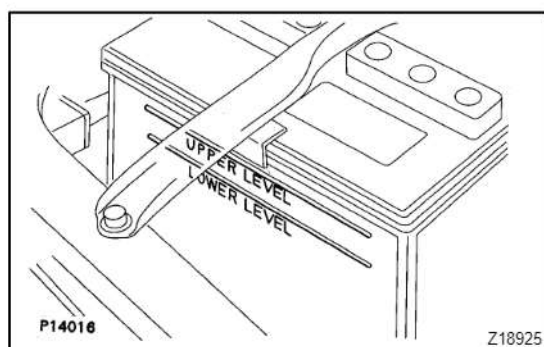


CHARGING SYSTEM ON-VEHICLE INSPECTION

CH01W-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 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.



Except Maintenance-Free Battery

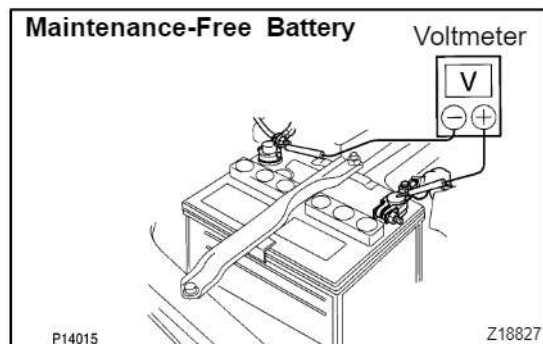
2. (Except Maintenance-Battery)

CHECK BATTERY SPECIFIC GRAVITY

Check the specific gravity of each cell.

Standard specific gravity: At 20°C (68°F): 1.25 - 1.29

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



3. (Maintenance-Free Battery) CHECK BATTERY VOLTAGE

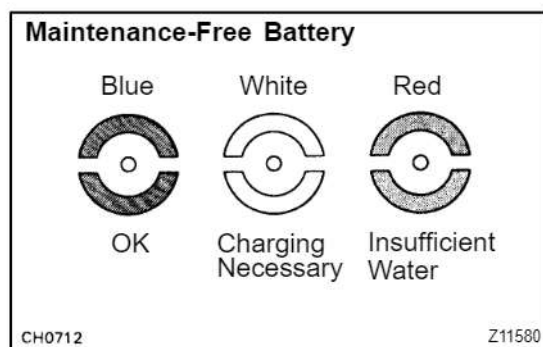
Measure the battery voltage between the negative (-) and positive (+) terminals of the battery.

Standard voltage: At 20°C (68°F): 12.7 - 12.9 V

HINT:

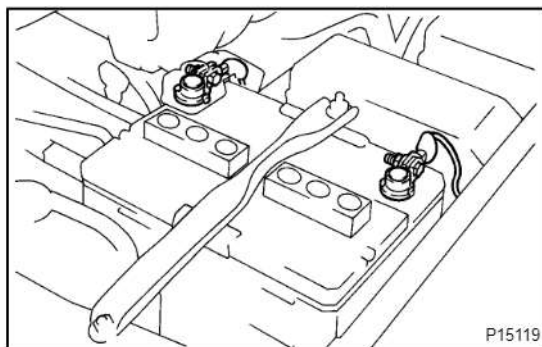
- Before measuring the voltage, turn the ignition switch OFF and turn off the electrical systems (headlight, blower motor, rear defogger etc.) for 60 seconds to remove the surface charge.
- When measuring the voltage, however, turn the ignition switch OFF and turn off the electrical systems.

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



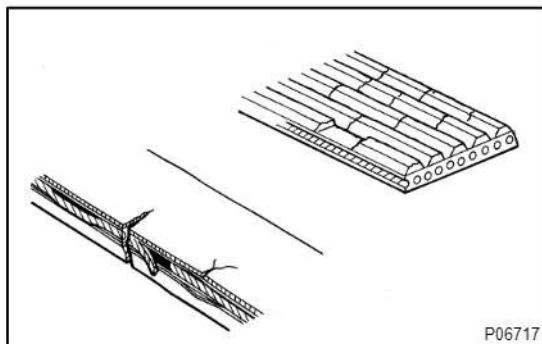
HINT:

Check the indicator as shown in the illustration.



4. CHECK BATTERY TERMINALS, FUSIBLE LINK AND FUSES

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

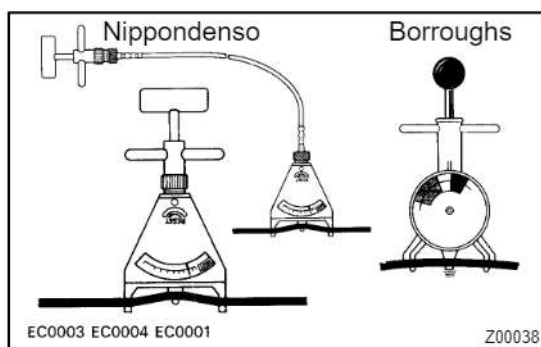


5. INSPECT DRIVE BELT

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

HINT:

Cracks on the ribbed side of the belt are considered acceptable. If the belt has chunks missing from the ribs, it should be replaced.



- (b) Using a belt tension gauge, check the drive belt tension.

Belt tension gauge:

Nippondenso BTG 20 (95506-00020) or

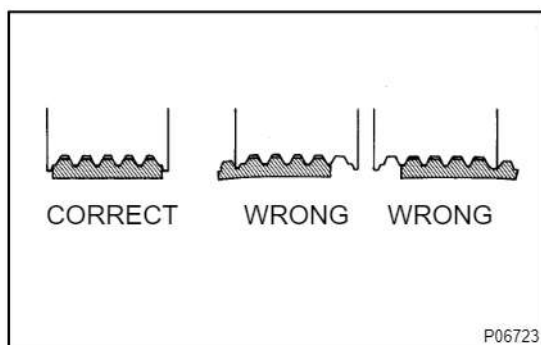
Borroughs No. BT-33-73F

Drive belt tension:

New belt: 160 ± 20 lbf

Used belt: 100 ± 20 lbf

If necessary, adjust the drive belt tension.



