each cell.
 (1) If the electrolyte is under the low level, replace the battery (or add distilled water if possible) and check the charging system.



2. CHECK BATTERY SPECIFIC GRAVITY

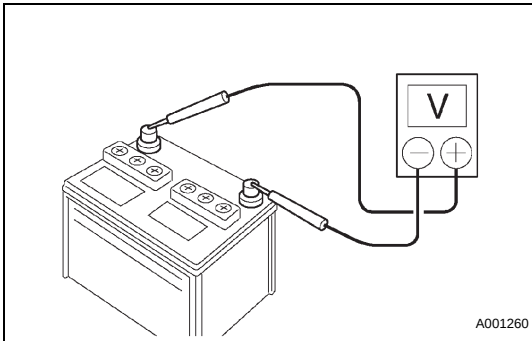
- (a) Check the specific gravity of each cell.

Standard specific gravity:

1.25 to 1.29 at 20°C (68°F)

HINT:

If the specific gravity is less than specification, charge the battery.



3. CHECK BATTERY VOLTAGE

- (a) If it has not been 20 minutes since you drove the vehicle or since the engine was stopped, turn the ignition switch and the electrical system (headlight, blower motor, rear defogger etc.) to the on position for 60 seconds. This will remove the surface charge on the battery.
 (b) Turn off the ignition switch and the electrical systems.
 (c) Measure the battery voltage between the negative (-) and positive (+) terminals of the battery.

Standard voltage:

12.6 to 12.8 V at 20°C (68°F)

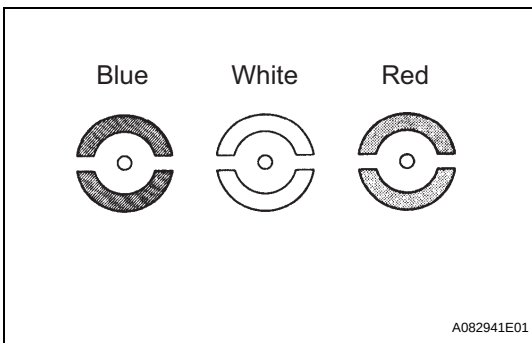
HINT:

If the voltage is less than specification, charge the battery.

- (d) Check the indicator as shown in the illustration.

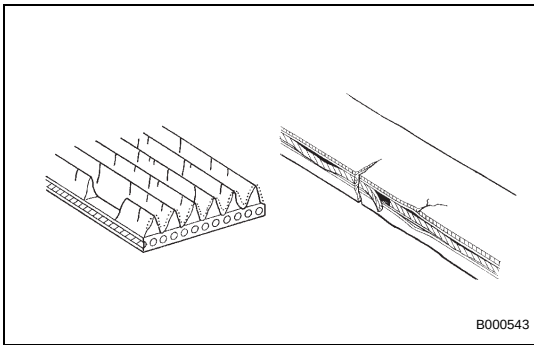
HINT:

- Blue: OK
- White: Charging Necessary
- Red: Insufficient Water



4. CHECK BATTERY TERMINAL, FUSIBLE LINK AND FUSES

- (a) Check that the battery terminals are not loosened or corroded.
 (b) Check the fusible links, high-current fuses and regular fuses.



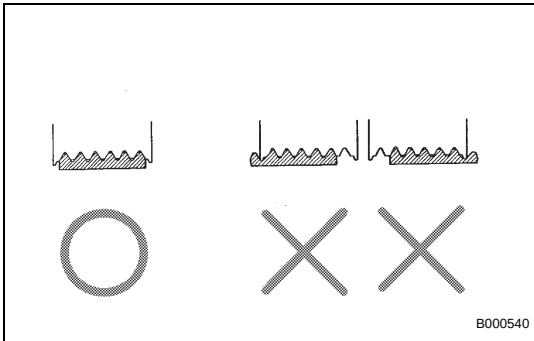
5. INSPECT DRIVE BELT

- (a) Visually check the belt for excessive wear, frayed cords etc.

HINT:

- If any defect found, replace the drive belt.
- Cracks on the rib side of a belt are considered acceptable.

If the belt has chunks missing from the ribs, it should be replaced.



- (b) Check that it fits properly in the ribbed grooves.

HINT:

Confirm that the belt has not slipped out of the groove on the bottom of the pulley by hand.

6. VISUALLY CHECK GENERATOR WIRING

- (a) Check that the wiring is in good condition.

7. LISTEN FOR ABNORMAL NOISES FROM GENERATOR

- (a) Check that there is no abnormal noise from the generator while the engine is running.

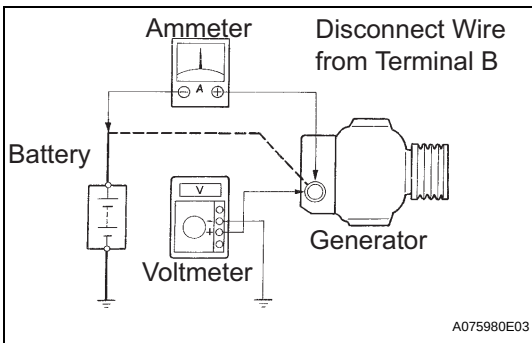
8. INSPECT CHARGE WARNING LIGHT CIRCUIT

- (a) Turn the ignition switch ON. Check that the charge warning light comes on.

- (b) Start the engine and check that the light goes off.

HINT:

If the light does not operate as specified, troubleshoot the charge warning light circuit.



9. INSPECT CHARGING CIRCUIT WITHOUT LOAD

- (a) If a tester is not available, connect a voltmeter to the charging circuit as follows.

- (1) Disconnect the wire from terminal B of the generator and connect it to the negative (-) lead of the ammeter.
- (2) Connect the positive (+) lead of the ammeter to terminal B of the generator.
- (3) Connect the positive (+) lead of the voltmeter to terminal B of the generator.
- (4) Ground the negative (-) lead of the voltmeter.

- (b) Check the charging circuit.

- (1) Keep the engine speed at 2,000 rpm, check the reading on the ammeter and voltmeter.

Standard amperage:

10 A or less

Standard voltage:

13.2 to 14.8 V

10. INSPECT CHARGING CIRCUIT WITH LOAD

- (a) With the engine running at 2,000 rpm, turn on the high beam headlights and turn the heater blower switch to the "HI" position.

- (b) Check the reading on the ammeter.

