

CHARGING SYSTEM

ON-VEHICLE INSPECTION

CH0B4-01

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 do tests with a high voltage insulation resistance tester.
- Never disconnect the battery while the engine is running.

1. CHECK BATTERY ELECTROLYTE LEVEL

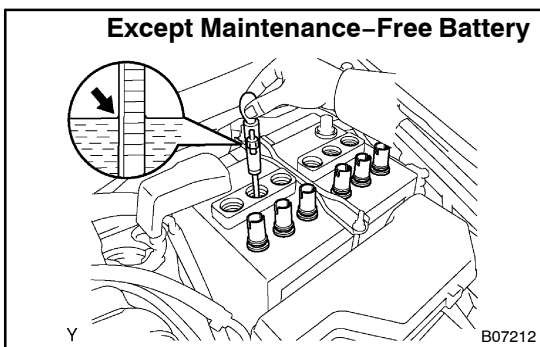
Check the electrolyte quantity of each cell.

Maintenance-Free Battery:

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

Except Maintenance-Free Battery:

If under the lower level, add distilled water.

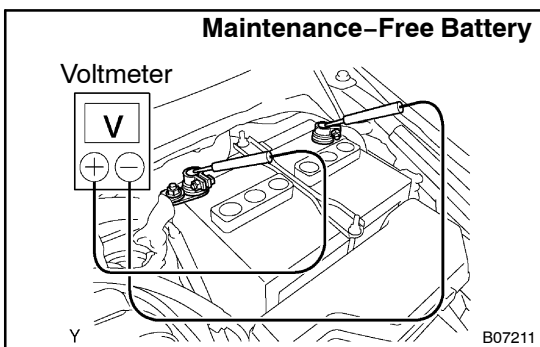


2. Except Maintenance-Free Battery: CHECK BATTERY SPECIFIC GRAVITY

Check the specific gravity of each cell.

Standard specific gravity: 1.25 – 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

- 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.
- Turn the ignition switch OFF and turn off the electrical systems.
- 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)

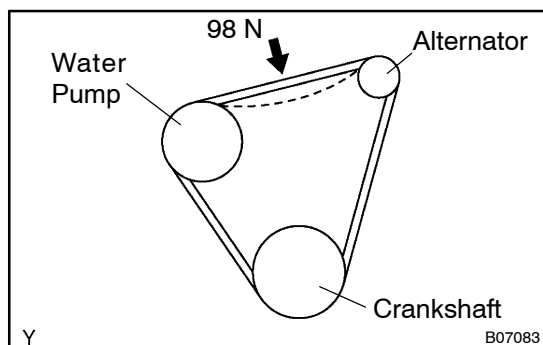
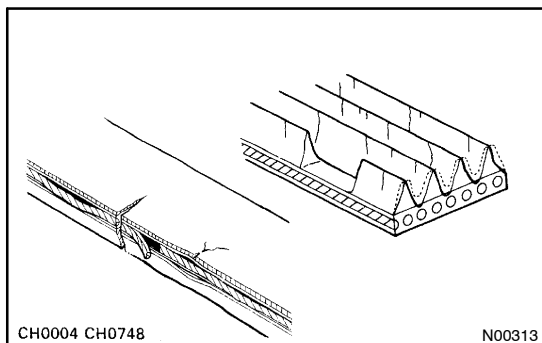
If the voltage is less than specification, charge the battery.

4. CHECK BATTERY TERMINALS AND FUSES

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

If the terminals are corroded, clean the terminals.

- Check the fusible link and fuses for continuity.



5. INSPECT DRIVE BELT

- (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.

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

Drive belt deflection:

New belt	11 – 13 mm (0.43 – 51 in.)
Used belt	14 – 18 mm (0.55 – 71 in.)

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

Reference:

Using a belt tension gauge, check the drive belt tension.

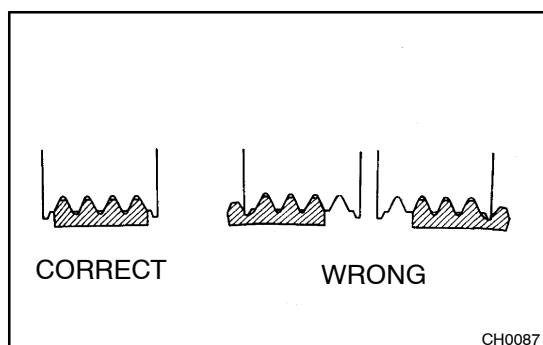
Drive belt tension:

New belt	520 – 755 N (53 – 77 kgf)
Used belt	196 – 392 N (20 – 40 kgf)

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

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 new belt, run the engine for about 5 minutes and recheck the belt tension.
- After installing a drive 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.



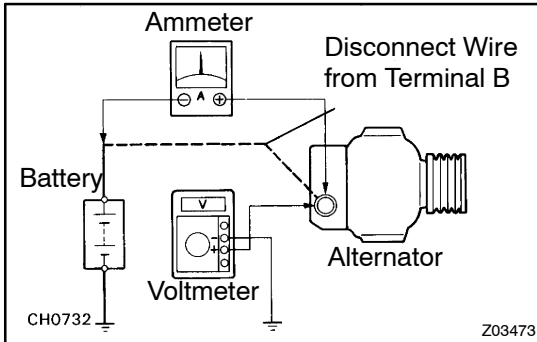
6. VISUALLY CHECK ALTERNATOR WIRING AND LISTEN FOR ABNORMAL NOISES

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

7. CHECK CHARGE WARNING LIGHT CIRCUIT

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

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

**8. 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.

- 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 (–) probe of the ammeter.
 - Connect the positive (+) probe of the ammeter to terminal B of the alternator.
 - Connect the positive (+) probe of the voltmeter to terminal B of the alternator.
 - Ground the negative (–) 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 IC regulator.

