

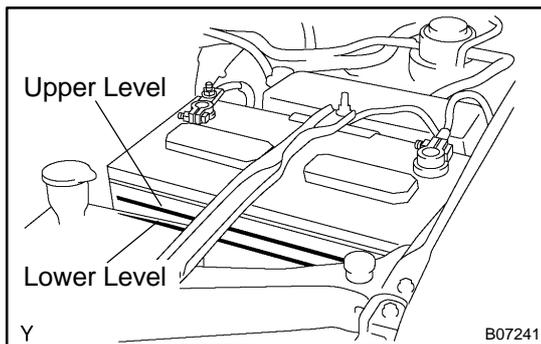
CHARGING SYSTEM

ON-VEHICLE INSPECTION

CH0J6-03

CAUTION:

- ◆ Check that the battery cables are connected to the correct terminals.
- ◆ Disconnect the battery cables when the battery is given a quick charge.
- ◆ Do not perform tests with a high voltage insulation resistance tester.
- ◆ Never disconnect the battery while the engine is running.



1. CHECK BATTERY ELECTROLYTE LEVEL

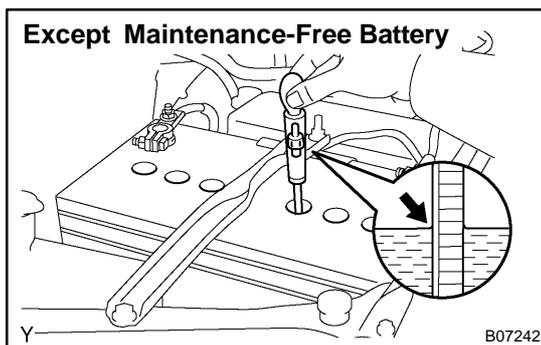
Check the electrolyte quantity of each cell.

Maintenance-Free Battery:

If under the lower level, replace the battery (or add distilled water if possible) and check the charging system.

Except Maintenance-Free Battery:

If under the lower level, add distilled water.



2. Except Maintenance-Free Battery: CHECK BATTERY SPECIFIC GRAVITY

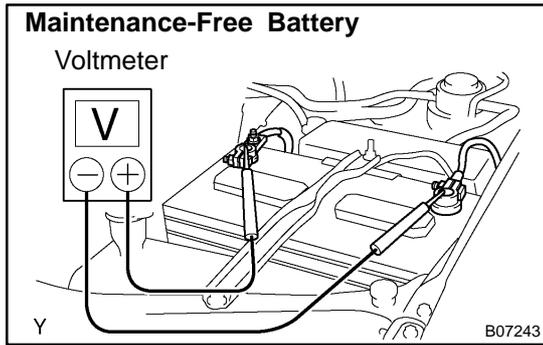
Check the specific gravity of each cell.

Standard specific gravity: 1.25 to 1.29 at 20°C (68°F)

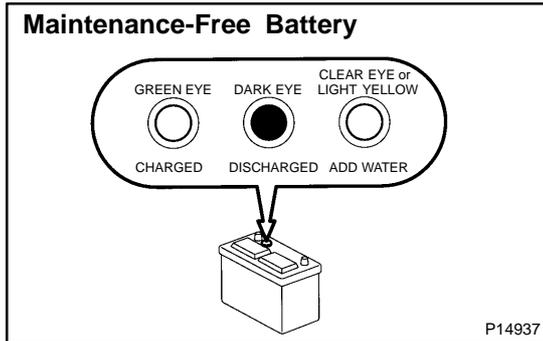
If the specific gravity is less than specification, charge the battery.

3. Maintenance-Free Battery: CHECK BATTERY VOLTAGE

- (a) After having driven the vehicle and in the case that 20 minutes have not passed after having stopped the engine, turn the ignition switch ON and turn on the electrical system (headlight, blower motor, rear defogger etc.) for 60 seconds to remove the surface charge.
- (b) Turn the ignition switch OFF and turn off the electrical systems.



- (c) 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 specification, charge the battery.



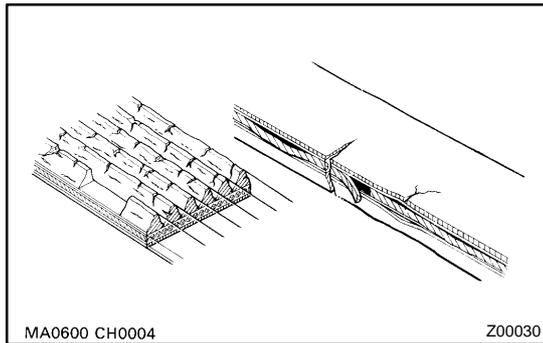
HINT:
 Check the indicator as shown in the illustration.

4. CHECK BATTERY TERMINALS, FUSIBLE LINK AND FUSES

- (a) Check that the battery terminals are not loose or corroded.
 (b) Check the fusible link and fuses for continuity.

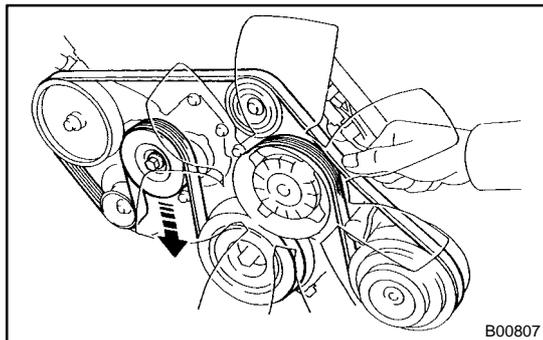
5. INSPECT DRIVE BELT

HINT:
 A belt tensioner is used, so checking the belt tension is not necessary.



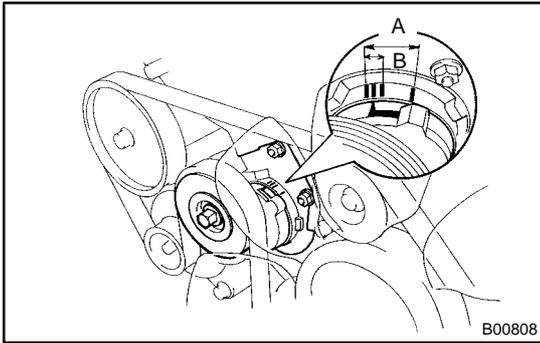
- (a) Visually check the drive belt for excessive wear, frayed cords etc.
 If necessary, replace the drive belt.

- HINT:
- ◆ Cracks on the rib side of a drive belt are considered acceptable. If the drive belt has chunks missing from the ribs, it should be replaced.
 - ◆ The drive belt tension can be released by turning the belt tensioner counterclockwise. The pulley bolt for the belt tensioner has a left-hand thread.



- (b) Check the belt tensioner operation.
- ◆ Check that the belt tensioner moves downward when the drive belt is pressed down at the points indicated in the illustration with approx. 98 N (10 kgf, 22.0 lbf) of force.
 - ◆ Check the alignment of the belt tensioner pulley to make sure the drive belt has not slipped off the pulley.

If necessary, replace the belt tensioner.

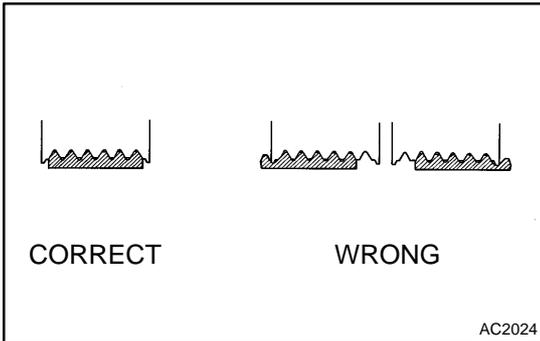


- ◆ Check that the arrow mark on the belt tensioner falls within area A of the scale.

If it is outside area A, replace the drive belt.

HINT:

- ◆ When a new belt is installed, it should lie within area B. If not, the drive belt is not correct.



- ◆ After installing a belt, check that it fits properly in the ribbed grooves.
- ◆ Check by hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.

6. REMOVE ENGINE UNDER COVER

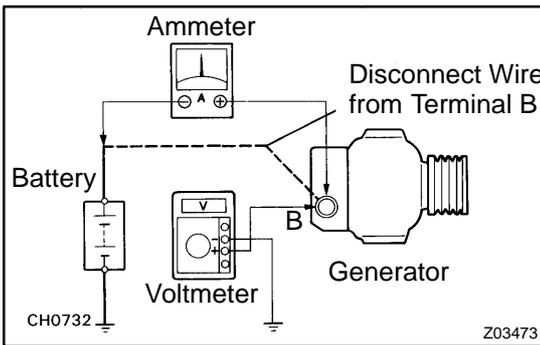
7. VISUALLY CHECK GENERATOR WIRING AND LISTEN FOR ABNORMAL NOISES

- Check that the wiring is in good condition.
- Check that there is no abnormal noise from the generator while the engine is running.

8. CHECK CHARGE WARNING LIGHT CIRCUIT

- Warm up the engine and then turn it off.
- Switch off all accessories.
- Turn the ignition switch ON, and check that the charge warning light is lit.
- Start the engine, and check that the light goes off.

If the light does not go off as specified, troubleshoot the charge light circuit.



9. INSPECT CHARGING CIRCUIT WITHOUT LOAD

HINT:

If a battery/generator tester is available, connect the tester to the charging circuit as per manufacturer's instructions.

- If a tester is not available, connect a voltmeter and ammeter to the charging circuit as follows:
 - ◆ Disconnect the wire from terminal B of the generator, and connect it to the negative (-) tester probe of the ammeter.
 - ◆ Connect the positive (+) tester probe of the ammeter to terminal B of the generator.
 - ◆ Connect the positive (+) tester probe of the voltmeter to terminal B of the generator.
 - ◆ Ground the negative (-) tester probe of the voltmeter.

- Check the charging circuit as follows: With the engine running from idling to 2,000 rpm, check the reading on the ammeter and voltmeter.

Standard amperage: 10 A or less

Standard voltage: 13.2 - 14.8 V

If the voltmeter reading is more than standard voltage, replace the voltage regulator.

If the voltmeter reading is less than standard voltage, check the voltage regulator and generator.

10. INSPECT CHARGING CIRCUIT WITH LOAD

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

Standard amperage: 30 A or more

If the ammeter reading is less than the standard amperage, repair the generator.

