

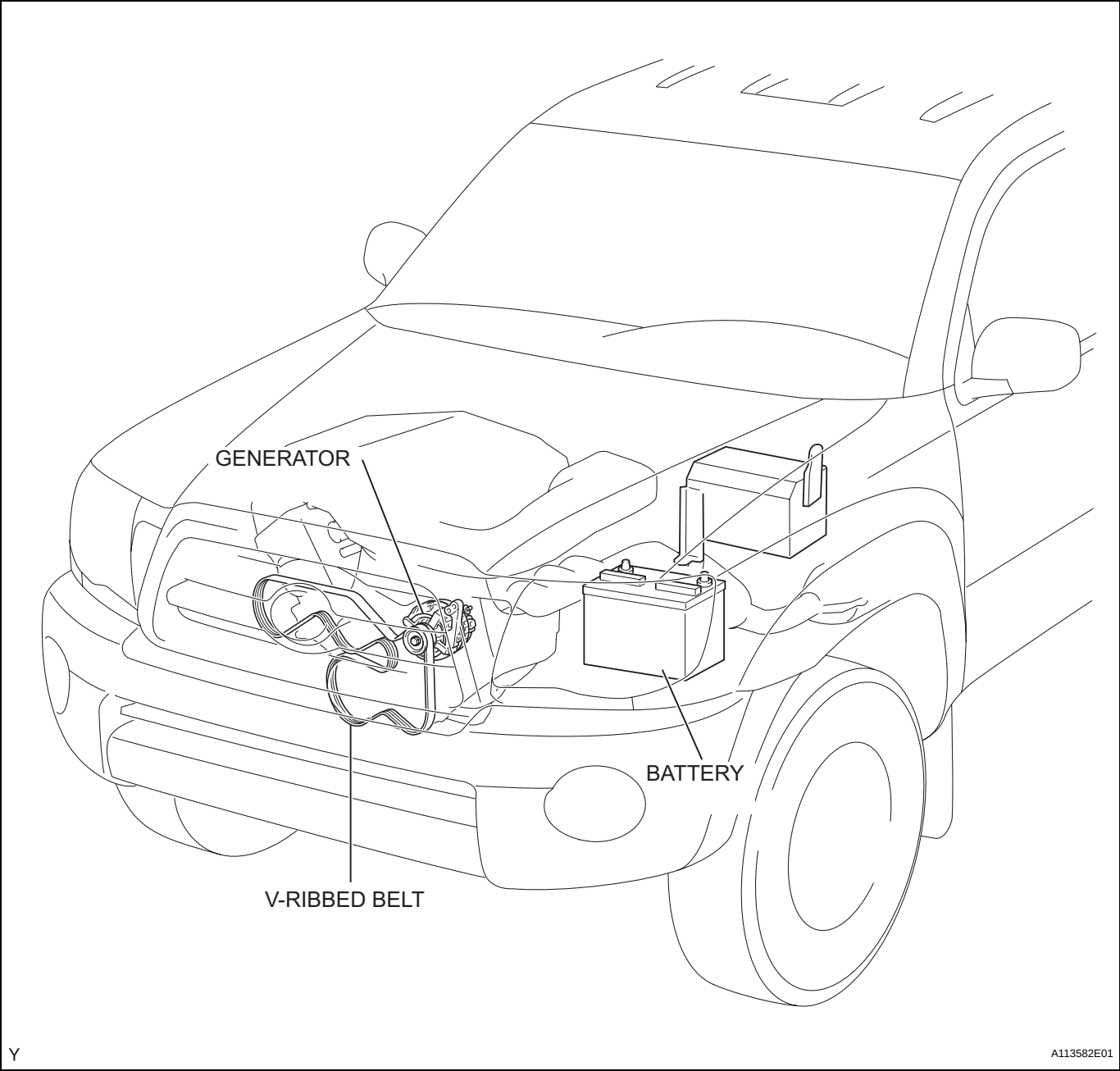
CHARGING SYSTEM

PRECAUTION

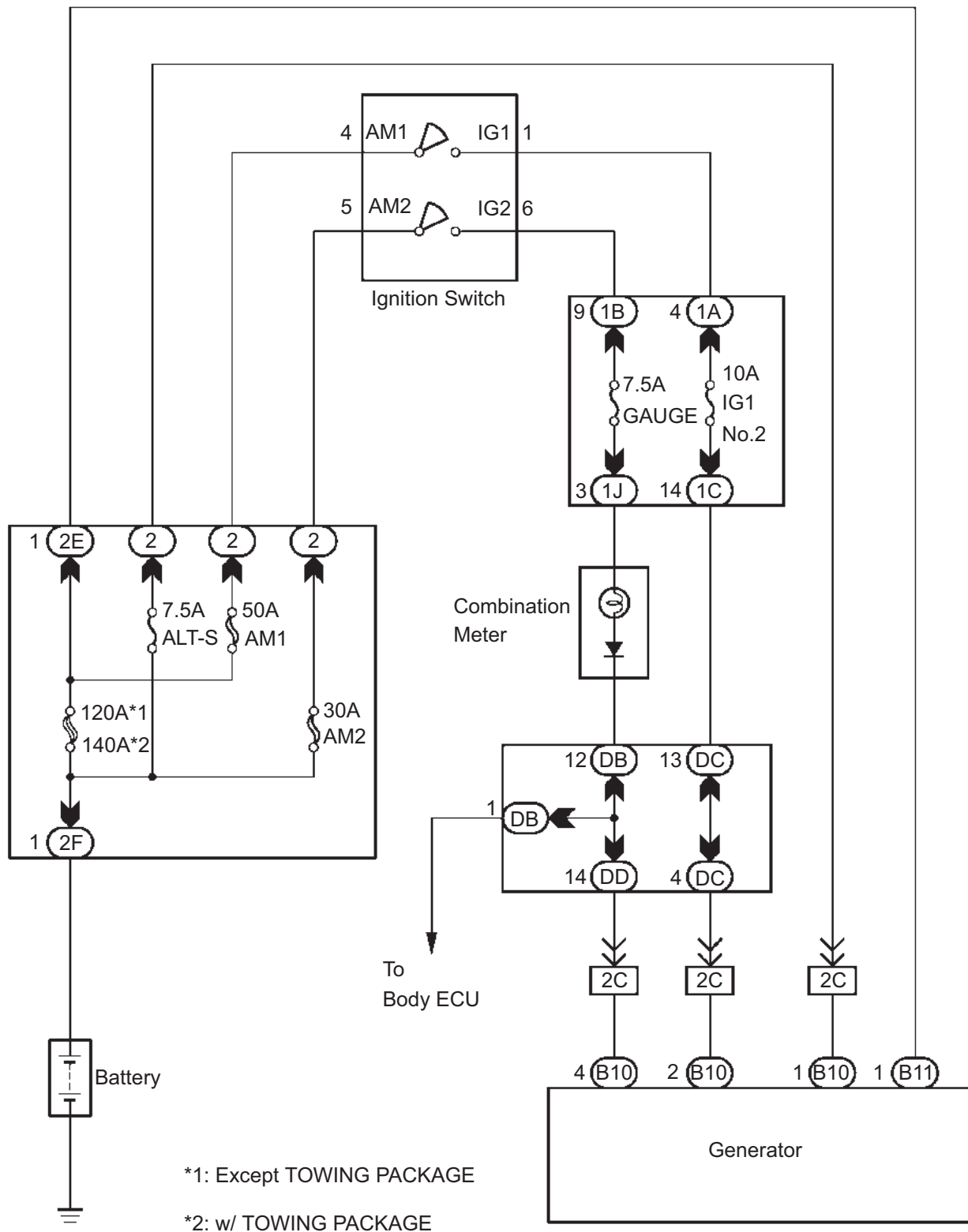
1. PRECAUTION

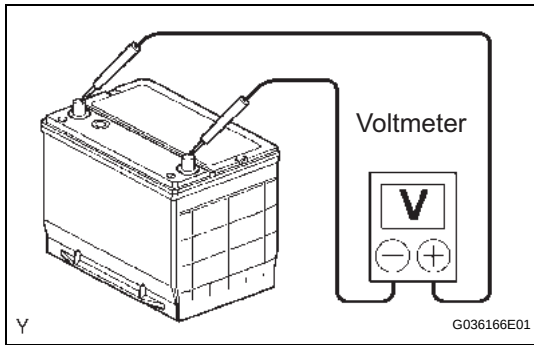
- (a) Check that the battery cables are connected to the correct terminals.
- (b) Disconnect the battery cables if the battery is charged quickly.
- (c) Do not perform tests using a high voltage insulation resistance tester.
- (d) Never disconnect the cable from the battery while the engine is running.
- (e) Check that the charging cables are tightly connected to terminals B of the generator and the fuse box.
- (f) Do not check whether the generator generates current or not while terminal F is connected to the other terminals.

PARTS LOCATION



SYSTEM DIAGRAM





ON-VEHICLE INSPECTION

1. INSPECT BATTERY (for Maintenance Free Battery)

(a) Check the voltage.

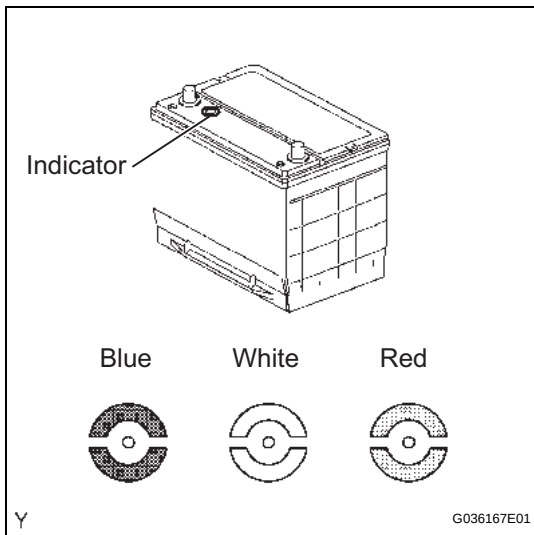
- (1) If it has been less than 20 minutes since you stopped driving the vehicle or since the engine was stopped, turn the ignition switch and electrical systems (headlight, blower motor, rear defogger etc.) to the ON position for 60 seconds. This will remove the surface charge on the battery.
- (2) Turn the ignition switch to OFF.
- (3) Turn the electrical systems to OFF.
- (4) Using a voltmeter, measure the battery voltage between the negative (-) and positive (+) terminals of the battery.

Standard:

12.6 to 12.9 V at 20°C(68°F)

If the result is not as specified, replace the battery.

(b) Check the indicator is as shown in the illustration.



Indicator Color	Condition
Blue	Ready
White	Charging Necessary
Red	Have battery checked by your Toyota dealer

2. INSPECT BATTERY TERMINALS, FUSIBLE LINK AND FUSES

(a) Visually check the battery terminals.

- (1) Check that the battery terminals are not loose or corroded.

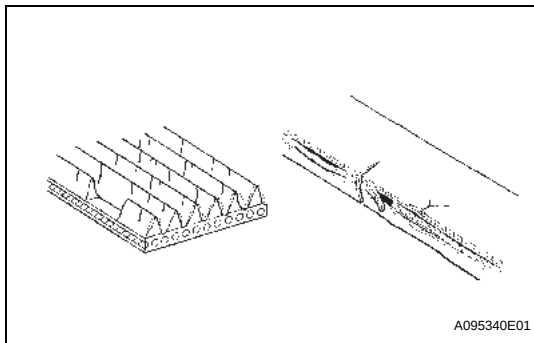
(b) Visually check the fusible link and fuses.

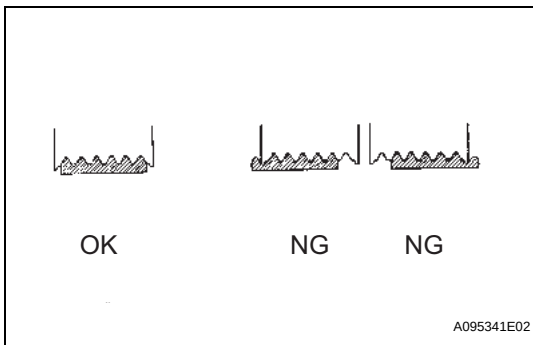
- (1) Check that there is continuity between the fusible links, high current fuses and regular fuses.

3. INSPECT DRIVE BELT

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

- If any defects are found, replace the V-ribbed belt.
- Cracks on the rib side of the belt are considered acceptable. If the belt has chunks missing from the ribs, it should be replaced.





- (b) Check that the belt fits properly in the ribbed grooves. Confirm by hand that the belt has not slipped out of the grooves on the bottom of the pulley.

4. INSPECT GENERATOR WIRING

- (a) Visually check the generator wiring.
(1) Check that the wiring is in good condition.

5. INSPECT ABNORMAL NOISES

- (a) Listen for abnormal noises from the generator.
(1) Check that no abnormal noises are heard from the generator while the engine is running.

6. INSPECT CHARGING WARNING LIGHT CIRCUIT

- (a) Turn the ignition switch to ON. Check that the charge warning light comes on.
(b) Start the engine and check that the light goes off. If the light does not operate as specified, troubleshoot the charge warning light circuit.

7. INSPECT CHARGING CIRCUIT WITHOUT LOAD

- (a) If a tester is not available, connect a voltmeter and ammeter to the charging circuit as follows.
(1) Disconnect the wire from terminal B of the generator, then 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) Maintain the engine speed at 2,000 rpm and check the reading on the ammeter and voltmeter.

