CHARGING SYSTEM

CH021–01

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.**

CH0DG–01

ON–VEHICLE INSPECTION

1. CHECK BATTERY ELECTROLYTE LEVEL

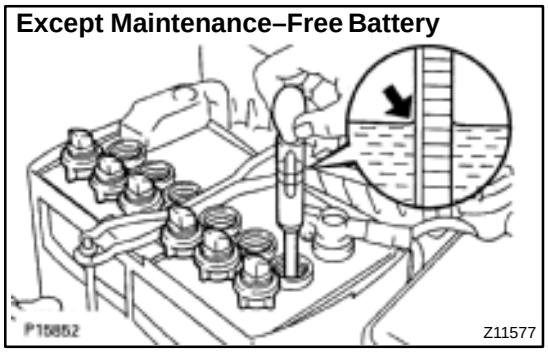
Check the electrolyte quantity of each cell.

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.

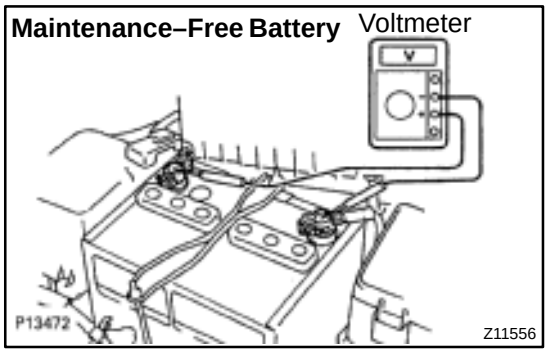


2. Except Maintenance–Free Battery: CHECK BATTERY SPECIFIC GRAVITY

Check the specific gravity of each cell.

Standard specific gravity: 1.25 – 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

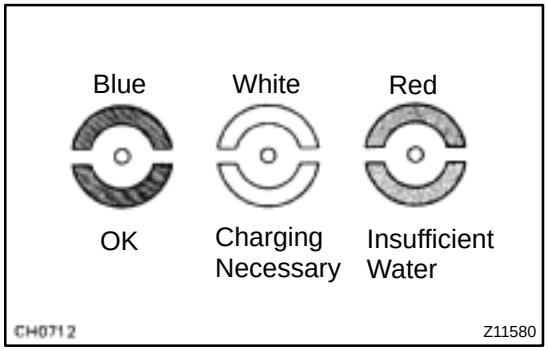
(a) After having driven the vehicle and in the case that 20 minutes have not passed after having stopped the engine, turn the ignition switch ON and turn on the electrical system (headlight, blower motor, rear defogger etc.) for 60 seconds to remove the surface charge.

(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 – 12.9 V at 20˚C (68˚F)

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



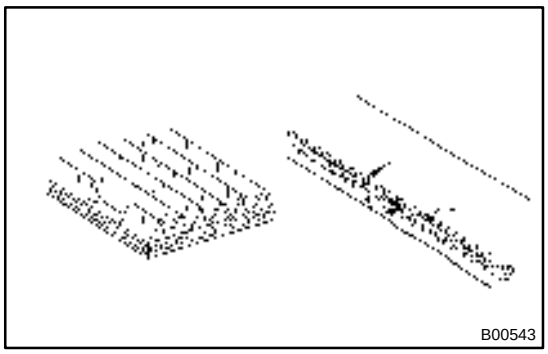
HINT:

Check the indicator as shown in 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, H–fuses and fuses for continuity.


B00543

5. INSPECT DRIVE BELT

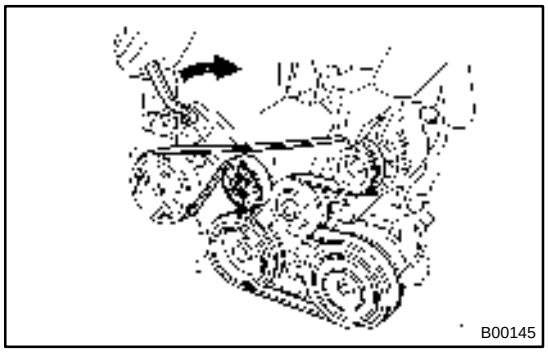
(a) Visually check the belt for excessive wear, frayed cords etc.

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

HINT:

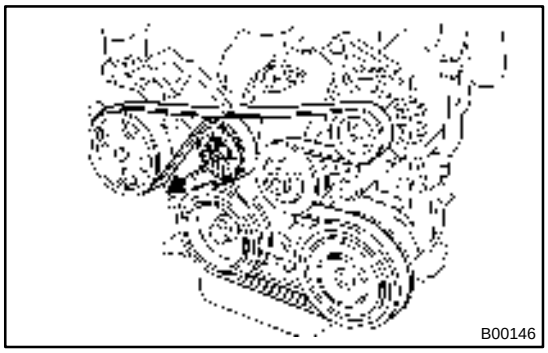
Cracks on the rib side of a belt are considered acceptable.

If the belt has chunks missing from the ribs, it should be replaced.


B00145

HINT:

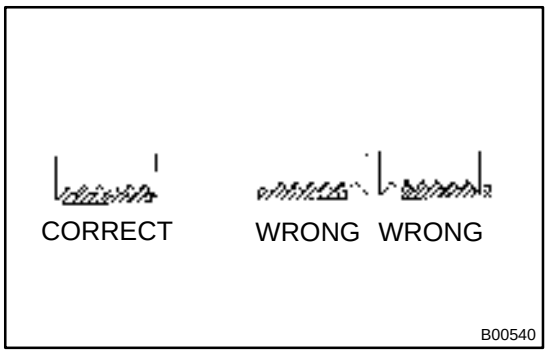
The drive belt tension can be released by turning the belt tensioner clockwise.


B00146

(b) Check the belt tensioner operation.

- Check that 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 alighment of the belt tensioner pulley to make sure the drive belt will not slip off the pulley.

If necessary, replace the belt tensioner.



B00540

HINT:

- 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 belts, run the engine for about 5 minutes and check the belt tension existing.

6. VISUALLY CHECK GENERATOR 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 generator while the engine is running.

7. INSPECT DISCHARGE WARNING LIGHT CIRCUIT

(a) Turn the ignition switch ”ON”. Check that the discharge warning light comes on.

(b) Start the engine. Check that the light goes off.

If the light does not operate as specified, troubleshoot the discharge warning light circuit.