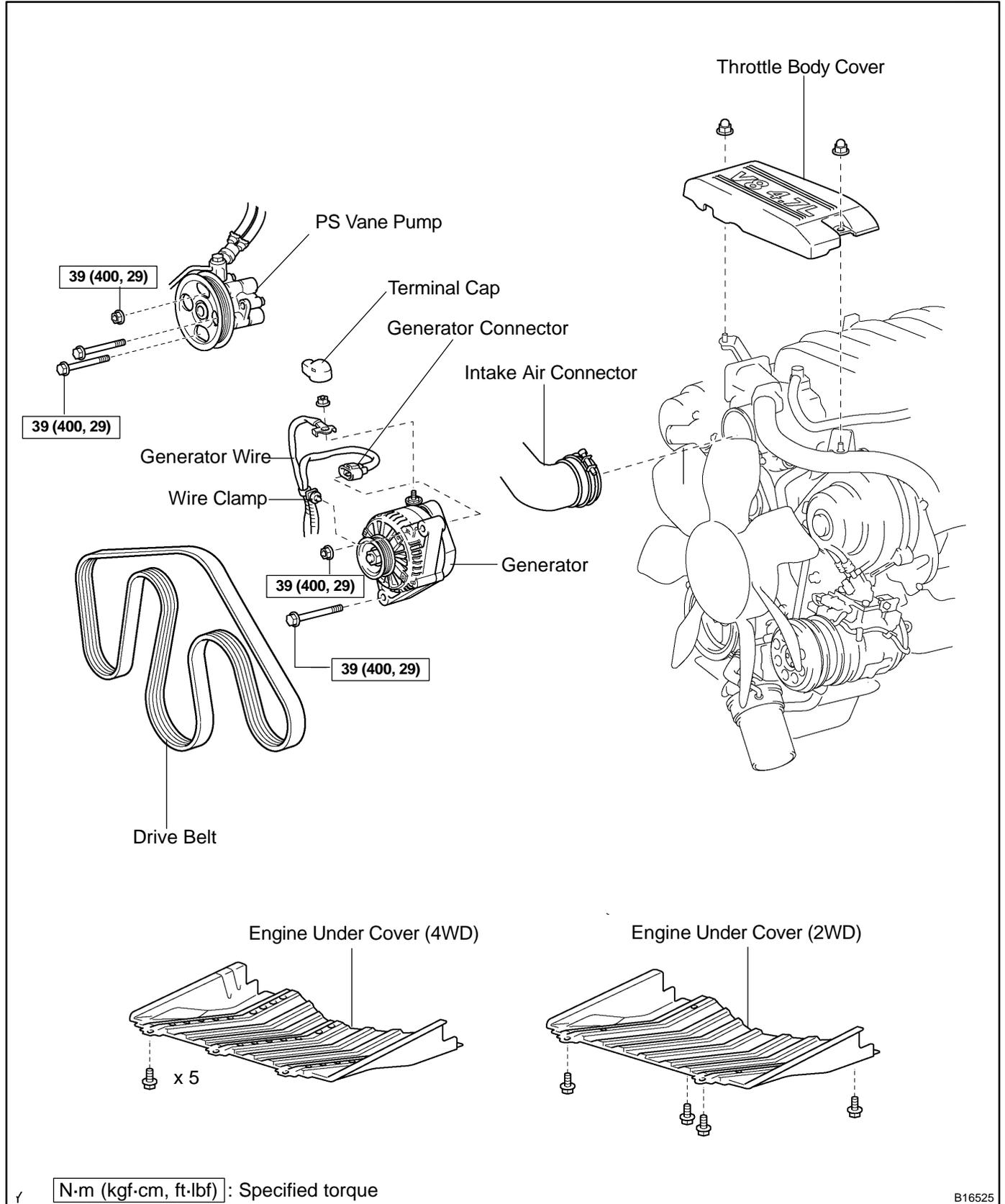
HINT:

If the battery is fully charged, the indication will sometimes be less than standard amperage.

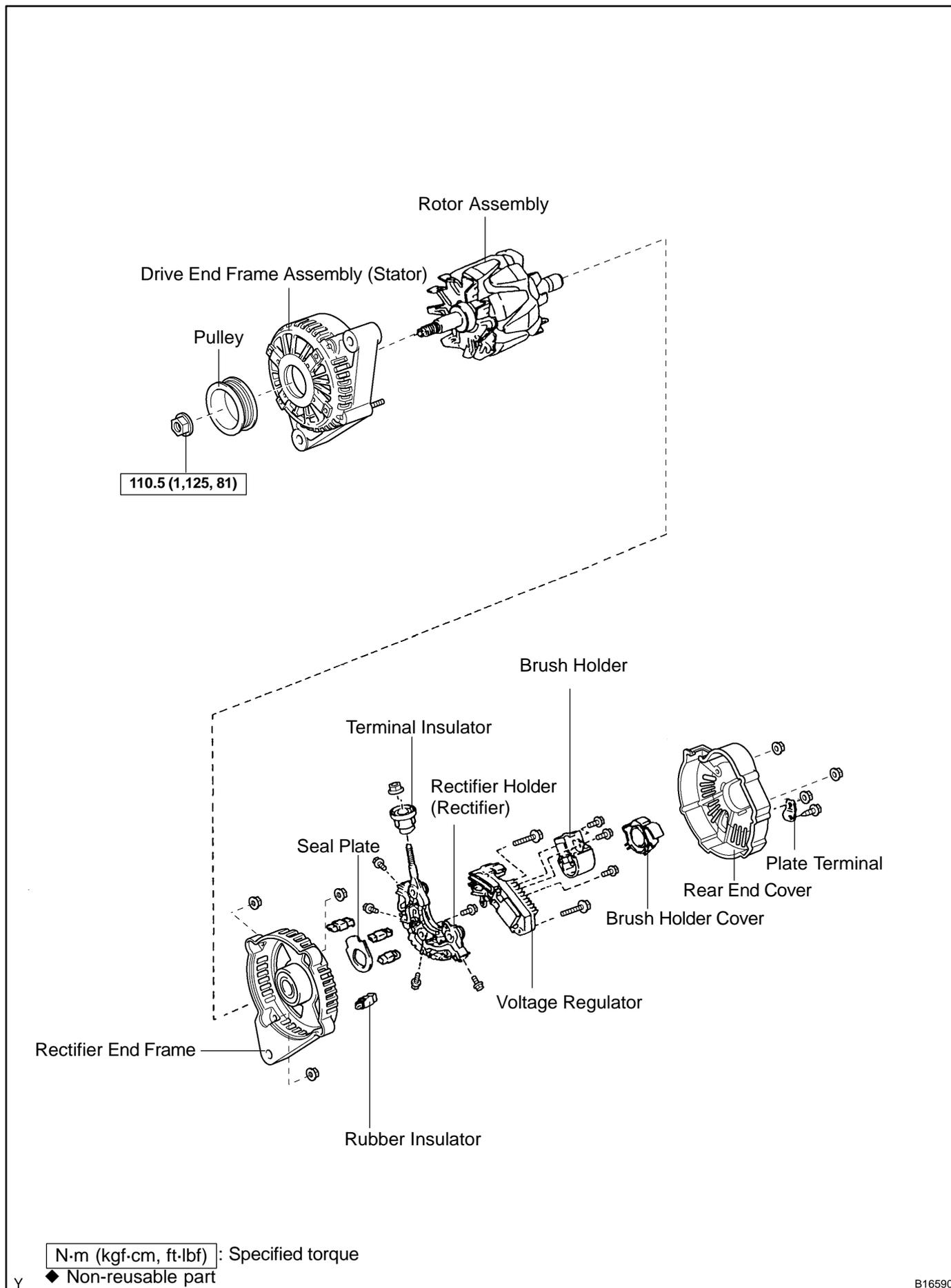
11. REINSTALL ENGINE UNDER COVER

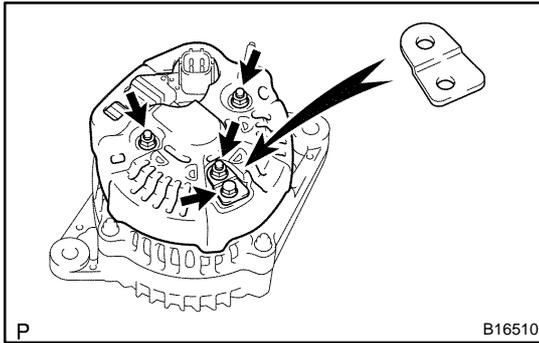
GENERATOR (Standard Spec.) COMPONENTS

CH0LL-02



B16525

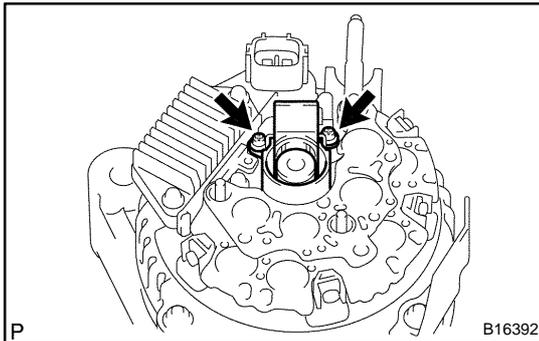




DISASSEMBLY

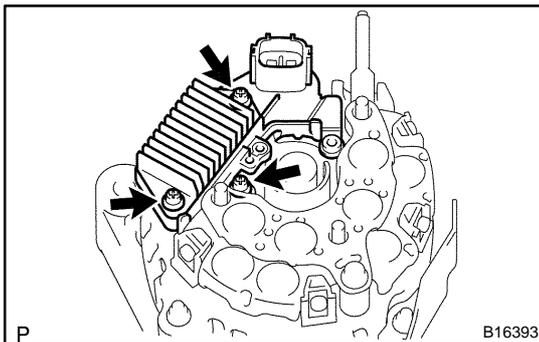
1. REMOVE REAR END COVER

- Remove the nut and terminal insulator.
- Remove the bolt 3 nuts, plate terminal and end cover.
- Remove the brush holder cover from the brush holder.



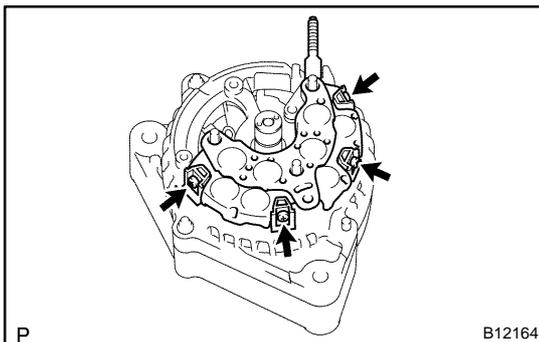
2. REMOVE BRUSH HOLDER

- Remove the 2 screws and brush holder.
- Remove the seal plate from the rectifier end frame.

