
CHARGING

CHARGING SYSTEM	CH-1
ALTERNATOR	CH-5



CHARGING SYSTEM

CH07B-01

PRECAUTION

- 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.

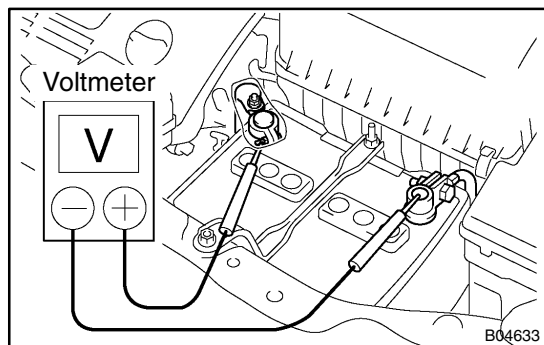


ON-VEHICLE INSPECTION

1. CHECK BATTERY ELECTROLYTE LEVEL

Check the electrolyte quantity of each cell.

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



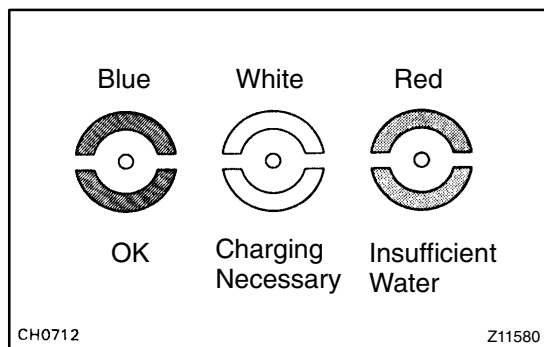
2. CHECK BATTERY VOLTAGE

- (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 – 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.

3. CHECK BATTERY TERMINALS, FUSIBLE LINK AND FUSES

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

If the terminals are corroded, clean the terminals.

- (b) Check the fusible link, H-fuses, M-fuse and fuses for continuity.

4. INSPECT DRIVE BELTS

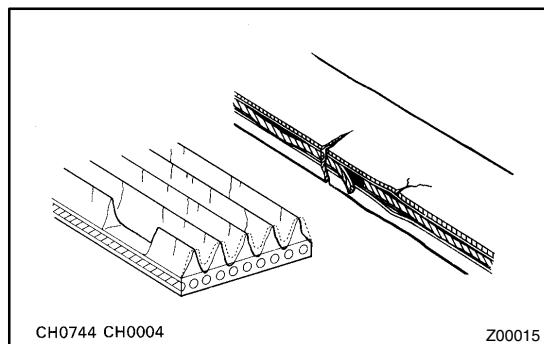
- (a) Visually check the drive belt for excessive wear, frayed cords etc.

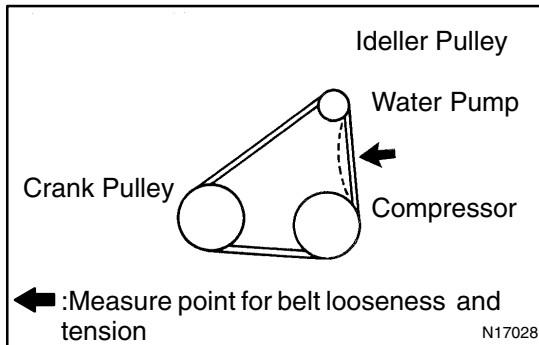
If any defect has been found, replace the drive belt.

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.

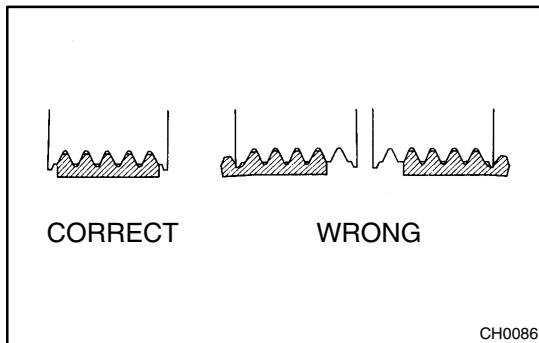




- (b) Check the drive belt deflection by peressing on the belt at the points indicated in the illustration with 98 N (10 kgf, 22 lbf) of pressure.

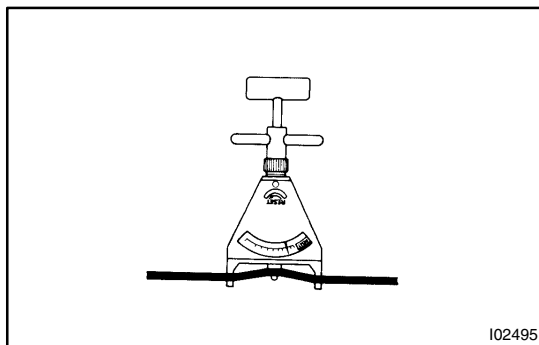
New belt 8.0 – 9.0 mm (0.35 – 0.47 in.)