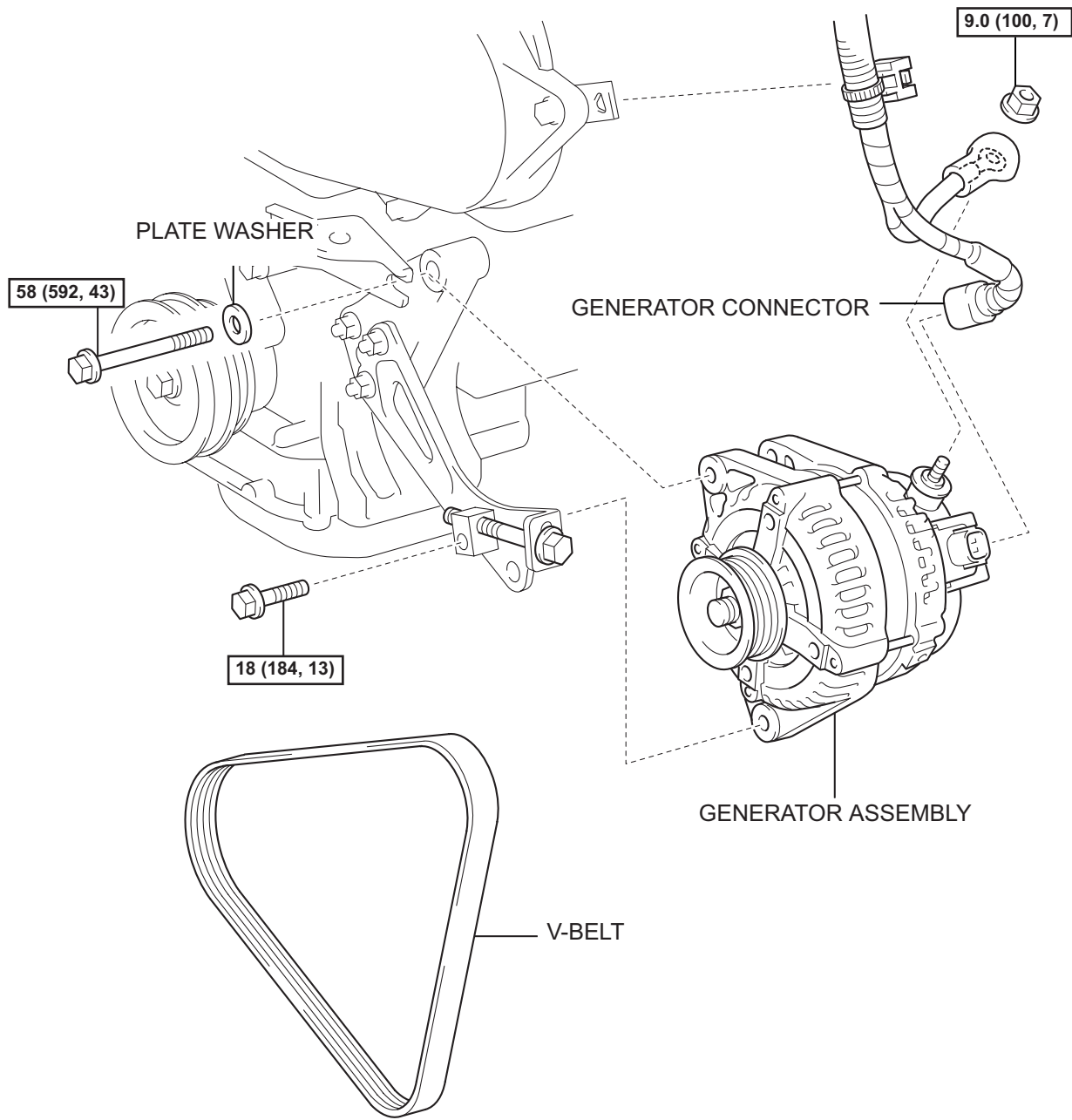
Standard amperage:

30 A or more

HINT:

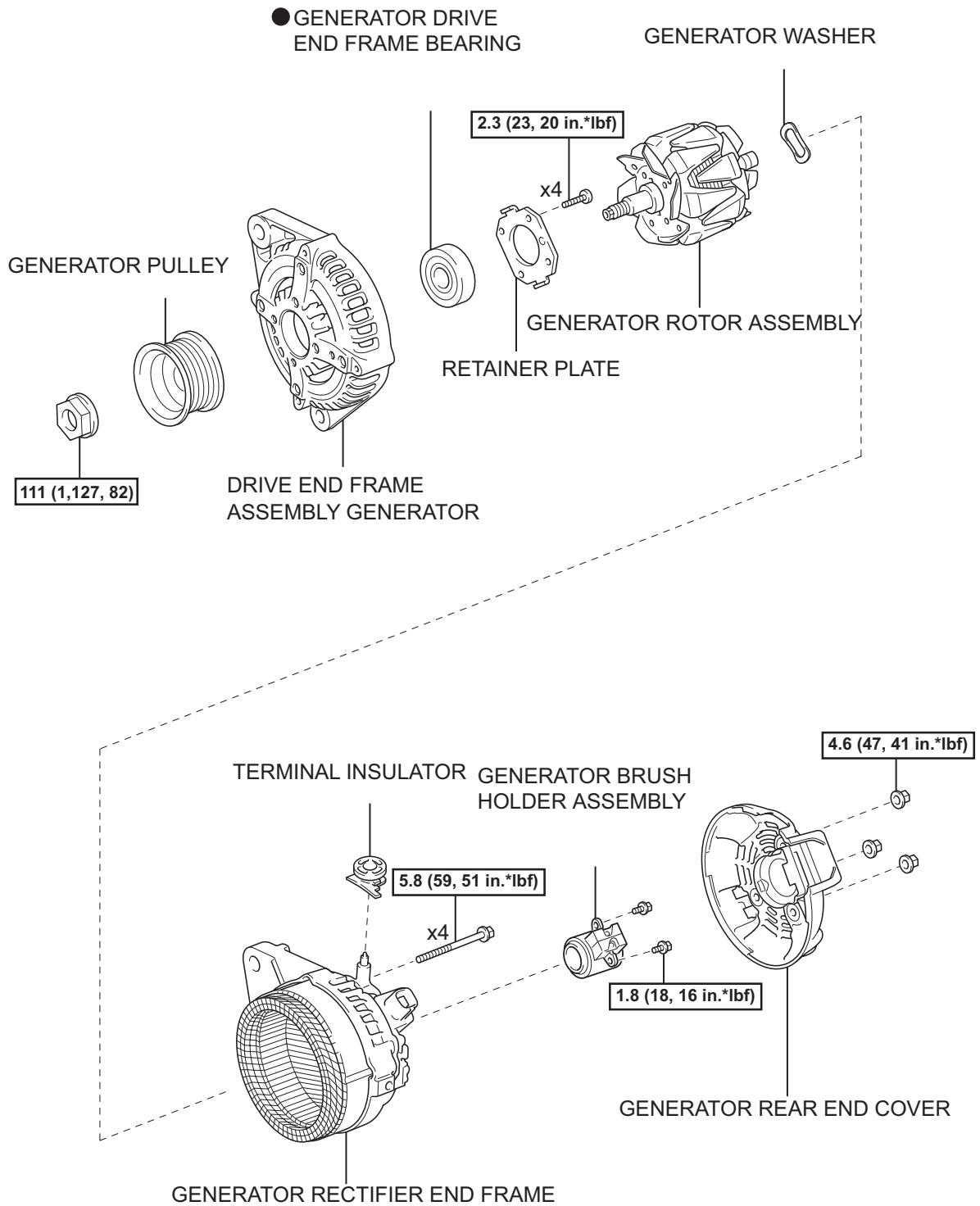
- If the ammeter reading is less than standard amperage, repair the generator.
- If the battery is fully charged, the indication will sometimes be less than standard amperage.