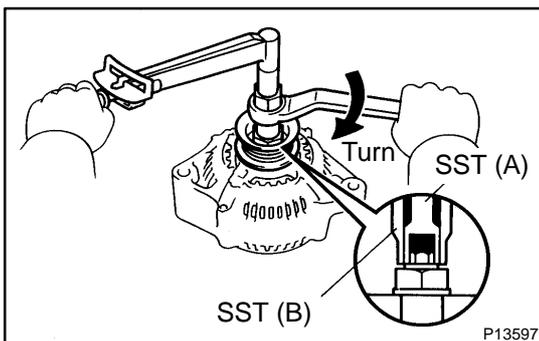


3. REMOVE VOLTAGE REGULATOR AND RECTIFIER HOLDER

- Remove the 3 screws and voltage regulator.

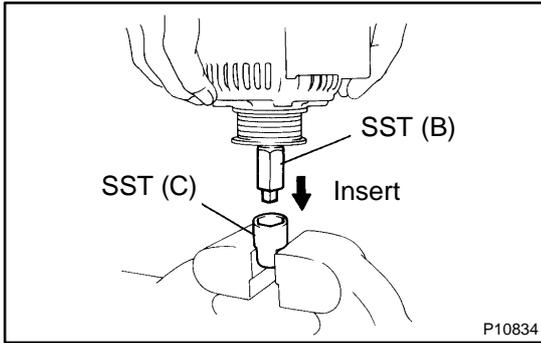


- Remove the 4 screws and rectifier holder.
- Remove the 4 rubber insulators.

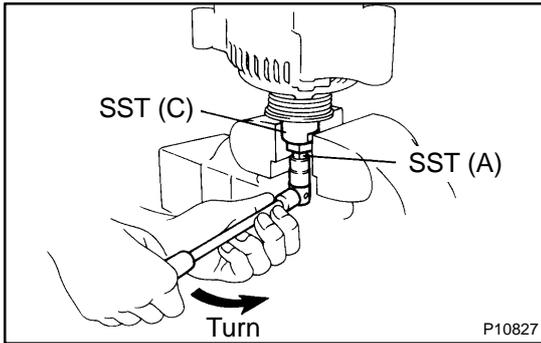


4. REMOVE PULLEY

- Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820-6301 1
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
- Check that SST (A) is secured to the rotor shaft.



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

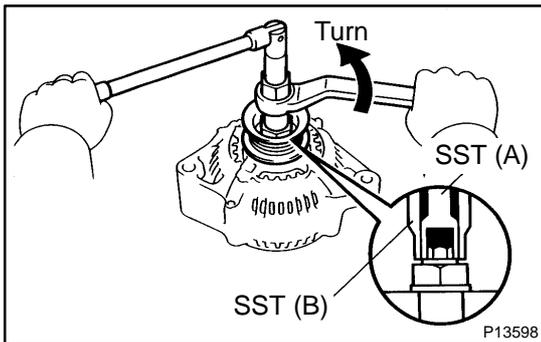


- (e) To loosen the pulley nut, turn SST (A) in the direction shown in the illustration.

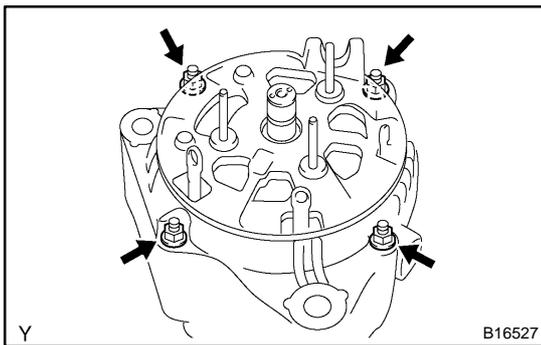
NOTICE:

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

- (f) Remove the generator from SST (C).

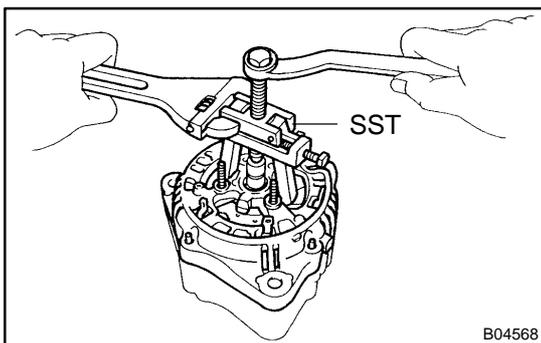


- (g) Turn SST (B), and remove SST (A and B).
- (h) Remove the pulley nut and pulley.



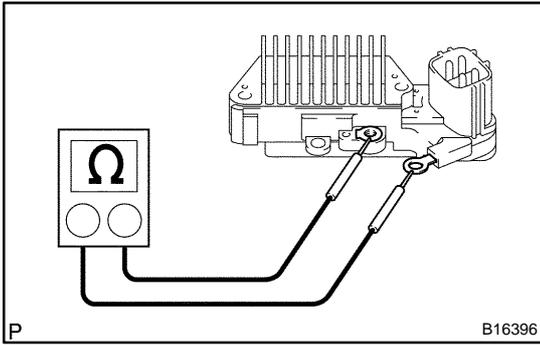
5. REMOVE RECTIFIER END FRAME

- (a) Remove the 4 nuts.



- (b) Using SST, remove the rectifier end frame.
SST 09286-4601 1
- (c) Remove the generator washer from the rectifier end frame.

6. REMOVE ROTOR FROM DRIVE END FRAME



INSPECTION

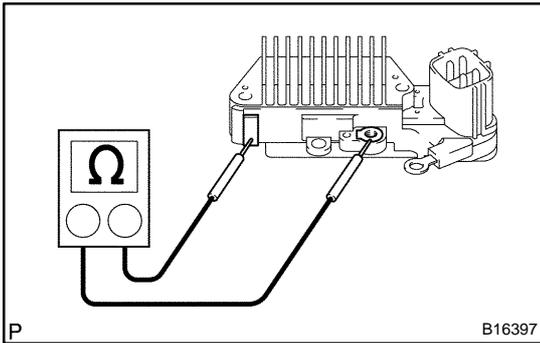
1. INSPECT VOLTAGE REGULATOR

- (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 as specified, replace the regulator.

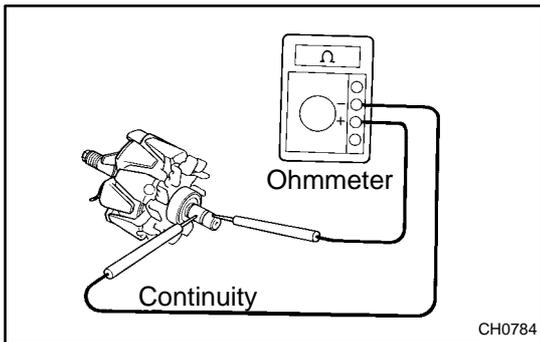


- (b) Using an ohmmeter, check the continuity between terminals F and E.

Standard:

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

If the continuity is not as specified, replace the regulator.



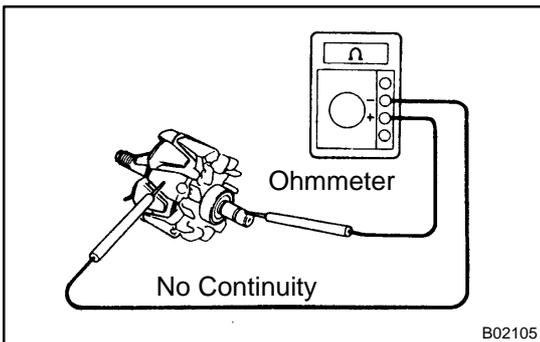
2. INSPECT ROTOR FOR OPEN CIRCUIT

- (a) Check the rotor for open circuit.

Using an ohmmeter, check that there is continuity between the slip rings.

Standard resistance: 2.1 to 2.5 Ω at 20°C (68°F)

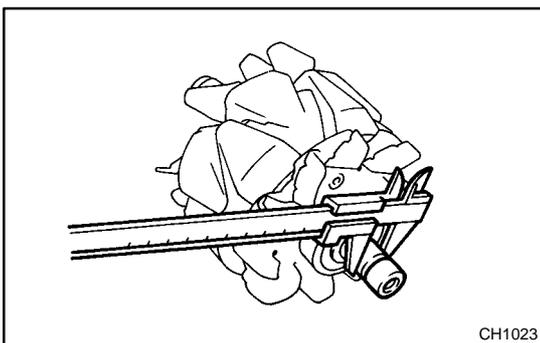
If there is no continuity, replace the rotor.



- (b) Check the rotor for ground.

Using an ohmmeter, check that there is no continuity between the slip ring and rotor.

If there is continuity, replace the rotor.



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

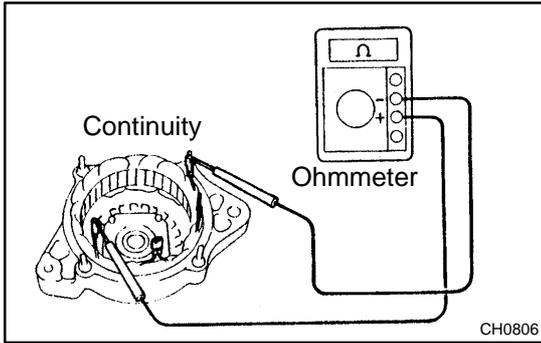
If rough or scored, replace the rotor.

- (d) Using vernier calipers, measure the slip ring diameters.

Standard diameter: 14.2 to 14.4 mm (0.559 to 0.567 in.)

Minimum diameter: 12.8 mm (0.504 in.)

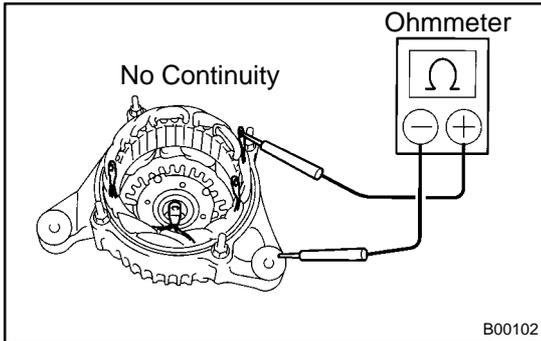
If the diameter is less than minimum, replace the rotor.



3. INSPECT STATOR FOR OPEN CIRCUIT

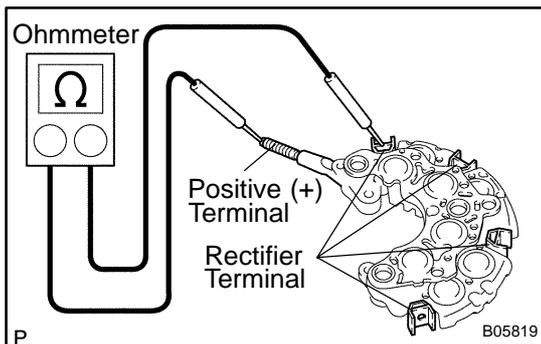
- (a) Check the stator for open circuit.
Using an ohmmeter, check that there is continuity between the coil leads.