Standard:

10 A or less for amperage

13.2 to 14.8 V for voltage

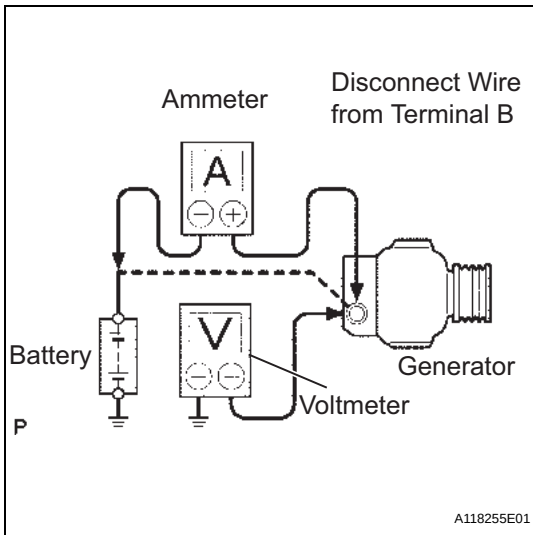
8. INSPECT CHARGING CIRCUIT WITH LOAD

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

Standard:

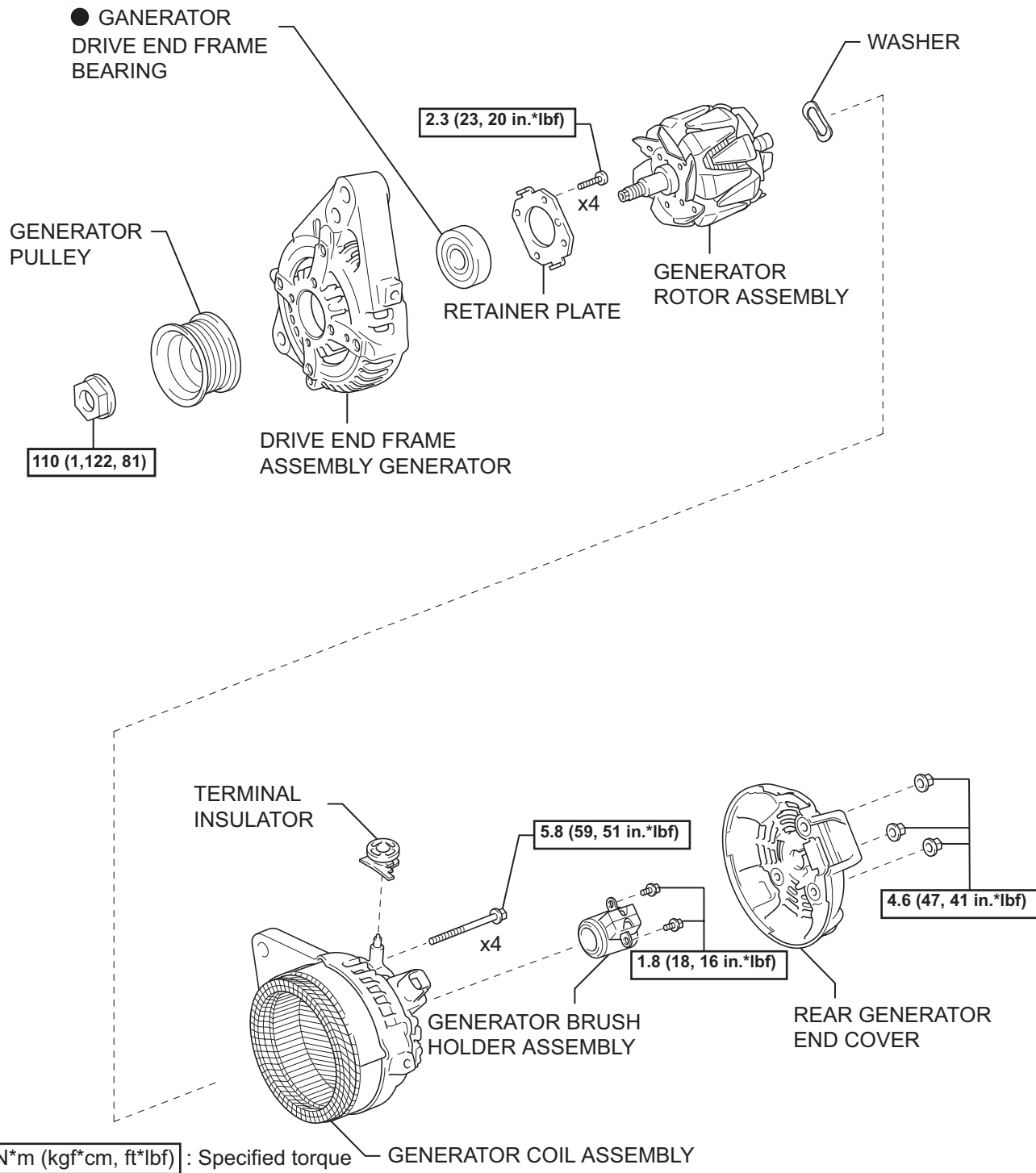
30 A or more

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



GENERATOR (for DENSO Made)

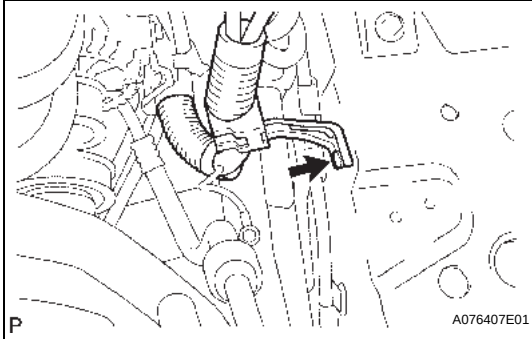
COMPONENTS



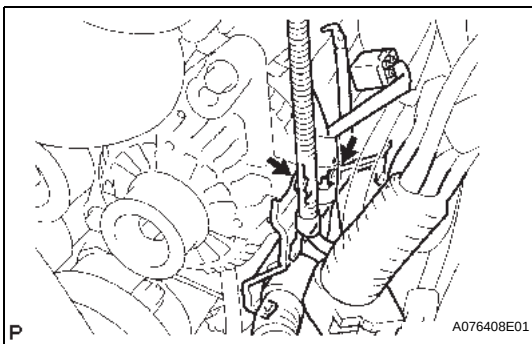
● Non-reusable part

REMOVAL

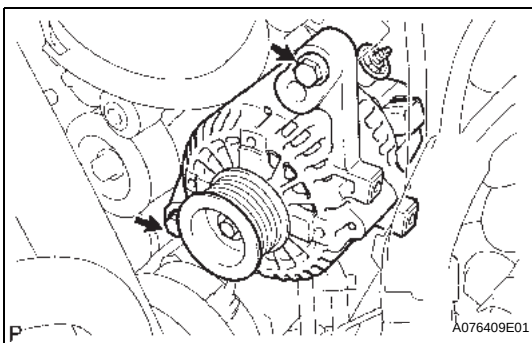
1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL
2. REMOVE V-BANK COVER (See page [ES-414](#))
3. REMOVE RADIATOR SUPPORT TO FRAME SEAL LH (See page [CO-15](#))
4. REMOVE FAN SHROUD (See page [CO-15](#))
5. REMOVE GENERATOR ASSEMBLY



- (a) Disconnect the wire harness.
 - (1) Remove the bolt and wire harness stay.
 - (2) Disconnect the connector from the generator assembly.
 - (3) Remove the terminal cap and nut.
 - (4) Disconnect the wire harness from terminal B.



- (b) Remove the 2 bolts, then separate the wire harness clamp bracket from the generator assembly.



- (c) Remove the 2 bolts, then remove the generator assembly.

DISASSEMBLY

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

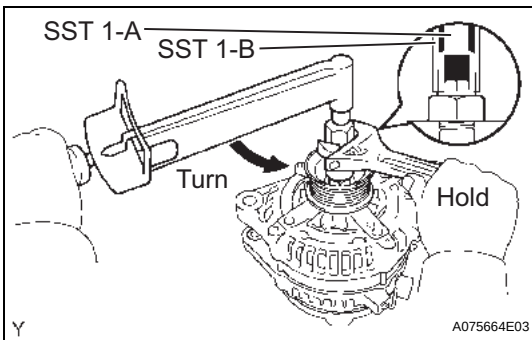
SST 1-A and B	09820-06010
SST 2	09820-06020

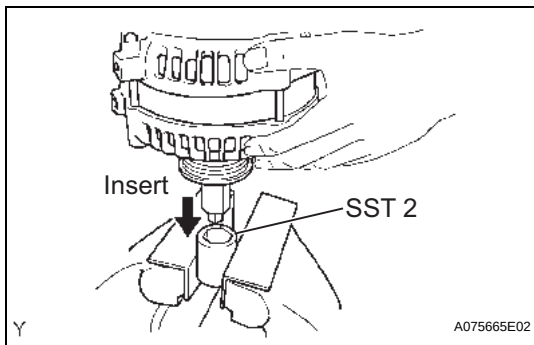
- (a) Hold SST 1-A with a torque wrench, and tighten SST 1-B clockwise to the specified torque.

Torque: 39 N*m (400 kgf*cm, 29 ft.*lbf)

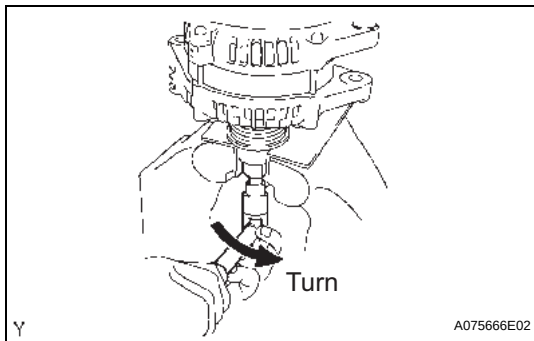
NOTICE:

Check that SST is secured on the rotor shaft.





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

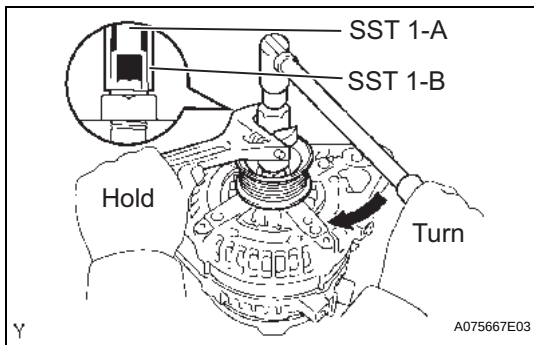


- (d) To loosen the pulley nut, turn SST 1-A in the direction shown in the illustration.

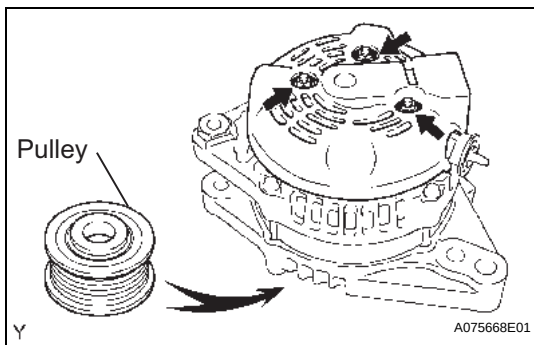
NOTICE:

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.

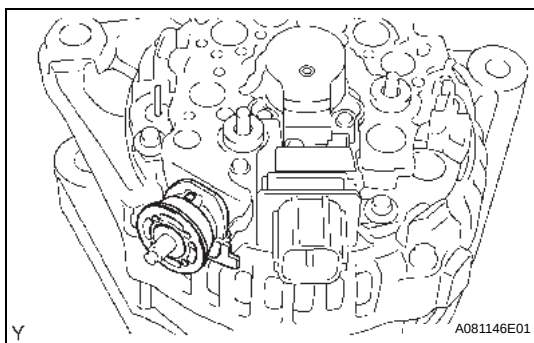


- (f) Turn SST 1-B, and remove SST 1-A and B.
- (g) Remove the pulley nut and pulley.

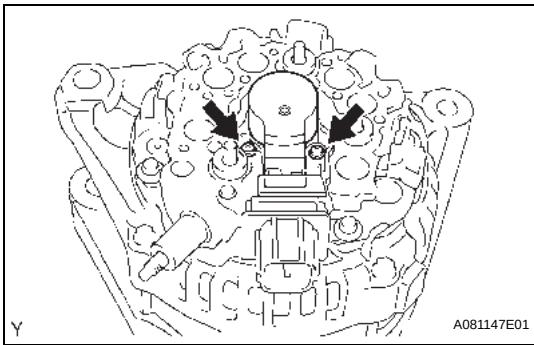


2. REMOVE REAR GENERATOR END COVER

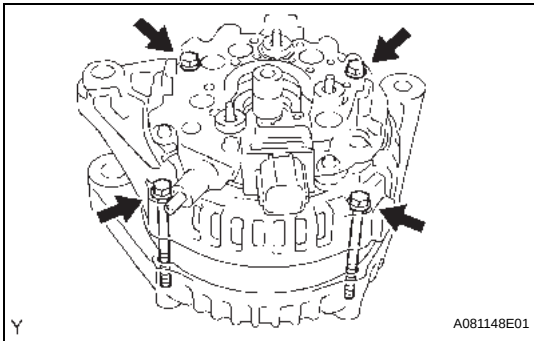
- (a) Place the generator on the pulley.
- (b) Remove the 3 nuts, then remove the rear end cover.



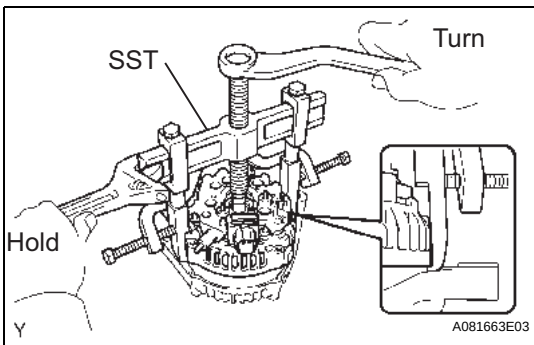
3. REMOVE TERMINAL INSULATOR

**4. REMOVE GENERATOR BRUSH HOLDER ASSEMBLY**

- (a) Remove the plate seal.
- (b) Remove the 2 nuts, then remove the brush holder.
- (c) Remove the plate seal.

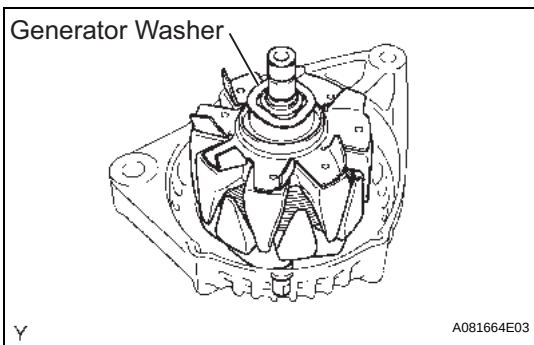
**5. REMOVE GENERATOR COIL ASSEMBLY**

- (a) Remove the 4 bolts.

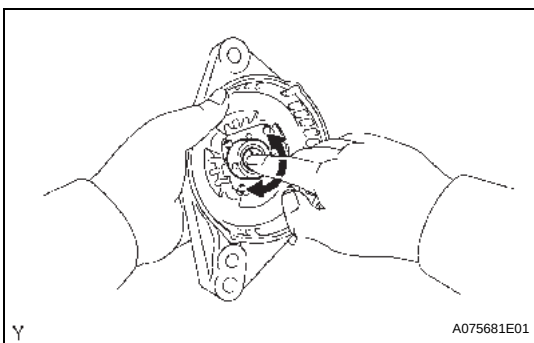


- (b) Using SST, remove the coil.

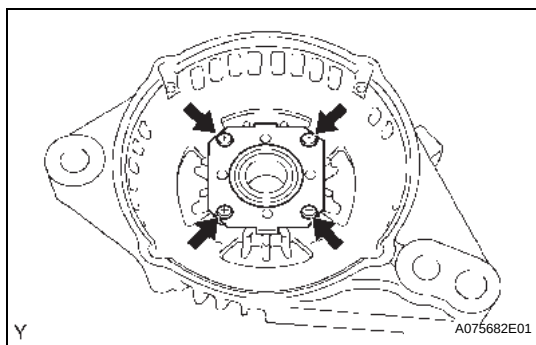
SST 09950-40011 (09951-04020, 09952-04010, 09953-04020, 09954-04010, 09955-04071, 09957-04010, 09958-04011)

**6. REMOVE GENERATOR ROTOR ASSEMBLY**

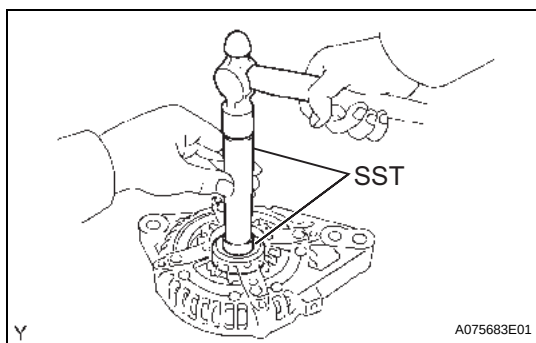
- (a) Remove the generator washer and the generator rotor.