Used belt 12.0 – 14.0 mm (0.43 – 0.59 in.)



HINT:

- "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing a belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.



- (c) Reference:
Using a belt tension gauge, measure the belt tension.

Belt tension gauge:

DENSO BTG-20 (95506-00020)

Drive belt tension:

New belt	756 – 801 N (77 – 82 kgf)
Used belt	422 – 601 N (43 – 61 kgf)

If the belt tension is not as specified, adjust it.

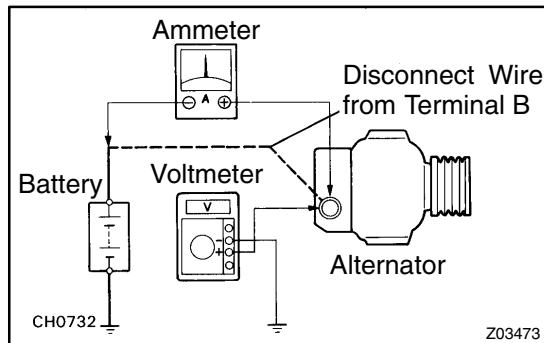
5. VISUALLY CHECK ALTERNATOR WIRING AND LISTEN FOR ABNORMAL NOISES

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

6. CHECK DISCHARGE WARNING LIGHT CIRCUIT

- (a) Warm up the engine and then turn it off.
- (b) Switch off all accessories.
- (c) Turn the ignition switch "ON". Check that the discharge warning light is lit.
- (d) Start the engine. Check that the light goes off.

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

**7. INSPECT CHARGING CIRCUIT WITHOUT LOAD****HINT:**

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

- (a) 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 alternator, and connect it to the negative (–) tester probe of the ammeter.
 - Connect the positive (+) tester probe of the ammeter to terminal B of the alternator.
 - Connect the positive (+) tester probe of the voltmeter to terminal B of the alternator.
 - Ground the negative (–) tester probe of the voltmeter.
- (b) 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 – 14.0 V**