If the voltmeter reading is less than standard voltage, check the IC regulator and alternator as follows:

- With terminal F grounded, start the engine and check the voltmeter reading of terminal B.
- If the voltmeter reading is more than standard voltage, replace the IC regulator.
- If the voltmeter reading is less than standard voltage, check the alternator.

9. INSPECT CHARGING CIRCUIT WITH LOAD

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

Standard amperage: 30 A or more

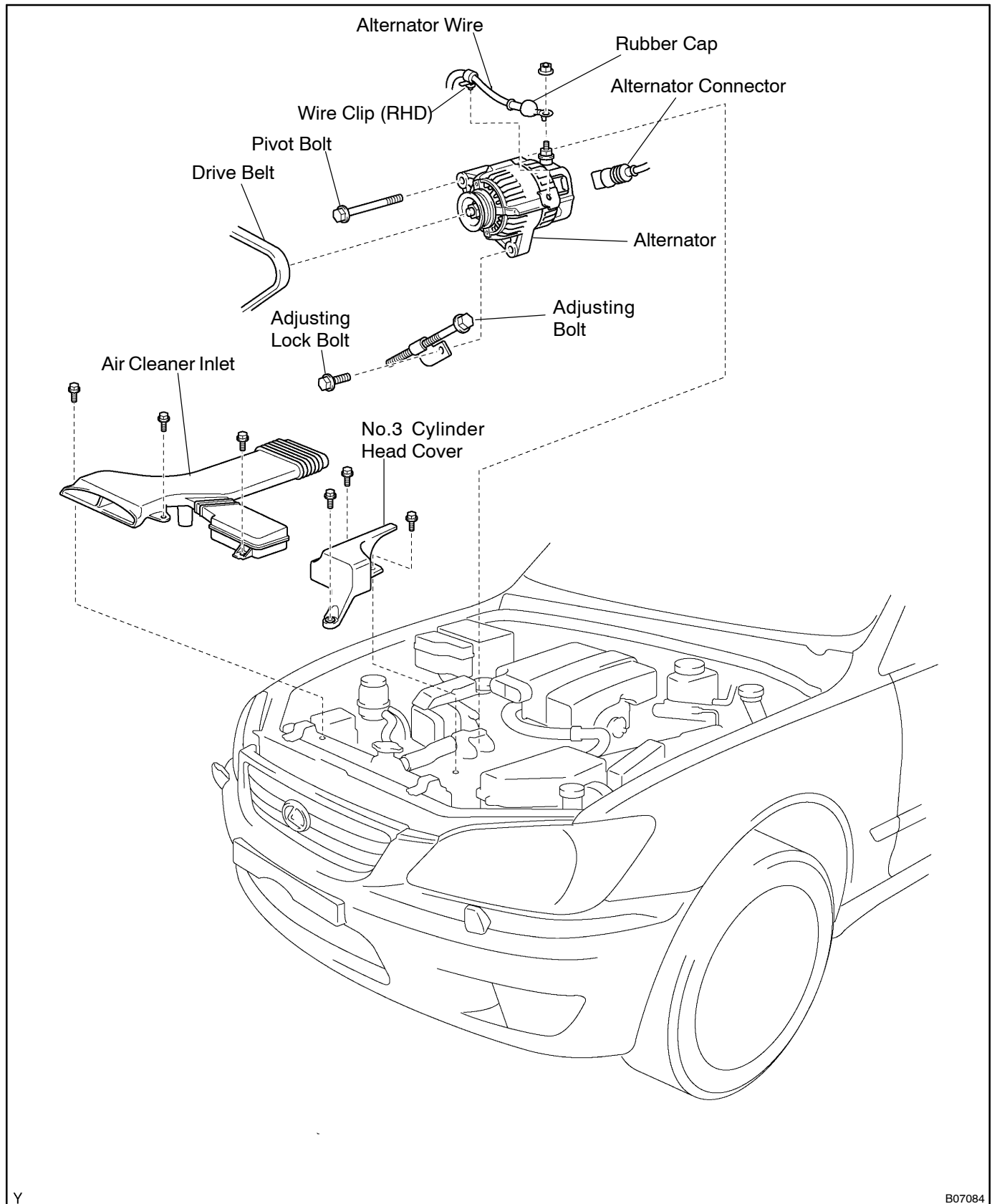
If the ammeter reading is less than the standard amperage, repair the alternator.

HINT:

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

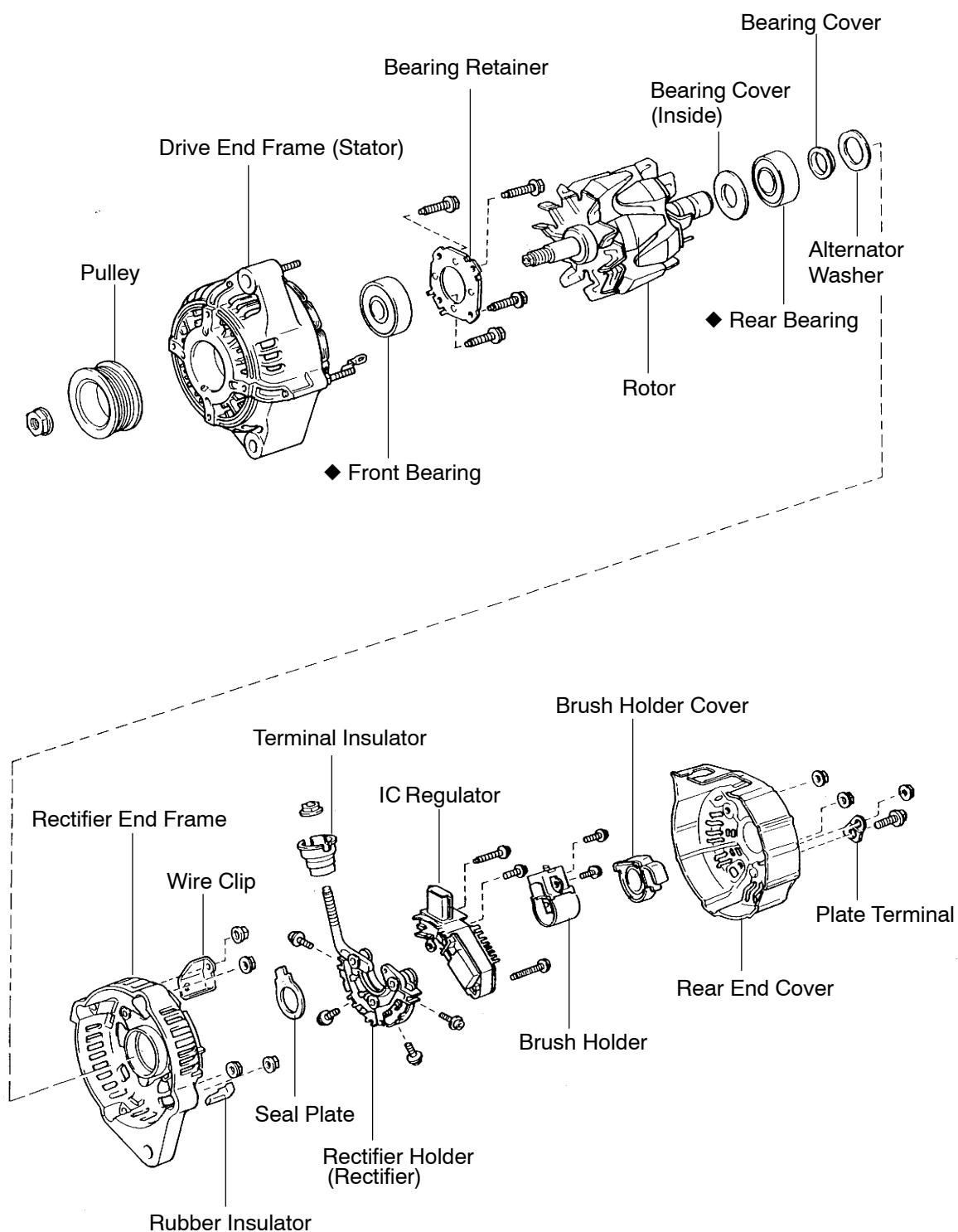
ALTERNATOR COMPONENTS

CH044-03



Y

B07084

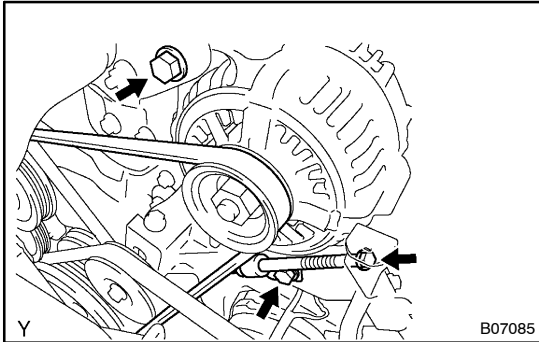


◆ Non-reusable part

B01642

REMOVAL

1. REMOVE AIR CLEANER INLET
2. REMOVE NO.3 CYLINDER HEAD COVER

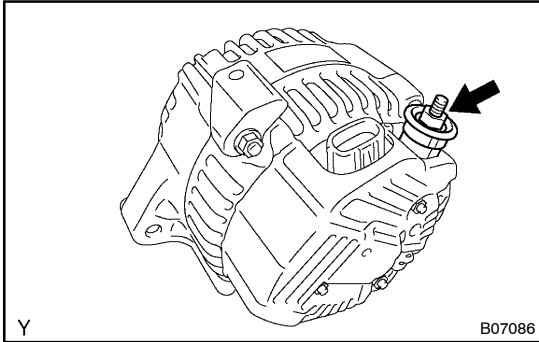


3. DISCONNECT DRIVE BELT FROM ALTERNATOR PULLEY

- (a) Loosen the pivot bolt, adjusting lock bolt and adjusting bolt.
- (b) Disconnect the drive belt from the alternator pulley.

4. REMOVE ALTERNATOR

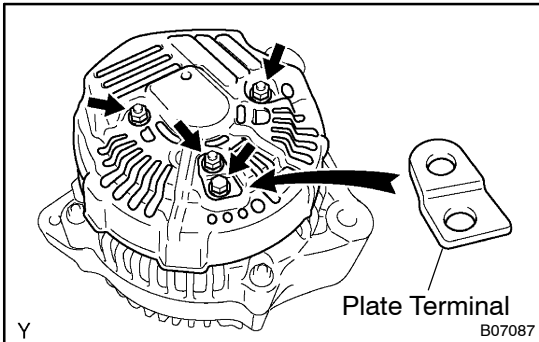
- (a) Disconnect the alternator connector.
- (b) Remove the rubber cap and nut, and disconnect the alternator wire.
- (c) RHD:
Disconnect the wire clamp from the wire clip on the alternator.
- (d) Remove the pivot bolt and adjusting lock bolt.
- (e) Remove the alternator.