If there is no continuity, replace the drive end frame assembly.



- (b) Check the stator for ground.
Using an ohmmeter, check that there is no continuity between the coil lead and drive end frame.

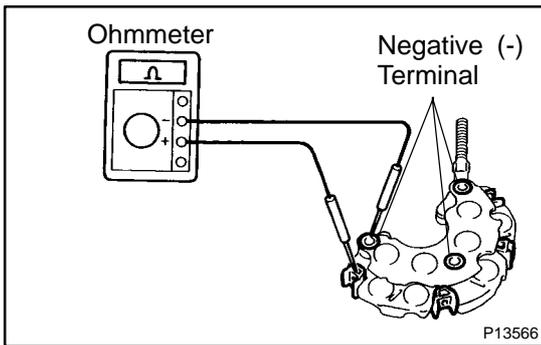
If there is continuity, replace the drive end frame assembly.



4. INSPECT POSITIVE RECTIFIER

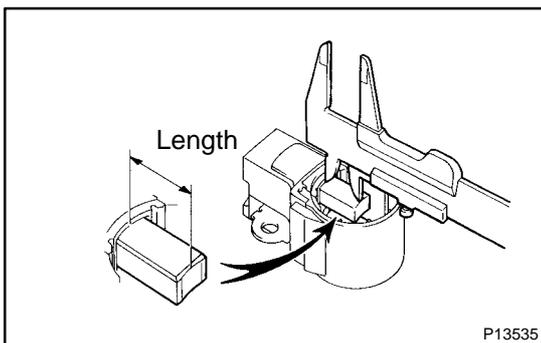
- (a) Check the positive (+) rectifier.
 - (1) Using an ohmmeter, connect one tester probe to the positive (+) terminal and the other to each rectifier terminal.
 - (2) Reverse the polarity of the tester probes and repeat step (a).
 - (3) Check that one shows continuity and the other shows no continuity.

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



- (b) Check the negative (-) rectifier.
 - (1) Using an ohmmeter, connect one tester probe to each negative (-) terminal and the other to each rectifier terminal.
 - (2) Reverse the polarity of the tester probes and repeat step (a).
 - (3) Check that one shows continuity and the other shows no continuity.

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



5. INSPECT EXPOSED BRUSH LENGTH

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: 1.5 mm (0.059 in.)

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

6. INSPECT BEARING

Check that the bearing is not rough or worn.

If necessary, replace the drive end frame assembly (front bearing) or rotor assembly (rear bearing).

INSTALLATION

1. INSTALL GENERATOR

- (a) Install the generator with the bolt and nut.

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

- (b) Connect the generator connector.
(c) Connect the generator wire with the nut and rubber.
(d) Install the terminal cap.
(e) Install the wire clamp to the cord clip on the generator.

2. INSTALL PS VANE PUMP (See page [SR-69](#))

3. INSTALL DRIVE BELT

Install the belt by turning the belt tensioner counterclockwise.

HINT:

The pulley bolt for the belt tensioner has a left-hand thread.

4. CONNECT INTAKE AIR CONNECTOR TO THROTTLE BODY

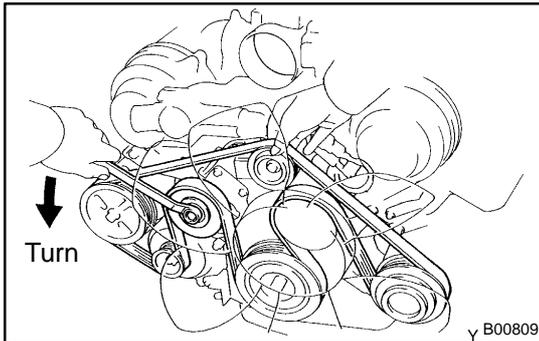
5. PERFORM ON-VEHICLE INSPECTION

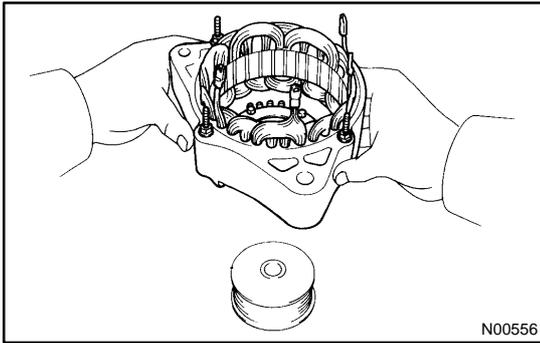
(See page [CH-1](#))

6. INSTALL THROTTLE BODY COVER

7. INSTALL ENGINE UNDER COVER

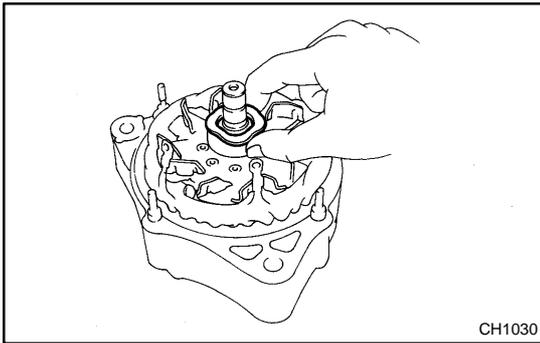
8. CONNECT CABLE TO NEGATIVE (-) BATTERY TERMINAL



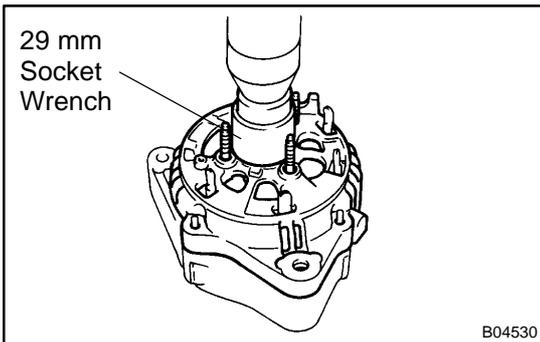


REASSEMBLY

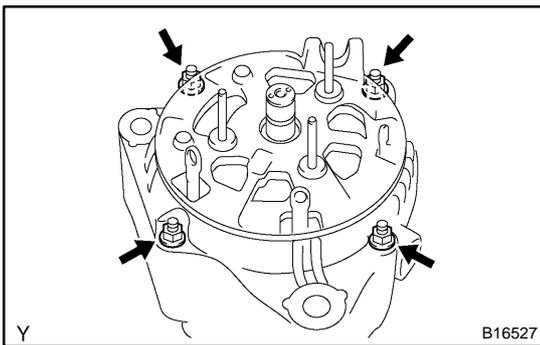
1. PLACE RECTIFIER END FRAME ON PULLEY
2. INSTALL ROTOR TO DRIVE END FRAME



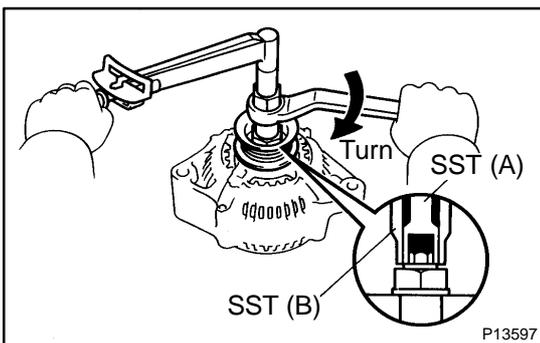
3. INSTALL RECTIFIER END FRAME
 - (a) Place the generator washer on the rotor.



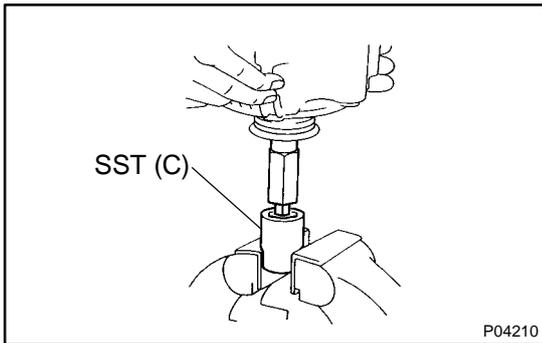
- (b) Using a 29 mm socket wrench and press, slowly press in the rectifier end frame.



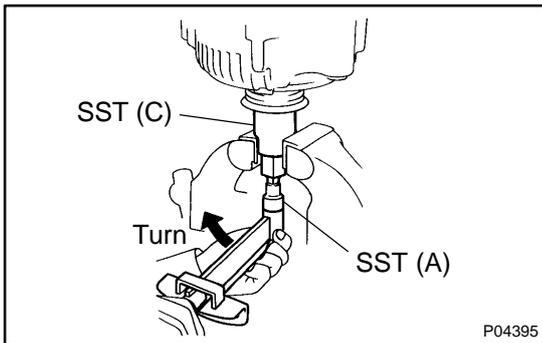
- (c) Install the 4 nuts.
Torque: 4.5 N·m (46 kgf·cm, 39 in.-lbf)



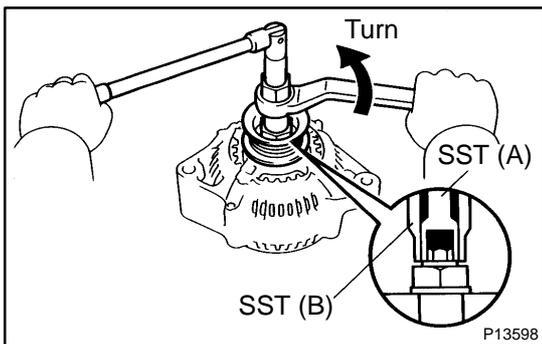
4. INSTALL PULLEY
 - (a) Install the pulley to the rotor shaft by tightening the pulley nut by hand.
 - (b) Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820-6301 1
Torque: 39 N·m (400 kgf·cm, 29 ft-lbf)
 - (c) Check that SST (A) is secured to the pulley shaft.



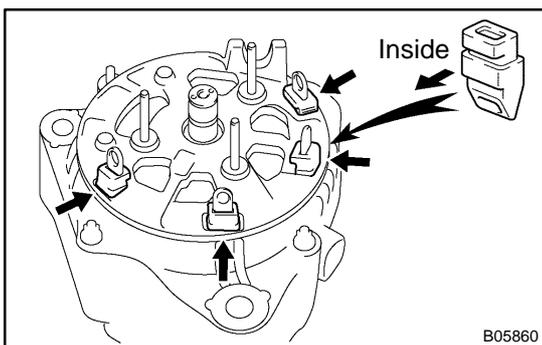
- (d) Mount SST (C) in a vise.
- (e) Insert SST (B) into SST (C), and attach the pulley nut to SST (C).



- (f) To torque the pulley nut, turn SST (A) in the direction shown in the illustration.
Torque: 110.5 N·m (1,125 kgf·cm, 81 ft·lbf)
- (g) Remove the generator from SST (C).