GENERATOR
COMPONENTS



N*m (kgf*cm, ft.*lbf) : Specified torque

100A GENERATOR:

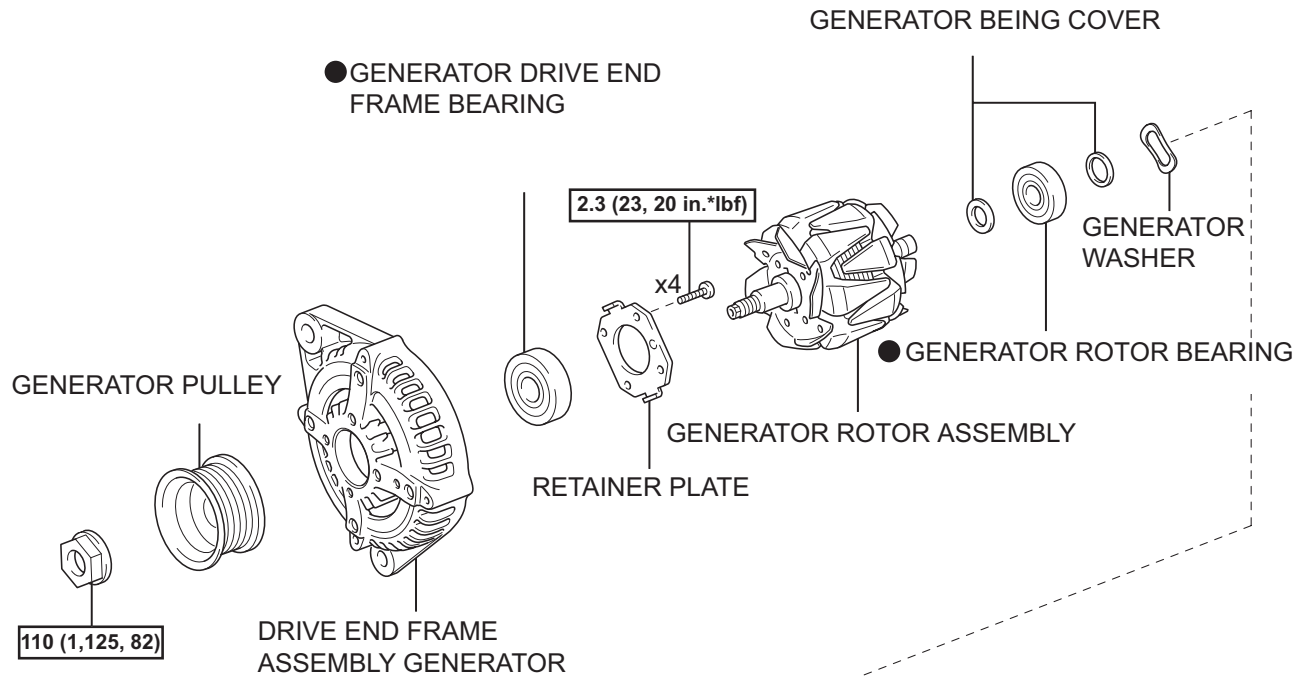


N*m (kgf*cm, ft.*lbf) : Specified torque

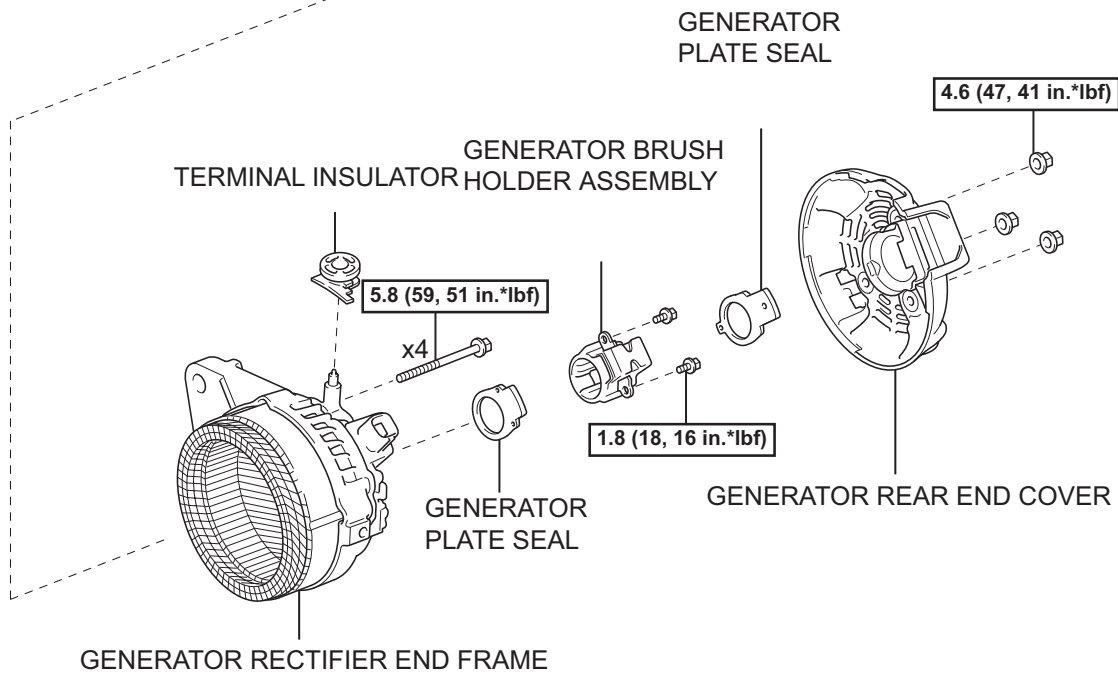
● Non-reusable part

CH

130A GENERATOR:



CH



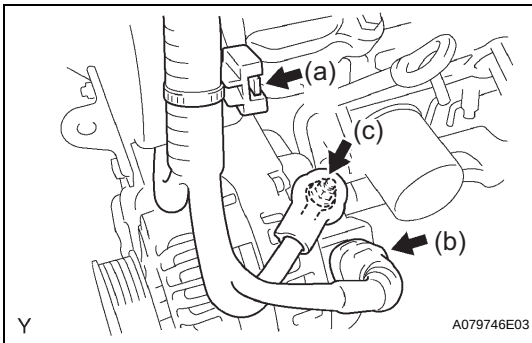
N*m (kgf*cm, ft.*lbf) : Specified torque

● Non-reusable part

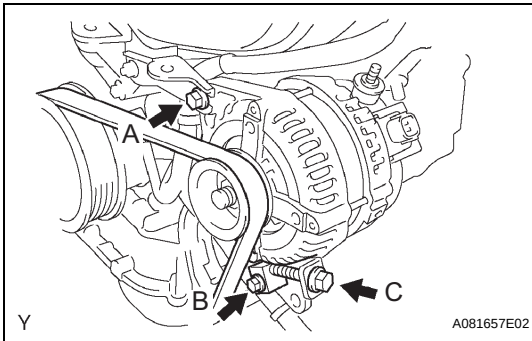
REMOVAL

1. REMOVE GENERATOR ASSEMBLY

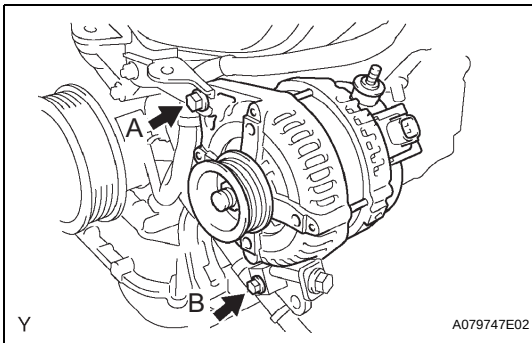
- (a) Remove the wire harness clamp.
- (b) Disconnect the generator connector.
- (c) Open the terminal cap, remove the nut and disconnect the generator wire.