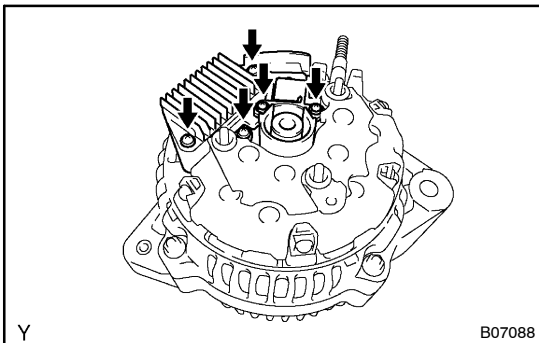
DISASSEMBLY

1. REMOVE REAR END COVER

- (a) Remove the nut and terminal insulator.

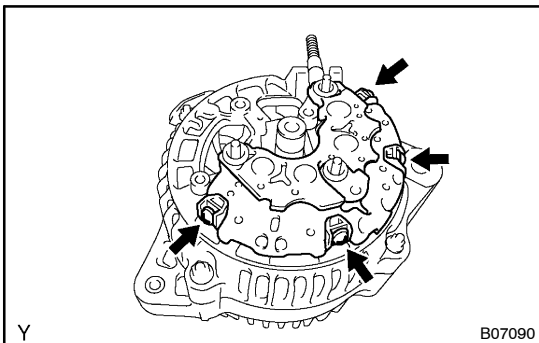


- (b) Remove the bolt, 3 nuts, plate terminal and end cover.



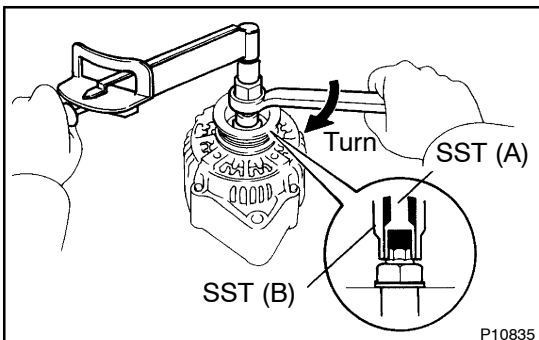
2. REMOVE BRUSH HOLDER AND IC REGULATOR

- (a) Remove the brush holder cover from the brush holder.
- (b) Remove the 5 screws, brush holder and IC regulator.
- (c) Remove the seal plate from the rectifier end frame.



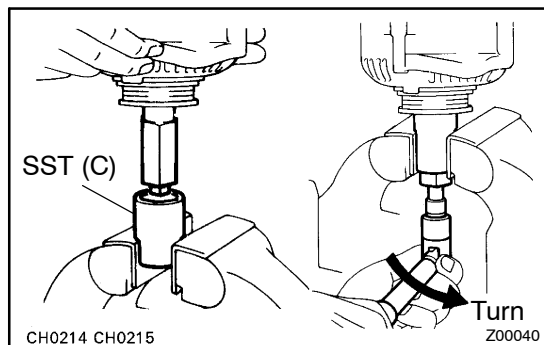
3. REMOVE RECTIFIER HOLDER

- (a) Remove the 4 screws and rectifier holder.
- (b) Remove the 4 rubber insulators.



4. REMOVE PULLEY

- (a) Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820-06010, 09820-06020
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
- (b) Check that SST (A) is secured to the rotor shaft.

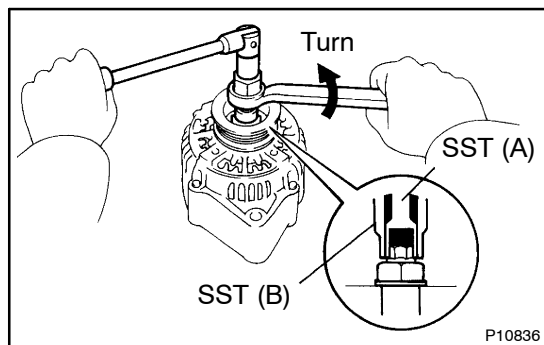


- (c) Mount SST (C) in a vise.
- (d) Insert SST (B) into SST (C), and attach the pulley nut to SST (C).
- (e) To loosen the pulley nut, turn SST (A) in the direction shown in the illustration.

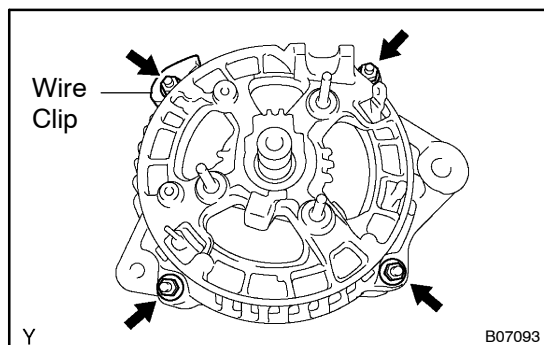
NOTICE:

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

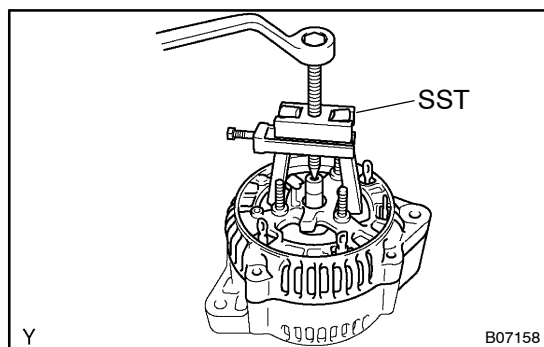
- (f) Remove the alternator from SST (C).