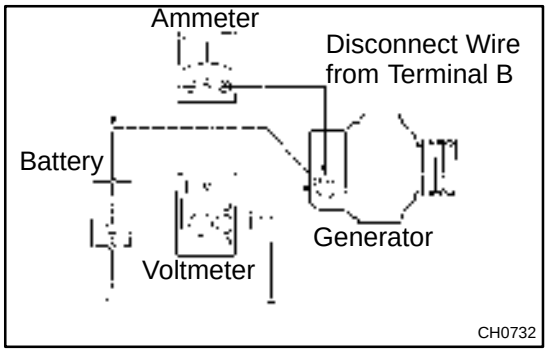
8. INSPECT CHARGING CIRCUIT WITHOUT LOAD

HINT:

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

(a) If a tester is not available, connect a voltmeter to the charging circuit as follows:

- Disconnect to the wire from terminal B of the generator and connect it to the negative (–) lead of the ammeter.



- Connect the positive (+) lead 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:

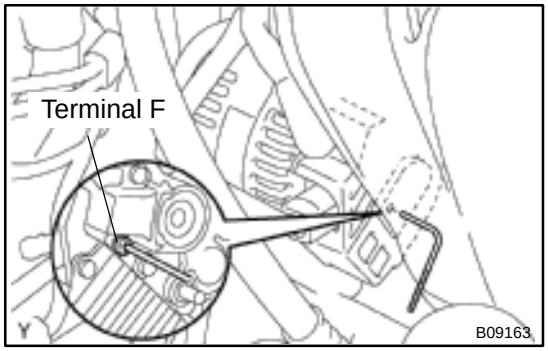
With the engine running from idle to 2,000 rpm, check the reading on the ammeter and voltmeter.

Standard amperage: 10A or less

Standard voltage: 13.2 – 14.0 V

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

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

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 blower switch at "H".

(b) Check the reading on the ammeter.

Standard amperage: 30 A or more

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

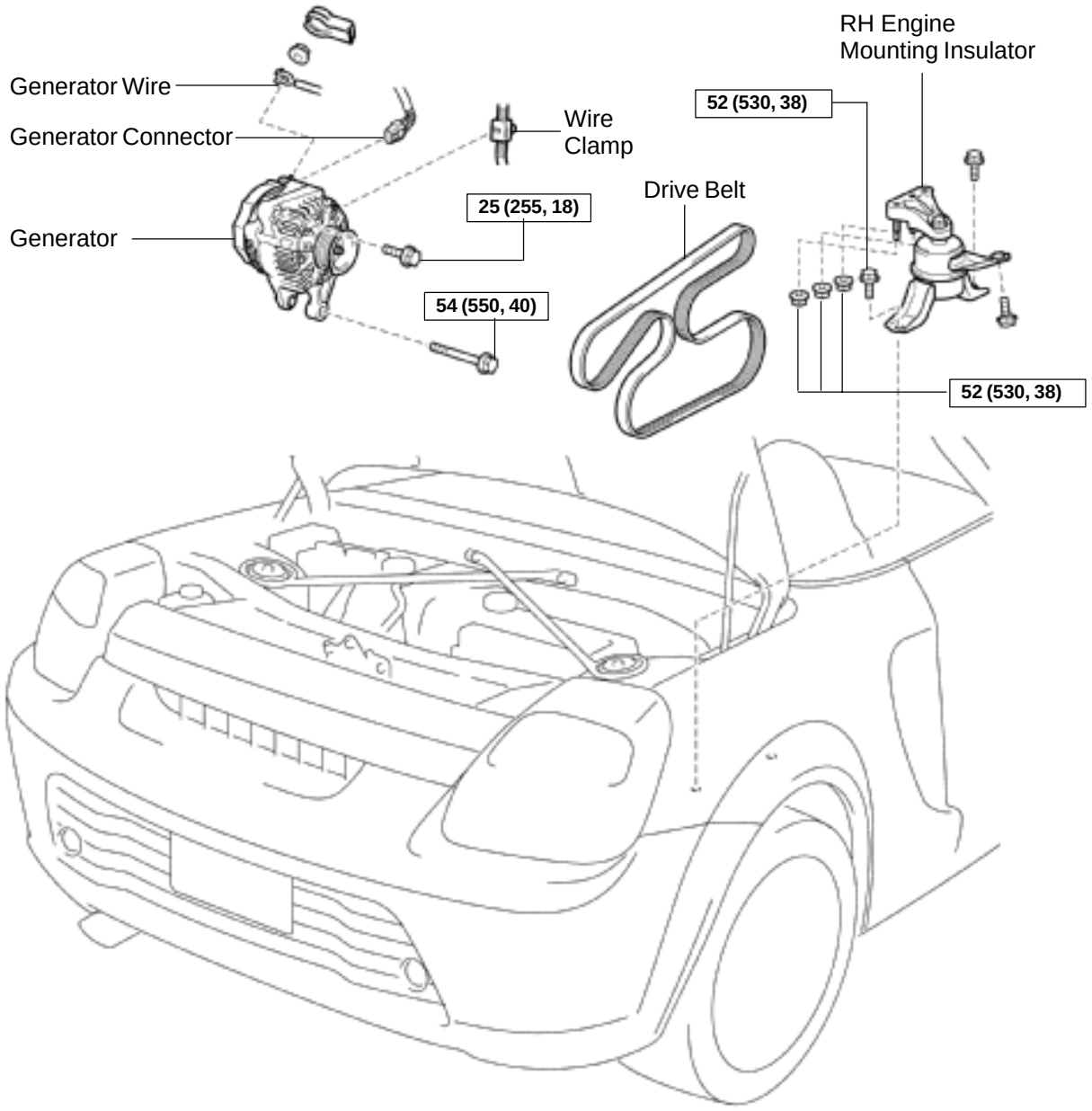
HINT:

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

GENERATOR

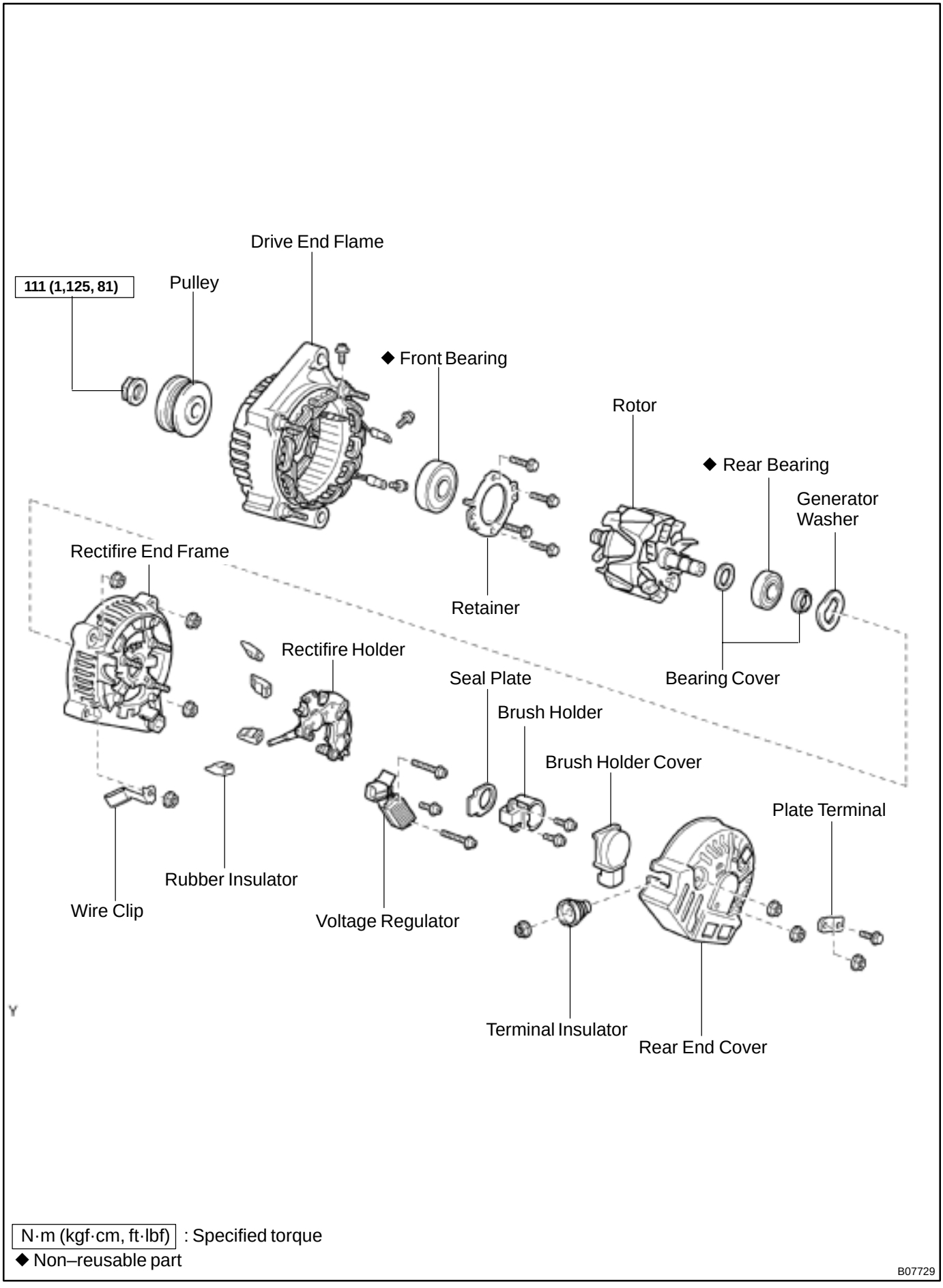
COMPONENTS

CH023–04



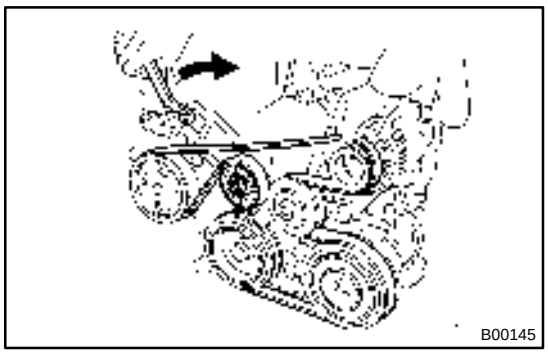
N·m (kgf·cm, ft·lbf) : Specified torque

B10240


Drive End Flame
111 (1,125, 81)
Pulley
◆ Front Bearing
Rotor
◆ Rear Bearing
Generator Washer
Rectifire End Frame
Retainer
Rectifire Holder
Seal Plate
Brush Holder
Brush Holder Cover
Plate Terminal
Bearing Cover
Rubber Insulator
Wire Clip
Voltage Regulator
Terminal Insulator
Rear End Cover
Y
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
B07729

CH024–03

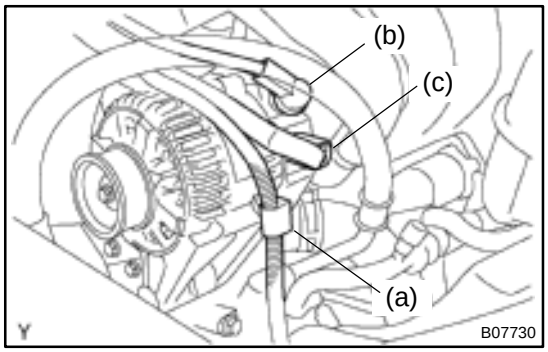
REMOVAL



1. REMOVE DRIVE BELT

Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and replace the drive belt tensioner little by little and fix it quietly.

2. REMOVE RH ENGINE MOUNTING INSULATOR (See page EM–54)

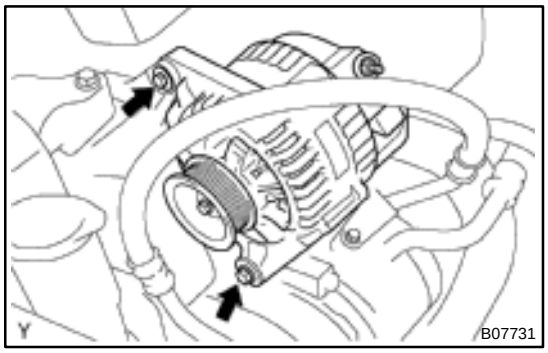


3. REMOVE GENERATOR

(a) Disconnect the wire clamp from the wire clip on the rectifier end frame.

(b) Remove the cap and nut, and disconnect the generator wire.

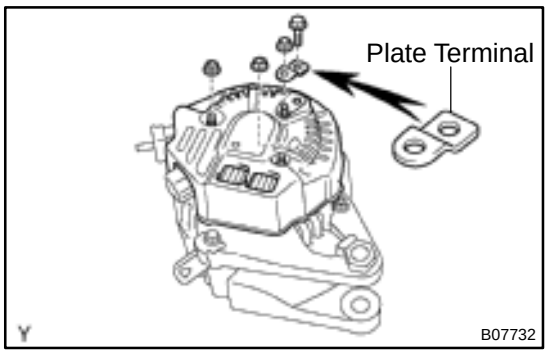
(c) Disconnect the generator connector.



(d) Remove the 2 bolts and generator.

CH025–03

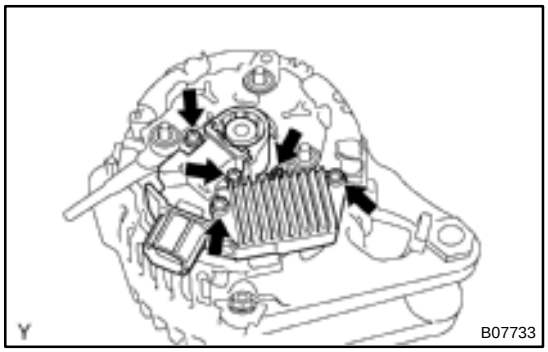
DISASSEMBLY



1. REMOVE REAR END COVER

(a) Remove the nut and terminal insulator.