- (d) Loosen bolts A and B.
- (e) Loosen bolt C to lessen the tension of the V belt No. 1.



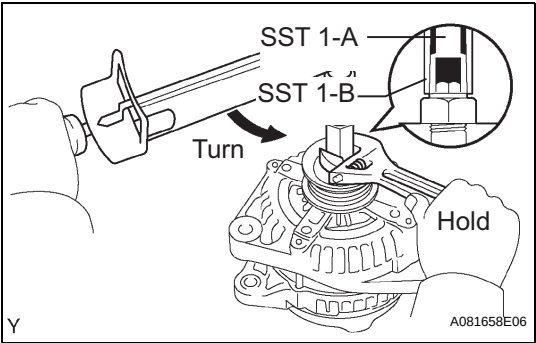
- (f) Remove bolts A and B, and then remove the generator.



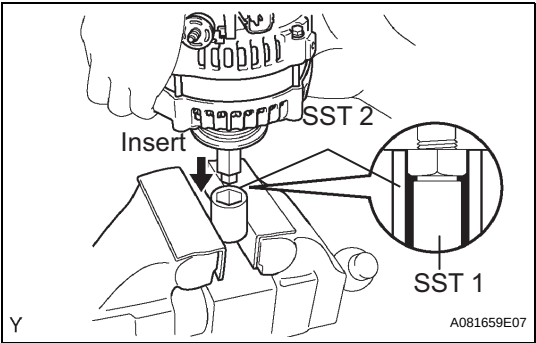
DISASSEMBLY

1. REMOVE GENERATOR PULLEY
SST 09820-63010 (09820-06010, 09820-06020)

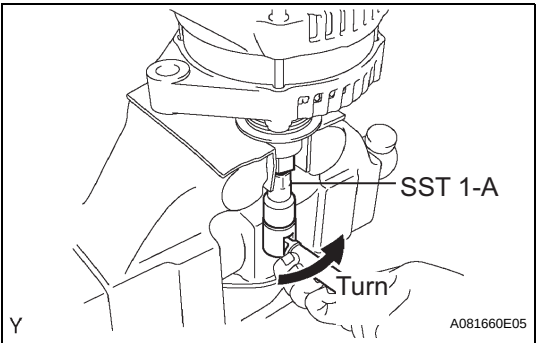
SST 1-A and B	09820-06010
SST 2	09820-06020



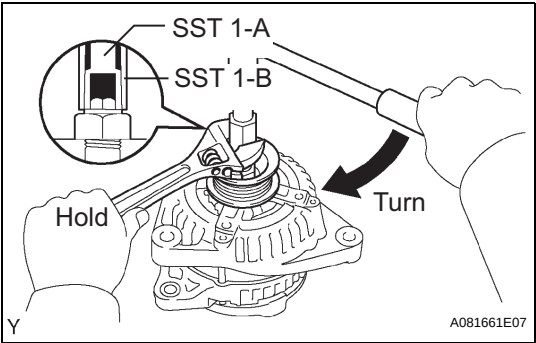
- (a) Hold SST 1-A with a torque wrench, and tighten SST 1-B clockwise with the specified torque.
Torque: 39 N*m (400 kgf*cm, 29 ft.*lbf)
NOTICE:
Check that SST is secured to the rotor shaft.



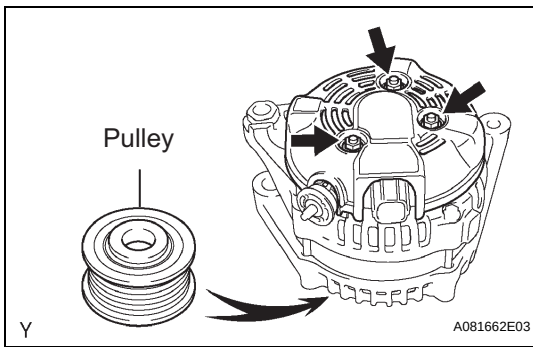
- (b) Clamp SST 2 in a vise.
(c) Insert SST 1-A and B into SST 2, and attach the pulley nut to SST 2.



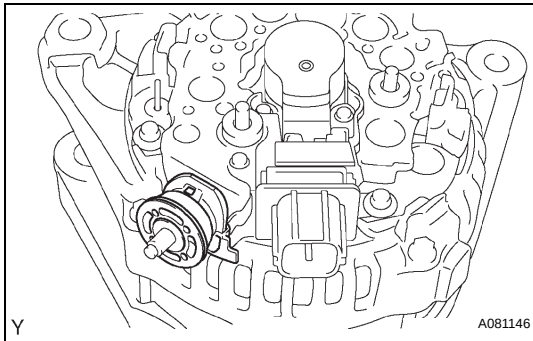
- (d) To loosen the pulley nut, turn SST 1-A in the direction shown in the illustration.
NOTICE:
To prevent damage to the rotor shaft, do not loosen the pulley nut more than one-half turn.
(e) Remove the generator from SST 2.



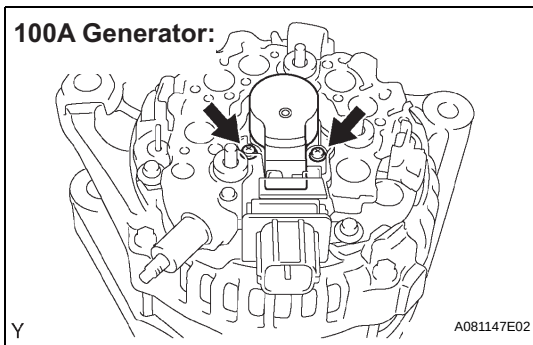
- (f) Turn SST 1-B, and remove SST 1-A and B.
(g) Remove the pulley nut, and then remove the generator pulley.

**2. REMOVE GENERATOR REAR END COVER**

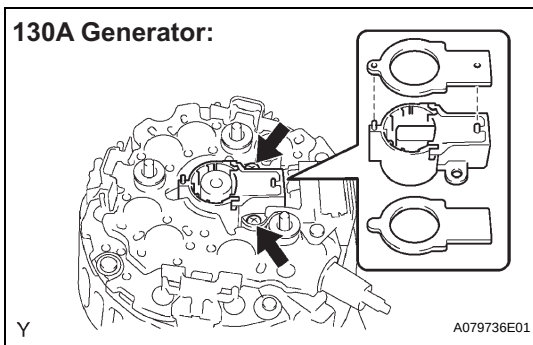
- (a) Place the generator on the generator pulley.
- (b) Remove the 3 nuts, and then remove the generator rear end cover.