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

**5. REMOVE RECTIFIER END FRAME**

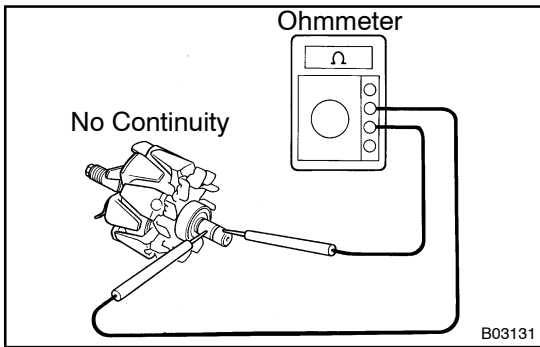
- (a) Remove the 4 nuts and wire clip.



- (b) Using SST, remove the rectifier end frame.
SST 09286-46011

- (c) Remove the alternator washer.

6. REMOVE ROTOR FROM DRIVE END FRAME



INSPECTION

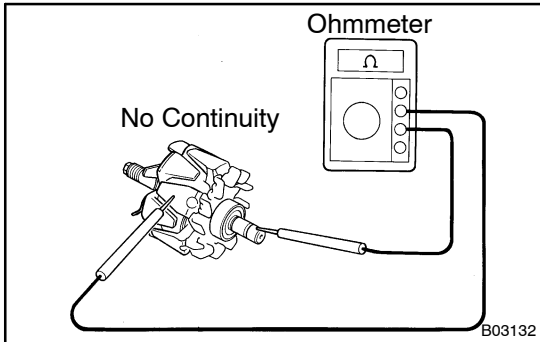
1. INSPECT ROTOR

- (a) Check rotor for open circuit.

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

Standard resistance: 2.8 – 3.0 Ω at 20°C (68°F)

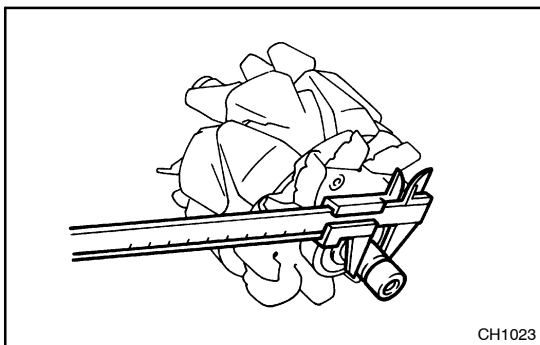
If there is no continuity, replace the rotor.



- (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.

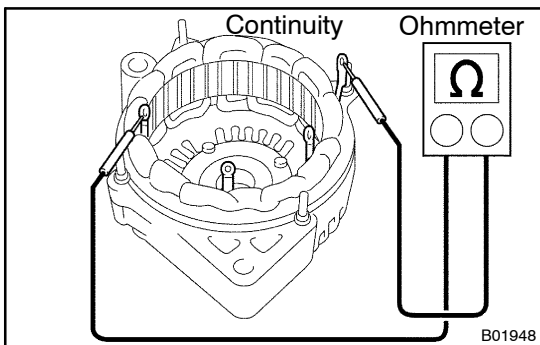
If rough or scored, replace the rotor.

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

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

Minimum diameter: 12.8 mm (0.504 in.)

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

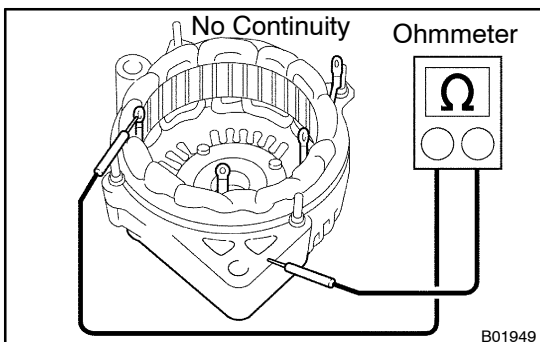


2. INSPECT STATOR (DRIVE END FRAME)

- (a) Check the stator for open circuit.

Using an ohmmeter, check that there is continuity between the coil leads.

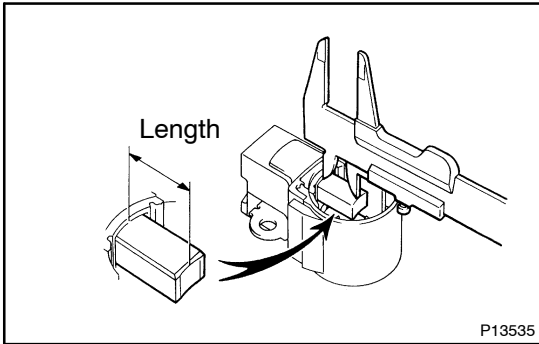
If there is no continuity, replace the drive end frame.



- (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.



3. INSPECT BRUSHES

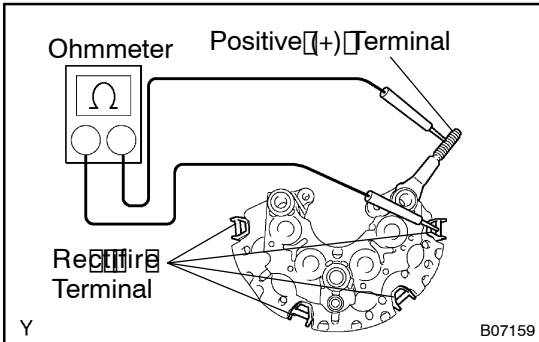
Using vernier calipers, measure the exposed brush length.