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

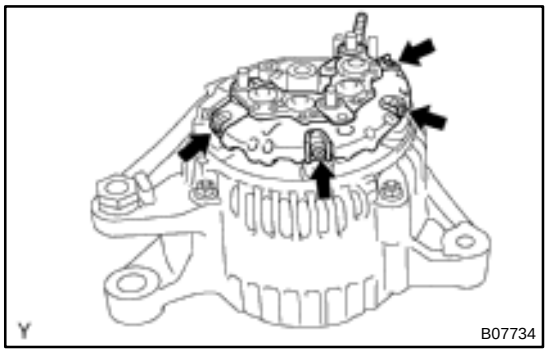


2. REMOVE BRUSH HOLDER AND VOLTAGE REGULATOR

(a) Remove the brush holder cover from the brush holder.

(b) Remove the 5 screws, brush holder and voltage regulator.

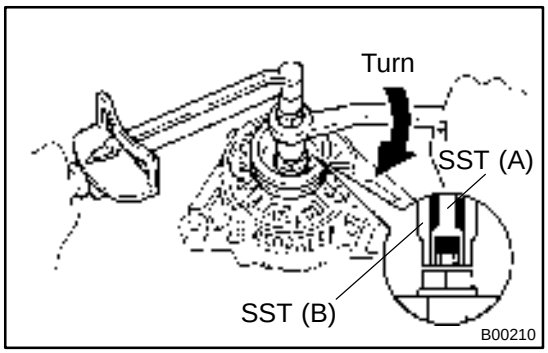
(c) Remove the seal plate from the rectifier end frame.



3. REMOVE RECTIFIER HOLDER

(a) Remove the 4 screws and rectifier holder.

(b) Remove the 4 rubber insulators.



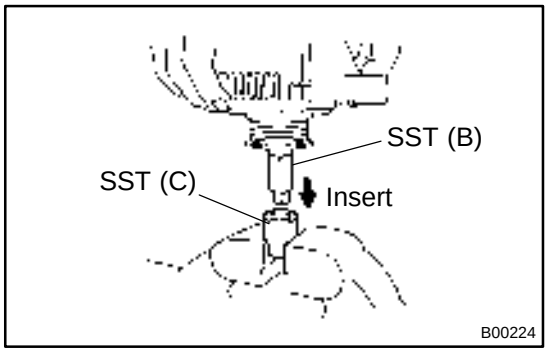
4. REMOVE PULLEY

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

SST 09820–63010

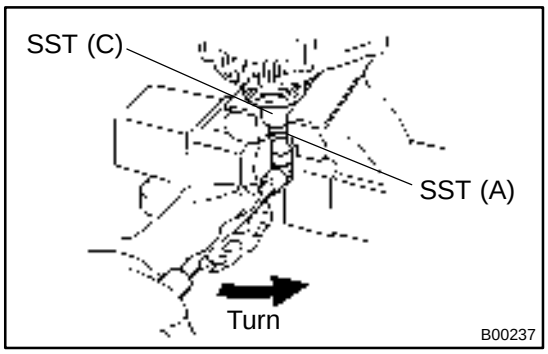
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(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).

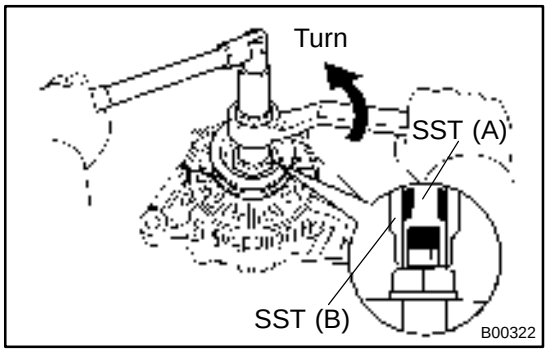


(e) To loosen the pulley nut, turn SST (A) in the direction shown in the illustration.

NOTICE:

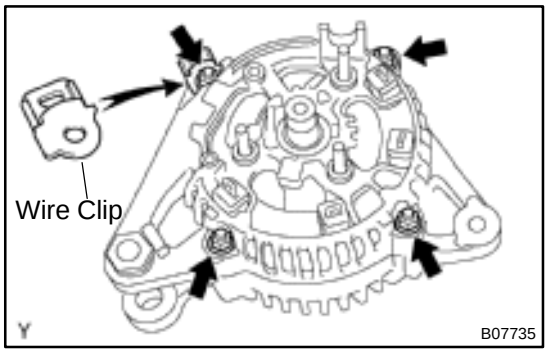
To prevent damage to the rotor shaft, do not loosen the pulley nut more than one–half of a turn.

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



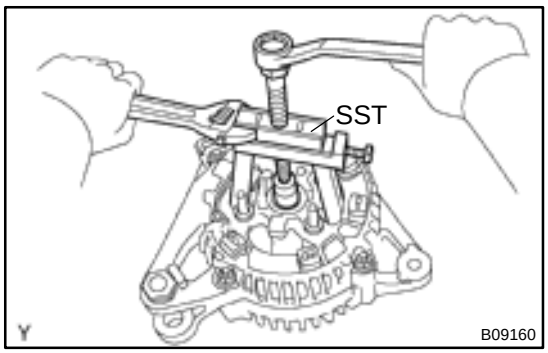
(g) Turn SST (B), and remove SST (A and B).

(h) Remove the pulley nut and pulley.



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 generator washer from the rotor

6. REMOVE ROTOR FROM DRIVE END FRAME

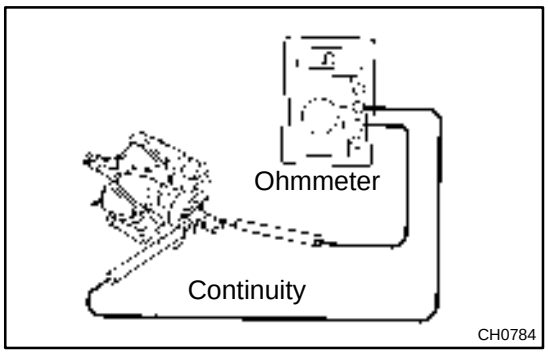
CH0DH–01

INSPECTION

1. INSPECT ROTOR

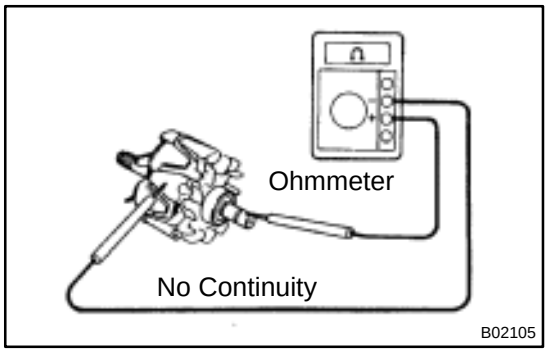
(a) Check the rotor for open circuit.
Using an ohmmeter, check that there is continuity between the slip rings.
Standard resistance: 2.1 – 2.5 Ω at 20˚C (68˚F)

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.