**7. REMOVE GENERATOR DRIVE END FRAME BEARING**

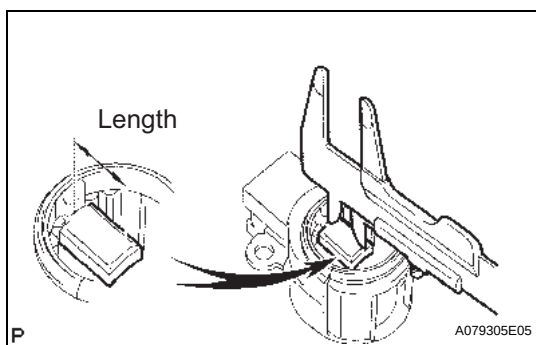
- (a) Check the bearing whether it is rough or worn. If necessary, replace the bearing.



- (b) Remove the 4 screws, then remove the retainer plate.



- (c) Using SST, tap out the bearing.
SST 09950-60010 (09951-00250), 09950-70010 (09951-07100)



INSPECTION

1. INSPECT GENERATOR BRUSH HOLDER ASSEMBLY

- (a) 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 the minimum, replace the brush holder.

2. INSPECT GENERATOR ROTOR ASSEMBLY

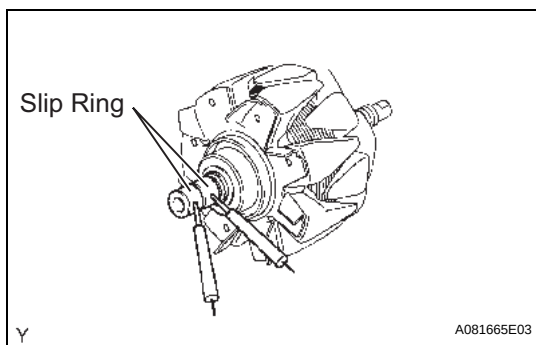
- (a) Check the rotor for an open circuit.

- (1) Using an ohmmeter, measure the resistance between the slip rings.

Standard:

2.3 to 2.7Ω at 20°C(68°F)

If the result is not as specified, replace the rotor.



- (b) Check the rotor for ground.

- (1) Using an ohmmeter, measure the resistance between the slip ring and rotor.

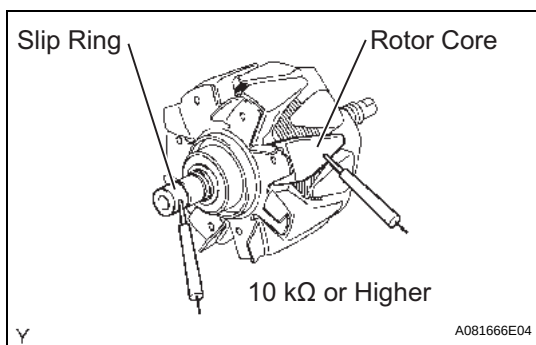
Standard:

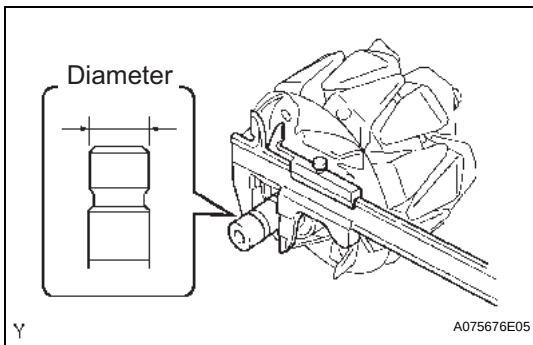
10 kΩ or higher

If the result is not as specified, replace the rotor.

- (c) Inspect the slip rings.

- (1) Check that the slip rings are not rough or scored. If rough or scored, replace the rotor.





- (2) Using vernier calipers, measure the slip ring diameter.

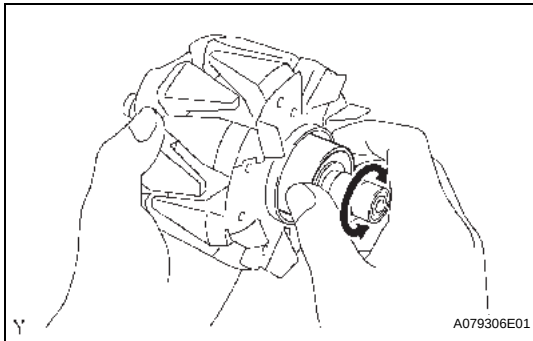
Standard diameter:

14.2 to 14.4 mm (0.559 to 0.567 in.)

Minimum diameter:

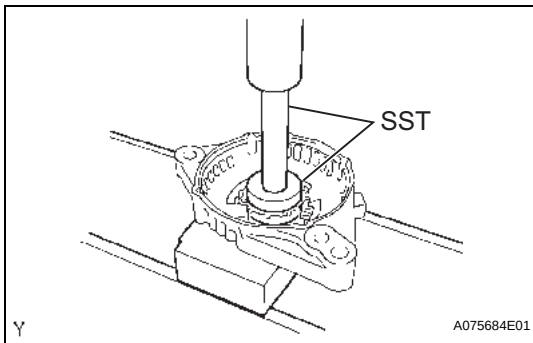
14.0 mm (0.551 in.)

If the diameter is less than the minimum, replace the rotor.



3. INSPECT GENERATOR ROTOR BEARING

- (a) Check the bearing whether it is rough or worn. If necessary, replace the generator rotor.



REASSEMBLY

1. INSTALL GENERATOR DRIVE END FRAME BEARING

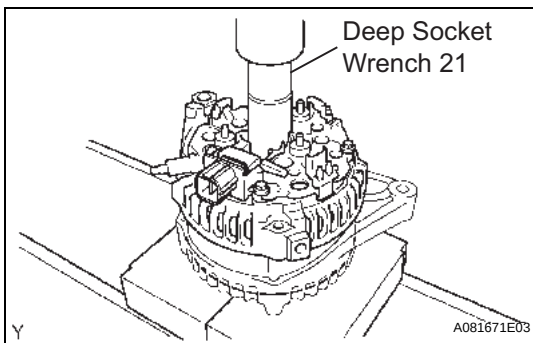
- (a) Using SST and a press, press in a new bearing.
SST 09950-60010 (09951-00250), 09950-70010 (09951-07100)
- (b) Install the retainer plate with the 4 screws.
Torque: 2.2 N*m (22 kgf*cm, 19 in.*lbf)

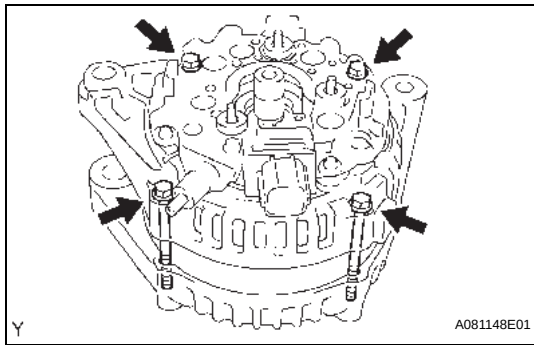
2. INSTALL GENERATOR ROTOR ASSEMBLY

- (a) Place the drive end frame on the rotor.
 (b) Install the rotor and washer.

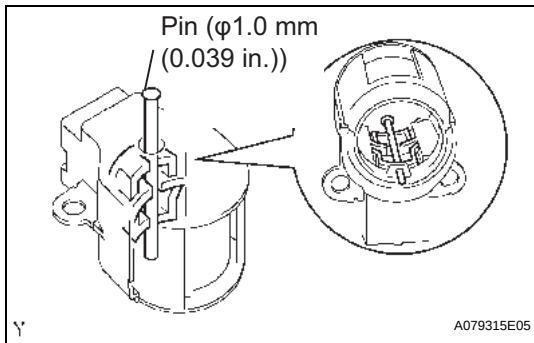
3. INSTALL GENERATOR COIL ASSEMBLY

- (a) Using a deep socket wrench 21 and a press, in the generator rectifier end frame carefully.



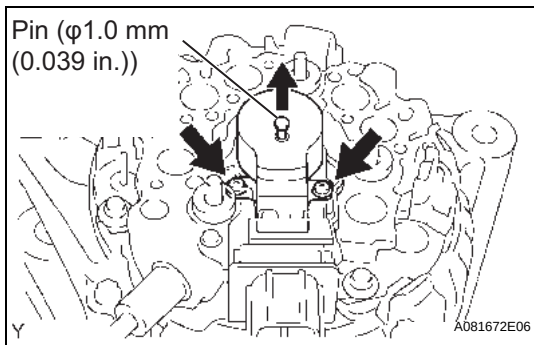


- (b) Install the 4 bolts.
Torque: 5.8 N*m (59 kgf*cm, 51 in.*lbf)

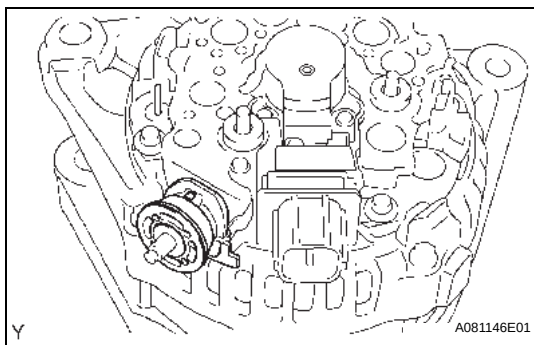


4. INSTALL GENERATOR BRUSH HOLDER ASSEMBLY

- (a) While pushing the 2 brushes to inside the brush holder, insert a pin (φ1.0 mm (0.039 in.)) into the brush holder hole.



- (b) Install the generator brush holder with the 2 screws.
Torque: 1.8 N*m (18 kgf*cm, 16 in.*lbf)
 (c) Pull out the pin (φ1.0 mm (0.039 in.)) from the generator brush hold.



5. INSTALL TERMINAL INSULATOR

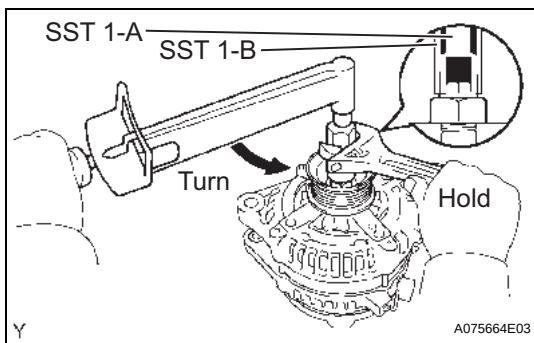
- (a) Install the terminal insulator to the generator rectifier end frame.

NOTICE:

Pay attention the mounting orientation of the terminal insulator.

6. INSTALL REAR GENERATOR END COVER

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



7. INSTALL GENERATOR PULLEY

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

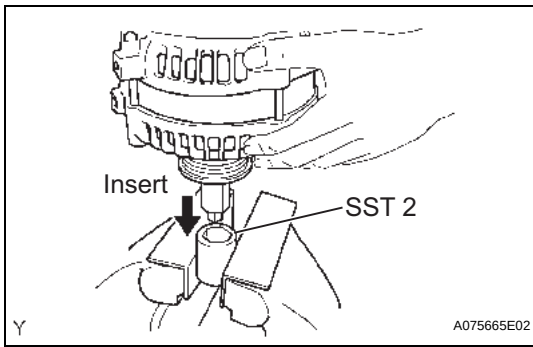
HINT:

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

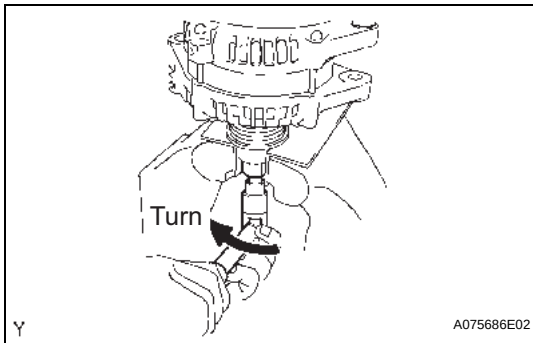
- (a) Install the pulley onto the rotor shaft by tightening the pulley nut by hand.
 (b) Hold SST 1-A with a torque wrench, and tighten SST 1-B clockwise to the specified torque.
Torque: 39 N*m (400 kgf*cm, 29 ft.*lbf)

NOTICE:**Check that SST is secured to the rotor shaft.**

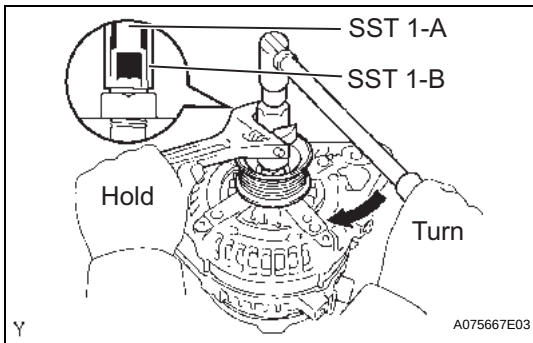
- (c) Mount SST 2 in a vise.
- (d) Insert SST 1-A and B into SST 2, and attach the pulley nut to SST 2.



- (e) Tighten the 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 and B.
- (h) Turn the pulley and check that the pulley moves smoothly.