Standard exposed length:

9.5 – 11.5 mm (0.374 – 0.453 in.)

Minimum exposed length: 1.5 mm (0.059 in.)

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



4. INSPECT RECTIFIERS (RECTIFIER HOLDER)

(a) Check the positive (+) rectifier.

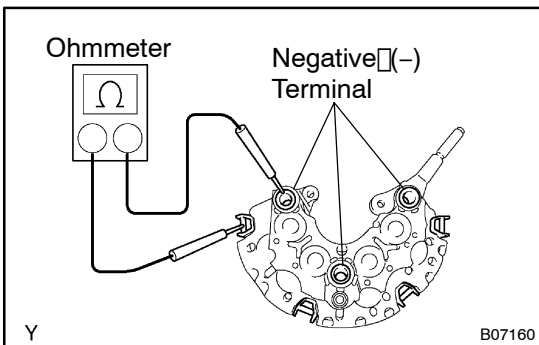
- (1) Using an ohmmeter, connect one tester probe to the positive (+) terminal and the other to each rectifier terminal.
- (2) Reverse the polarity of the tester probes and repeat step (a).
- (3) Check that one shows continuity and the other shows no continuity.

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.

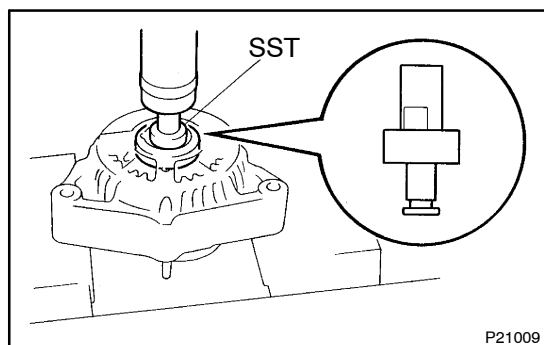
If continuity is not as specified, replace the rectifier holder.



5. INSPECT BEARINGS

Check the bearing is not rough or worn.

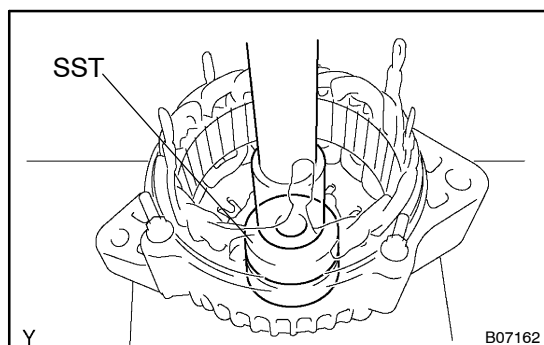
If necessary, replace the bearing. (See page CH-11)



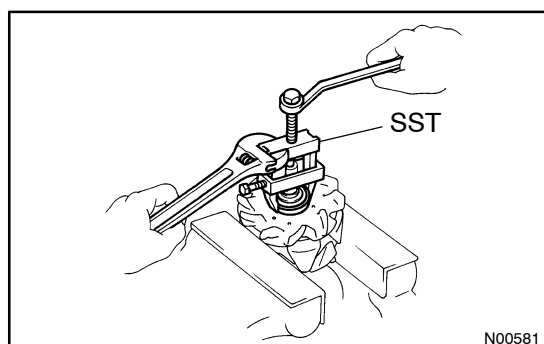
REPLACEMENT

1. REPLACE FRONT BEARING

- (a) Remove the 4 screws, bearing retainer and bearing.
- (b) Using SST and a press, press out the bearing.
SST 09950-60010 (09951-00260, 09952-06010)



- (c) Using SST and a press, press in a new bearing.
SST 09950-60010 (09951-00520)
- (d) Install the bearing retainer with the 4 screws.
Torque: 3.0 N·m (31 kgf·cm, 27 in.·lbf)



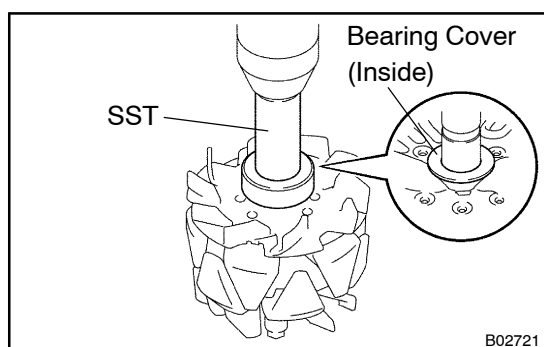
2. REPLACE REAR BEARING

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

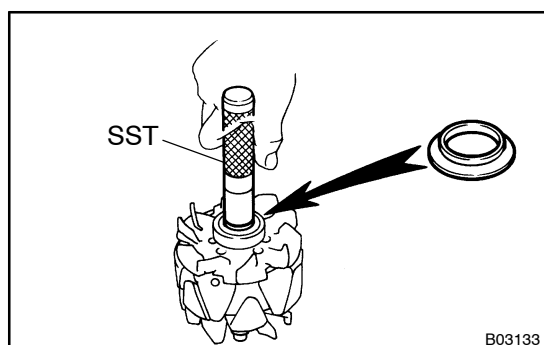
NOTICE:

Be careful not to damage the fan.

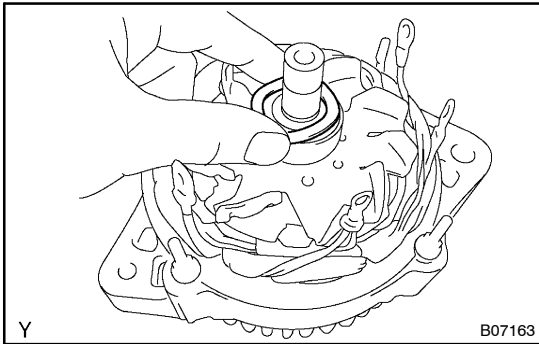
- (b) Remove the bearing cover (inside).