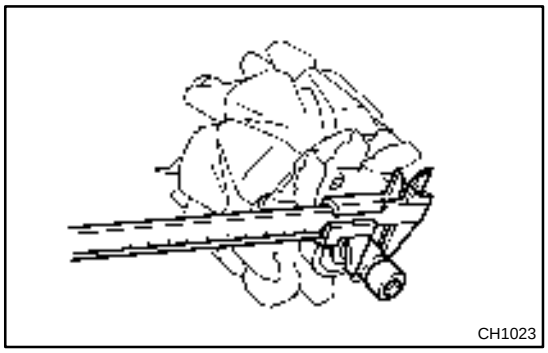


(c) Check that the slip rings are not rough or scored.

If rough or scored, replace the rotor.

(d) Using a vernier caliper, 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.)

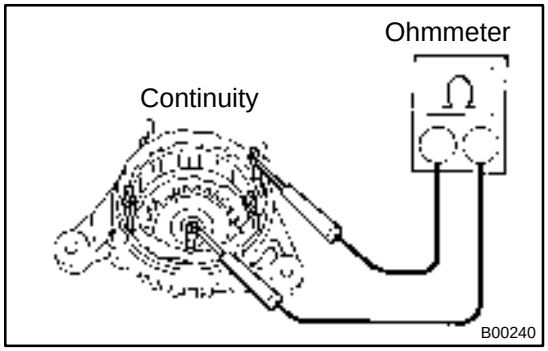
If the diameter is less than minimum, replace the rotor.



2. INSPECT STATOR (DRIVE END FRAME)

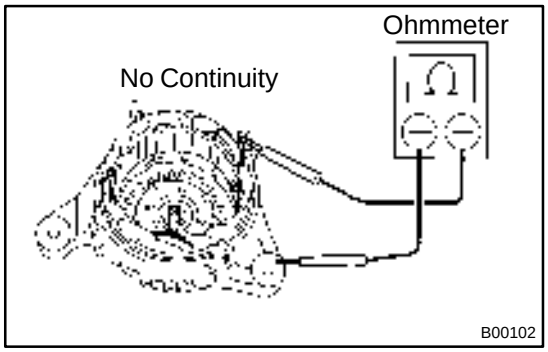
(a) Check the stator for open circuit.
Using an ohmmeter, check that there is continuity between the coil leads.

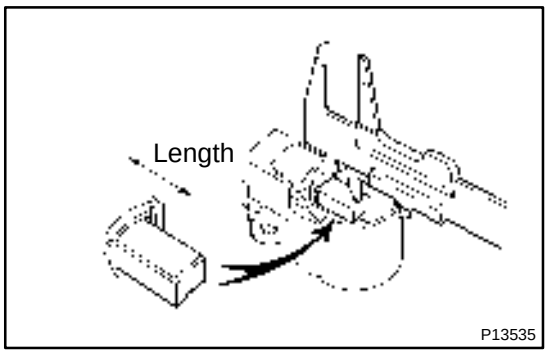
If there is no continuity, replace the drive end frame assembly.



(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.



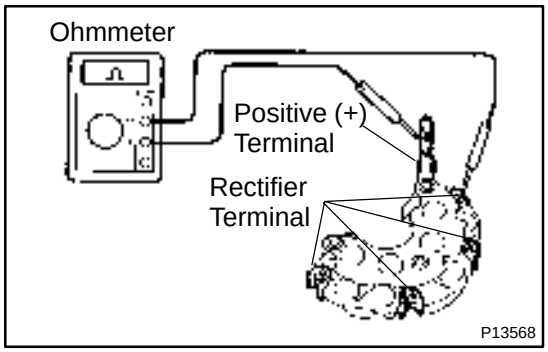


3. INSPECT BRUSHES

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.)

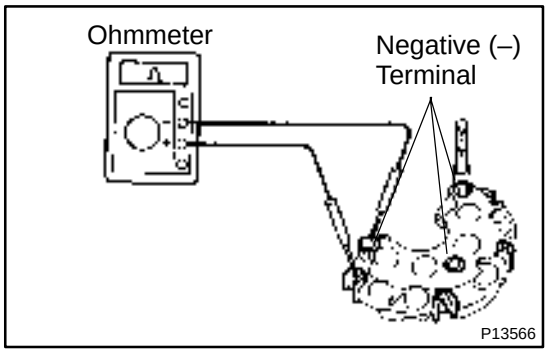
If the exposed length is less than minimum, replace the brush holder assembly.



4. INSPECT RECTIFIERS (RECTIFIRE HOLDER)

(a) Check the positive (+) rectifire.
  (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 (–) rectifire.
  (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.

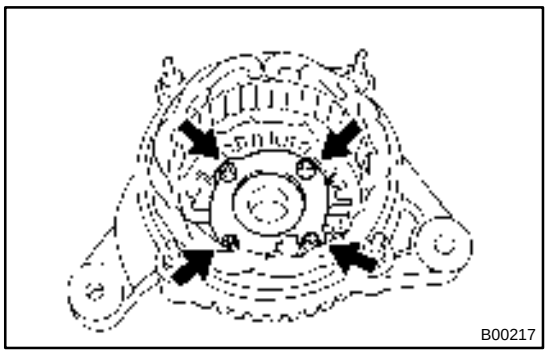
5. INSPECT BEARINGS

Check the bearing is not rough or worn.

If necessary, replace the bearing (See page CH–12).