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 the drive 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 crank pulley.
- After installing a new belt, run the engine for approx. 5 minutes and then recheck the tension.

6. INSPECT FUSES FOR CONTINUITY

- ENGINE 10A
- CHARGE 7.5A
- IGN 7.5A

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.

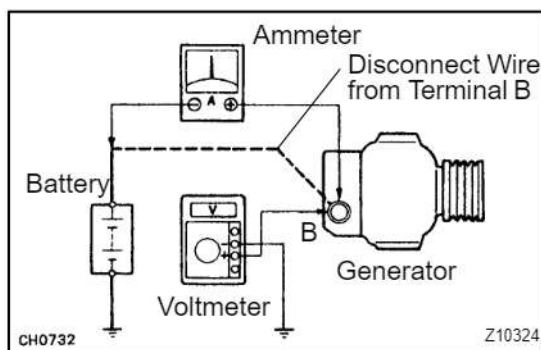
8. CHECK CHARGING CIRCUIT WITHOUT LOAD

HINT:

If a battery/generator tester is available, connect the tester to the charging circuit according to the 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 the wire to the negative (-) terminal of the ammeter.
- Connect the test lead from the positive (+) terminal of the ammeter to terminal B of the generator.
- Connect the positive (+) lead of the voltmeter to terminal B of the generator.
- Ground the negative (-) lead 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:

At 25 °C (77 °F): 13.7 - 14.7 V

At 115 °C (239 °F): 13.2 - 14.0 V

If the voltage reading is greater than the standard voltage, check the voltage regulator (See page [CH-9](#)).

9. INSPECT CHARGING CIRCUIT WITH LOAD

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

Standard amperage: 30 A or more

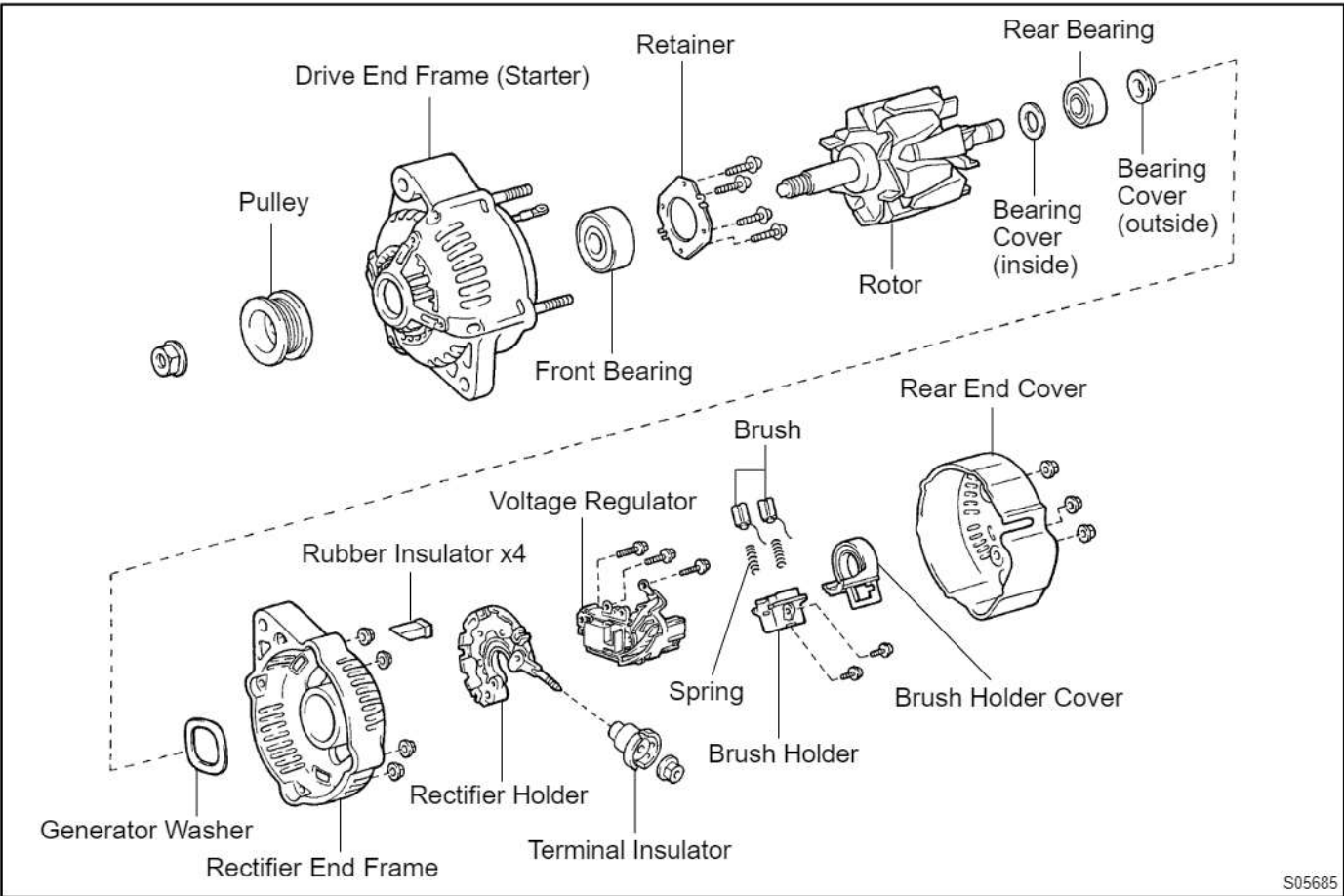
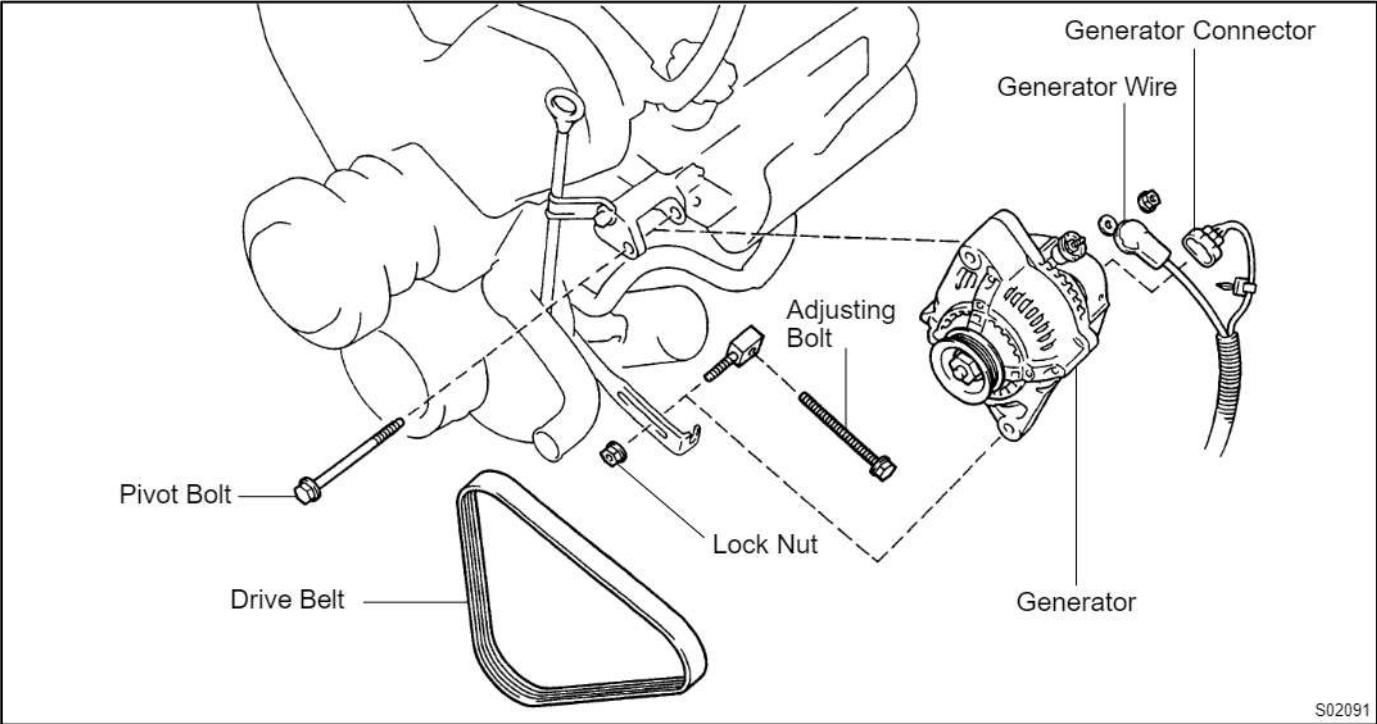
If the ammeter reading is less than 30 A, repair the generator.