INSTALLATION

1. INSTALL GENERATOR ASSEMBLY

- (a) Install the generator assembly with the 2 bolts.
Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)
- (b) Install the wire harness clamp bracket with the 2 bolts.
Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)
- (c) Connect the wire harness.
 - (1) Connect the wire harness to terminal B and install the nut.
Torque: 9.8 N*m (100 kgf*cm, 7.0 ft.*lbf)
 - (2) Connect the connector to the generator assembly.
 - (3) Install the wire harness stay with the bolt.
Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)

2. INSTALL FAN SHROUD (See page [CO-20](#))

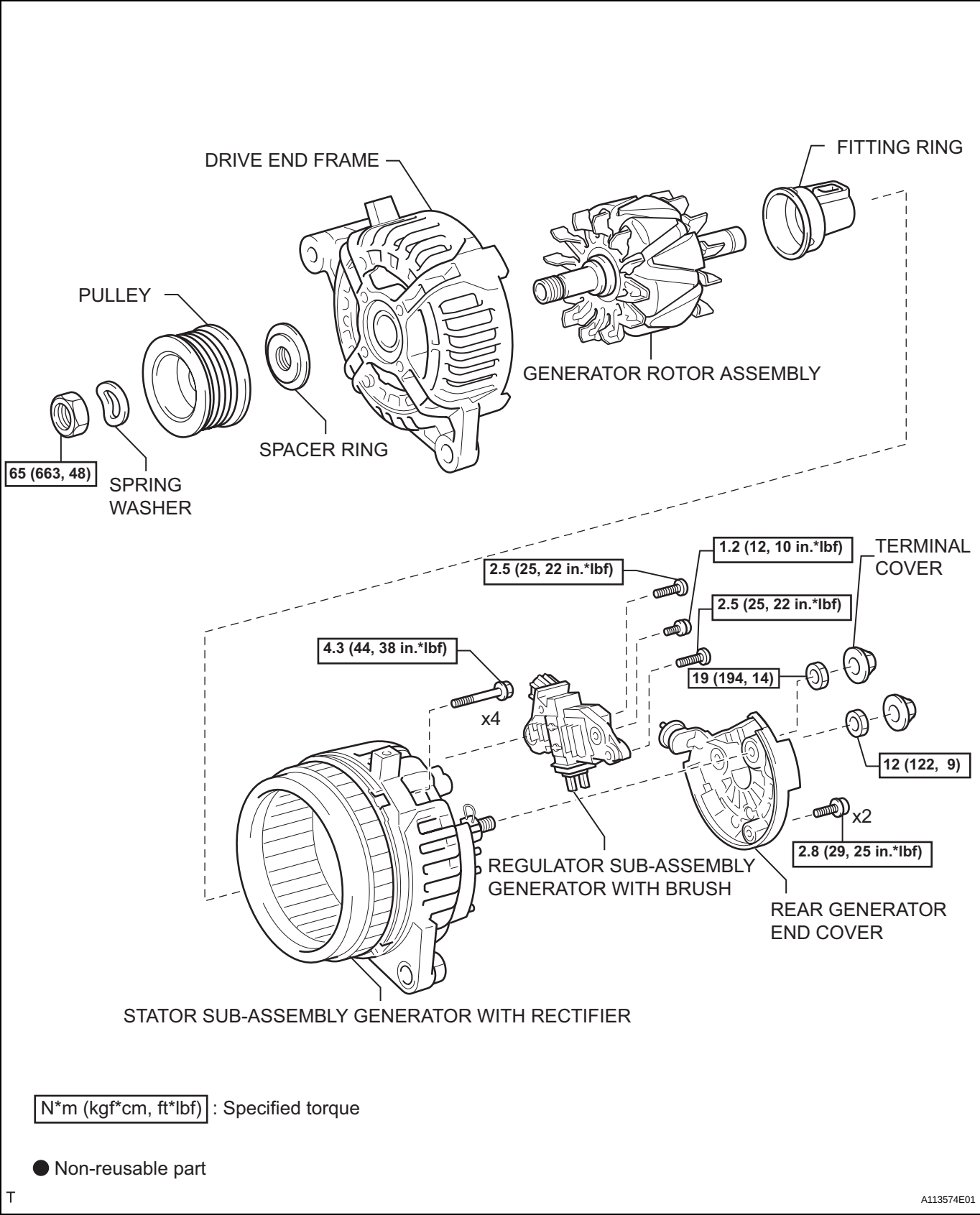
3. INSTALL RADIATOR SUPPORT TO FRAME SEAL LH

4. INSTALL V-BANK COVER (See page [ES-416](#))

5. CONNECT CABLE TO NEGATIVE TERMINAL Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)

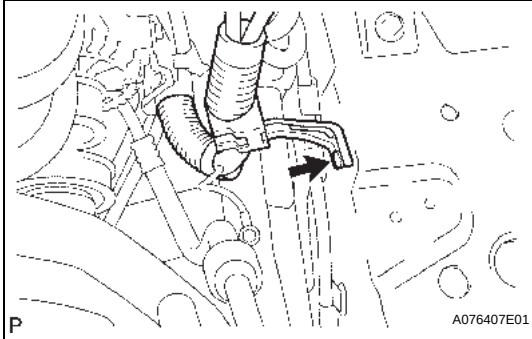
GENERATOR (for BOSCH Made)

COMPONENTS

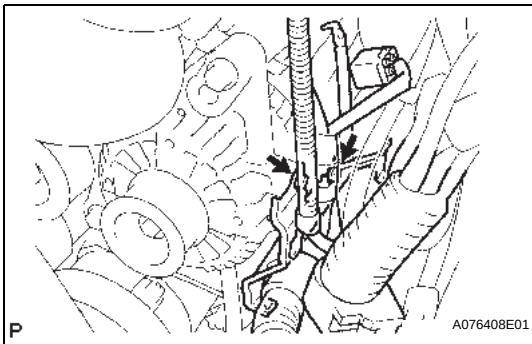


REMOVAL

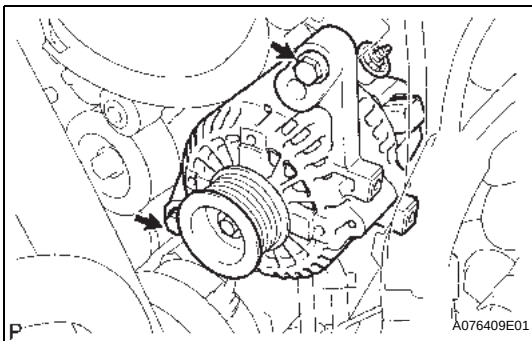
1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL
2. REMOVE V-BANK COVER (See page [ES-414](#))
3. REMOVE RADIATOR SUPPORT TO FRAME SEAL LH (See page [CO-15](#))
4. REMOVE FAN SHROUD (See page [CO-15](#))
5. REMOVE GENERATOR ASSEMBLY



- (a) Disconnect the wire harness.
 - (1) Remove the bolt and wire harness stay.
 - (2) Disconnect the connector from the generator assembly.
 - (3) Remove the terminal cap and nut.
 - (4) Disconnect the wire harness from terminal B.



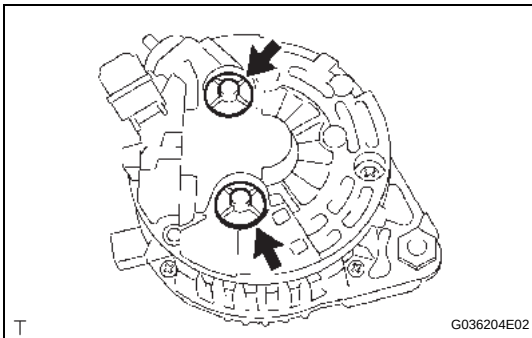
- (b) Remove the 2 bolts, then separate the wire harness clamp bracket from the generator assembly.

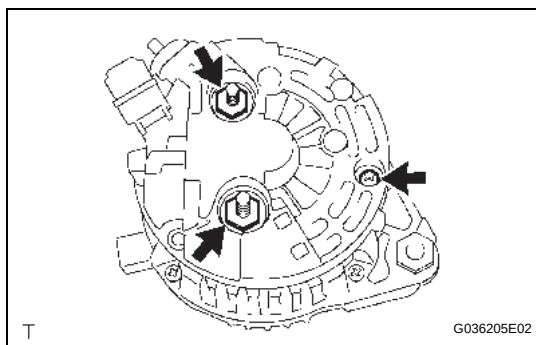


- (c) Remove the 2 bolts, then remove the generator assembly.

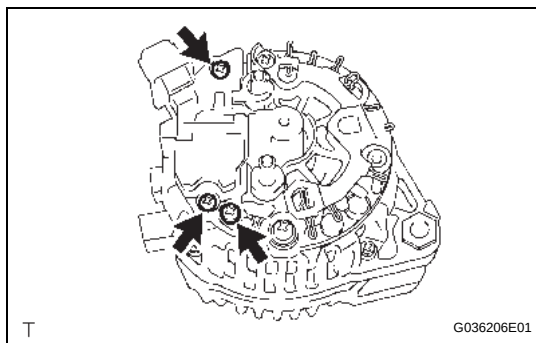
DISASSEMBLY

1. REMOVE REAR GENERATOR END COVER
 - (a) Remove the 2 terminal covers by turning them counterclockwise.



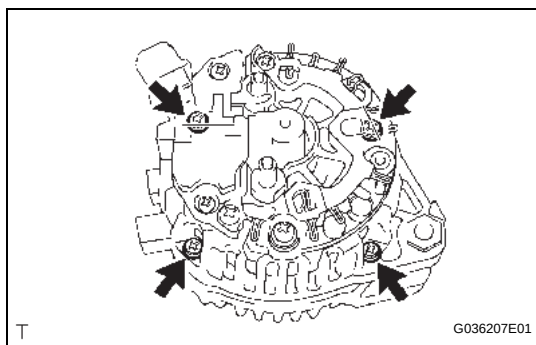


- (b) Using a 15 mm socket wrench, remove the 2 nuts from the generator rear end cover.
- (c) Remove the screw, then remove the generator rear end cover.



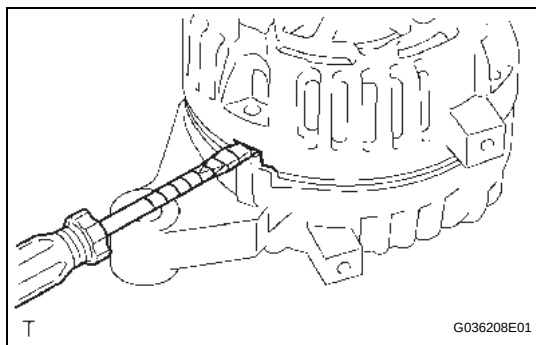
2. REMOVE REGULATOR SUB-ASSEMBLY GENERATOR W/BRUSH

- (a) Remove the 3 screws, then remove the regulator generator with brush.

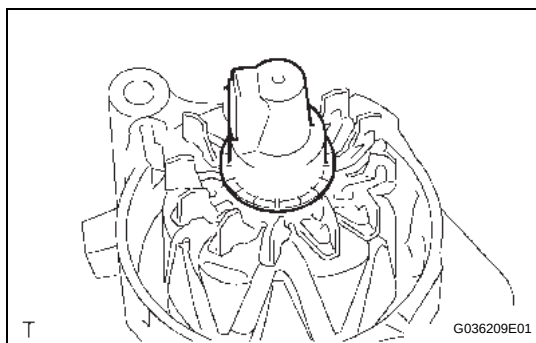


3. REMOVE STATOR SUB-ASSEMBLY GENERATOR W/ RECTIFIER

- (a) Remove the 4 screws.



- (b) Using a screwdriver, pry out the stator generator with rectifier.



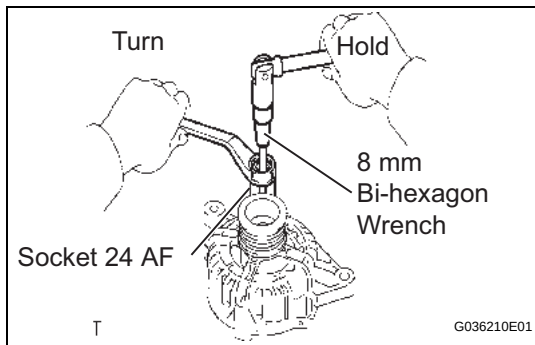
4. REMOVE BEARING SET GENERATOR

5. REMOVE PULLEY SET GENERATOR

- (a) Clamp the swivel arm in a vise.

NOTICE:

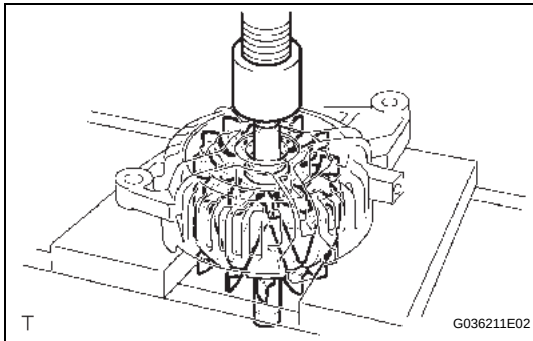
Do not clamp the generator rotor in a vise.



- (b) Using a socket 24 AF and 8 mm bi-hexagon wrench, remove the nut and spring washer, then detach the pulley.

6. REMOVE GENERATOR ROTOR ASSEMBLY

- (a) Using a press, press out the generator rotor assembly and spacer ring.



INSPECTION

1. INSPECT GENERATOR ROTOR ASSEMBLY

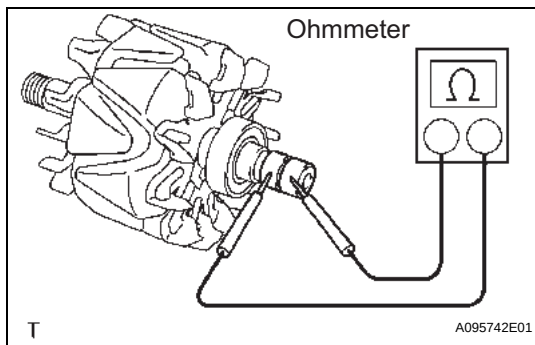
- (a) Inspect the generator rotor assembly for an open circuit.

- (1) Using an ohmmeter, measure the resistance between the slip rings.

Standard:

1.8 to 2.8 Ω at 20°C(68°F)

If the result is not as specified, replace the generator rotor.



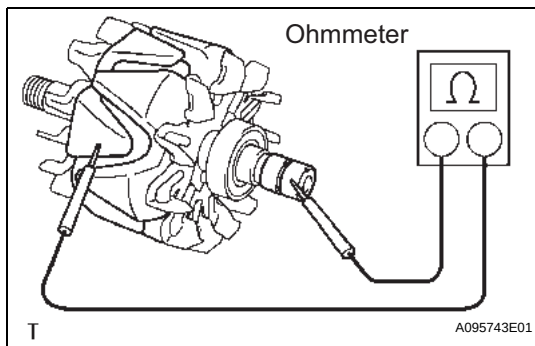
- (b) Inspect the generator rotor assembly for ground.

- (1) Using an ohmmeter, measure the resistance between the slip ring and generator rotor assembly.

Standard:

10 k Ω or higher

If the result is not as specified, replace the generator rotor.



- (c) Check the appearance.

- (1) Check that the slip rings are not rough or scored.

If rough or scored, replace the generator rotor.

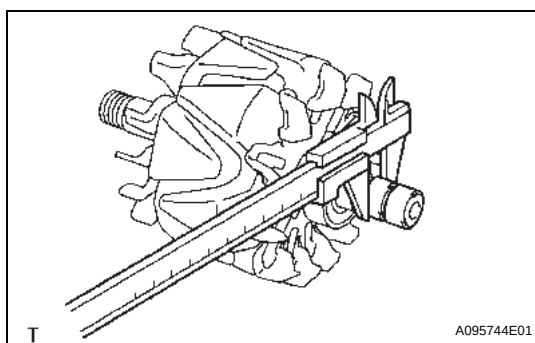
- (2) Using vernier calipers, measure the slip ring diameter.

Standard diameter:

15.3 to 15.5 mm (0.602 to 0.610 in.)

Minimum diameter:

14.9 mm (0.587 in.)