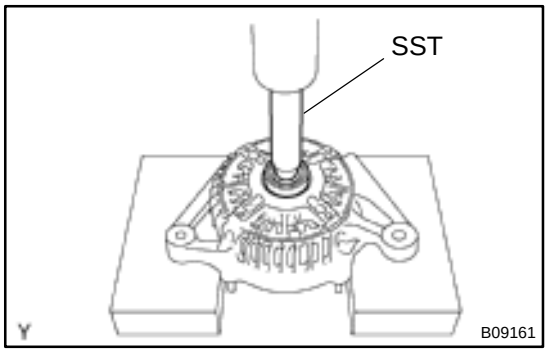
CH0DI–01

REPLACEMENT

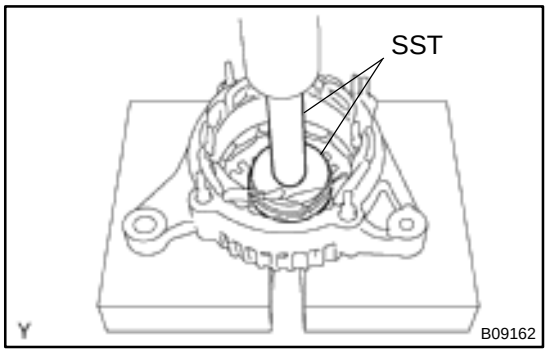


1. REPLACE FRONT BEARING

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

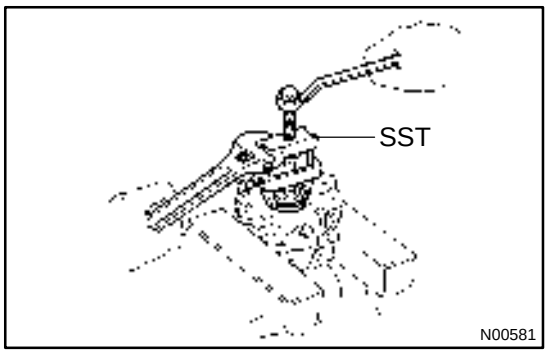


(b) Using SST and a press, press out the bearing.
SST 09950–60010 (09951–00350), 09950–70010 (09951–07100)



(c) Using SST and a press, press in a new bearing.
SST 09950–60010 (09951–00530), 09950–70010 (09951–07100)

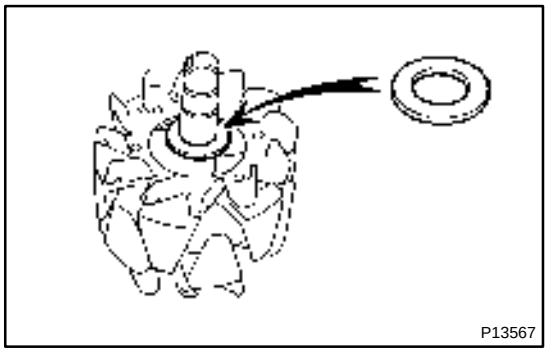
(d) Install the bearing retainer with the 4 screws.
Torque: 3.0 N·m (31 kgf·cm, 27 in.·lbf)



2. REPLACE REAR BEARING

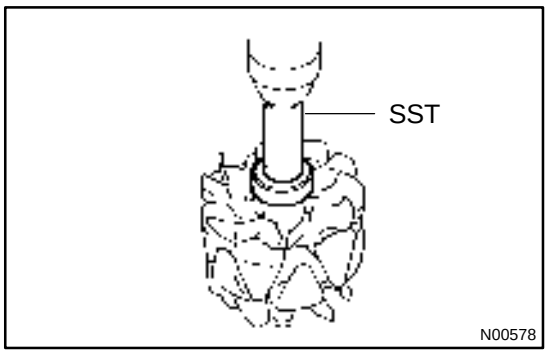
(a) Using SST, remove the bearing cover (outside) and bearing.
SST 09820–00021

NOTICE:
Be careful not to damage the fan.

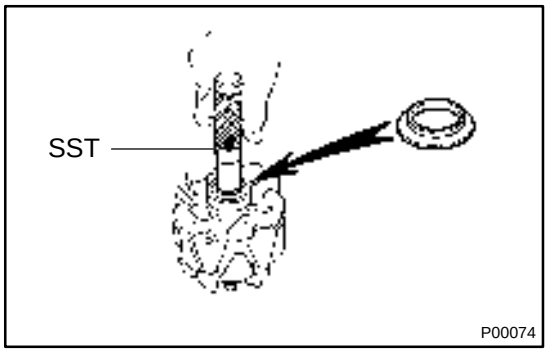


(b) Remove the bearing cover (inside).

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



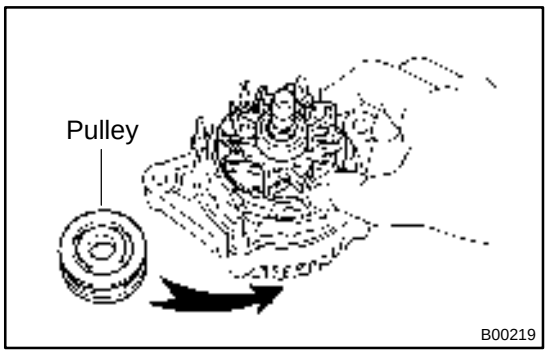
(d) Using SST and a press, press in a new bearing.
SST 09820–00030



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

CH0CB–02

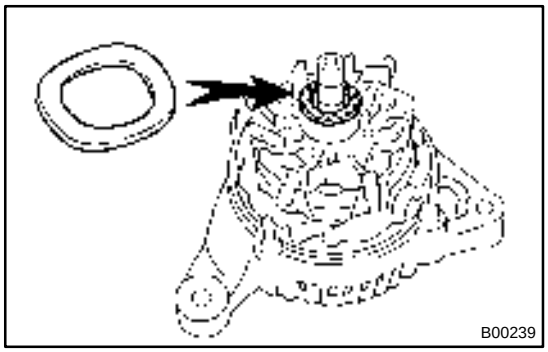
REASSEMBLY



1. INSTALL ROTOR TO DRIVE END FRAME

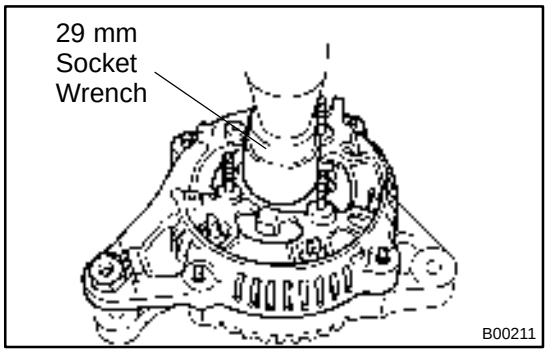
(a) Place the drive end frame on the pulley.

(b) Install the rotor to the drive end frame.

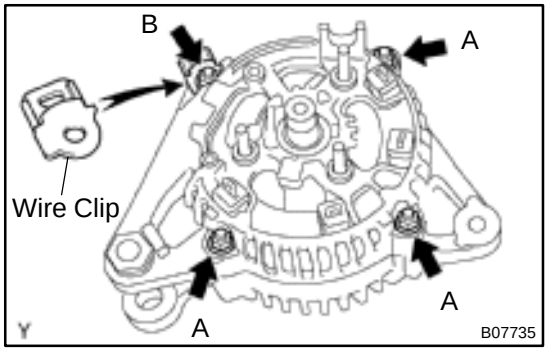


2. INSTALL RECTIFIER END FRAME

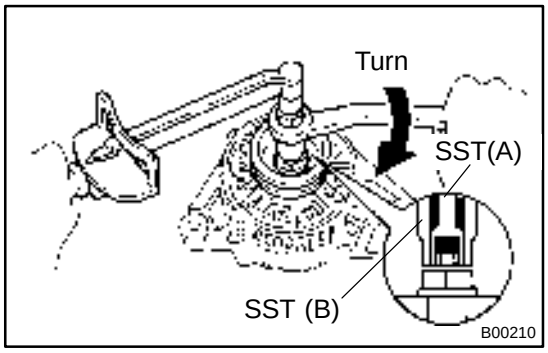
(a) Place the generator washer on the rotor.