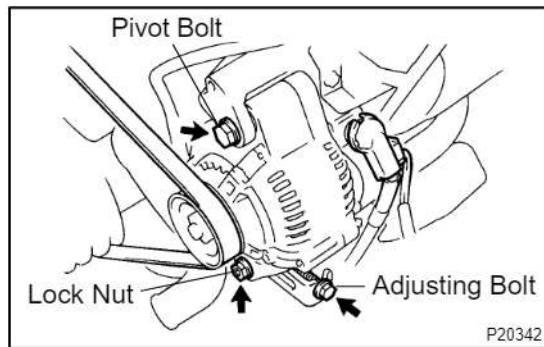
HINT:

If the battery is fully charged, the indication will sometimes be less than 30 A.

GENERATOR COMPONENTS

CH00F-03





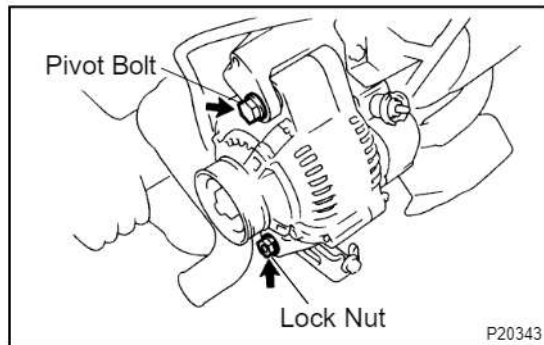
REMOVAL

1. DISCONNECT WIRING FROM GENERATOR

- Disconnect the connector from the generator.
- Remove the nut and disconnect the wire from the generator.

2. REMOVE GENERATOR DRIVE BELT

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



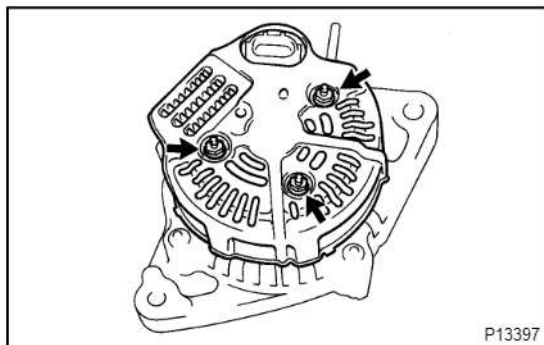
3. REMOVE GENERATOR

- Remove the pivot bolt and adjusting lock nut.
- Remove the generator.