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

8. 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**

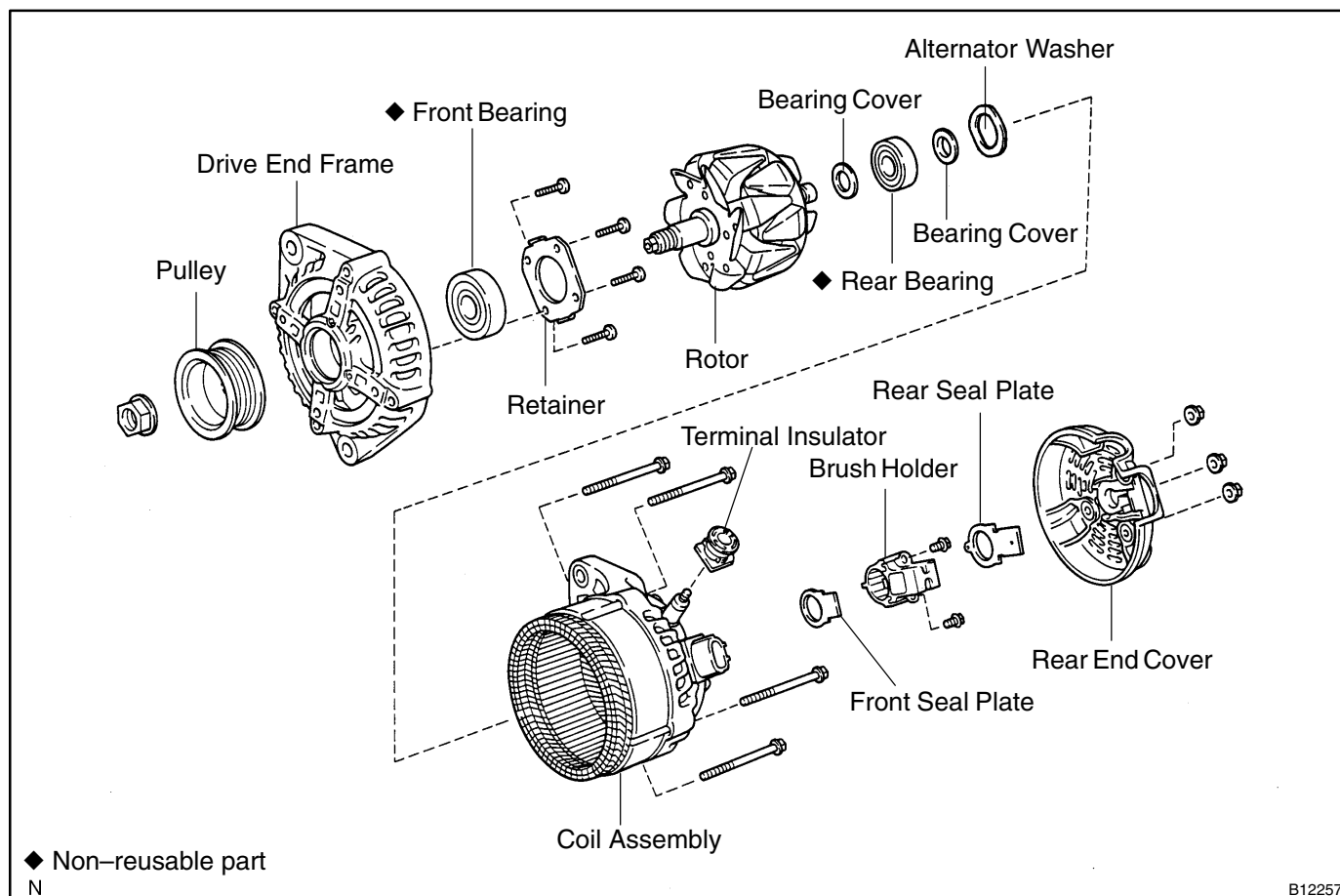
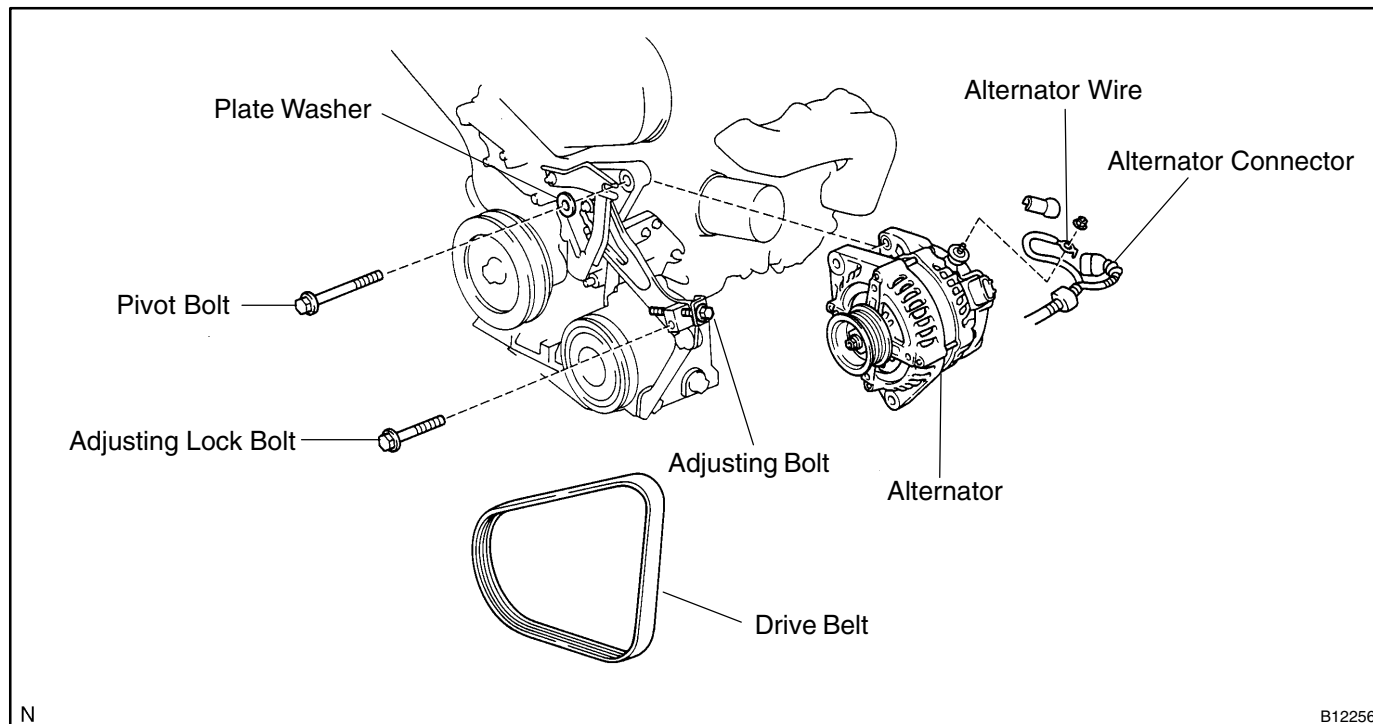
If the ammeter reading is less than the standard amperage, repair the alternator.