- (h) Turn SST (B), and remove SST (A and B).

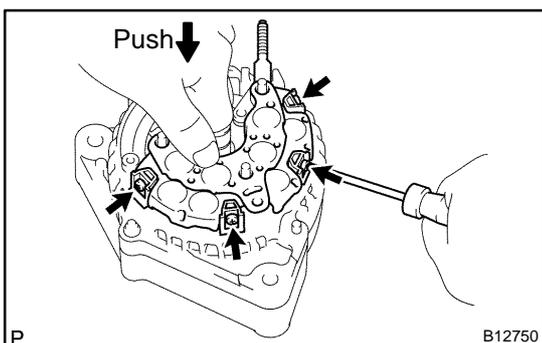


5. INSTALL RECTIFIER HOLDER

- (a) Install the 4 rubber insulators on the lead wires.

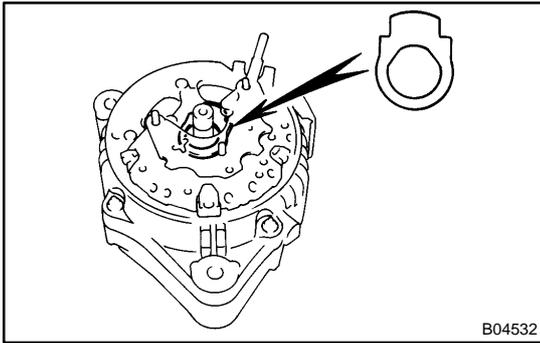
NOTICE:

Be careful of the rubber insulators installation direction.



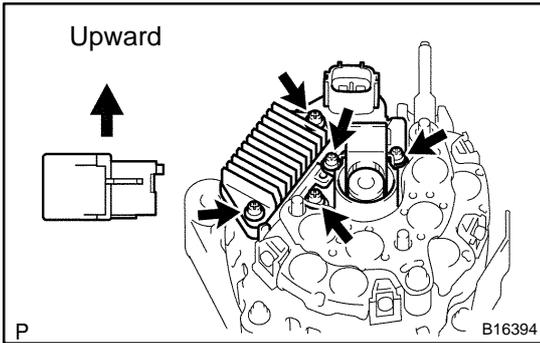
- (b) Install the rectifier while pushing it with the 4 screws.

Torque: 1.96 N·m (20 kgf·cm, 17 in.-lbf)



6. INSTALL BRUSH HOLDER AND VOLTAGE REGULATOR

- (a) Place the seal plate on the rectifier end frame.



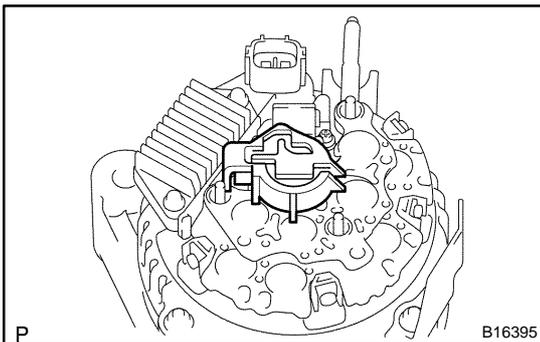
- (b) Place the voltage regulator and brush holder on the rectifier end frame.

NOTICE:

Be careful of the brush holder installation direction.

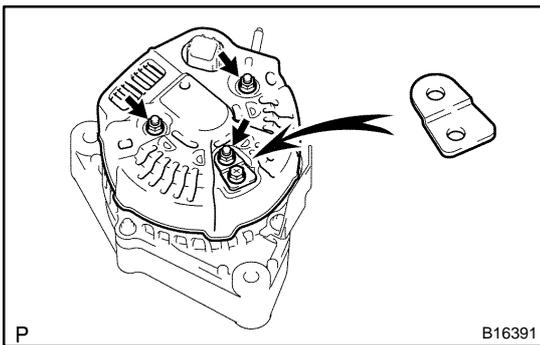
- (c) Install the 5 screws.

Torque: 1.96 N·m (20 kgf·cm, 17 in.-lbf)



7. INSTALL REAR END COVER

- (a) Place the brush holder cover on the brush holder.

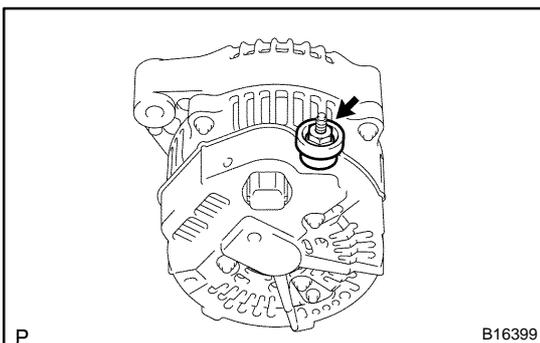


- (b) Install the end cover and plate terminal with the bolt and 3 nuts.

Torque:

Bolt: 3.85 N·m (39 kgf·cm, 34 in.-lbf)

Nut: 4.4 N·m (46 kgf·cm, 39 in.-lbf)



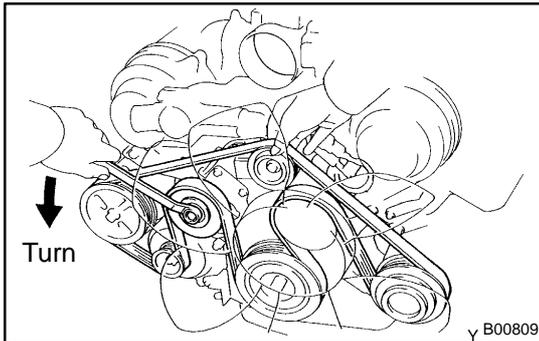
- (c) Install the terminal insulator with the nut.

Torque: 4.1 N·m (41.5 kgf·cm, 36 in.-lbf)

8. CHECK THAT ROTOR ROTATES SMOOTHLY

REMOVAL

1. REMOVE ENGINE UNDER COVER
2. REMOVE THROTTLE BODY COVER
3. DISCONNECT CABLE FROM NEGATIVE (-) BATTERY TERMINAL
4. DISCONNECT INTAKE AIR CONNECTOR FROM THROTTLE BODY



5. REMOVE GENERATOR DRIVE BELT

Loosen the belt tension by turning the belt tensioner counter-clockwise, and remove the drive belt.

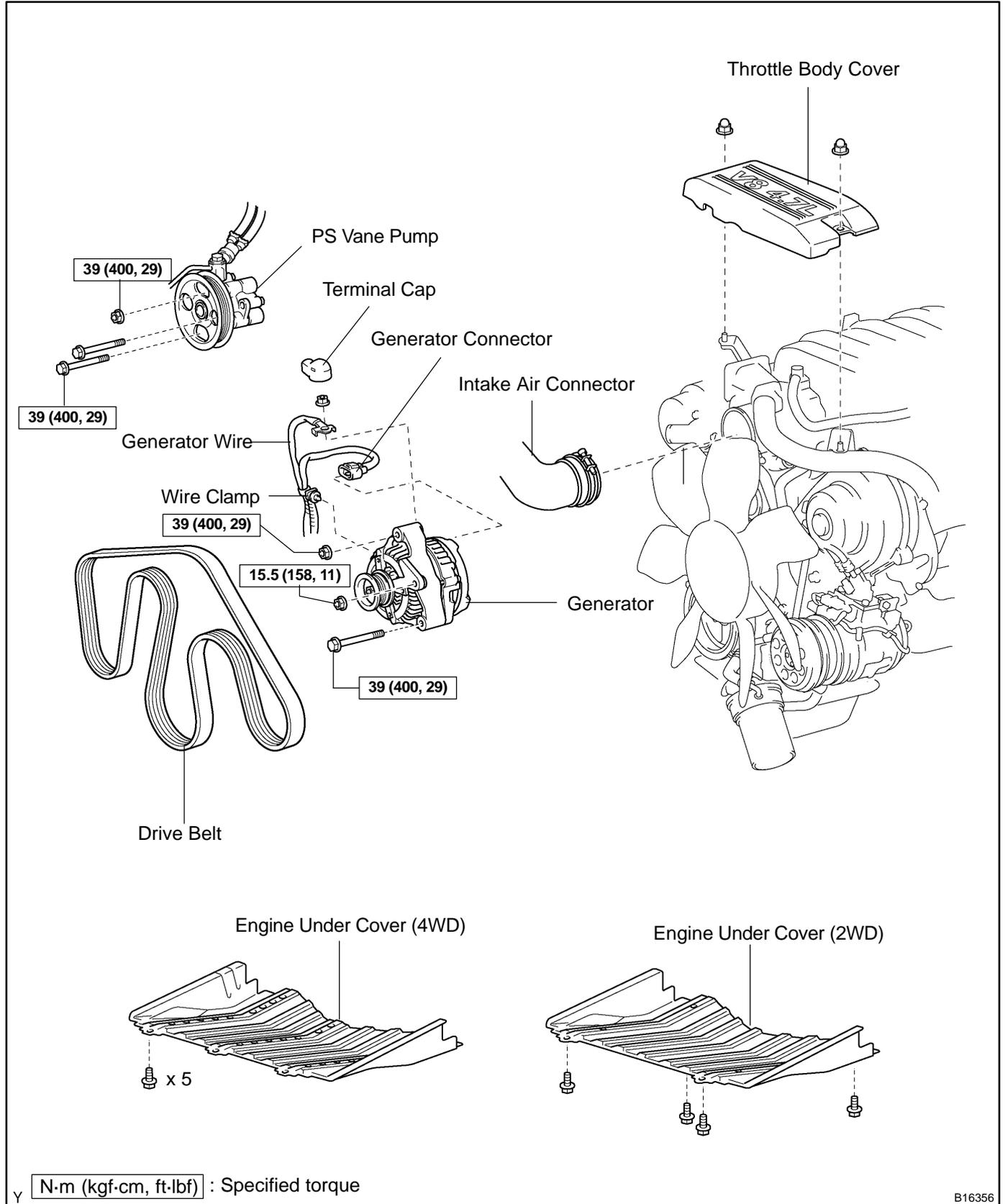
HINT:

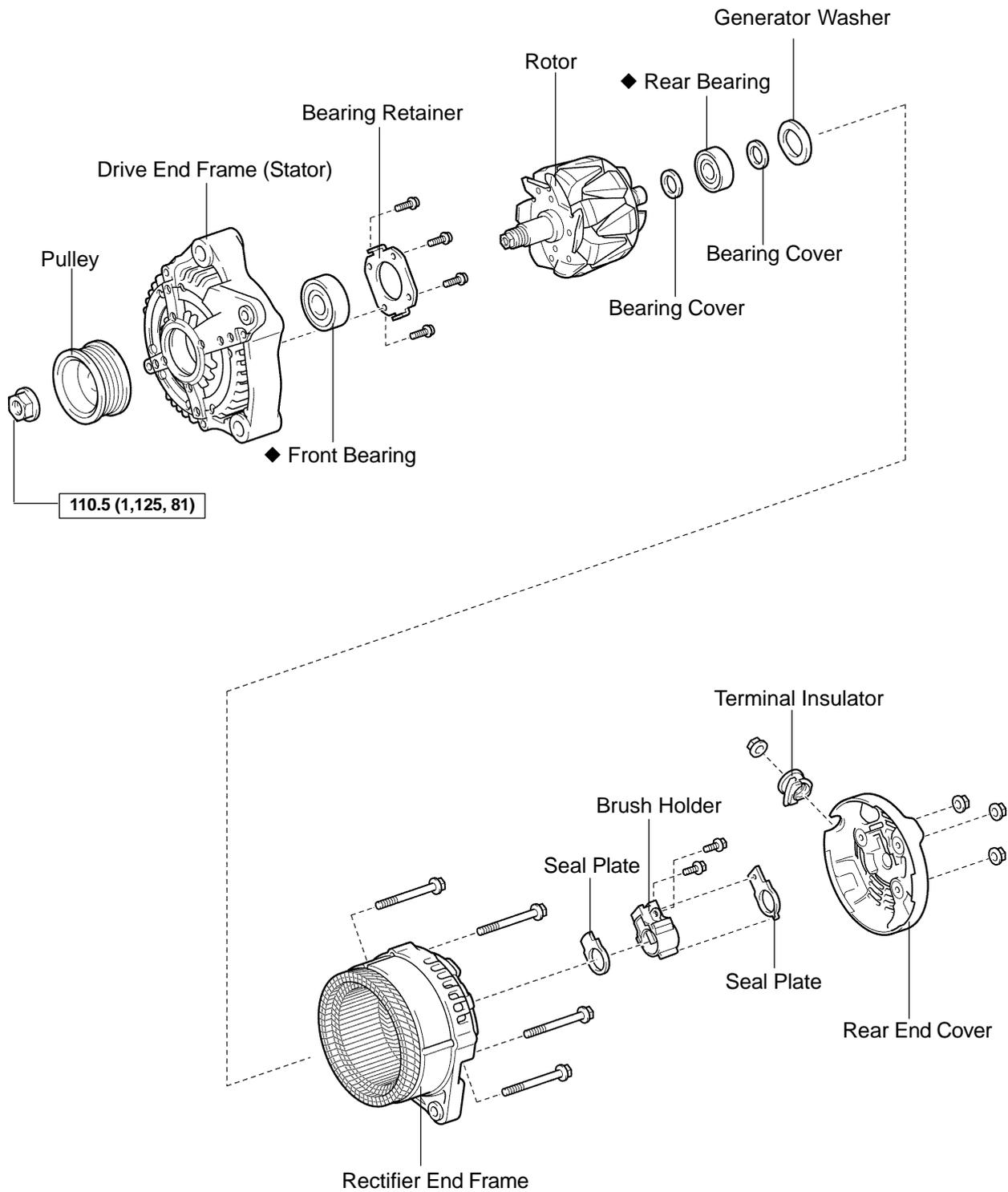
The pulley bolt for the belt tensioner has a left hand thread.

6. REMOVE PS VANE PUMP FROM ENGINE (See page [SR-61](#))
7. REMOVE GENERATOR
 - (a) Disconnect the generator connector.
 - (b) Remove the terminal cap and nut, and disconnect the generator wire.
 - (c) Disconnect the wire clamp from the cord clip on the generator.
 - (d) Remove the bolt, nut and generator.

GENERATOR (Towing Package Spec.) COMPONENTS

CH0LR-02



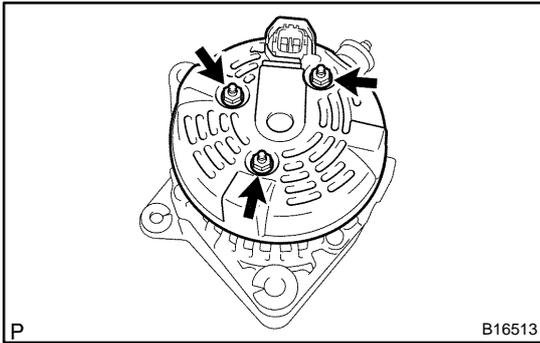


110.5 (1,125, 81)

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

◆ Non-reusable part

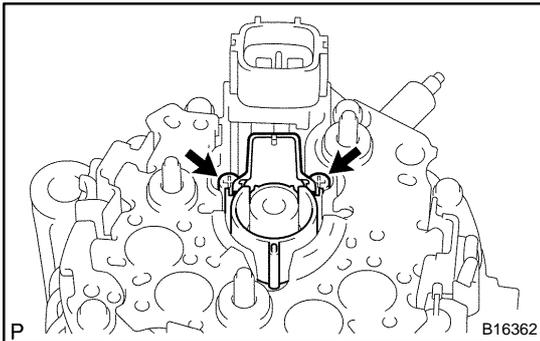
B16514



DISASSEMBLY

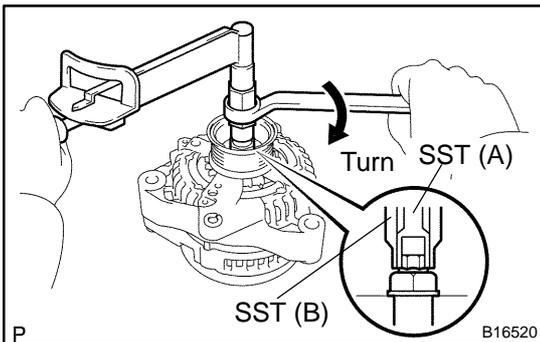
1. REMOVE REAR END COVER

- (a) Remove the 3 nuts and end cover.
- (b) Remove the terminal insulator.



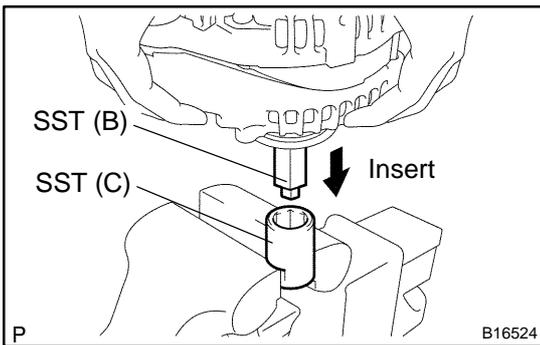
2. REMOVE BRUSH HOLDER

- (a) Remove the rear seal plate from the brush holder.
- (b) Remove the 2 screws and brush holder.
- (c) Remove the front seal plate from the coil assembly.

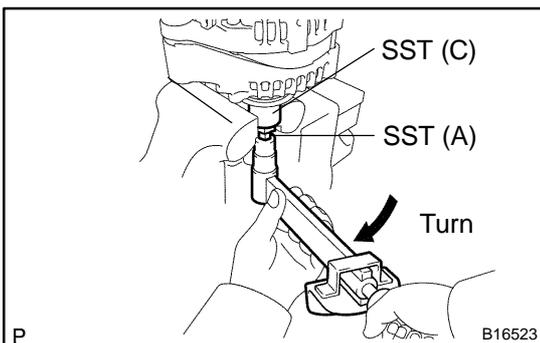


3. REMOVE PULLEY

- (a) Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820-6301 1
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
- (b) Check that SST (A) is secured to the rotor shaft.



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

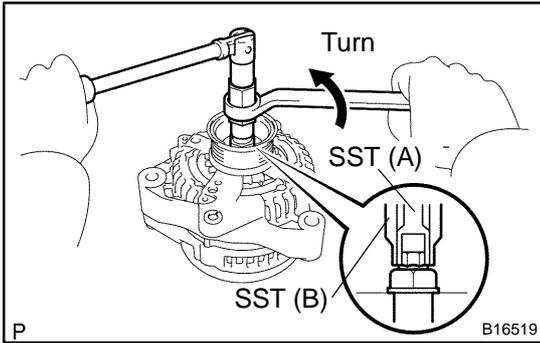


- (e) To loosen the pulley nut, turn SST (A) in the direction shown in the illustration.

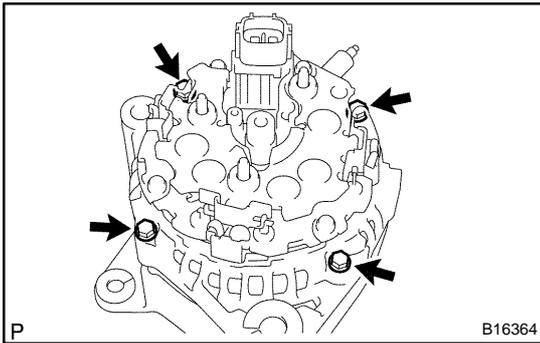
NOTICE:

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

- (f) Remove the generator from SST (C).

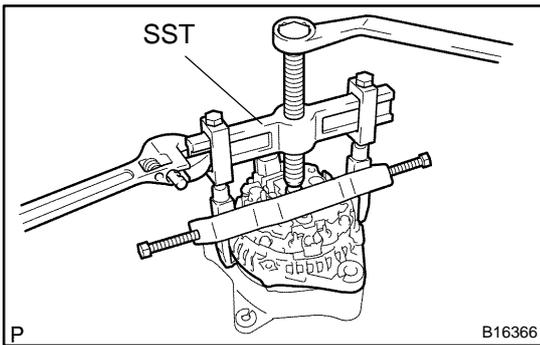


- (g) Turn SST (B), and remove SST (A and B).
- (h) Remove the pulley nut and pulley.



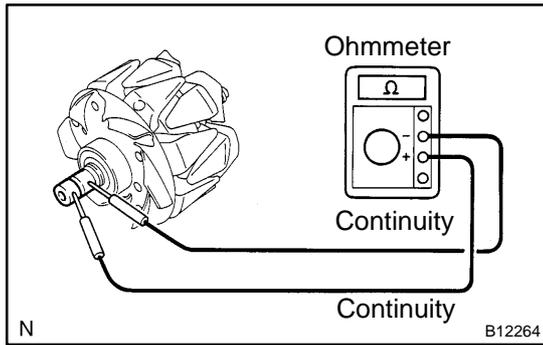
4. REMOVE COIL ASSEMBLY

- (a) Remove the 4 bolts.



- (b) Using SST, remove the coil assembly.
 SST 09950-40011 (09951-04020, 09952-04010, 09953-04020, 09954-04010, 09955-04071, 09957-04010, 09958-04011)
- (c) Remove the generator washer.