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



(c) Install the wire clip and 4 nuts.
Torque:
Nut A: 4.5 N·m (46 kgf·cm, 40 in.·lbf)
Nut B: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

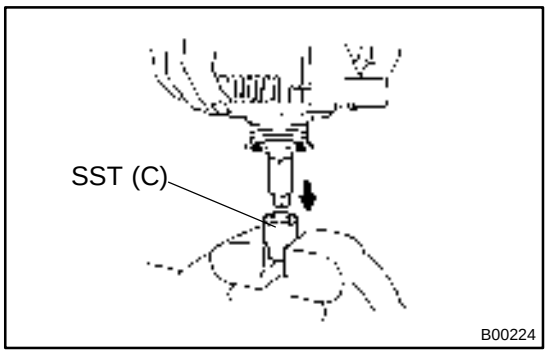


3. INSTALL PULLEY

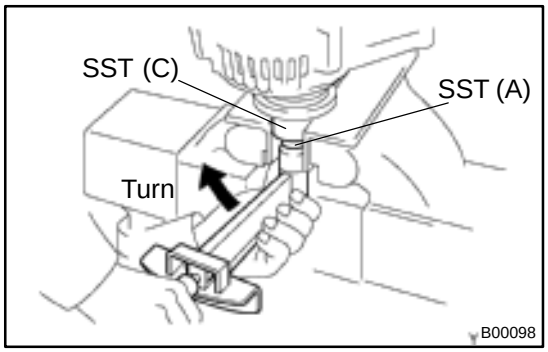
(a) Install the pulley to the rotor shaft by tightening the pulley nut by hand.

(b) Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820–63010
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

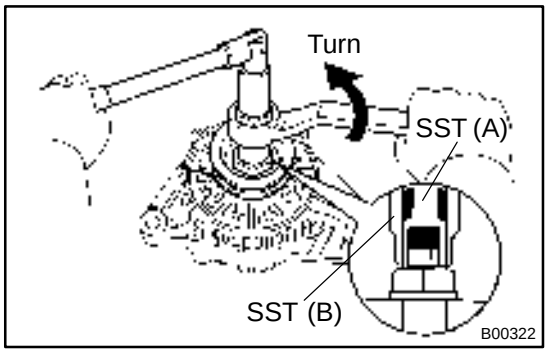
(c) Check that SST (A) is secured to the pulley shaft.



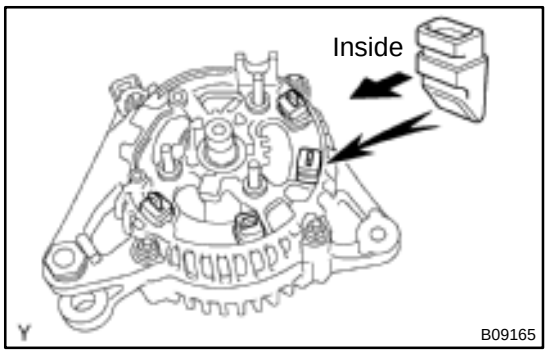
(d) Mount SST (C) in a vise.
(e) Insert SST (B) into SST (C), and attach the pulley nut to SST (C).



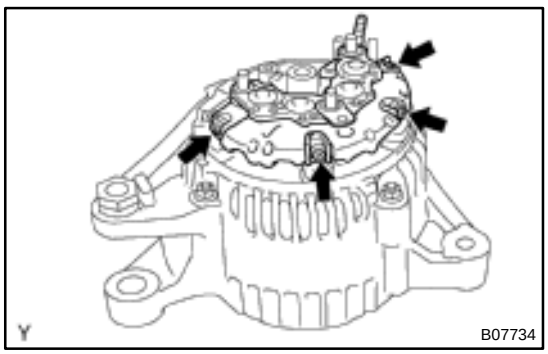
(f) To torque the pulley nut, turn SST (A) in the direction shown in the illustration.
Torque: 111 N·m (1,125 kgf·cm, 81 ft·lbf)
(g) Remove the generator from SST (C).



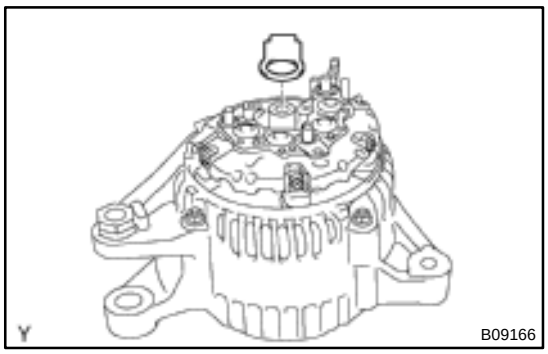
(h) Turn SST (B), and remove SST (A and B).



4. INSTALL RECTIFIER HOLDER
(a) Install the 4 rubber insulators on the lead wires.
NOTICE:
Be careful of the rubber insulators installation direction.

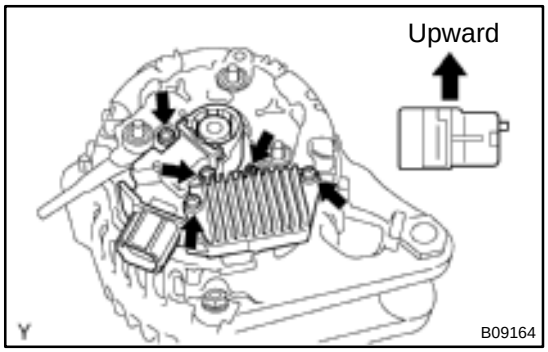


(b) Install the rectifier holder while pushing it with the 4 screws
Torque: 2.9 N·m (30 kgf·cm, 26 in.·lbf)



5. INSTALL VOLTAGE REGULATOR AND BRUSH HOLDER

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



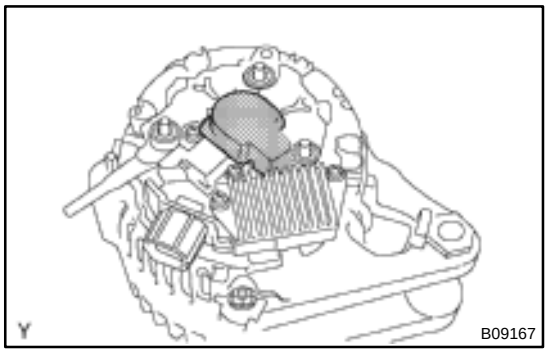
(b) Place the voltage regulator and brush holder on the rectifier end frame.