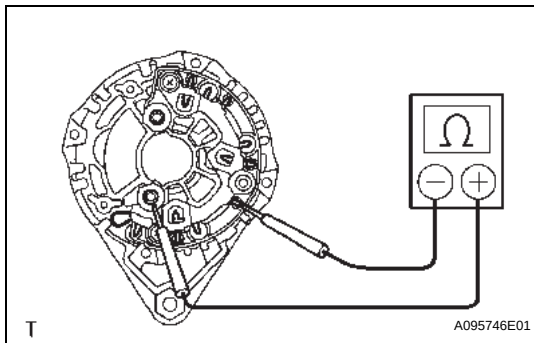
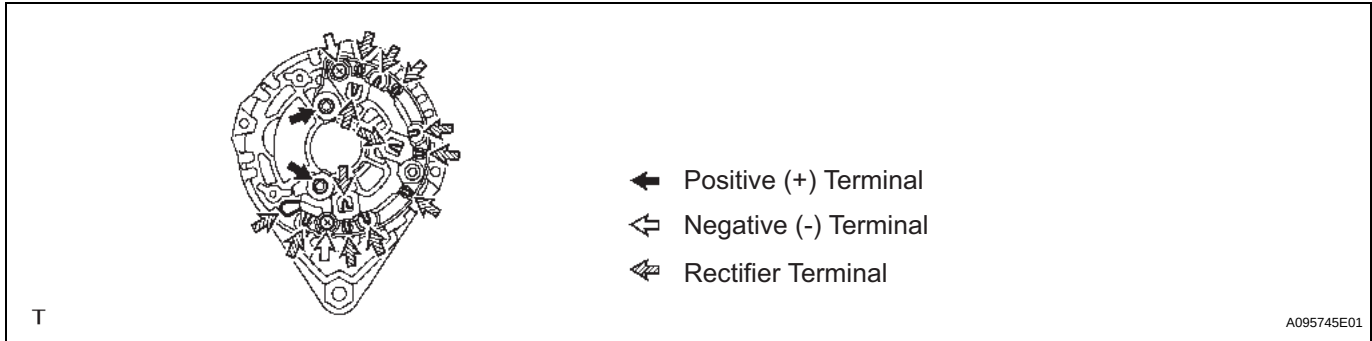


If the diameter is less than the minimum, replace the generator rotor.

2. INSPECT STATOR SUB-ASSEMBLY GENERATOR WITH RECTIFIER

HINT:

For terminal positions of the stator generator, refer to the illustration below.



(a) Inspect the positive (+) rectifier.

HINT:

Inspect the positive terminal after pulling it up.

- (1) Using an ohmmeter, connect the positive (+) tester probe to the positive (+) terminal and the negative (-) tester probe to each rectifier terminal.
- (2) Measure the resistance between the positive (+) terminal and rectifier terminal.

Standard:

Below 1 Ω

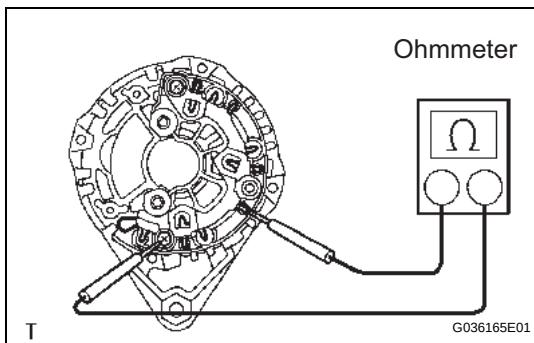
If the result is not as specified, replace the stator generator.

- (3) Reverse the polarity of the tester probes and repeat step (1).
- (4) Measure the resistance between the positive (+) terminal and rectifier terminal.

Standard:

10 k Ω or higher

If the result is not as specified, replace the stator generator.



(b) Inspect the negative (-) rectifier.

- (1) Using an ohmmeter, connect the positive (+) tester probe to each negative (-) terminal and the negative (-) tester probe to each rectifier terminal.
- (2) Measure the resistance between the negative (-) terminal and rectifier terminal.

Standard:

10 k Ω or higher

If the result is not as specified, replace the stator generator.

- (3) Reverse the polarity of the tester probes and repeat step (1).

- (4) Measure the resistance between the negative (-) terminal and rectifier terminal.

Standard:

Below 1 Ω

If the result is not as specified, replace the stator generator.

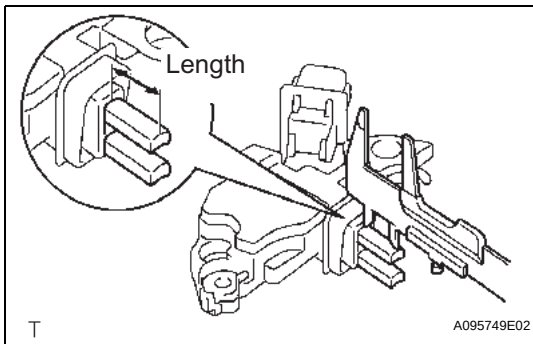
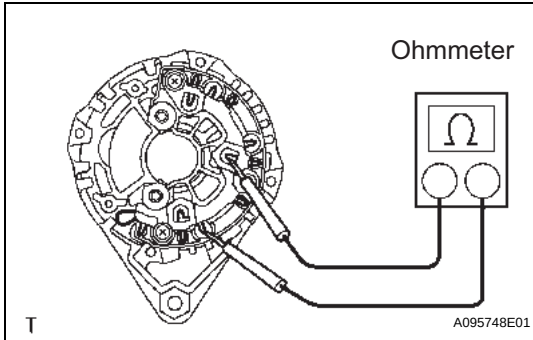
- (c) Inspect the stator for an open circuit.

- (1) Using an ohmmeter, measure the resistance between the rectifier terminals.

Standard:

Below 1 Ω

If the result is not as specified, replace the stator generator.



3. INSPECT BRUSH

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

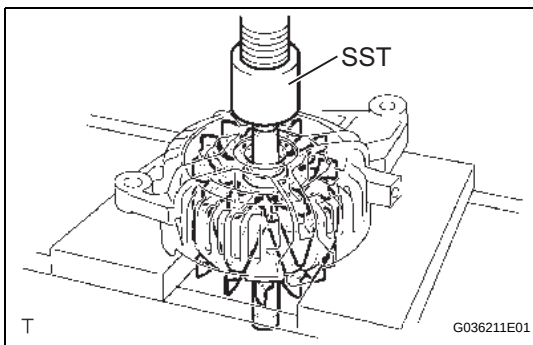
Exposed length on new brush:

13.2 mm (0.520 in.)

Minimum exposed length:

6 mm (0.236 in.)

If the exposed length is less than the minimum, replace the voltage regulator and brush assembly.



REASSEMBLY

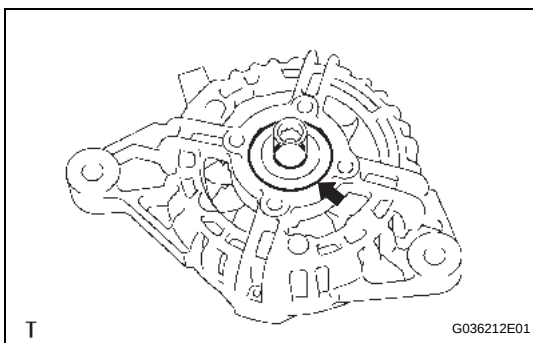
1. INSTALL GENERATOR ROTOR ASSEMBLY

- (a) Using SST and a press, press in the generator rotor assembly.

SST 09285-76010

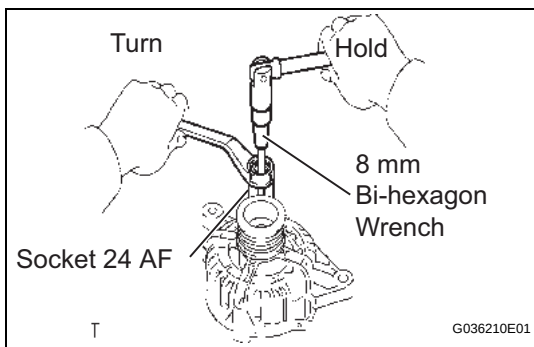
NOTICE:

Avoid misalignment during pressing.



2. INSTALL PULLEY SET GENERATOR

- (a) Install the spacer ring.

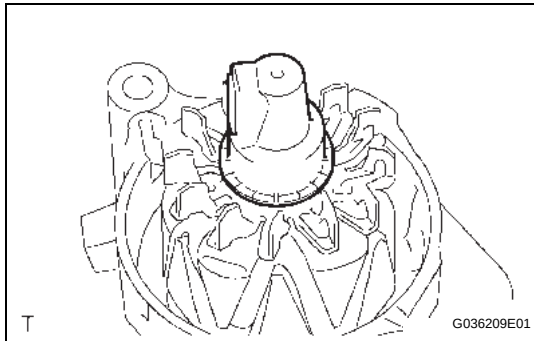


- (b) Using a socket 24 AF and 8 mm bi-hexagon wrench, install the pulley with the spring washer and nut.

Torque: 65 N*m (663 kgf*cm, 48 ft.*lbf)

3. INSTALL BEARING SET GENERATOR

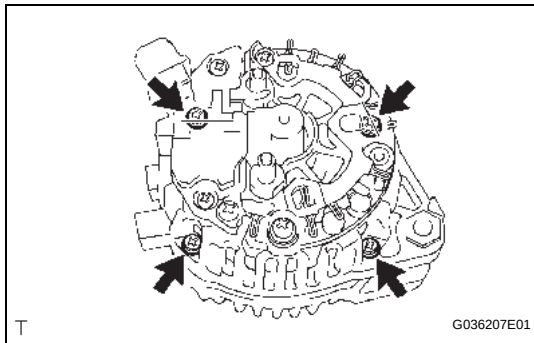
- (a) Align the 3 cutouts of the bearing set generator with the stator generator with rectifier.



4. INSTALL STATOR SUB-ASSEMBLY GENERATOR WITH RECTIFIER

- (a) Align the key of the drive end frame with the keyway of the stator sub-assembly generator with rectifier.
- (b) Install the stator generator with rectifier with the 4 bolts.

Torque: 4.3 N*m (44 kgf*cm, 38 in.*lbf)

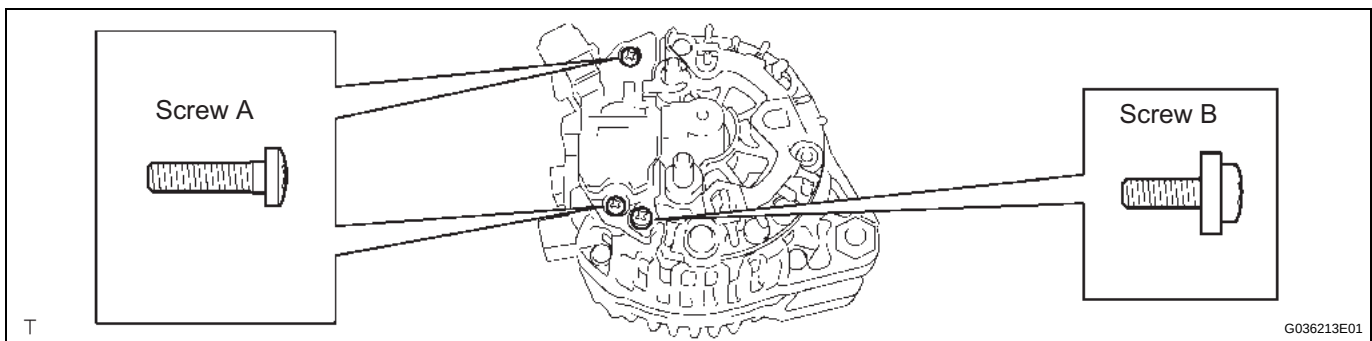
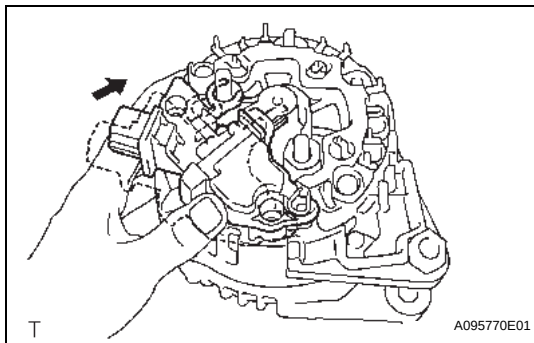


5. INSTALL REGULATOR SUB-ASSEMBLY GENERATOR WITH BRUSH

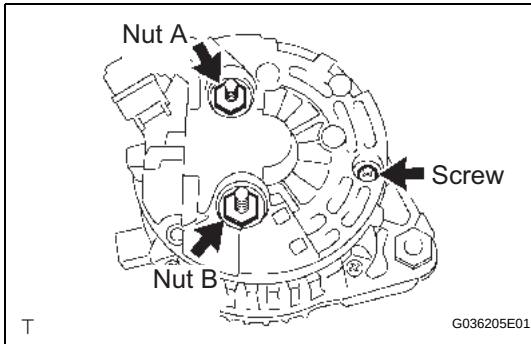
- (a) Attach the brushes and terminals to the rectifier end frame of the regulator generator with brush.
- (b) Install the regulator generator with brush with the 3 screws.

HINT:

Install the screw B into the position shown in the illustration.



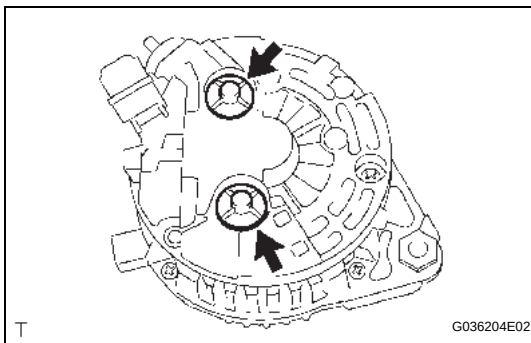
Torque: 2.5 N*m (25 kgf*cm, 22 in.*lbf) for screw A
1.2 N*m (12 kgf*cm, 11 in.*lbf) for screw B



6. INSTALL REAR GENERATOR END COVER

- (a) Install the generator rear end cover with the 2 nuts and screw.

Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf) for nut A
12 N*m (122 kgf*cm, 9 ft.*lbf) for nut B
2.8 N*m (29 kgf*cm, 25 in.*lbf) for screw



- (b) Install the 2 terminal covers by turning them clockwise.