Torque:

Pivot bolt: 51 N·m (520kgf·cm, 38 ft·lbf)

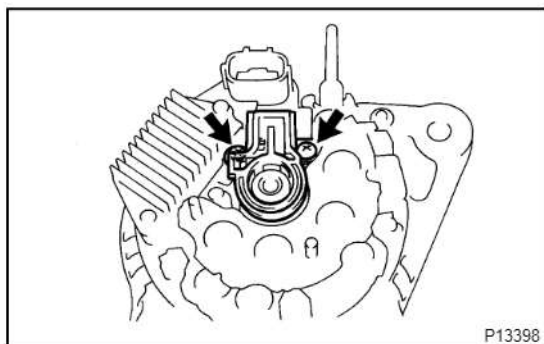
Lock Nut: 18.5 N·m (189kgf·cm, 25 ft·lbf)



DISASSEMBLY

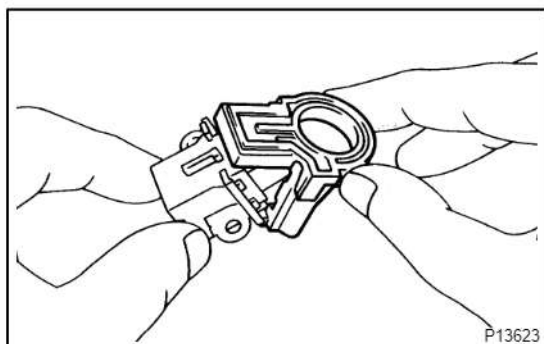
1. REMOVE REAR END COVER

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

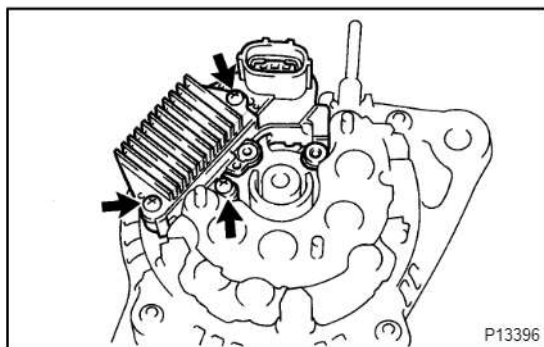


2. REMOVE BRUSH HOLDER

- (a) Remove the 2 screws, brush holder and cover.

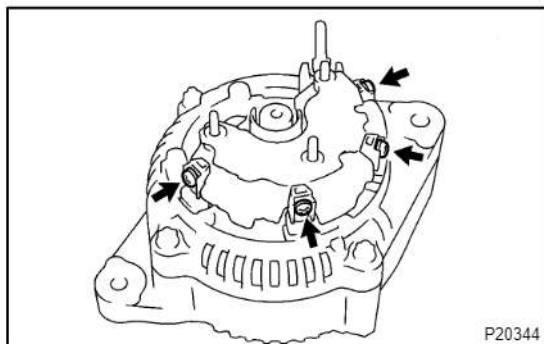


- (b) Remove the brush holder cover from the brush holder.



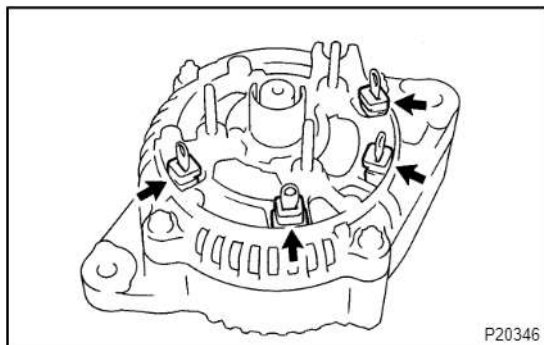
3. REMOVE VOLTAGE REGULATOR

Remove the 3 screws and voltage regulator.

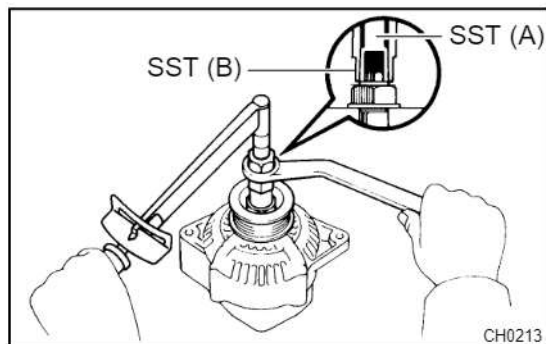


4. REMOVE RECTIFIER HOLDER

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

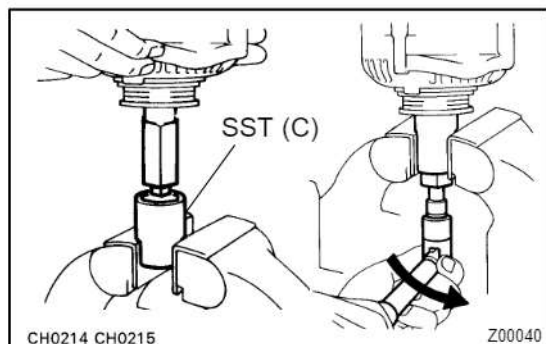


- (b) Remove the 4 rubber insulators.



5. 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) As shown in the illustration, mount SST (C) in a vise, and install the generator with SST (A) and (B) to SST (C).
(d) To loosen the pulley nut, turn SST (A) in the direction shown in the illustration.