5. REMOVE ROTOR FROM DRIVE END FRAME



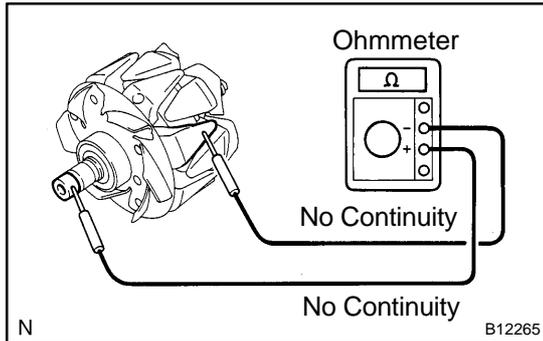
INSPECTION

1. INSPECT ROTOR

- (a) Check the rotor for open circuit.
Using an ohmmeter, check that there is continuity between the slip rings.

Standard resistance: 2.3 to 2.7 Ω at 20°C (68°F)

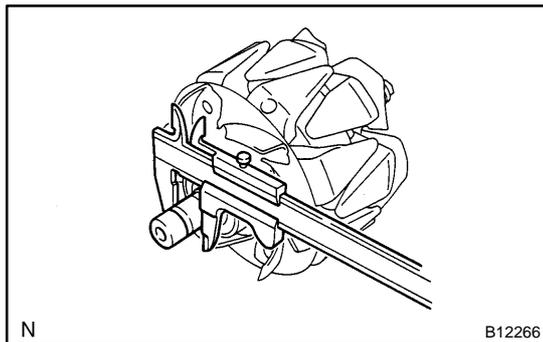
If there is no continuity, replace the rotor.



- (b) Check the rotor for ground.
Using an ohmmeter, check that there is no continuity between the slip ring and rotor.

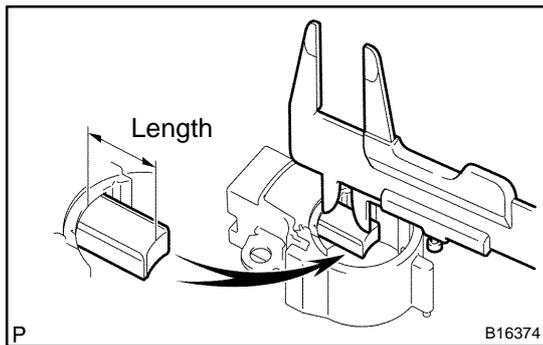
If there is continuity, replace the rotor.

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



- (d) 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 rotor.



2. INSPECT BRUSHES

Using vernier caliper, measure the exposed brush length.

Standard exposed length: 10.5 mm (0.413 in.)

Minimum exposed length: 4.5 mm (0.177 in.)

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

3. INSPECT BEARING

Check the bearing is not rough or worn.

If necessary, replace the bearing (See page [CH-23](#)).

INSTALLATION

1. INSTALL GENERATOR

- (a) Install the generator with the bolt and 2 nuts.

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

- (b) Connect the generator connector.
(c) Connect the generator wire with the nut.
(d) Install the terminal cap.
(e) Install the wire clamp to the cord clip on the generator.

2. INSTALL PS VANE PUMP (See page [SR-69](#))

3. INSTALL DRIVE BELT

Install the belt by turning the belt tensioner counterclockwise.

HINT:

The pulley bolt for the belt tensioner has a left-hand thread.

4. CONNECT INTAKE AIR CONNECTOR TO THROTTLE BODY

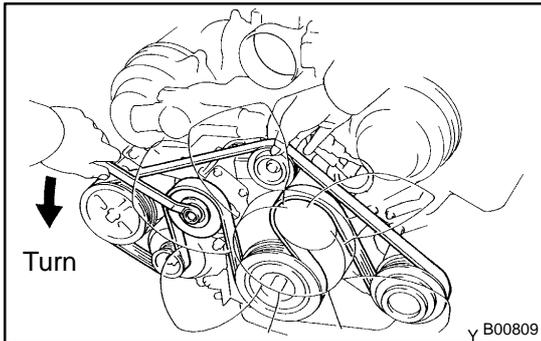
5. PERFORM ON-VEHICLE INSPECTION

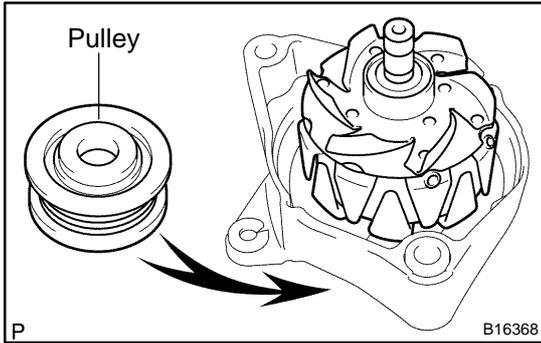
(See page [CH-1](#))

6. INSTALL THROTTLE BODY COVER

7. INSTALL ENGINE UNDER COVER

8. CONNECT CABLE TO NEGATIVE (-) BATTERY TERMINAL

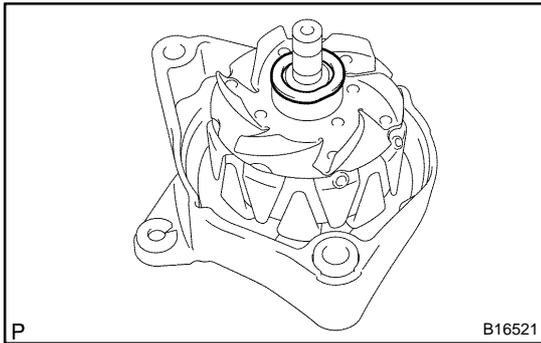




REASSEMBLY

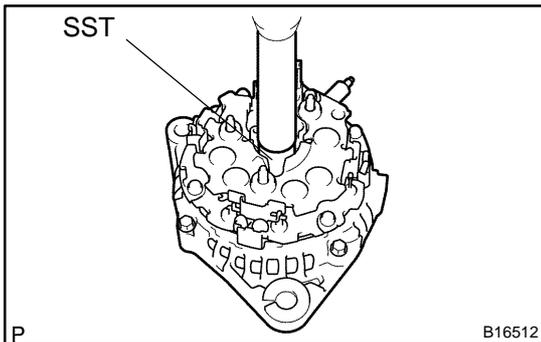
1. INSTALL ROTOR TO DRIVE END FRAME

- (a) Place the drive end frame on the pulley.
- (b) Install the rotor to the drive end frame.

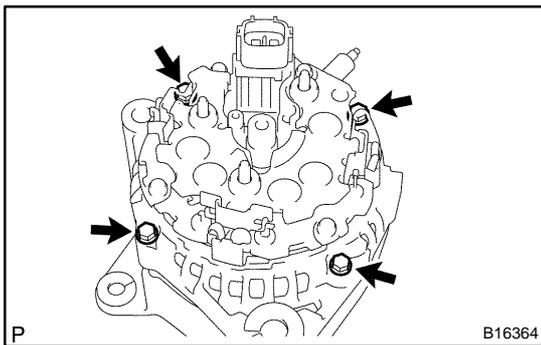


2. INSTALL COIL ASSEMBLY

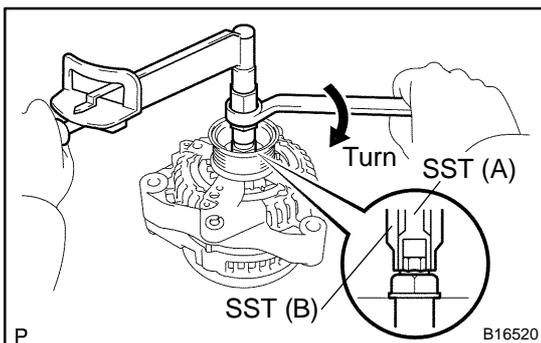
- (a) Place the generator washer on the rotor.



- (b) Using SST and a press, slowly press in the coil assembly.
SST 09285-76010

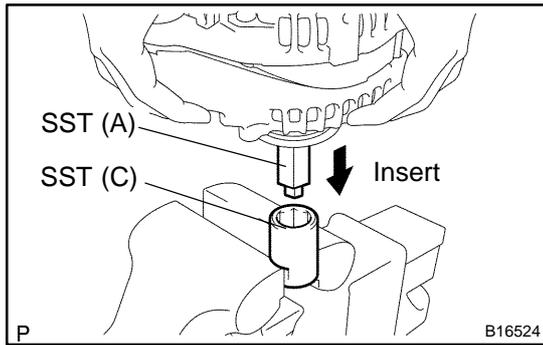


- (c) Install the coil assembly with the 4 bolts.
Torque: 5.8 N·m (59 kgf·cm, 51 in.-lbf)

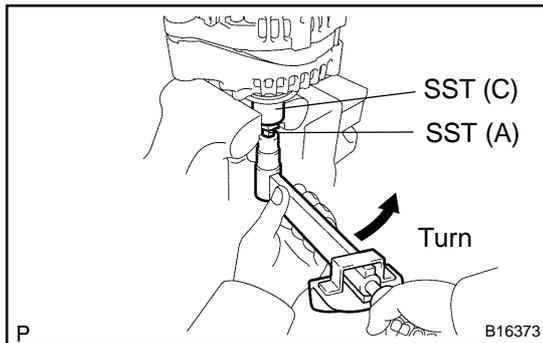


3. INSTALL PULLEY

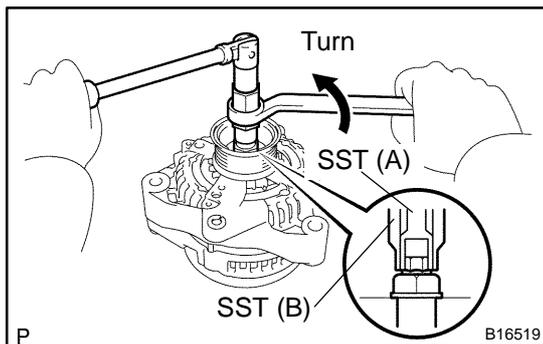
- (a) Install the pulley to the rotor shaft by tightening the pulley nut by hand.
- (b) Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820-6301 1
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
- (c) Check that SST (A) is secured to the pulley shaft.



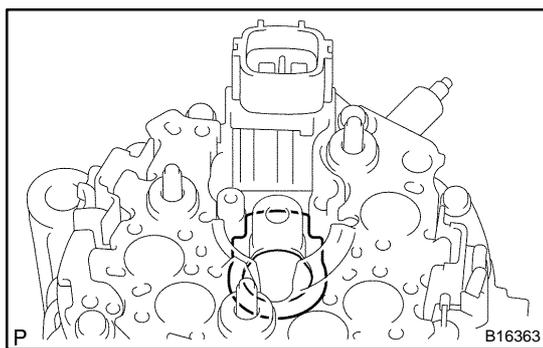
- (d) Mount SST (C) in a vise.
- (e) Insert SST (B) into SST (C), and attach the pulley nut to SST (C).