**3. REMOVE TERMINAL INSULATOR**

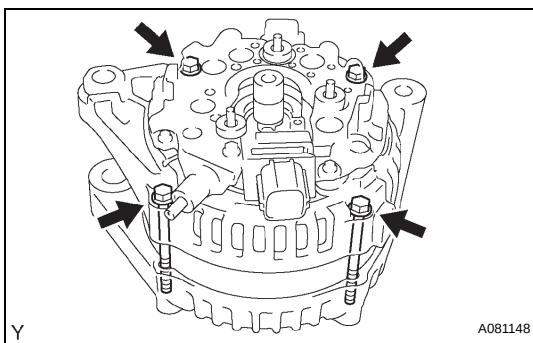
- (a) Remove the terminal insulator from the generator coil.

**4. REMOVE GENERATOR BRUSH HOLDER ASSEMBLY**

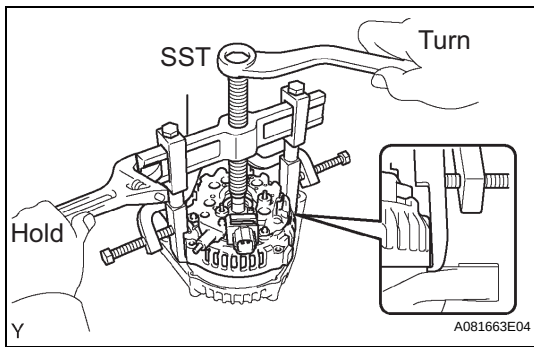
- (a) 100A Generator
 - (1) Remove the 2 screws, and then remove the generator brush holder.



- (b) 130A Generator
 - (1) Remove the generator plate seal.
 - (2) Remove the 2 screws, and then remove the generator brush holder.
 - (3) Remove the generator plate seal.

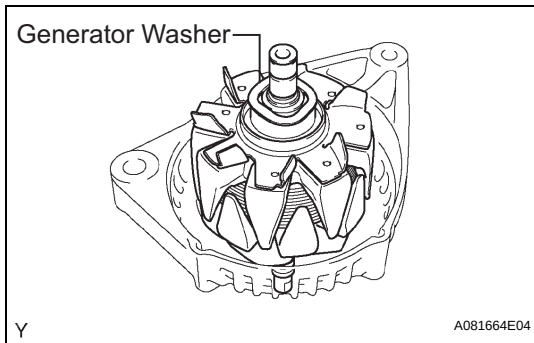
**5. REMOVE GENERATOR COIL ASSEMBLY**

- (a) Remove the 4 bolts.



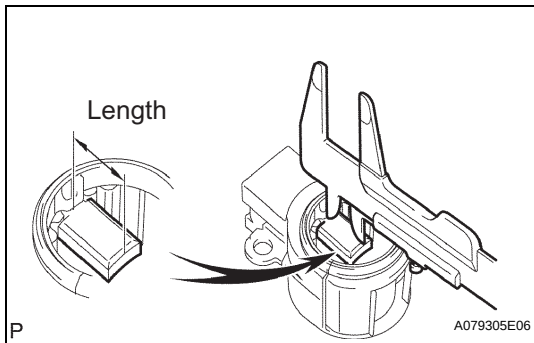
- (b) Using SST, remove the generator coil.

SST 09950-40011 (09951-04020, 09952-04010, 09953-04020, 09954-04010, 09955-04071, 09957-04010, 09958-04011)



6. REMOVE GENERATOR ROTOR ASSEMBLY

- (a) Remove the generator washer and the generator rotor.



INSPECTION

1. INSPECT GENERATOR BRUSH HOLDER ASSEMBLY

- (a) Check the brush length. (100A Generator)

- (1) Using vernier calipers, measure the exposed brush length.

Standard exposed brush length:

10.5 mm (0.413 in.)

Minimum exposed brush length:

4.5 mm (0.177 in.)

If the exposed brush length is less than minimum, replace the generator brush holder.

- (b) Check the brush length. (130A Generator)

- (1) Using vernier calipers, measure the exposed brush length.

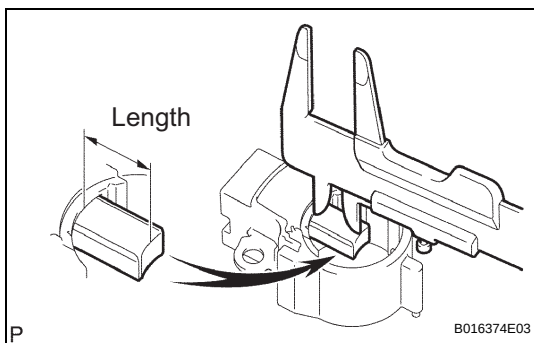
Standard exposed brush length:

10.5 mm (0.413 in.)

Minimum exposed brush length:

4.5 mm (0.177 in.)

If the exposed brush length is less than minimum, replace the generator brush holder.

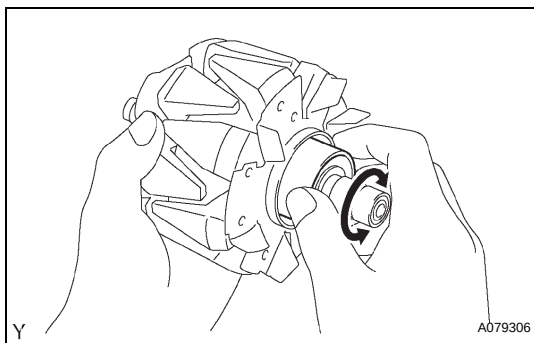


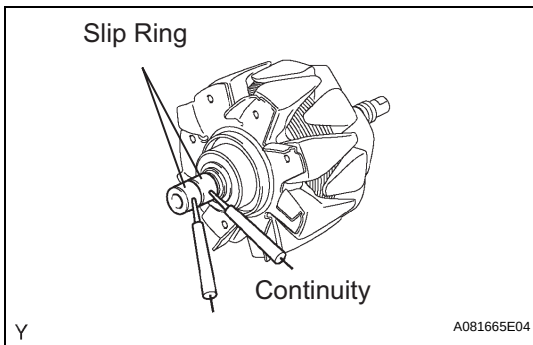
2. INSPECT GENERATOR ROTOR ASSEMBLY

- (a) Check that bearing is not rough or worn.