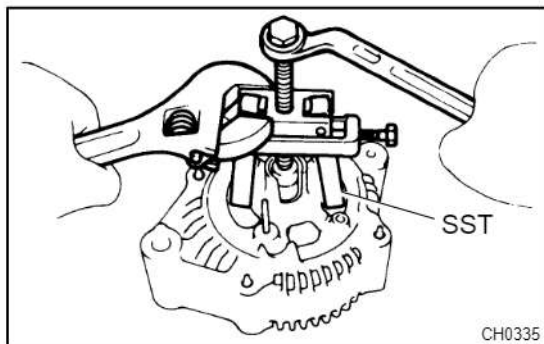
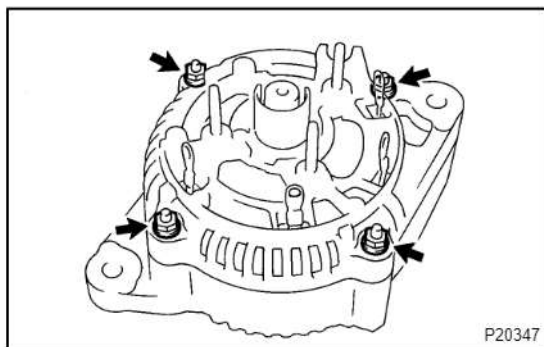
NOTICE:

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

- (e) Remove the generator with SST (A) and (B) from SST (C).
(f) Turn SST (B) and remove SST (A) and (B).
(g) Remove the pulley nut and pulley.

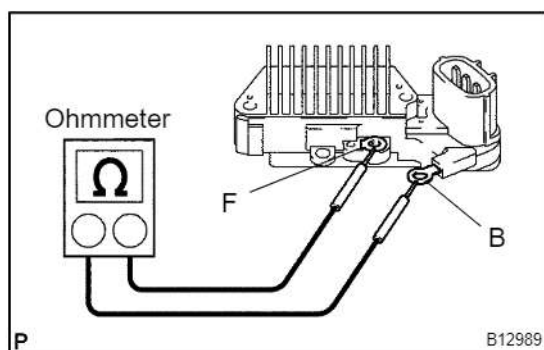
6. REMOVE RECTIFIER END FRAME

- (a) Remove the 4 nuts.



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

7. REMOVE ROTOR FROM DRIVE END FRAME



INSPECTION

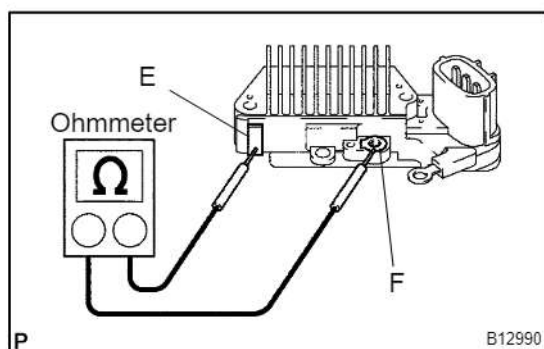
1. INSPECT VOLTAGE REGULATOR

- (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 voltage regulator.

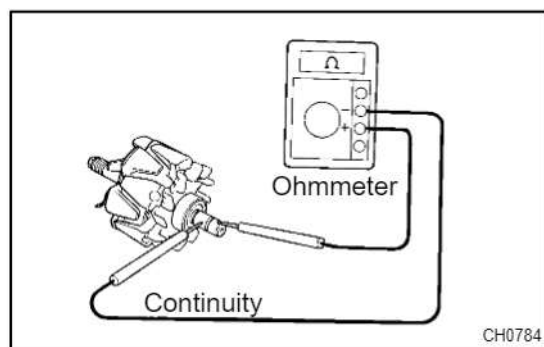


- (b) Using an ohmmeter, check the continuity between terminals F and E.

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 voltage regulator.

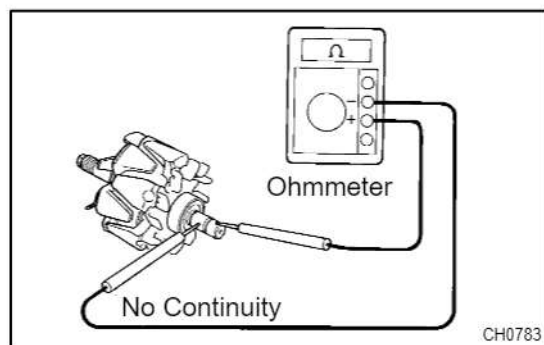


2. INSPECT ROTOR FOR OPEN CIRCUIT

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

Standard resistance: At 20°C (68°F): 2.1 - 2.5 Ω

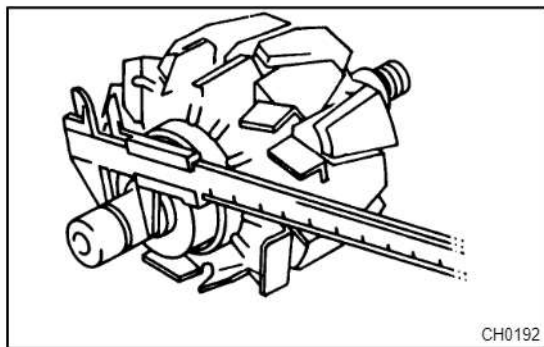
If there is no continuity, replace the rotor.