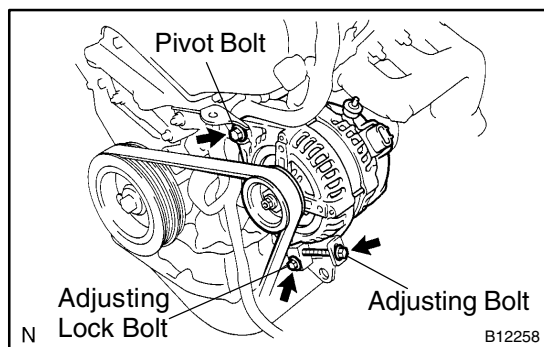
HINT:

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

ALTERNATOR COMPONENTS

CH07D-02





REMOVAL

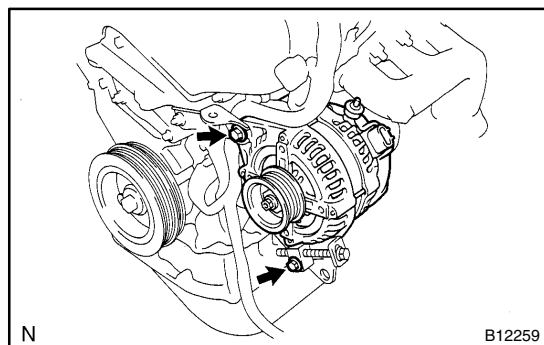
1. REMOVE DRIVE BELT

Loosen the pivot bolt, adjusting lock bolt, and adjusting bolt, and remove the drive belt.

Torque:

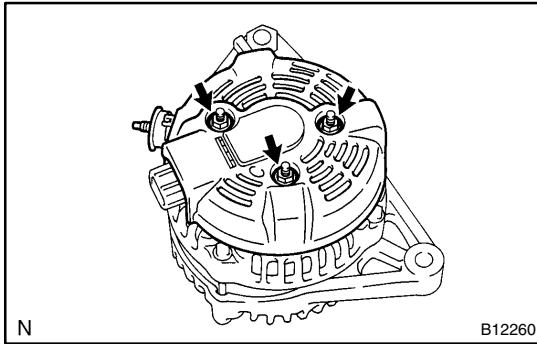
Pivot bolt: 56 N·m (570 kgf·cm, 41 ft·lbf)

Lock bolt: 18 N·m (180 kgf·cm, 13 ft·lbf)



2. REMOVE ALTERNATOR

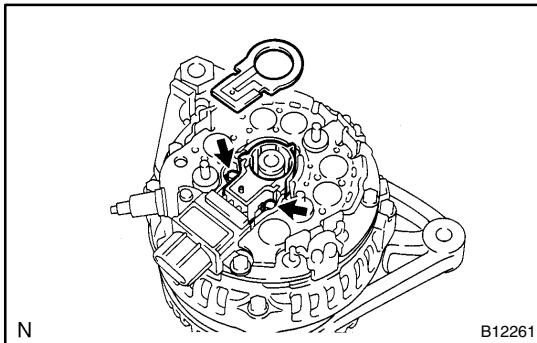
- Disconnect the alternator connector.
- Remove the nut, and disconnect the alternator wire.
- Disconnect the wire harness from the clip.
- Remove the pivot bolt, plate washer, adjusting lock bolt and alternator.



DISASSEMBLY

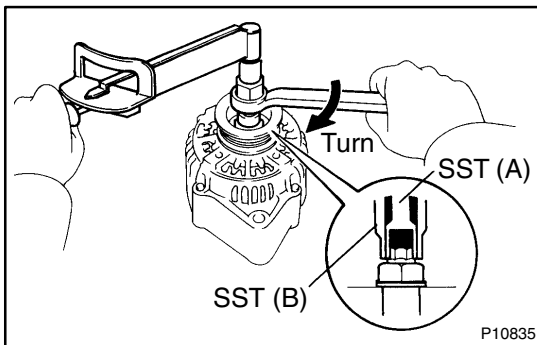
1. REMOVE REAR END COVER

- Remove the 3 nuts and end cover.
- Remove the terminal insulator.



2. REMOVE BRUSH HOLDER

- Remove the rear seal plate from the brush holder.
- Remove the 2 screws and brush holder.
- Remove the front seal plate from the coil assembly.



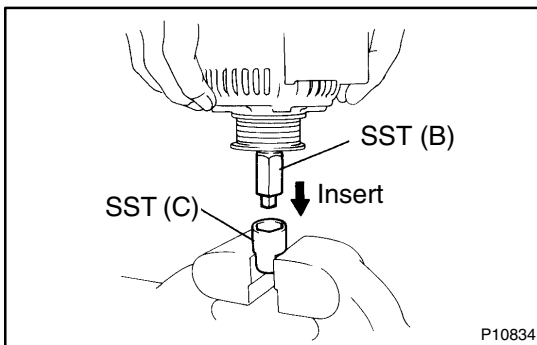
3. REMOVE PULLEY

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

SST 09820-63010

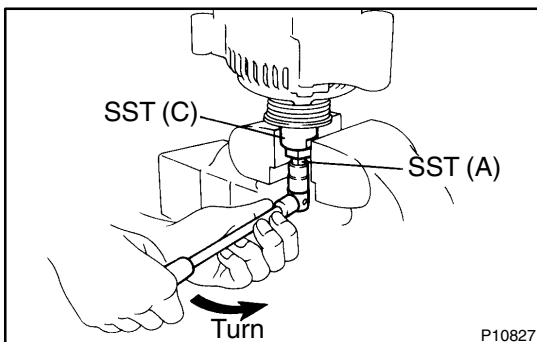
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

- Check that SST (A) is secured to the rotor shaft.