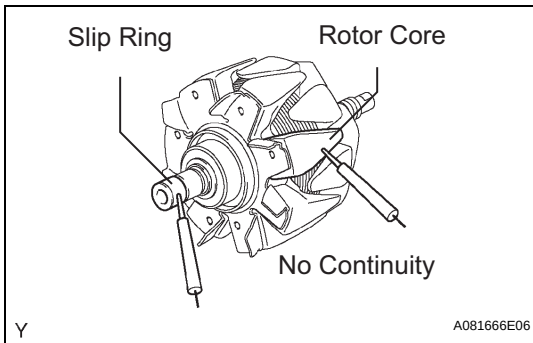
If necessary, replace the generator rotor. (100A Generator)

If necessary, replace the generator rotor bearing. (130A Generator)

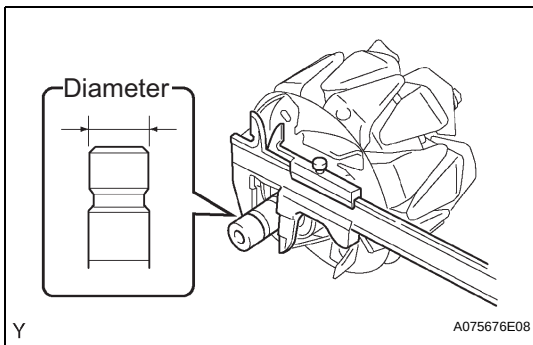




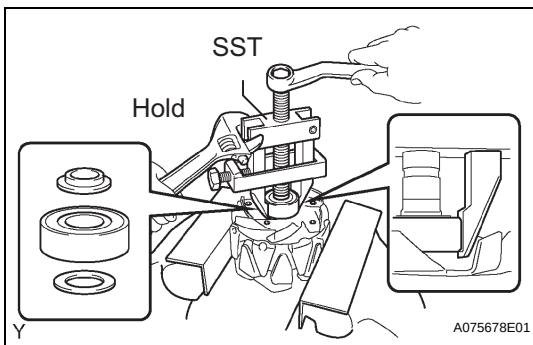
- (b) Check if the rotor has open circuit.
- Using an ohmmeter, measure the resistance between the slip ring.
- Resistance:**
2.3 to 2.7Ω at 20°C (68°F) for 100A Generator
1.5 to 1.9Ω at 20°C (68°F) for 130A Generator
- If the resistance is not as specified, replace the generator rotor.



- (c) Check if the rotor has ground.
- Using an ohmmeter, check that there is no continuity between the slip ring and rotor core. If there is continuity, replace the generator rotor.
- (d) Inspect slip rings.
- Check that the slip rings are not rough or scored. If rough or scored, replace the generator rotor.

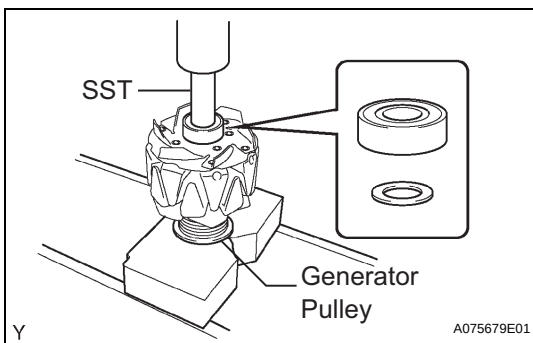


- (e) Check the slip ring diameter.
- Using vernier calipers, measure the slip ring diameter.
- Standard diameter:**
14.2 to 14.4 mm (0.559 to 0.567 in.)
Minimum diameter:
14.0 mm (0.551 in.)
- If the diameter is less than minimum, replace the generator rotor.



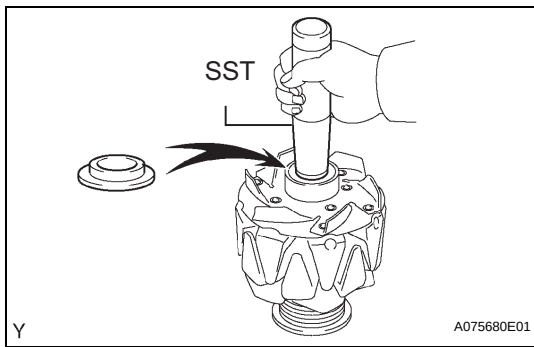
3. REMOVE GENERATOR ROTOR BEARING

- (a) 130A generator
- Using SST, remove the generator bearing cover (outside) and bearing.
- SST 09820-00021**
- NOTICE:**
Be careful not to damage the fan.
- Remove the generator bearing cover (inside).



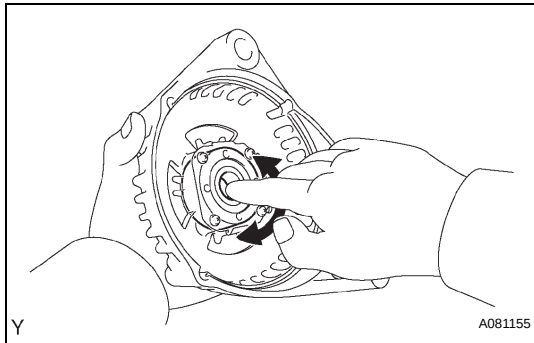
4. INSTALL GENERATOR ROTOR BEARING

- (a) 130A generator
- Place the generator rotor on the generator pulley.
 - Install the generator bearing cover (inside).
 - Using SST and a press, press in a new bearing.
- SST 09820-00031**



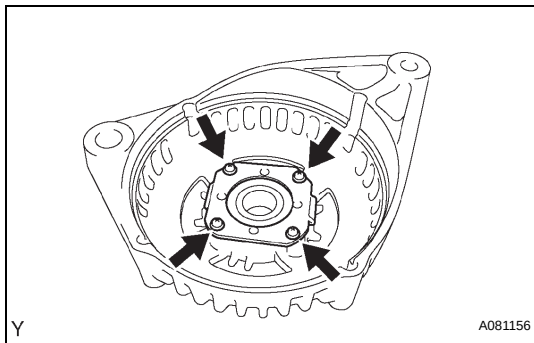
- (4) Using SST, push in the generator bearing cover (outside).

SST 09285-76010



5. INSPECT GENERATOR DRIVE END FRAME BEARING

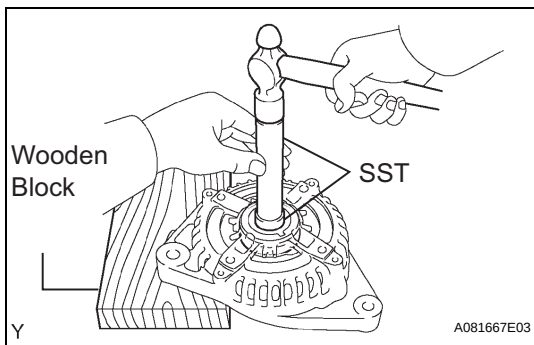
- (a) Check that bearing is not rough or worn.
If necessary, replace the bearing.



REASSEMBLY

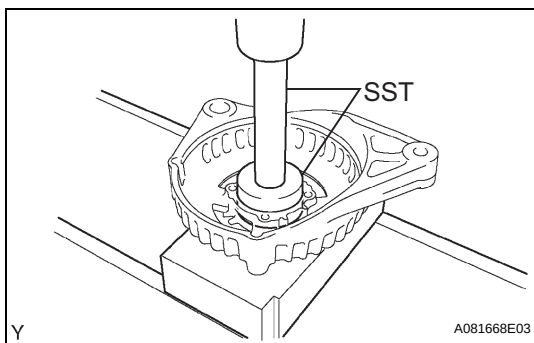
1. REMOVE GENERATOR DRIVE END FRAME BEARING

- (a) Remove the 4 screws, and remove the retainer plate.