- (c) Place the bearing cover (inside) on the rotor.
- (d) Using SST and a press, press in a new bearing.
SST 09820-00030



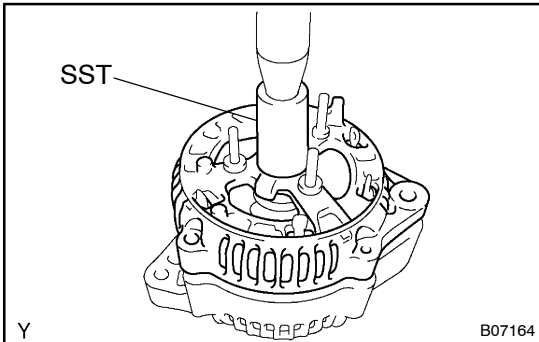
- (e) Using SST, push in the bearing cover (outside).
SST 09285-76010



REASSEMBLY

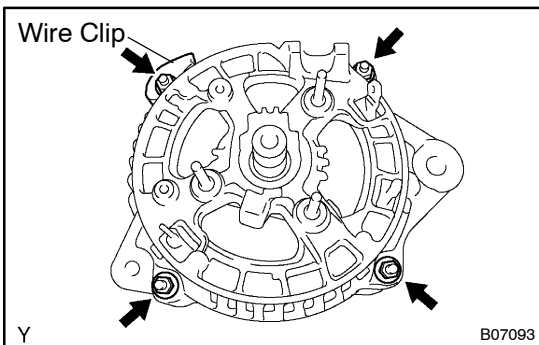
1. PLACE DRIVE END FRAME ON PULLEY
2. INSTALL ROTOR TO DRIVE END FRAME
3. INSTALL RECTIFIER END FRAME

(a) Place the alternator washer on the rotor.



(b) Using SST and a press, slowly press in the rectifier end frame.

SST 09820-00030

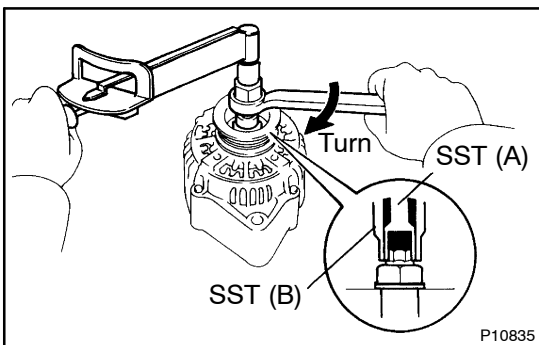


(c) Install the wire clip and 4 nuts.

Torque:

4.5 N·m (46 kgf·cm, 40 in·lbf) without wire clip

5.4 N·m (55 kgf·cm, 48 in·lbf) with wire clip



4. INSTALL PULLEY

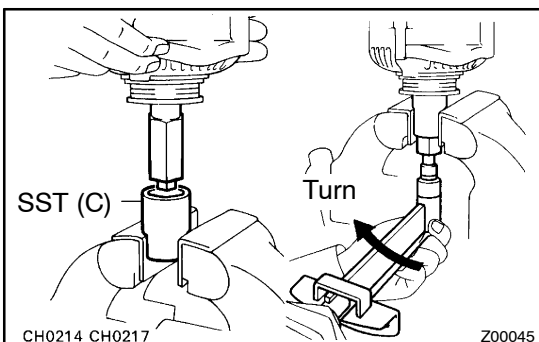
(a) Install the pulley to the rotor shaft by tightening the pulley nut by hand.

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

SST 09820-63010

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

(c) Check that SST (A) is secured to the pulley shaft.



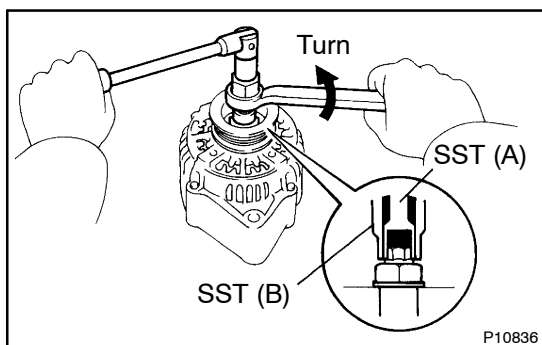
(d) Mount SST (C) in a vise.

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

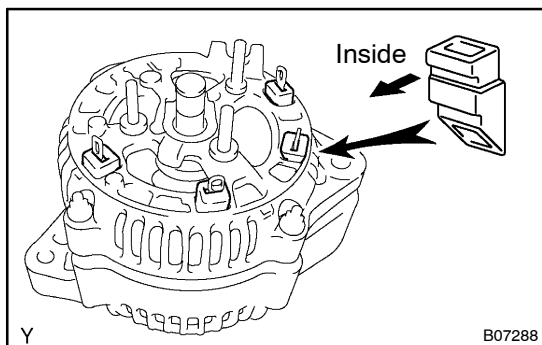
(f) To torque the pulley nut, turn SST (A) in the direction shown in the illustration.

Torque: 110.5 N·m (1,125 kgf·cm, 81 ft·lbf)

(g) Remove the alternator from SST (C).