- Mount SST (C) in a vise.

- Insert SST (B) into SST (C), and attach the pulley nut to SST (C).

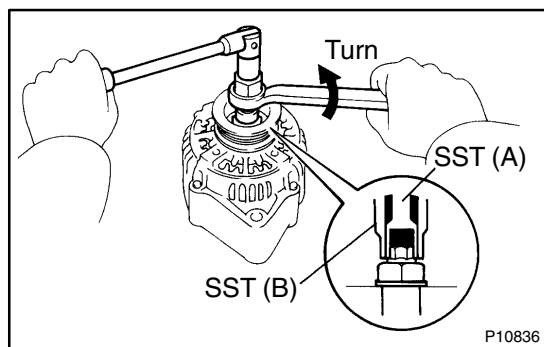


- To loosen the pulley nut, turn SST (A) in the direction shown in the illustration.

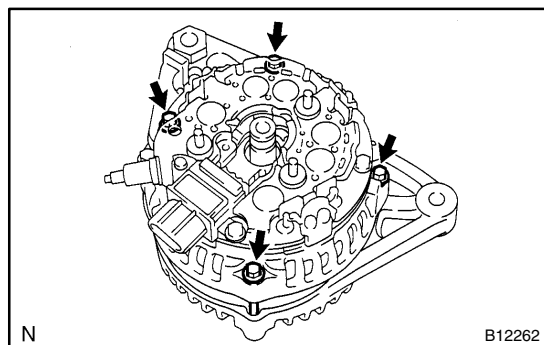
NOTICE:

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

- Remove the alternator from SST (C).

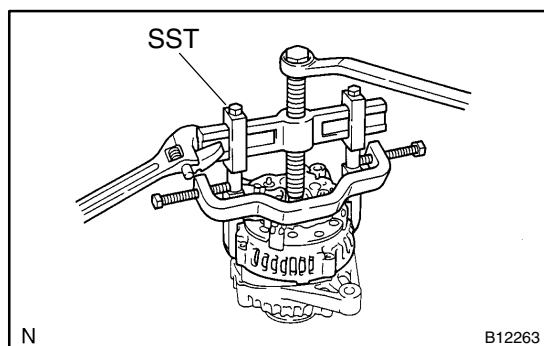


- (g) Turn SST (B), and remove SST (A and B).
- (h) Remove the pulley nut and pulley.



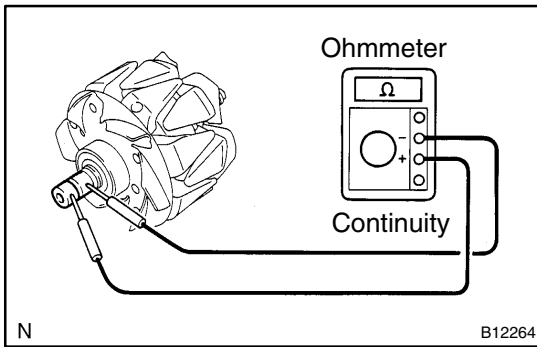
4. REMOVE COIL ASSEMBLY

- (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,
09958-04011)
- (c) Remove the alternator washer.

5. REMOVE ROTOR FROM DRIVE END FRAME



INSPECTION

1. INSPECT ROTOR

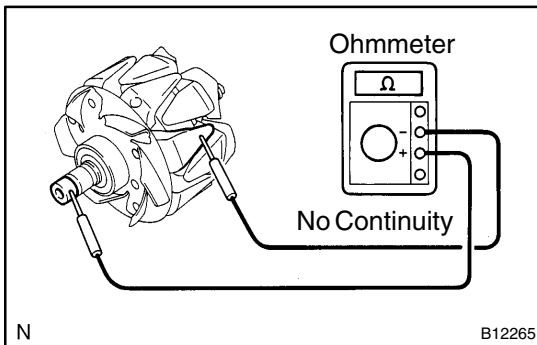
- (a) Check the rotor for open circuit.

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

Standard resistance:

2.3 – 2.7 Ω at 20°C (68°F)

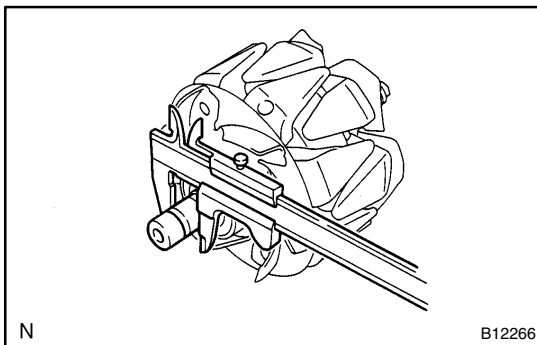
If there is no continuity, replace the rotor.



- (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.