- (f) To torque the pulley nut, turn SST (A) in the direction shown in the illustration.
Torque: 110.5 N·m (1,125 kgf·cm, 81 ft·lbf)
- (g) Remove the generator from SST (C).

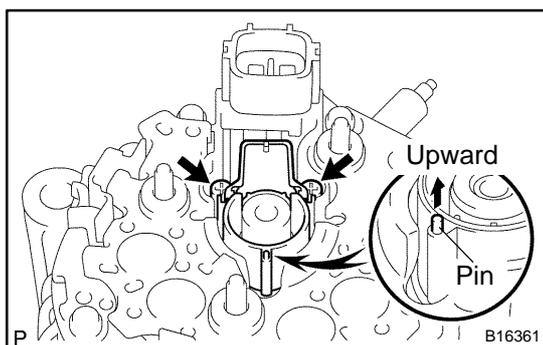


- (h) Turn SST (B), and remove SST (A and B).



4. INSTALL BRUSH HOLDER

- (a) Place the front seal plate on the coil assembly.

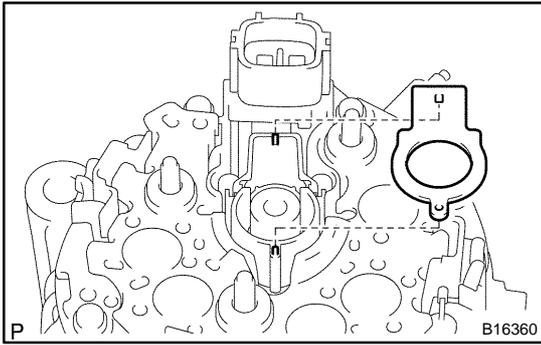


- (b) Place the brush holder on the coil assembly with the pin facing upward.

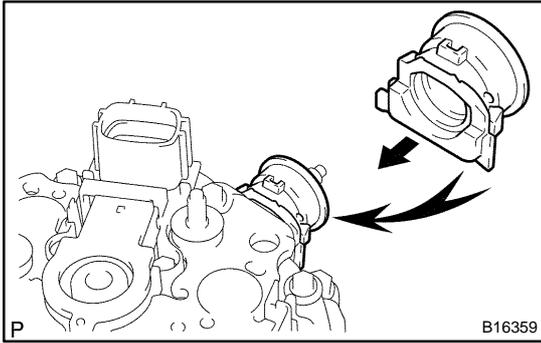
NOTICE:

Be careful of the holder installation direction.

- (c) Install the 2 screws.
Torque: 1.8 N·m (18 kgf·cm, 16 in.-lbf)



- (d) Align the pins of the brush holder with the holes of the rear seal plate, and install the rear seal plate.

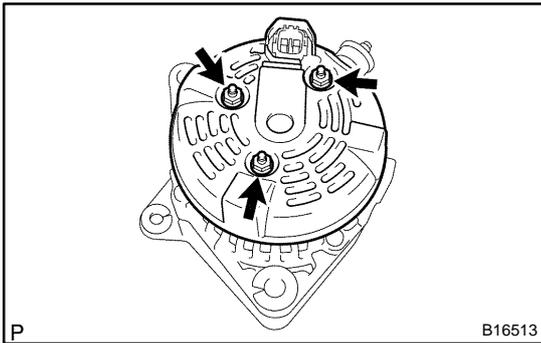


5. INSTALL REAR END COVER

- (a) Install the terminal insulator.

NOTICE:

Be careful of the terminal insulator installation direction.



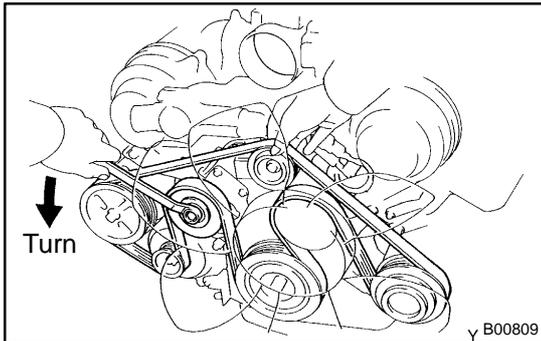
- (b) Install the end cover with the 3 nuts.

Torque: 4.6 N·m (47 kgf·cm, 41 in.-lbf)

6. CHECK THAT ROTOR ROTATES SMOOTHLY

REMOVAL

1. REMOVE ENGINE UNDER COVER
2. REMOVE THROTTLE BODY COVER
3. DISCONNECT CABLE FROM NEGATIVE (-) BATTERY TERMINAL
4. DISCONNECT INTAKE AIR CONNECTOR FROM THROTTLE BODY



5. REMOVE GENERATOR DRIVE BELT

Loosen the belt tension by turning the belt tensioner counter-clockwise, and remove the drive belt.

HINT:

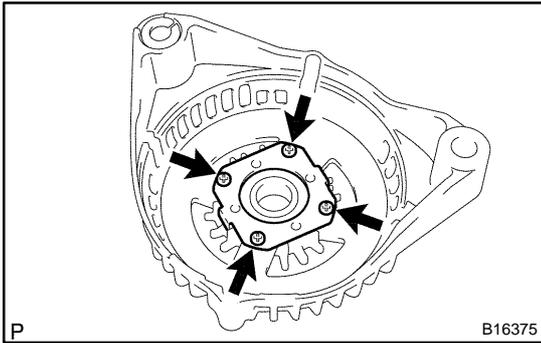
The pulley bolt for the belt tensioner has a left-hand thread.

6. REMOVE PS VANE PUMP FROM ENGINE

(See page [SR-61](#))

7. REMOVE GENERATOR

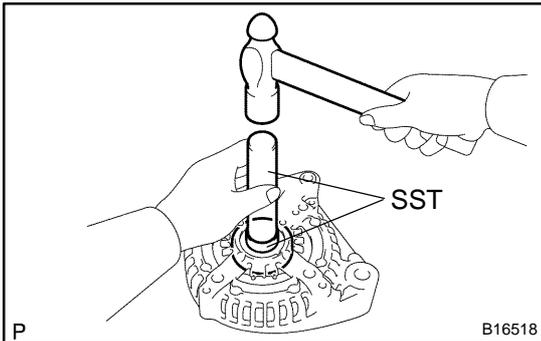
- (a) Disconnect the generator connector.
- (b) Remove the terminal cap and nut, and disconnect the generator wire.
- (c) Disconnect the wire clamp from the cord clip on the generator.
- (d) Remove the bolt, 2 nuts and generator.



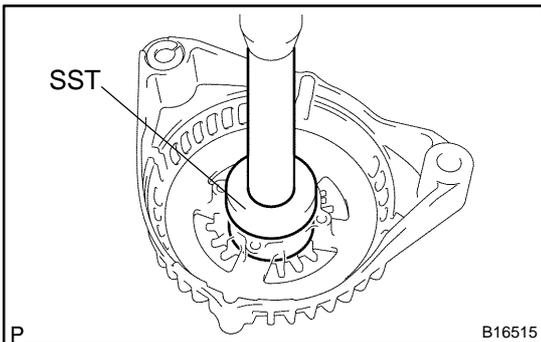
REPLACEMENT

1. REPLACE FRONT BEARING

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

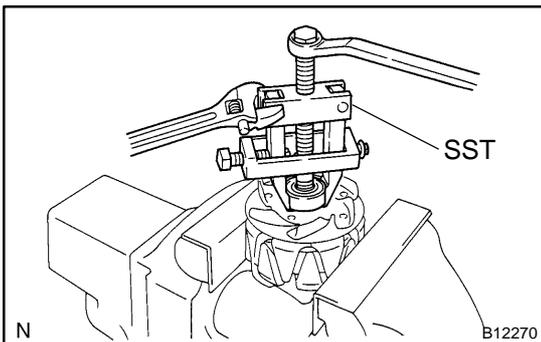


- (b) Using SST and a hammer, tap out the bearing.
 SST 09950-60010 (09951-00250), 09950-70010 (09951-07100)



- (c) Using SST and a press, press in a new bearing.
 SST 09950-60010 (09951-00470), 09950-70010 (09951-07100)

- (d) Install the bearing retainer with the 4 screws.
Torque: 2.6 N·m (27 kgf·cm, 23 in.-lbf)



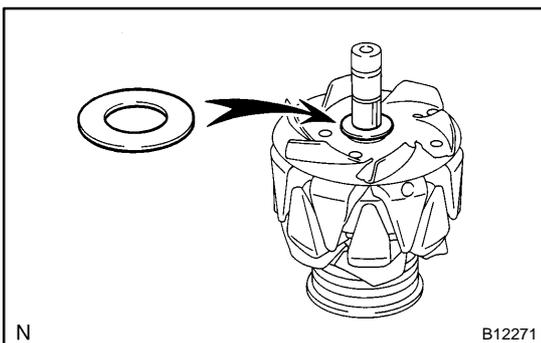
2. REPLACE REAR BEARING

- (a) Using SST, remove the bearing cover (outside) and bearing.
 SST 09820-00021

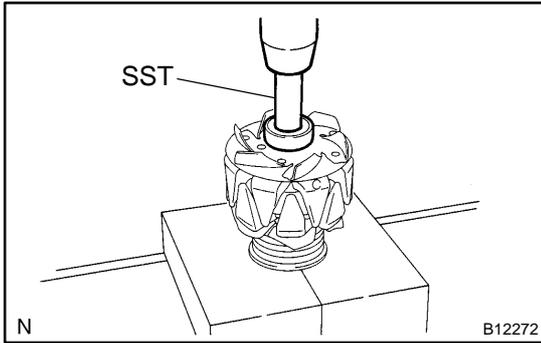
NOTICE:

Be careful not to damage the fan.

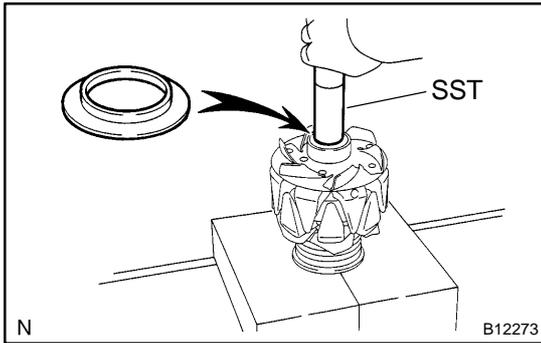
- (b) Remove the bearing cover (inside).



- (c) Place the bearing cover (inside) on the rotor.



- (d) Using SST and a press, press in a new bearing.
SST 09820-00031



- (e) Using SST, push in the bearing cover (outside).
SST 09285-76010