INSTALLATION

1. INSTALL GENERATOR ASSEMBLY

- (a) Install the generator assembly with the 2 bolts.
Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)
- (b) Install the wire harness clamp bracket with the 2 bolts.
Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)
- (c) Connect the wire harness.
 - (1) Connect the wire harness to terminal B and install the nut.
Torque: 9.8 N*m (100 kgf*cm, 7.0 ft.*lbf)
 - (2) Connect the connector to the generator assembly.
 - (3) Install the wire harness stay with the bolt.
Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)

2. INSTALL FAN SHROUD (See page [CO-20](#))

3. INSTALL RADIATOR SUPPORT TO FRAME SEAL LH

4. INSTALL V-BANK COVER (See page [ES-416](#))

5. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)

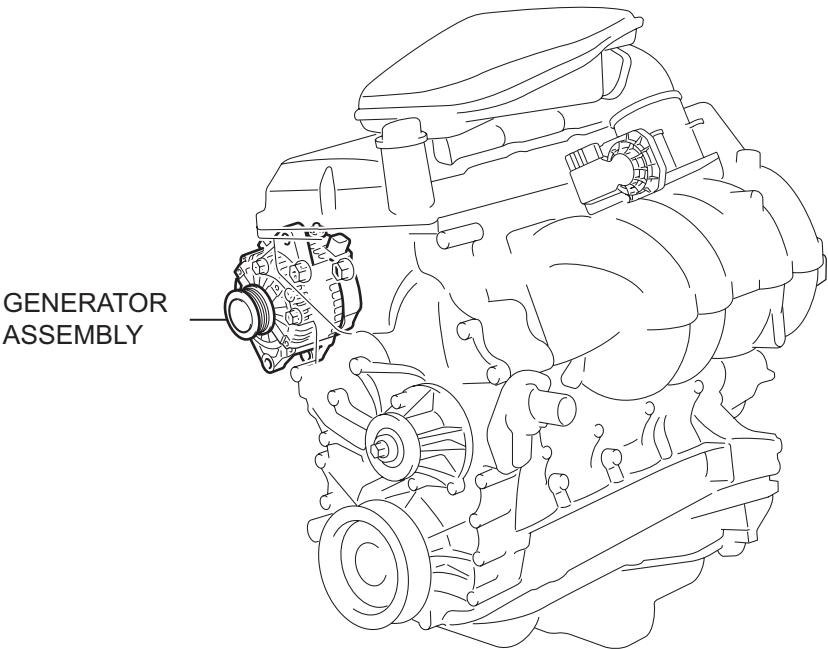
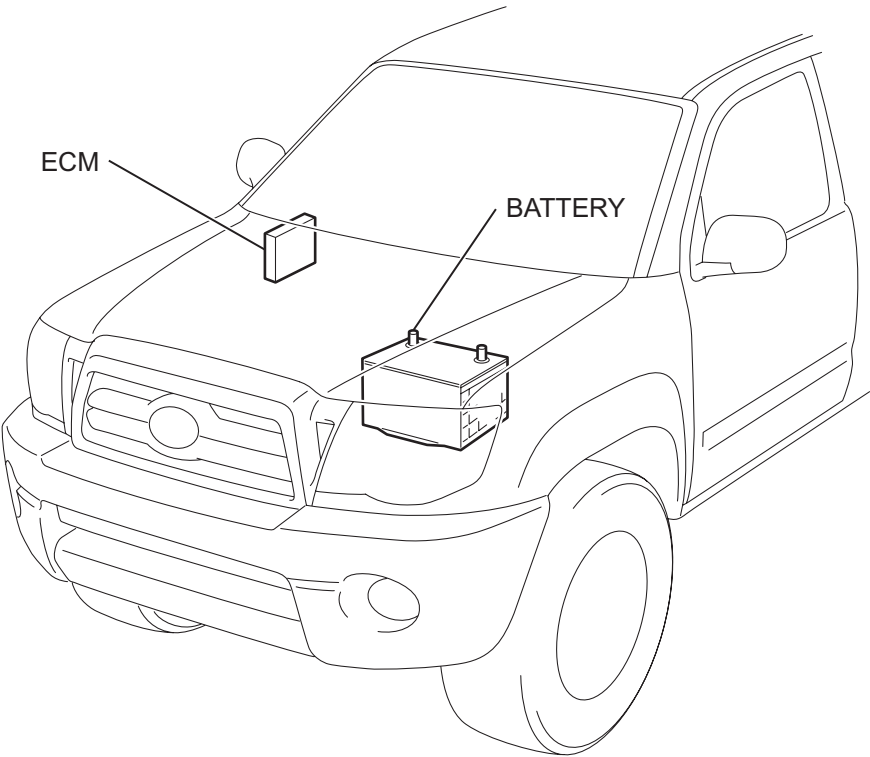
CHARGING SYSTEM

PRECAUTION

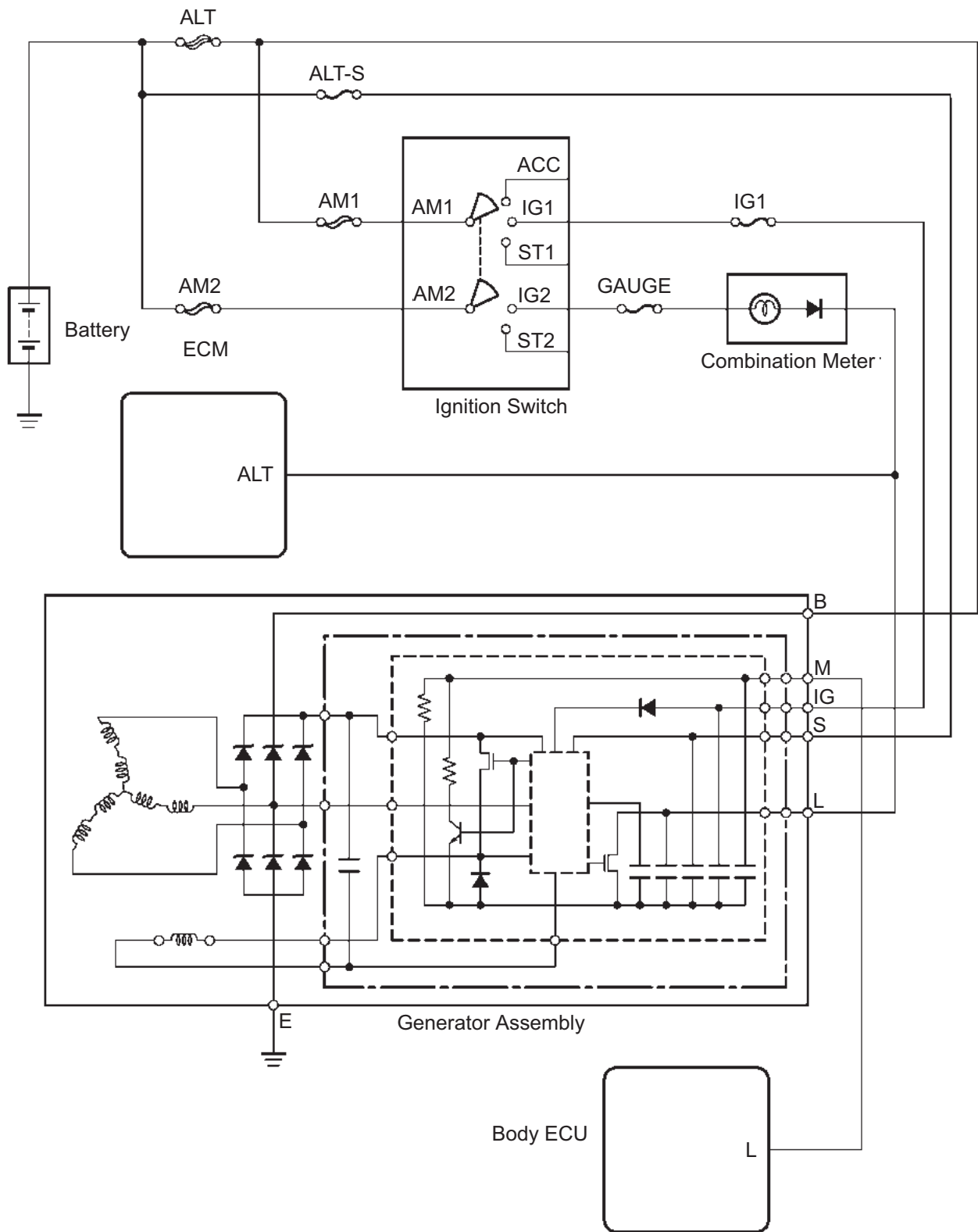
1. PRECAUTION

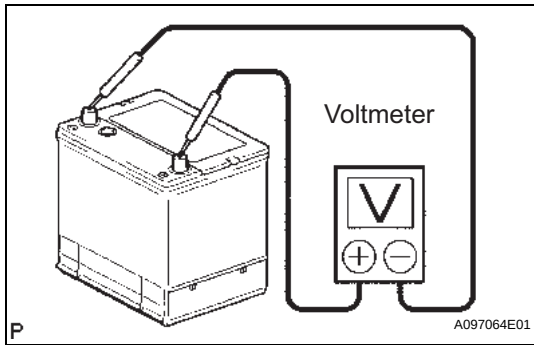
- (a) Check that the battery cables are connected to the correct terminals.
- (b) Disconnect the battery cables if the battery is charged quickly.
- (c) Do not perform tests using a high voltage insulation resistance tester.
- (d) Never disconnect any cable from the battery while the engine is running.
- (e) Check that the charging cables are tightly connected to terminal B of the generator and the fuse box.
- (f) Do not check whether the generator generates current or not while terminal F is connected to the other terminals.

PARTS LOCATION



SYSTEM DIAGRAM





ON-VEHICLE INSPECTION

1. INSPECT BATTERY (for Maintenance Free Battery)

(a) Check the voltage.

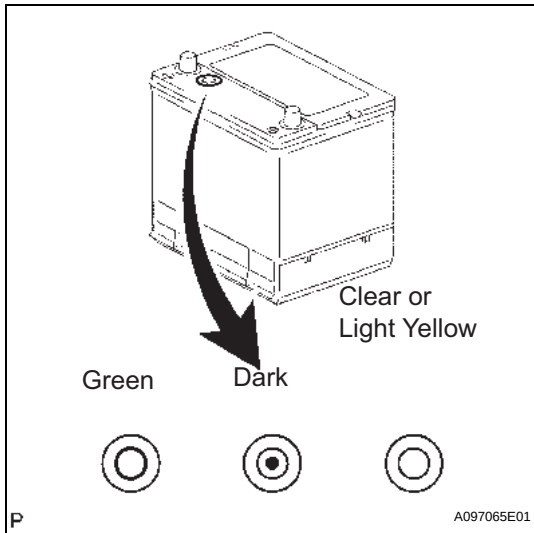
- (1) If it has been less than 20 minutes since you stopped driving the vehicle or since the engine was stopped, turn the ignition switch and electrical systems (headlight, blower motor, rear defogger etc.) to the ON position for 60 seconds. This will remove the surface charge on the battery.
- (2) Turn the ignition switch to OFF.
- (3) Turn the electrical systems OFF.
- (4) Using a voltmeter, measure the battery voltage between the negative (-) and positive (+) terminals of the battery.

Standard voltage:

12.5 to 12.9 V at 20°C (68°F)

If the voltage is less than the minimum, charge or replace the battery.

(b) Check the indicator is as shown in the illustration.



Indicator Color	Condition
Green	OK
Dark	Charging Necessary
Clear or Light Yellow	Insufficient Water

2. INSPECT BATTERY TERMINALS, FUSIBLE LINK AND FUSES

(a) Visually check the battery terminals.

- (1) Check that the battery terminals are not loose or corroded.

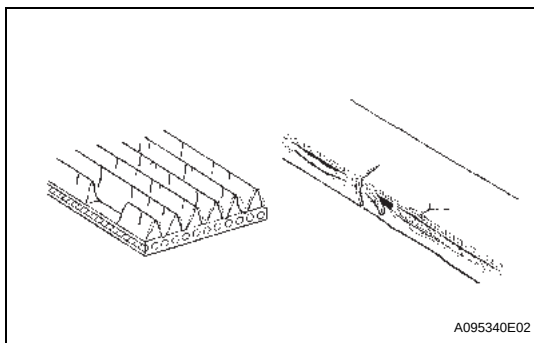
(b) Visually check the fusible links and fuses.

- (1) Check that there is continuity between the fusible links, high current fuses and regular fuses.

3. INSPECT V-RIBBED BELT

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

- If any defects are found, replace the V-ribbed belt.
- Cracks on the rib side of the belt are considered acceptable. If the belt has chunks missing from the ribs, it should be replaced.



4. INSPECT GENERATOR WIRING

(a) Visually check the generator wiring.

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

5. CHECK FOR ABNORMAL NOISES

(a) Listen for abnormal noises from the generator.

- (1) Check that no abnormal noises are heard from the generator while the engine is running.

6. INSPECT CHARGE WARNING LIGHT CIRCUIT

- (a) Turn the ignition switch to ON. Check that the charge warning light comes on.
- (b) Start the engine and check that the light goes off. If the light does not operate as specified, troubleshoot the charge warning light circuit.

7. INSPECT CHARGING CIRCUIT WITHOUT LOAD

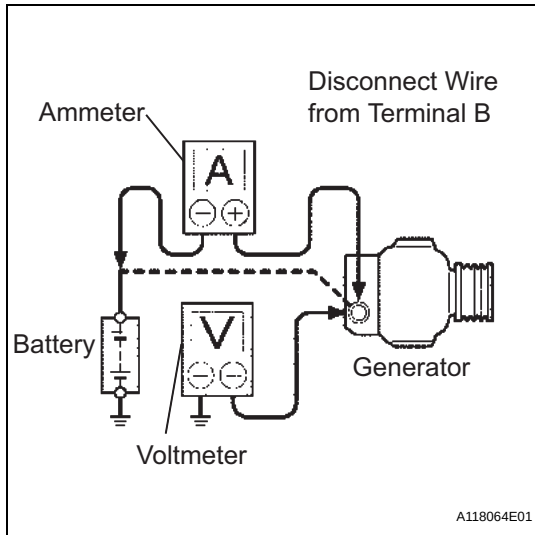
- (a) If a tester is not available, connect a voltmeter and ammeter to the charging circuit as follows.
 - (1) Disconnect the wire from terminal B of the generator, then connect it to the negative (-) lead of the ammeter.
 - (2) Connect the positive (+) lead of the ammeter to terminal B of the generator.
 - (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) Maintain the engine speed at 2,000 rpm and check the reading on the ammeter and voltmeter.