3. INSPECT ROTOR FOR GROUND

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

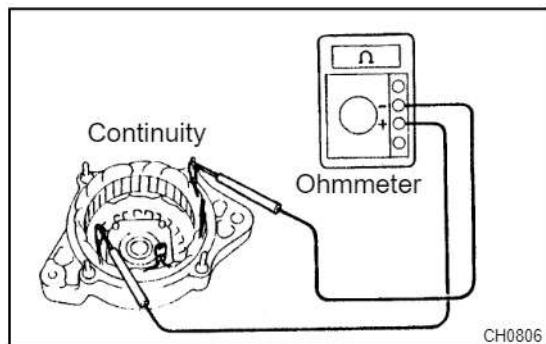
If there is continuity, replace the rotor.



4. INSPECT SLIP RINGS

- (a) Check that the slip rings are not rough or scored. If rough or scored, replace the rotor.
- (b) Using vernier calipers, measure the slip ring diameters.
Standard diameter: 14.2 - 14.4 mm (0.559 - 0.567 in.)
Minimum diameter: 12.8 mm (0.504 in.)

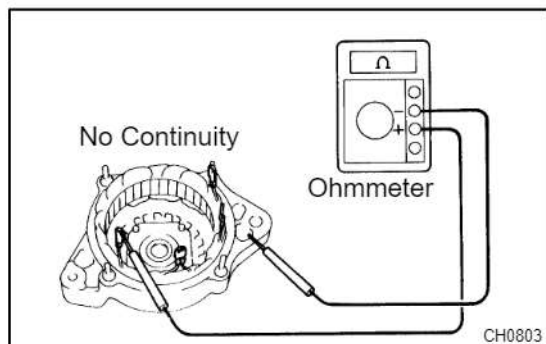
If the diameter is less than the minimum, replace the rotor.



5. INSPECT STATOR FOR OPEN CIRCUIT

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

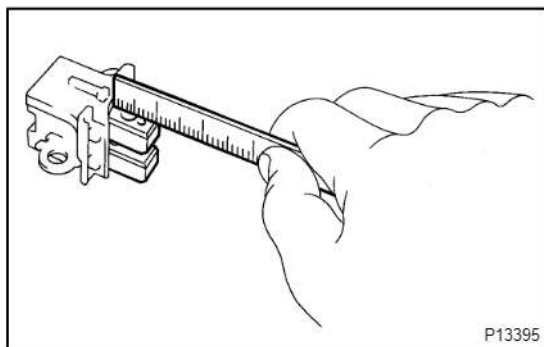
If there is no continuity, replace the drive end frame assembly.



6. INSPECT STATOR FOR GROUND

Using an ohmmeter, check that there is no continuity between the coil leads and drive end frame.

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



7. INSPECT EXPOSED BRUSH LENGTH

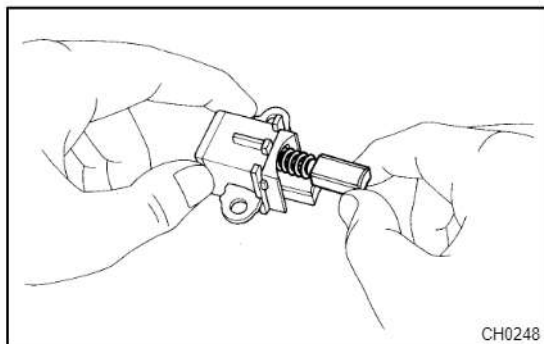
Using a scale, measure the exposed brush length.

Standard exposed length:

9.5 - 11.5 mm (0.374 - 0.452 in.)

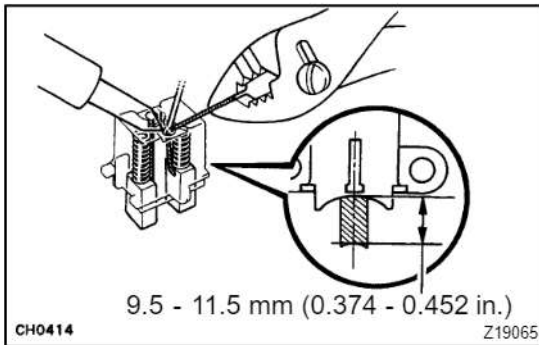
Minimum exposed length: 1.5 mm (0.059 in.)

If the exposed length is less than the minimum, replace the brushes.

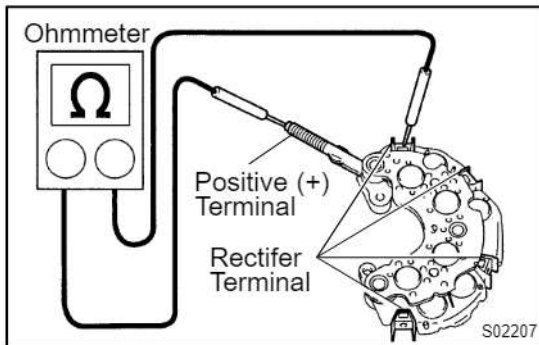


8. IF NECESSARY, REPLACE BRUSHES

- (a) Unsolder and remove the brush and spring.
- (b) Run the wire of the brush through the hole in the brush holder, and insert the spring and brush into the brush holder.



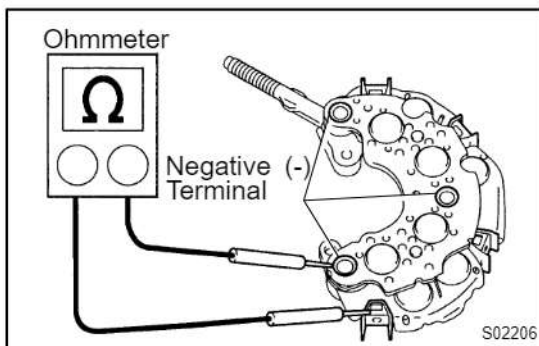
- (c) Solder the brush wire to the brush holder at the exposed length.
Exposed length: 9.5 - 11.5 mm (0.374 - 0.452 in.)
- (d) Check that the brush moves smoothly in the brush holder.
- (e) Cut off the excess wire.
- (f) Apply insulation paint to the soldered point.