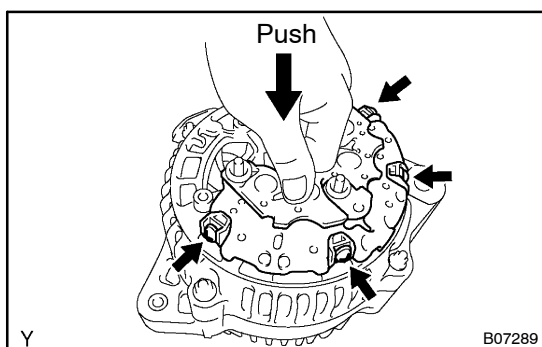


- (h) Turn SST (B), and remove SST (A and B).



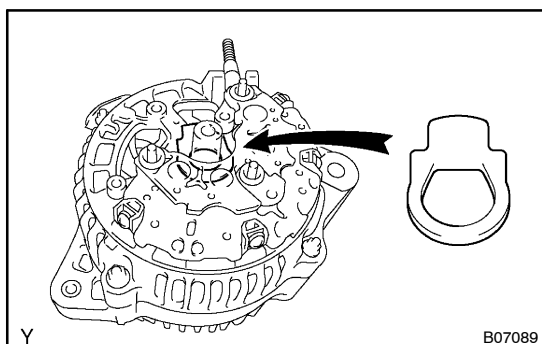
5. INSTALL RECTIFIER HOLDER

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



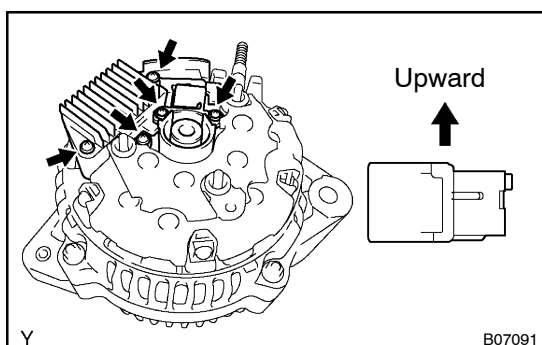
- (b) Install the rectifier holder while pushing it with the 4 screws.

Torque: 2.9 N·m (30 kgf·cm, 26 in·lbf)



6. INSTALL IC REGULATOR AND BRUSH HOLDER

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



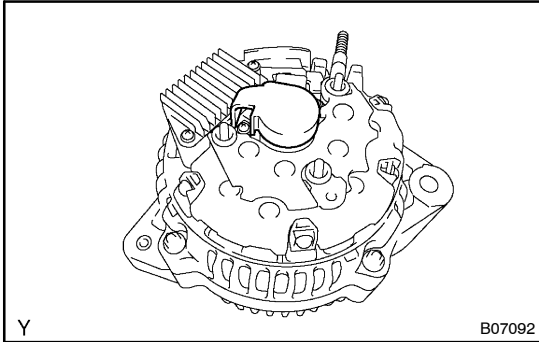
- (b) Place the IC regulator and brush holder on the rectifier end frame.

NOTICE:

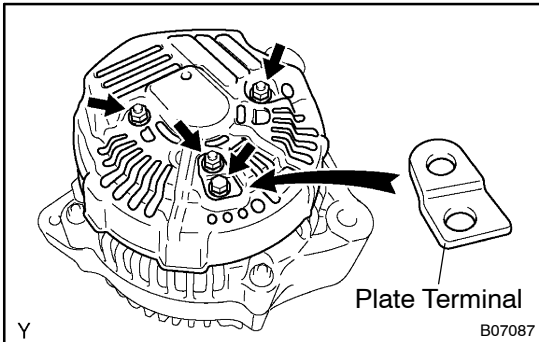
Be careful of the holder installation direction.

- (c) Install the 5 screws.

Torque: 2.0 N·m (20 kgf·cm, 18 in·lbf)



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



7. INSTALL REAR END COVER

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

Torque:

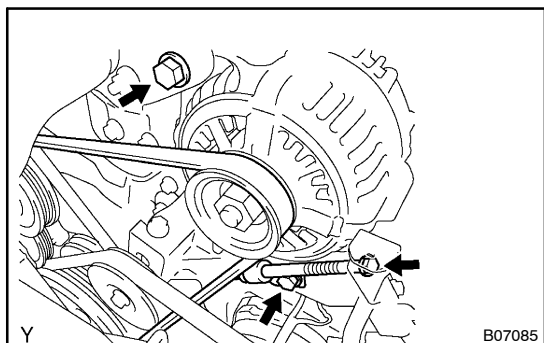
4.4 N·m (45 kgf·cm, 39 in.·lbf) for nut

3.9 N·m (39 kgf·cm, 35 in.·lbf) for bolt

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

Torque: 4.1 N·m (41.5 kgf·cm, 36.3 in.·lbf)

8. CHECK THAT ROTOR ROTATES SMOOTHLY



INSTALLATION

1. INSTALL ALTERNATOR

- (a) Temporarily install the alternator with the pivot bolt and adjusting lock bolt.
- (b) Connect the alternator wire with the nut.
- (c) RHD:
Install the wire clamp to the wire clip on the alternator.
- (d) Install the rubber cap.
- (e) Connect the alternator connector.

2. INSTALL DRIVE BELT

- (a) Install the drive belt.
- (b) Adjust the drive belt deflection. (See page CH-1)
- (c) Tighten the adjusting lock bolt and pivot bolt.

Torque:

55 N·m (561 kgf·cm, 41 ft·lbf) for pivot bolt

13 N·m (133 kgf·cm, 10 ft·lbf) for lock bolt

3. INSTALL NO.3 CYLINDER HEAD COVER
4. INSTALL AIR CLEANER INLET