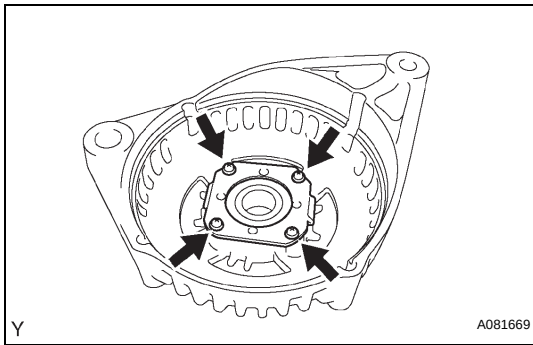
- (b) Using SST, tap out the bearing.

SST 09950-60010 (09951-00250), 09950-70010 (09951-07100)



2. INSTALL GENERATOR DRIVE END FRAME BEARING

- (a) Using SST and a press, press in a new bearing.



- (b) Install the retainer plate with the 4 screws.

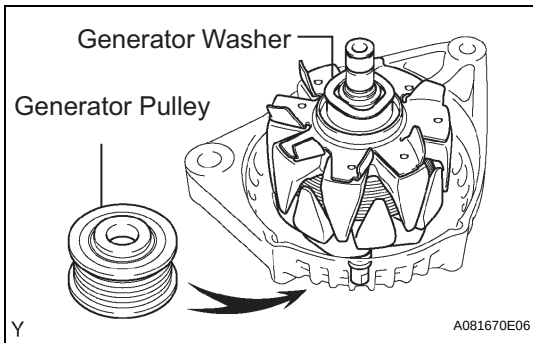
Torque: 2.3 N*m (23 kgf*cm, 20 in.*lbf)

SST 09950-60010 (09951-00470), 09950-70010 (09951-07100)

3. INSTALL GENERATOR ROTOR ASSEMBLY

- (a) Place the generator drive end frame on the generator pulley.

- (b) Install the generator rotor and the generator washer.



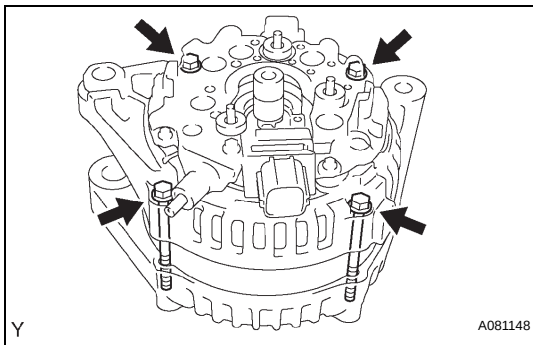
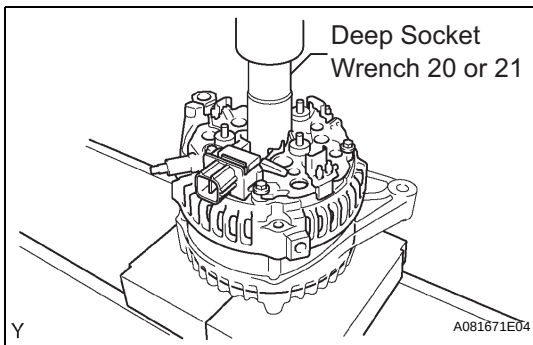
4. INSTALL GENERATOR COIL ASSEMBLY

- (a) 100A Generator

- (1) Using deep socket wrench 21 and a press, press in the coil carefully.

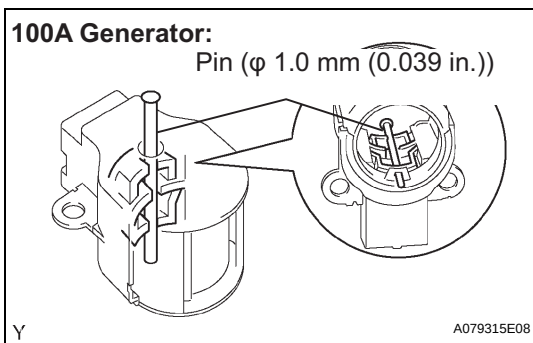
- (b) 130A Generator

- (1) Using deep socket wrench 20 and a press, press in the coil carefully.



- (c) Tighten the 4 bolts.

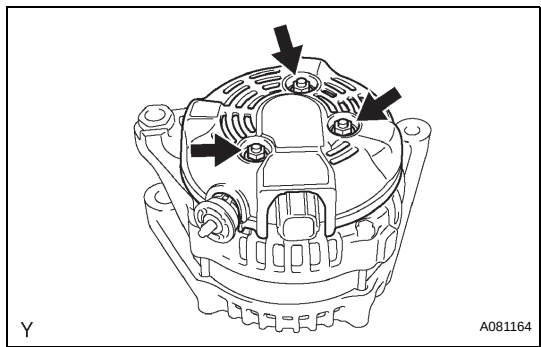
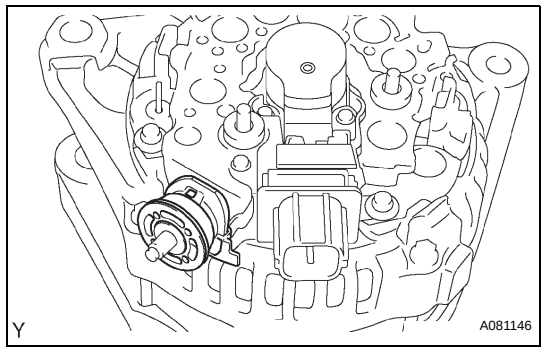
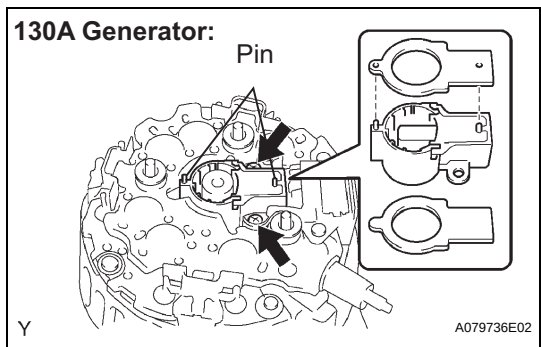
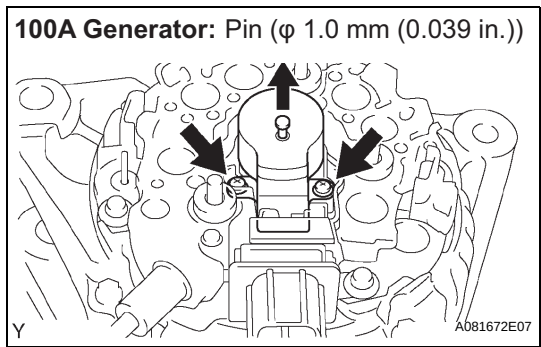
Torque: 5.8 N*m (59 kgf*cm, 51 in.*lbf)



5. INSTALL GENERATOR BRUSH HOLDER ASSEMBLY

- (a) 100A Generator

- (1) While pushing the 2 brushes to inside the brush holder, insert a pin (ϕ 1.0 mm (0.039 in.)) into the brush holder hole.