Standard:**10 A or less for amperage****13.2 to 14.8 V for voltage****8. INSPECT CHARGING CIRCUIT WITH LOAD**

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

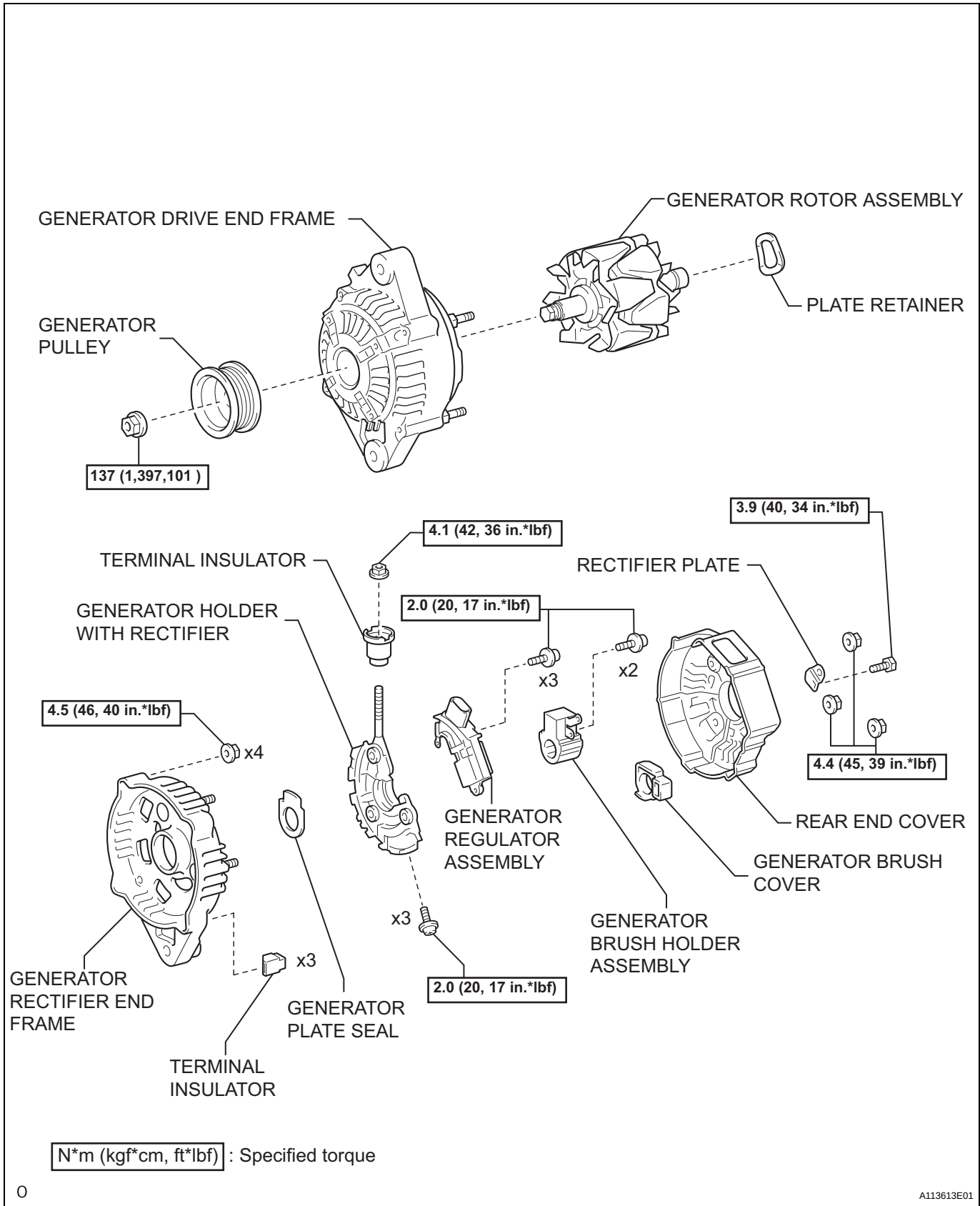
Standard:**30 A or more**

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



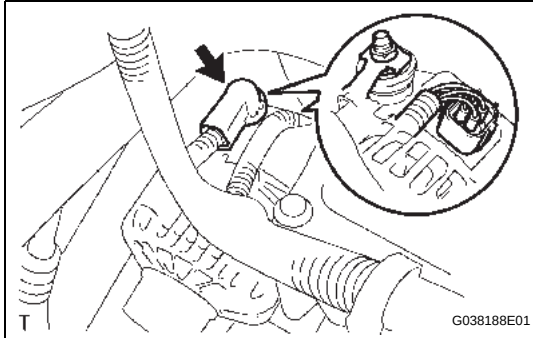
GENERATOR

COMPONENTS



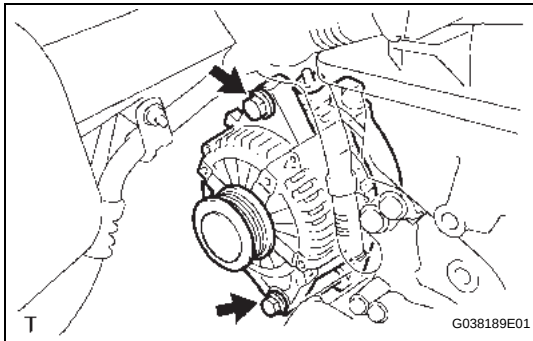
REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL
2. REMOVE FAN AND GENERATOR V BELT (See page EM-5)

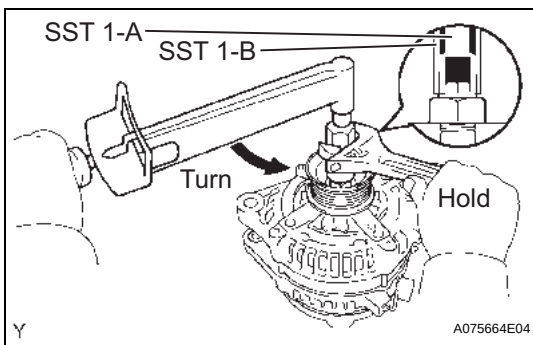


3. REMOVE GENERATOR ASSEMBLY

- (a) Remove the terminal cap.
- (b) Remove the nut, then remove the generator wire.
- (c) Disconnect the generator connector.



- (d) Remove the 2 bolts, then remove the generator.



DISASSEMBLY

1. REMOVE GENERATOR PULLEY

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

HINT:

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

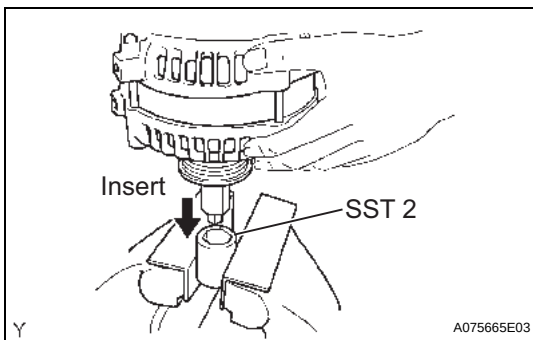
- (a) Hold SST 1-A with a torque wrench, and tighten SST 1-B clockwise with the specified torque.

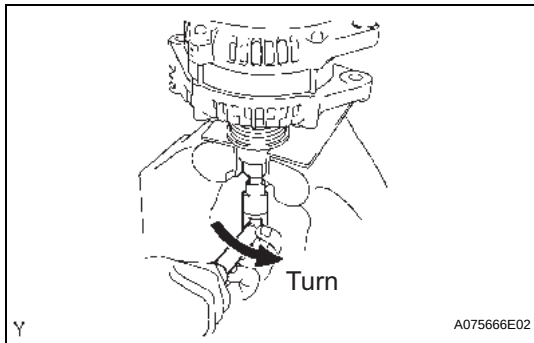
Torque: 39 N*m (400 kgf*cm, 29 ft.*lbf)

NOTICE:

Check that the SST is secured to the generator rotor shaft.

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



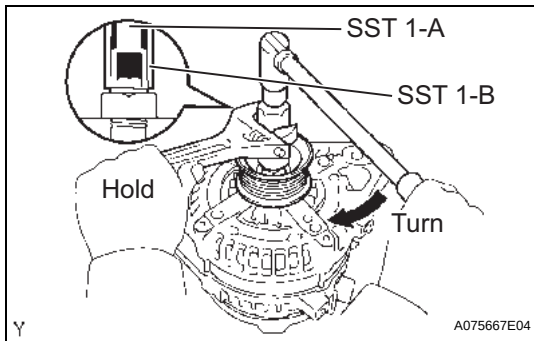


- (d) To loosen the generator pulley nut, turn SST 1-A in the direction shown in the illustration.

NOTICE:

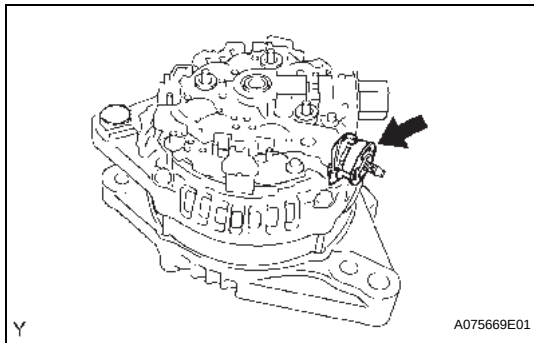
To prevent damage to the rotor shaft, do not loosen the generator pulley nut more than one-half turn.

- (e) Remove the generator from SST 2.



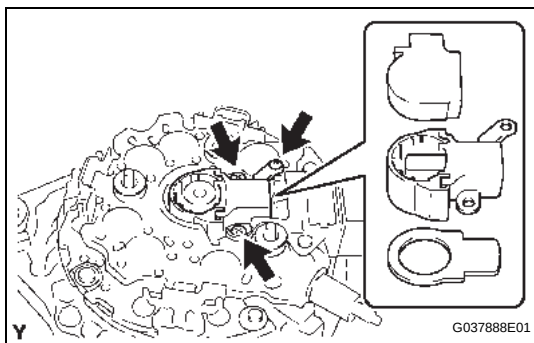
- (f) Turn SST 1-B, and remove SST 1-A and B.

- (g) Remove the generator pulley nut and generator pulley.

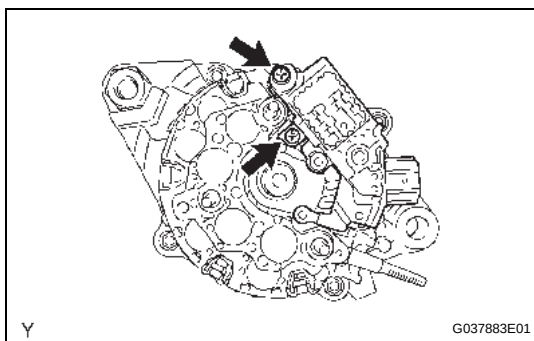


2. REMOVE GENERATOR BRUSH HOLDER ASSEMBLY

- (a) Remove the nut and terminal insulator.
 (b) Remove the nut, screw and rectifier plate.
 (c) Remove the 2 nuts and rear end cover.

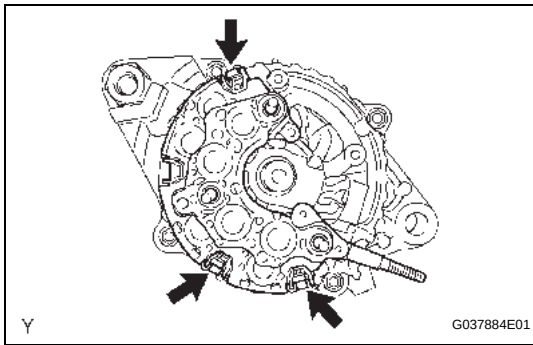


- (d) Remove the brush cover from the generator brush holder assembly.
 (e) Remove the 3 screws and generator brush holder assembly.
 (f) Remove the plate seal.

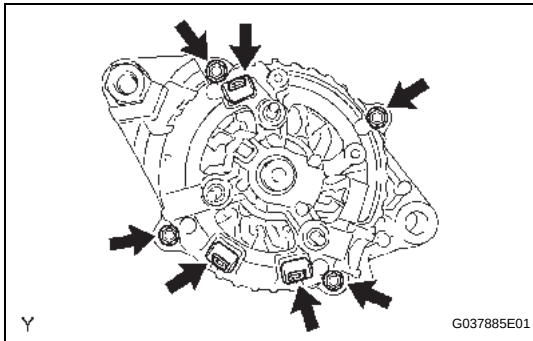


3. REMOVE GENERATOR REGULATOR ASSEMBLY

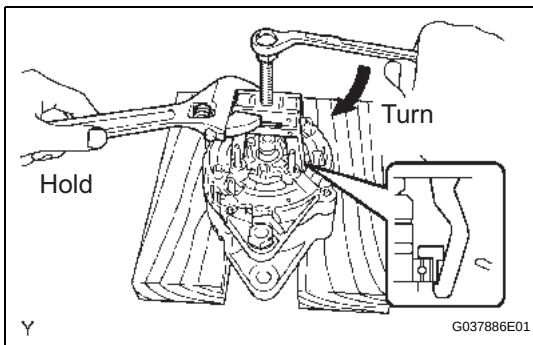
- (a) Remove the 2 screws and generator regulator assembly.



4. **REMOVE GENERATOR HOLDER WITH RECTIFIER**
 (a) Remove the 3 screws and generator rectifier holder.



5. **REMOVE GENERATOR ROTOR ASSEMBLY**
 (a) Remove the 3 terminal insulators from the rectifier end frame.
 (b) Remove the 4 nuts.



- (c) Using SST, remove the rectifier end frame.

SST 09286-46011

- (d) Remove the plate retainer.
 (e) Remove the generator rotor assembly from the drive end frame.

NOTICE:

Do not drop the generator rotor assembly.

HINT:

If the generator rotor is engaged too firmly, lightly tap the generator rotor shaft to remove it using a plastic hammer.

INSPECTION

1. INSPECT GENERATOR BRUSH HOLDER ASSEMBLY

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

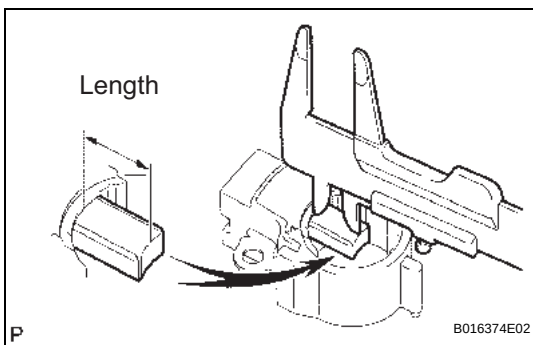
Standard exposed length:

9.5 to 11.5 mm (0.374 to 0.453 in.)

Minimum exposed length:

4.5 mm (0.177 in.)

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



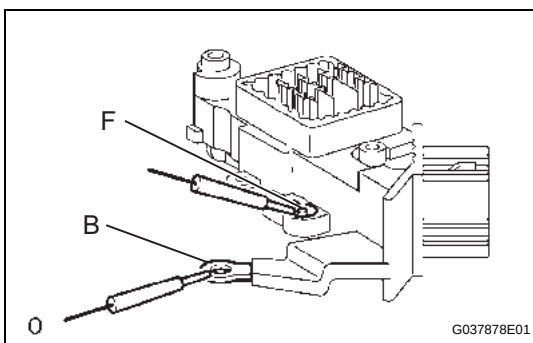
2. INSPECT GENERATOR REGULATOR ASSEMBLY

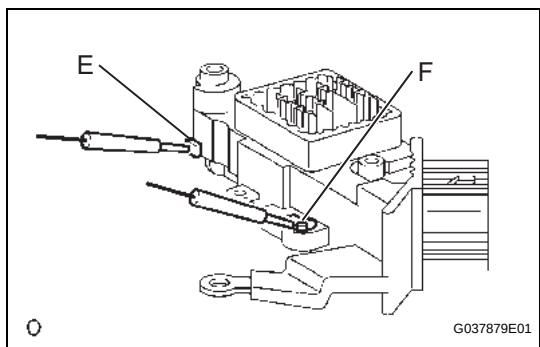
- (a) Using an ohmmeter, check the continuity between terminals F and B.

Standard:

When the positive and negative poles between terminals F and B are exchanged, there is continuity in one way but no continuity in another way.

If the continuity is not specified, replace the generator regulator assembly.



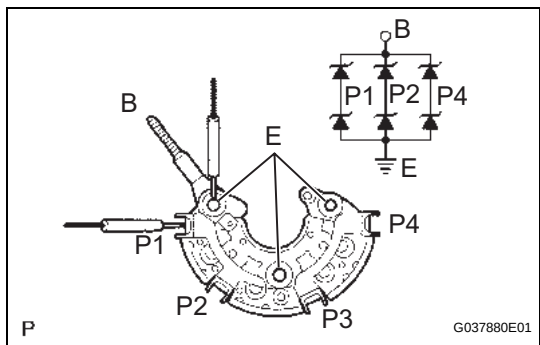


- (b) Using an ohmmeter, check the continuity between terminals F and E.