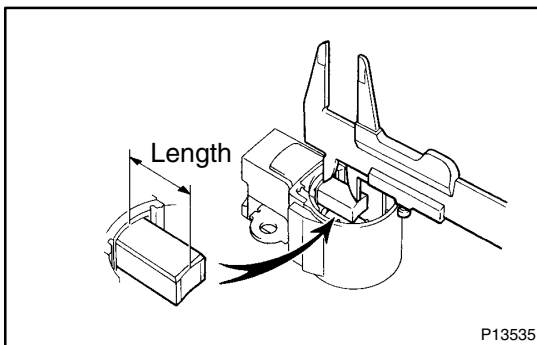
Standard diameter:

14.2 – 14.4 mm (0.559–0.567 in.)

Minimum diameter:

14.0 mm (0.551 in.)

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



2. INSPECT BRUSHES

Using a vernier caliper, measure the exposed brush length.

Standard exposed length:

10.5 mm (0.413 in.)

Minimum exposed length:

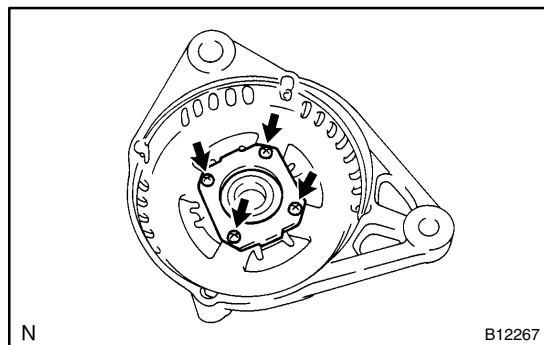
4.5 mm (0.177 in.)

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.

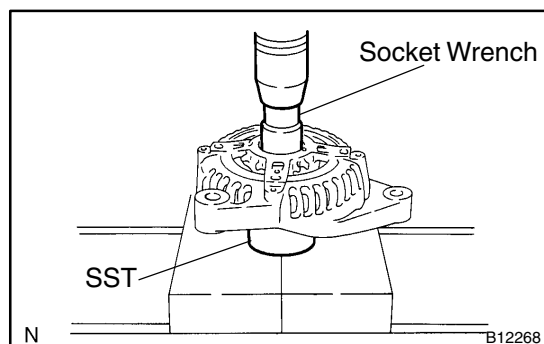
If necessary, replace the bearing. (See page CH-10)



REPLACEMENT

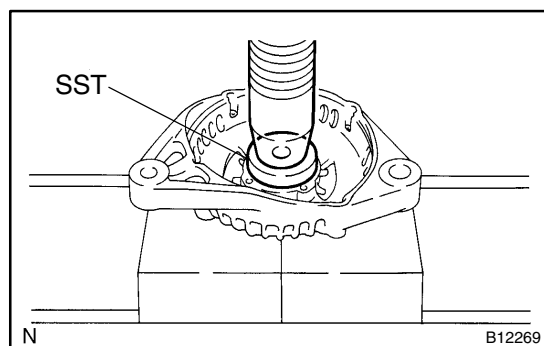
1. REPLACE FRONT BEARING

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



- (b) Using SST and a socket wrench and press, press out the bearing.

SST 09223-00010

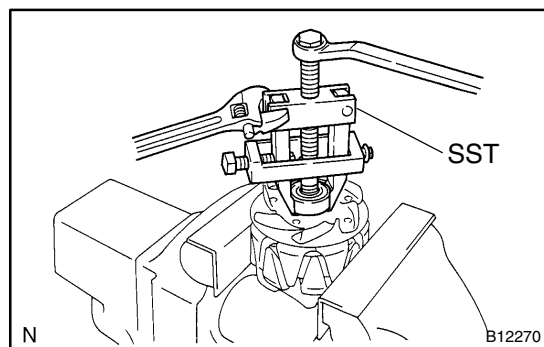


- (c) Using SST and a press, press in a new bearing.

SST 09950-60010 (09951-00480)

- (d) Install the bearing retainer with the 4 screws.

Torque: 2.6 N·m (27 kgf·cm, 23 in.-lbf)



2. REPLACE REAR BEARING

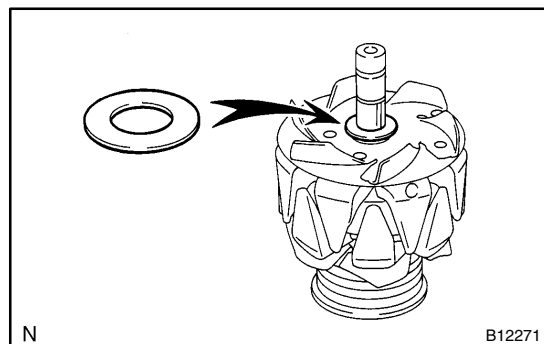
- (a) Using SST, remove the bearing cover (outside) and bearing.