- (2) Install the generator brush holder with the 2 screws.
Torque: 1.8 N*m (18 kgf*cm, 16 in.*lbf)
- (3) Pull out the pin (ϕ 1.0 mm (0.039 in.)) from the generator brush holder.

- (b) 130A Generator
- (1) Install the generator plate seal (inside).
(2) Place the generator brush holder with the pin facing upward.
NOTICE:
Be careful of the generator brush holder installing direction.
- (3) Tighten the 2 screws.
Torque: 1.8 N*m (18 kgf*cm, 16 in.*lbf)
- (4) Align the pins of the generator brush holder with the holes of the generator plate seal (outside), and install the generator plate seal (outside).

6. INSTALL TERMINAL INSULATOR

- (a) Install the terminal insulator.
NOTICE:
Pay attention the mounting orientation of the terminal insulator.

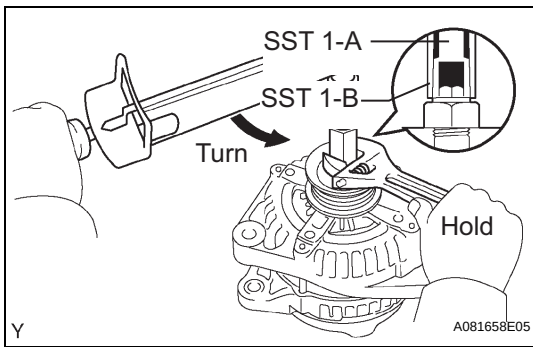
7. INSTALL GENERATOR REAR END COVER

- (a) Install the generator rear end cover with the 3 nuts.
Torque: 4.6 N*m (47 kgf*cm, 41 in.*lbf)

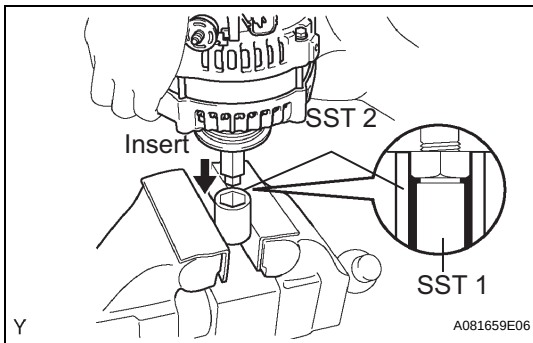
8. INSTALL GENERATOR PULLEY

SST 09820-63010 (09820-06010, 09820-06020)

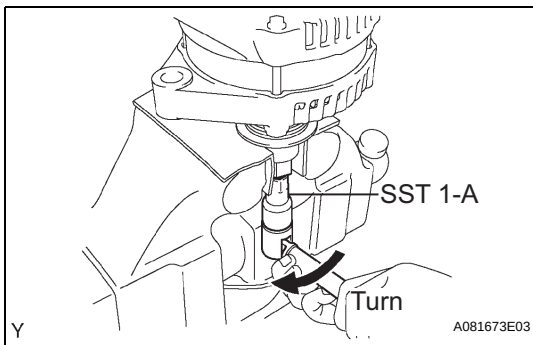
SST 1-A and B	09820-06010
SST 2	09820-06020



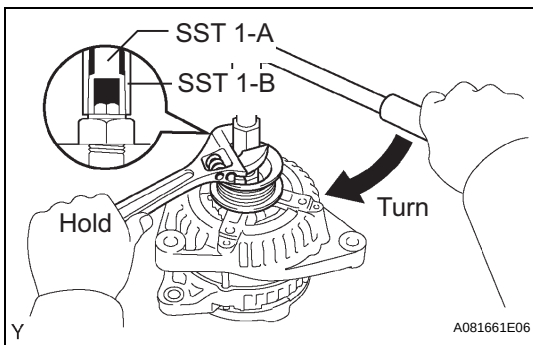
- (a) Install the generator pulley to the rotor shaft by tightening the generator pulley nut by hand.
- (b) Hold SST 1-A with a torque wrench, and tighten SST 1-B clockwise with the specified torque.
Torque: 39 N*m (400 kgf*cm, 29 ft.*lbf)
NOTICE:
Check that SST is secured to the rotor shaft.



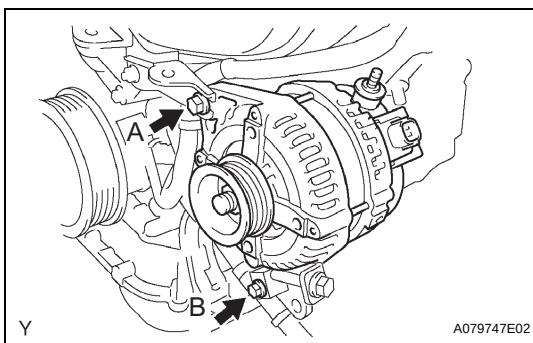
- (c) Clamp SST 2 in a vise.
- (d) Insert SST 1-A and B into SST 2, and attach the generator pulley nut to SST 2



- (e) Tighten the generator pulley nut by turning SST 1-A in the direction shown in the illustration.
Torque: 111 N*m (1,125 kgf*cm, 81 ft.*lbf)
- (f) Remove the generator from SST 2.



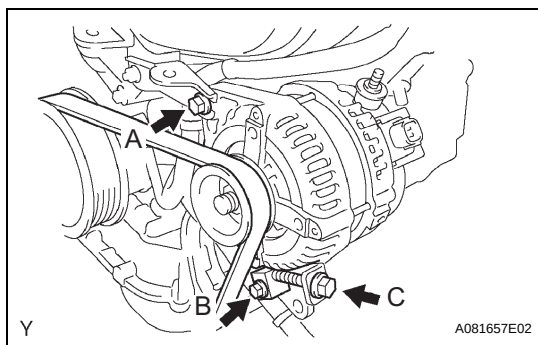
- (g) Turn SST 1-B, and remove SST 1-A, B.
- (h) Turn the generator pulley, and check that the generator pulley moves smoothly.



INSTALLATION

1. INSTALL GENERATOR ASSEMBLY

- (a) Temporarily install the generator with bolts A and B.



- (b) Adjust the V belt No. 1 tension by tightening bolt C
(See page [EM-1](#)).
- (c) Tighten bolts A and B
Torque: Bolt A
58 N*m (592 kgf*cm, 43 ft.*lbf)
Bolt B
18 N*m (184 kgf*cm, 13 ft.*lbf)
- (d) Install the generator wire with the nut.
Torque: 9.8 N*m (100 kgf*cm, 7 ft.*lbf)
- (e) Connect the generator connector.
- (f) Install the wire harness clamp.

2. INSPECT DRIVE BELT (See page [EM-1](#))