9. INSPECT POSITIVE RECTIFIER

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

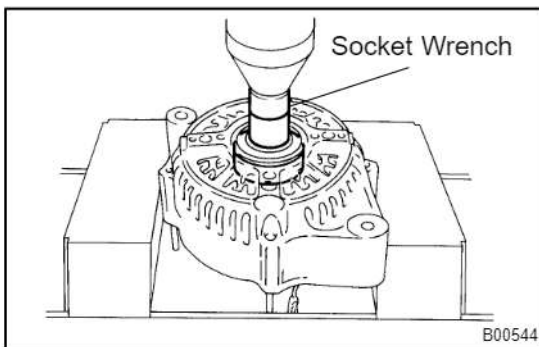
If continuity is not as specified, replace the rectifier holder.



10. INSPECT NEGATIVE RECTIFIER

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

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

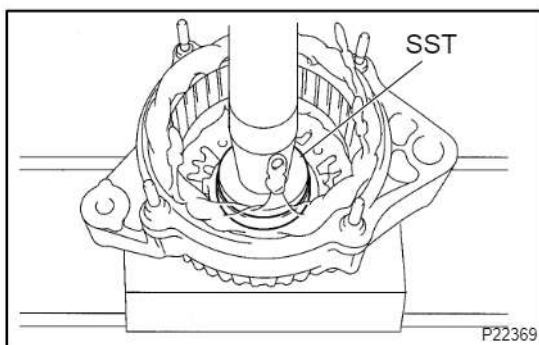


11. INSPECT FRONT BEARING

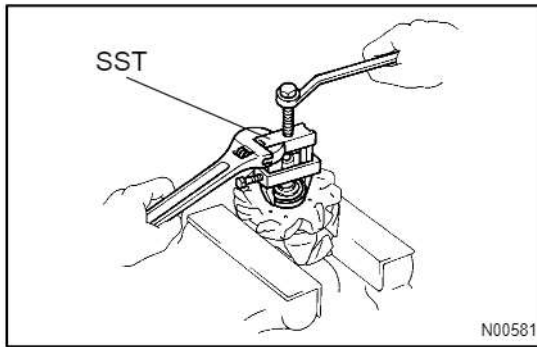
Check that the bearing is not rough or worn.

12. IF NECESSARY, REPLACE FRONT BEARING

- (a) Remove the 4 screws and bearing retainer.
- (b) Using a press and socket wrench, press out the front bearing.



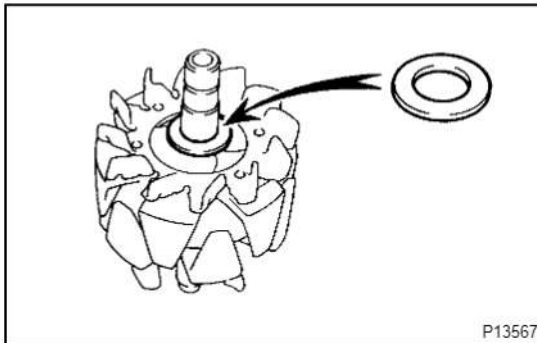
- (c) Using SST and a press, press the front bearing into the drive end frame.
SST 09950-60010 (09951-00500)
- (d) Install the bearing retainer with the 4 screws.

**13. INSPECT REAR BEARING**

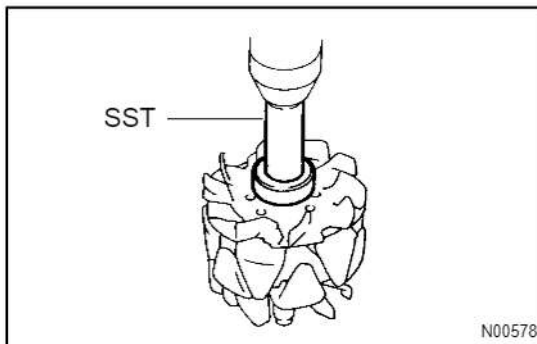
Check that the bearing is not rough or worn.

14. IF NECESSARY, REPLACE REAR BEARING

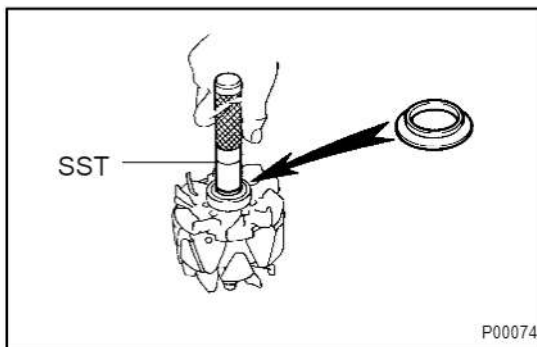
- (a) Using SST, remove the bearing cover and bearing.
SST 09820-00021
- (b) Remove the bearing cover (inside).



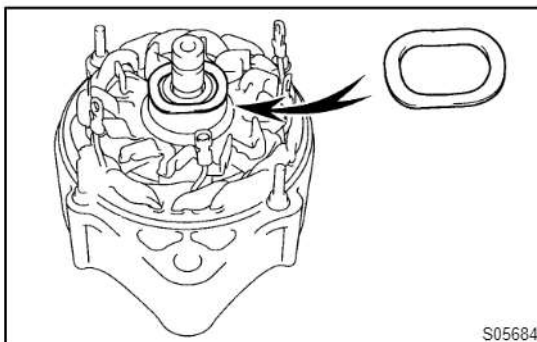
- (c) Place the bearing cover (inside) on the rotor.