SST 09820-00021

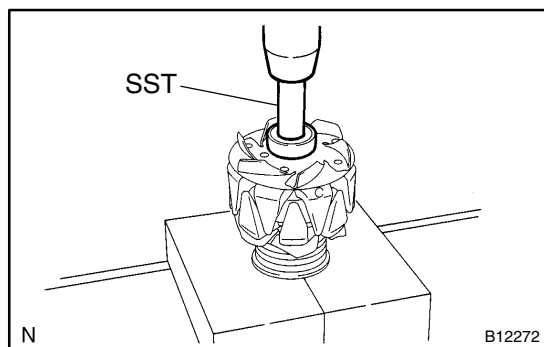
NOTICE:

Be careful not to damage the fan.

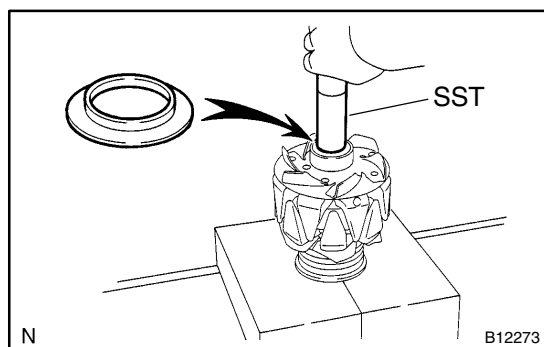
- (b) Remove the bearing cover (inside).



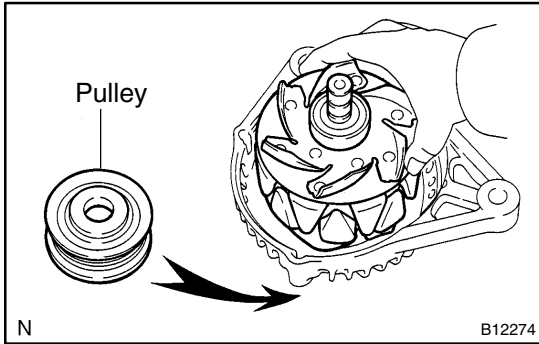
- (c) Place the bearing cover (inside) on the rotor.



- (d) Using SST and a press, press in a new bearing.
SST 09820-00030



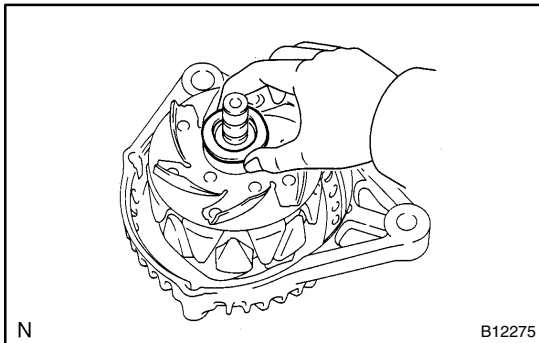
- (e) Using SST, push in the bearing cover (outside).
SST 09285-76010



REASSEMBLY

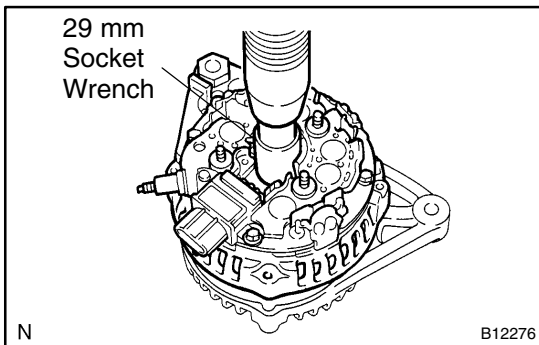
1. INSTALL ROTOR TO DRIVE END FRAME

- Place the drive end frame on the pulley.
- Install the rotor to the drive end frame.

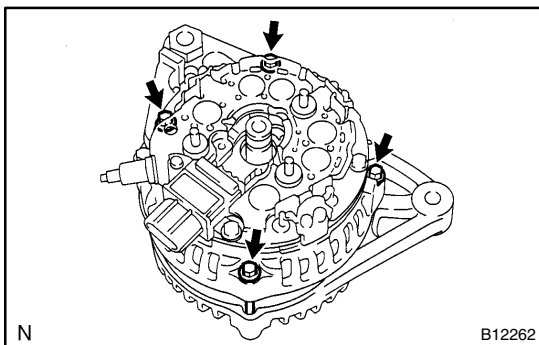


2. INSTALL COIL ASSEMBLY

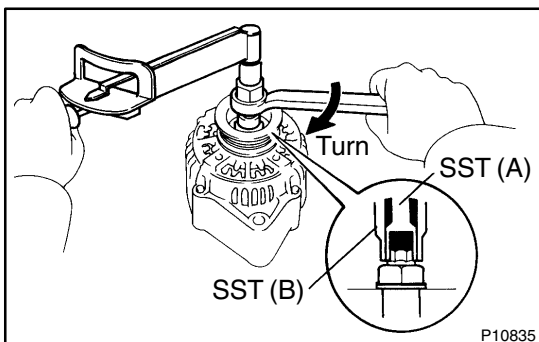
- Place the alternator washer on the rotor.