Standard:

When the positive and negative poles between terminals F and B are exchanged, there is continuity in one way but no continuity in another way.

If the continuity is not specified, replace the generator regulator assembly.



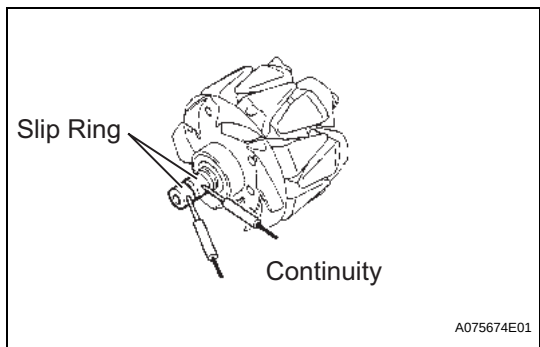
3. INSPECT GENERATOR HOLDER WITH RECTIFIER

- (a) Using an ohmmeter, check the continuity between terminals P1, P2, P3, P4 and B, and between P1, P2, P3, P4 and E.

Standard

Terminals	Specified Condition
P1, P2, P3, P4 and B	Continuity in one direction but no continuity in the other direction
P1, P2, P3, P4 and E	Continuity in one direction but no continuity in the other direction

If the continuity is not as specified, replace the generator rectifier holder.



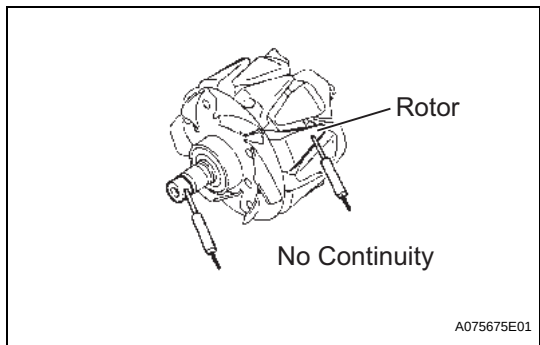
4. INSPECT GENERATOR ROTOR ASSEMBLY

- (a) Check for open in the generator rotor circuit.
(1) Using an ohmmeter, measure the resistance between the slip rings.

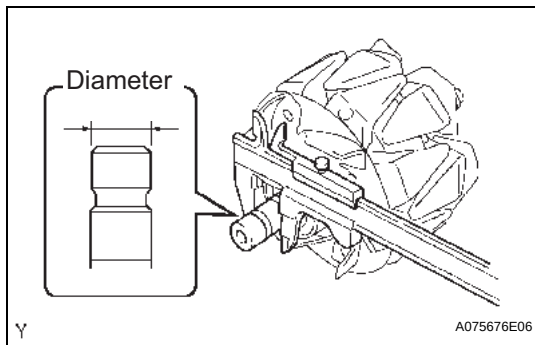
Standard resistance:

1.7 to 2.1 Ω at 20°C(68°F)

If the resistance is not as specified, replace the generator rotor assembly.



- (b) Check for short in the generator rotor circuit.
(1) Using an ohmmeter, check that there is no continuity between the slip ring and generator rotor assembly.
If there is continuity, replace the generator rotor assembly.
- (c) Inspect slip rings.
(1) Check that the slip rings are not rough or scored.
If rough or scored, replace the generator rotor assembly.



- (2) 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 the minimum, replace the generator rotor assembly.

REASSEMBLY

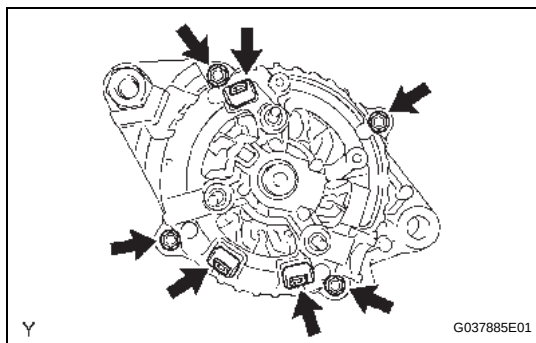
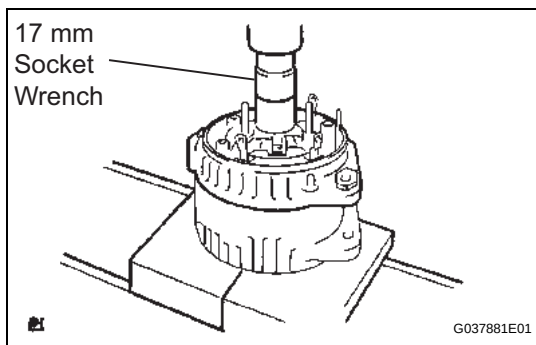
1. INSTALL GENERATOR ROTOR ASSEMBLY

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

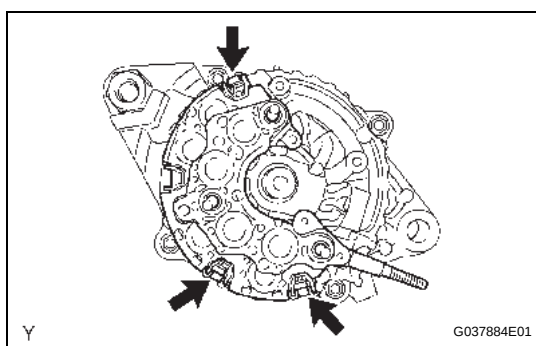
NOTICE:

Do not drop the generator rotor assembly.

- (b) Install the generator rotor assembly and plate retainer.
- (c) Using a 17 mm socket wrench and press, slowly press in the rectifier end frame.



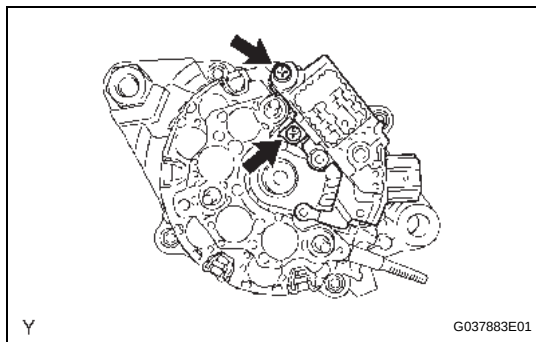
- (d) Install the 4 nuts.
Torque: 4.5 N*m (46 kgf*cm, 40 in.*lbf)
- (e) Install the 3 terminal insulators to the rectifier end frame.



2. INSTALL GENERATOR HOLDER WITH RECTIFIER

- (a) Install the generator rectifier holder with the 3 screws.

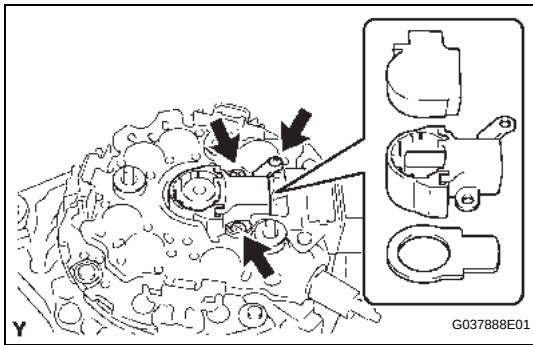
Torque: 2.0 N*m (20 kgf*cm, 17 in.*lbf)



3. INSTALL GENERATOR REGULATOR ASSEMBLY

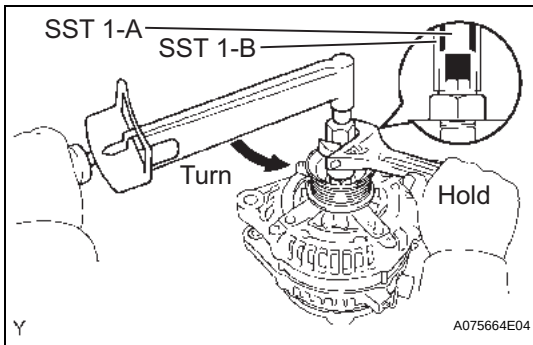
- (a) Install the generator regulator assembly with the 2 screws.

Torque: 2.0 N*m (20 kgf*cm, 17 in.*lbf)



4. INSTALL GENERATOR BRUSH HOLDER ASSEMBLY

- Install the plate seal.
- Install the generator brush holder assembly with the 3 screws.
Torque: 2.0 N*m (20 kgf*cm, 17 in.*lbf)
- Install the brush cover on the generator brush holder assembly.
- Install the rear end cover with the 2 nuts.
Torque: 4.4 N*m (45 kgf*cm, 39 in.*lbf)
- Install the rectifier plate with the nut and screw.
Torque: 4.4 N*m (45 kgf*cm, 39 in.*lbf) for nut
Torque: 3.9 N*m (40 kgf*cm, 34 in.*lbf) for bolt
- Install the terminal insulator with the nut.
Torque: 4.1 N*m (42 kgf*cm, 36 in.*lbf)



5. INSTALL GENERATOR PULLEY

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

HINT:

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

- Install the generator pulley to the generator rotor shaft by tightening the generator pulley nut by hand.
- Hold SST 1-A with a torque wrench, and tighten SST 1-B clockwise with the specified torque.

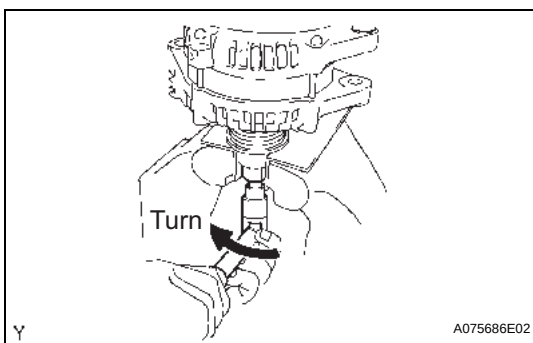
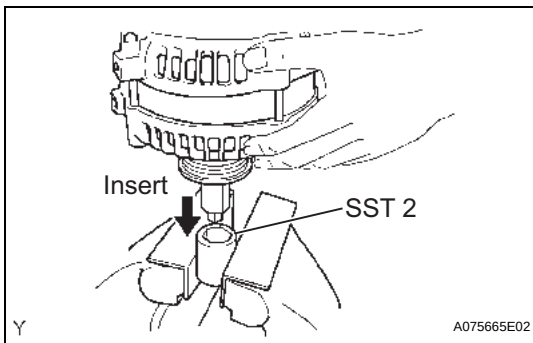
Torque:

39 N*m (398 kgf*cm, 29 ft.*lbf)

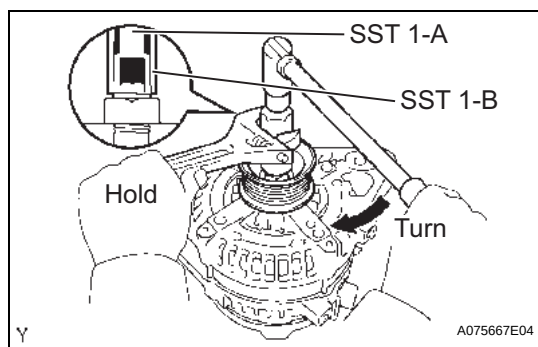
NOTICE:

Check that the SST is secured to the generator rotor shaft.

- Mount SST 2 in a vise.
- Insert SST 1-A and B into SST 2, and attach the generator pulley nut to SST 2.



- Tighten the generator pulley nut by turning SST 1-A in the direction shown in the illustration.
Torque: 137 N*m (1,397 kgf*cm, 101 ft.*lbf)
- Remove the generator from SST 2.

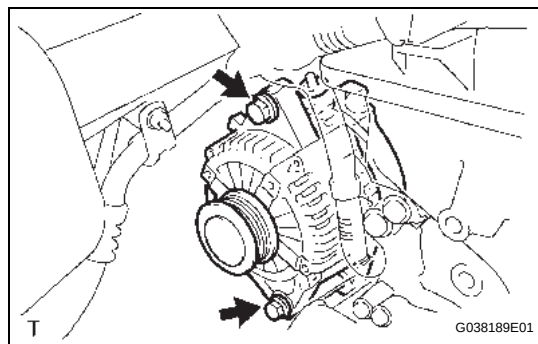


- (g) Turn SST 1-B, and remove SST 1-A and B.
- (h) Turn the generator pulley, and check that the generator pulley moves smoothly.

INSTALLATION

1. INSTALL GENERATOR ASSEMBLY

- (a) Install the generator with the 2 bolts.
Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)

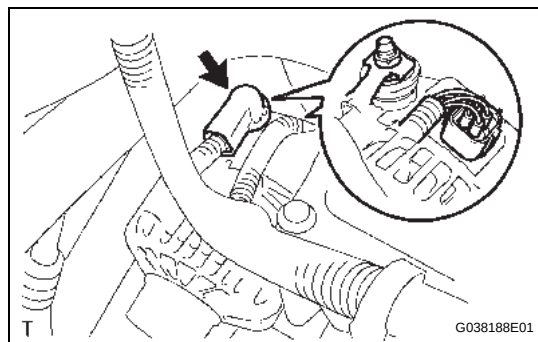


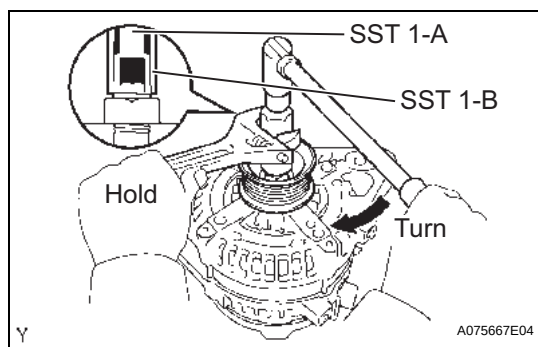
- (b) Connect the generator connector.
- (c) Install the generator wire with the nut.
Torque: 9.8 N*m (100 kgf*cm, 7 ft.*lbf)
- (d) Install the terminal cap.

2. INSTALL FAN AND GENERATOR V BELT (See page [EM-6](#))

3. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

- Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)**



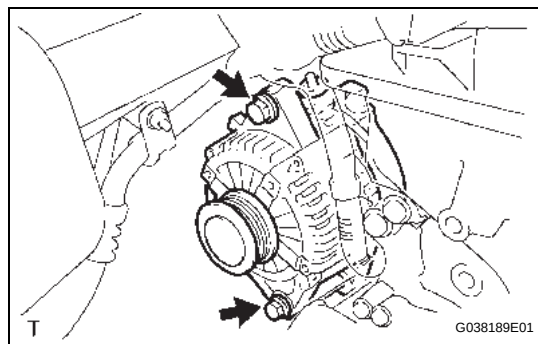


- (g) Turn SST 1-B, and remove SST 1-A and B.
- (h) Turn the generator pulley, and check that the generator pulley moves smoothly.

INSTALLATION

1. INSTALL GENERATOR ASSEMBLY

- (a) Install the generator with the 2 bolts.
Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)



- (b) Connect the generator connector.
- (c) Install the generator wire with the nut.
Torque: 9.8 N*m (100 kgf*cm, 7 ft.*lbf)
- (d) Install the terminal cap.

2. INSTALL FAN AND GENERATOR V BELT (See page [EM-6](#))

3. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

- Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)**