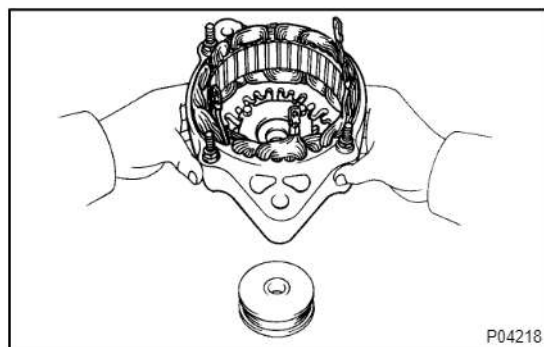
- (d) Using SST and a press, press in a new bearing and the bearing cover.
SST 09820-00031



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

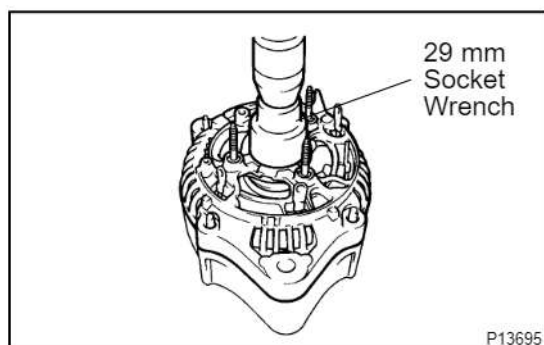


- (f) Place the generator washer on the rotor.



REASSEMBLY

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



3. INSTALL RECTIFIER END FRAME

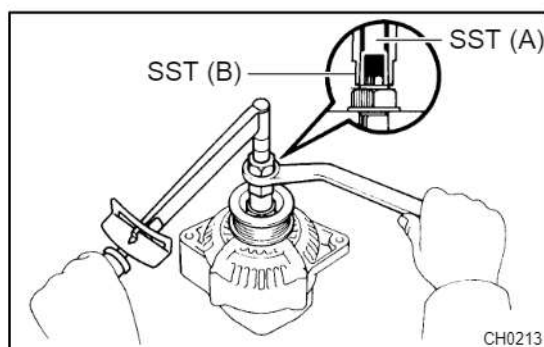
- (a) Install the generator washer to the rectifier end frame.

NOTICE:

Be careful of the generator washer installation direction.

- (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 (45 kgf·cm, 39 in·lbf)



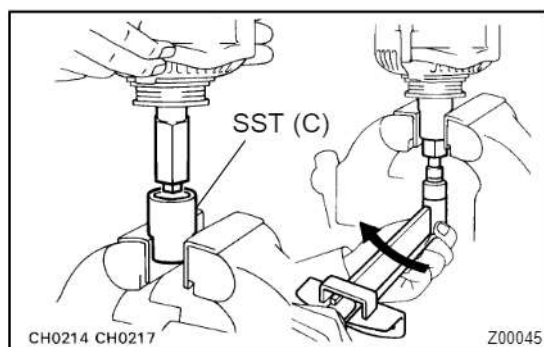
4. INSTALL PULLEY

- (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) As shown in the illustration, mount SST (C) in a vise, and install the generator with SST (A) and (B) to SST (C).
- (e) To torque the pulley nut, turn SST (A) in the direction shown in the illustration.

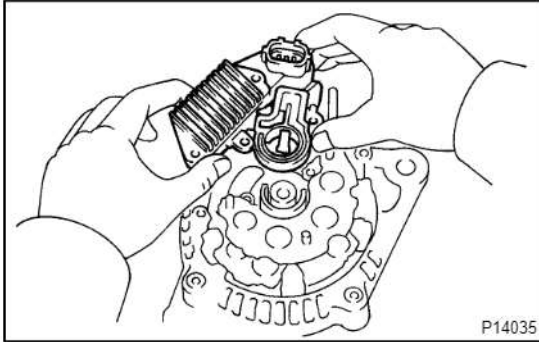
Torque: 110 N·m (1,125 kgf·cm, 81 ft·lbf)

- (f) Remove the generator with SST (A) and (B) from SST (C).
- (g) 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 with the 4 screws.

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

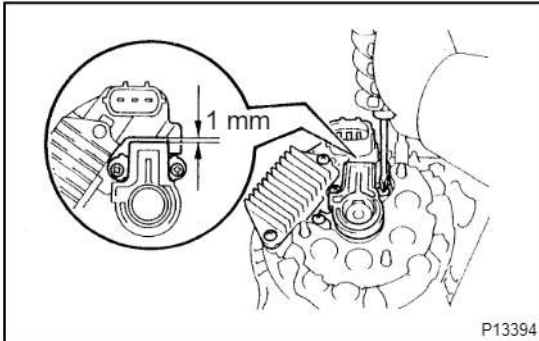


6. INSTALL BRUSH HOLDER AND VOLTAGE REGULATOR

- (a) Place the brush holder cover to the brush holder.
- (b) Install the voltage regulator and brush holder to the rear end frame horizontally as shown in the illustration.

HINT:

Check that the brush holder's cover doesn't slip to one side during installation.



- (c) Tighten the 5 screws until there is a clearance of at least 1 mm (0.04 in.) between the brush holder cover and connector.

7. INSTALL REAR END COVER

- (a) Install the end cover with the 3 nuts.
Torque: 4.5 N·m (45 kgf·cm, 39 in.·lbf)
- (b) Install the terminal insulator with the nut.
Torque: 4.1 N·m (42 kgf·cm, 36 in.·lbf)

8. MAKE SURE ROTOR ROTATES SMOOTHLY

INSTALLATION

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