- Using a 29 mm socket wrench and press, slowly press in the coil assembly.

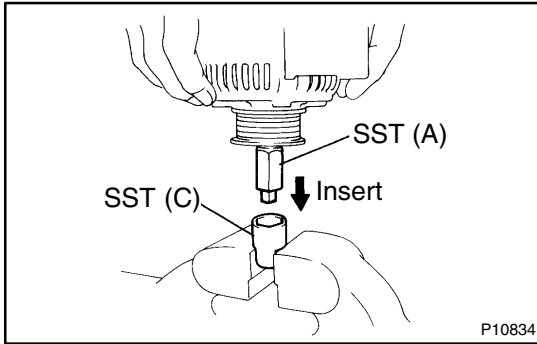


- Install the coil assembly with the 4 bolts.
Torque: 5.8 N·m (59 kgf·cm, 51 in·lbf)

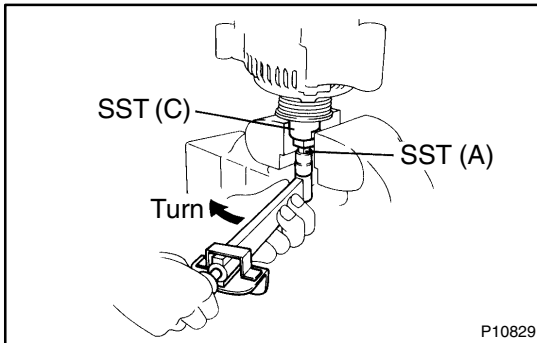


3. INSTALL PULLEY

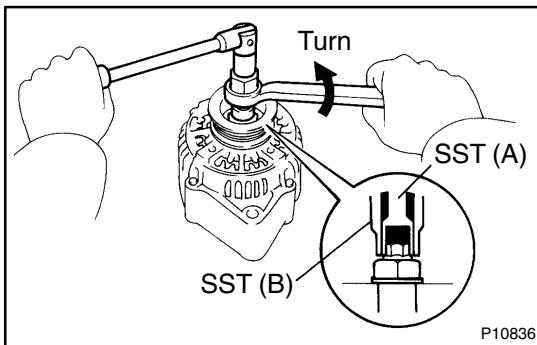
- Install the pulley to the rotor shaft by tightening the pulley nut by hand.
- Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820-63010
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
- Check that SST (A) is secured to the pulley shaft.



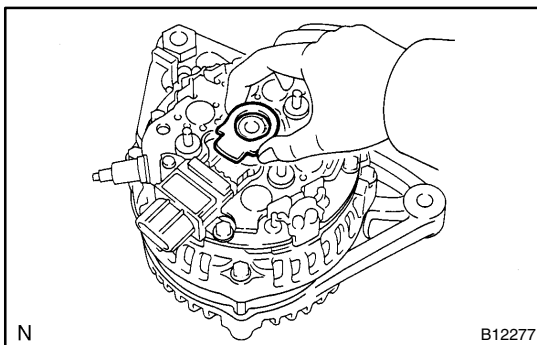
- (d) Mount SST (C) in a vise.
- (e) Insert SST (B) into SST (C), and attach the pulley nut to SST (C).



- (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 alternator from SST (C).

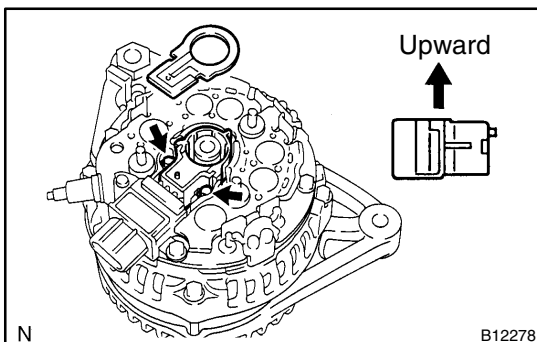


- (h) Turn SST (B), and remove SST (A and B).

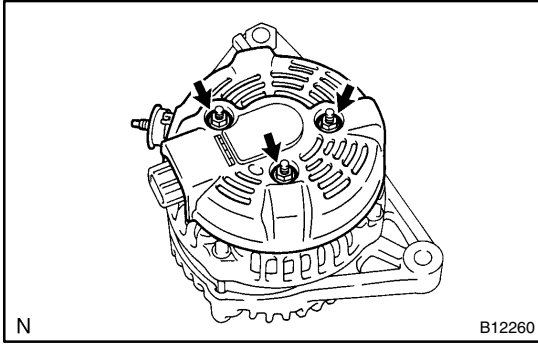


4. INSTALL BRUSH HOLDER

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



- (b) Place the brush holder on the coil assembly.
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) Place the rear seal plate on the brush holder.

**5. INSTALL REAR END COVER**

- (a) Install the terminal insulator.
- (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

INSTALLATION

Installation is in the reverse order of removal (See page CH-6).