NOTICE:

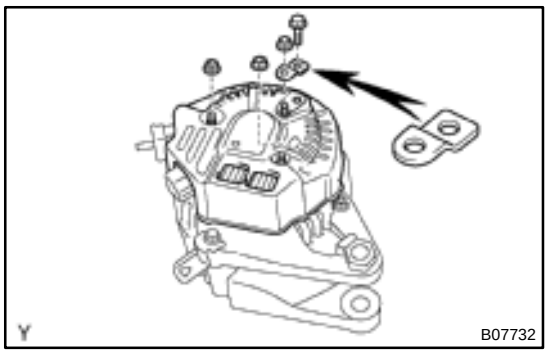
Be careful of the holder installation direction.

(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.



6. INSTALL REAR END COVER

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

Torque:

Nut: 4.4 N·m (45 kgf·cm, 39 in.·lbf)

Bolt: 3.9 N·m (39 kgf·cm, 35 in.·lbf)

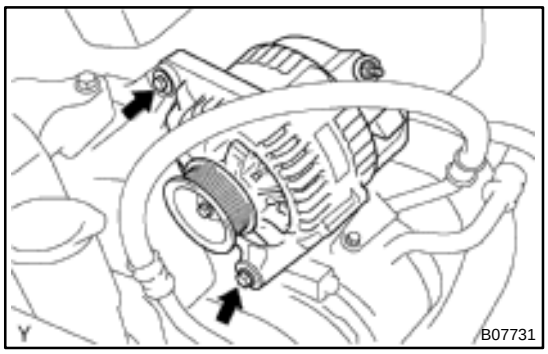
(b) Install the terminal insulator with the nut.

Torque: 4.1 N·m (42 kgf·cm, 36 in.·lbf)

7. CHECK THAT ROTOR ROTATES SMOOTHLY

CH0DJ–01

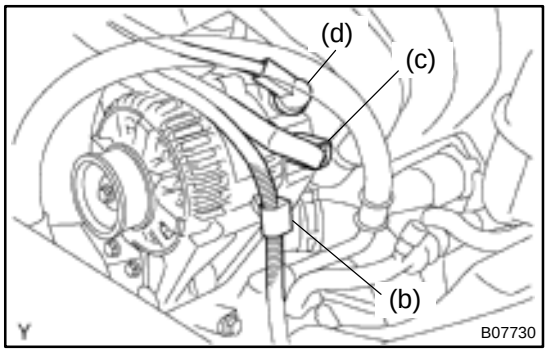
INSTALLATION



1. INSTALL GENERATOR

(a) Install the 2 bolts and generator.

Torque:
12 mm head: 25 N·m (255 kgf·cm, 18 ft·lbf)
14 mm head: 54 N·m (550 kgf·cm, 40 ft·lbf)

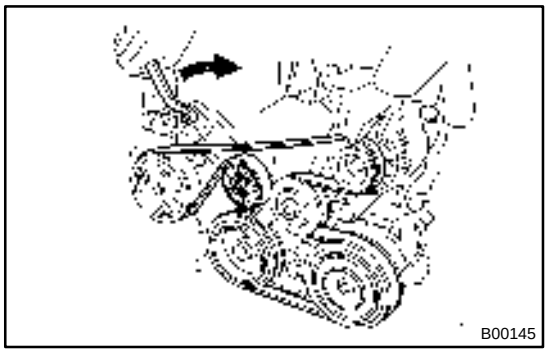


(b) Connect the wire clamp to the wire clip on the rectifire end flame.

(c) Connect the generator connector.

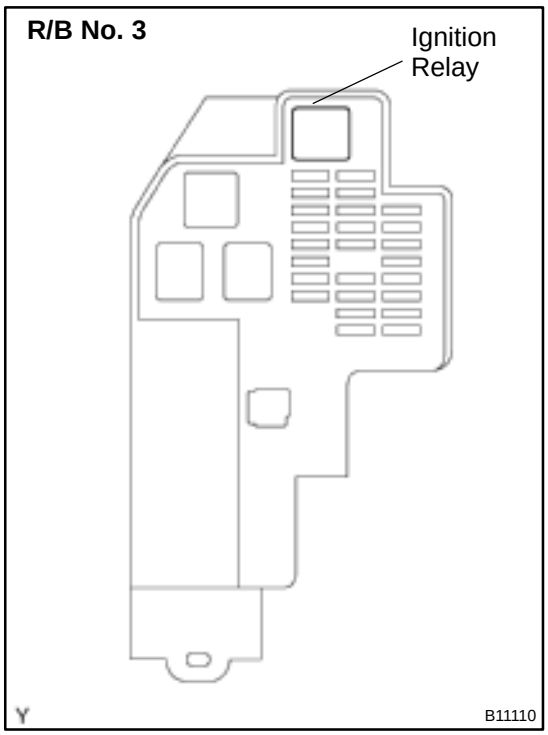
(d) Connect the generator wire, and install the nut and cap.

2. INSTALL RH ENGINE MOUNTING INSULATOR (See page EM–59)



3. INSTALL DRIVE BELT

Turning the drive belt tensioner clockwise, and install the drive belt.

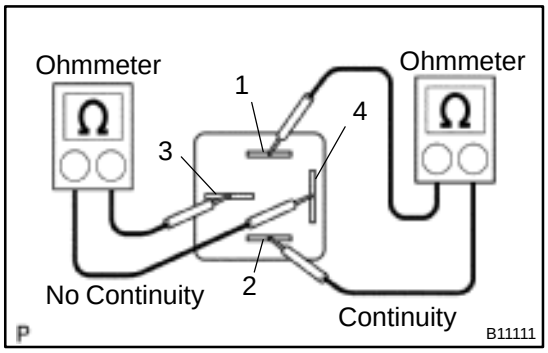


IGNITION RELAY (No.1)

SF0DX–06

INSPECTION

1. REMOVE IGNITION RELAY (Marking: IG1) FROM R/B No. 3



2. INSPECT IGNITION RELAY

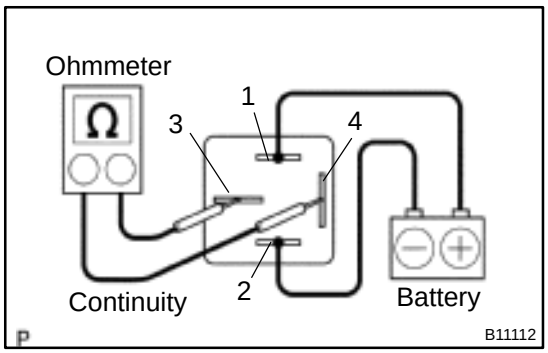
(a) Inspect the relay continuity.

(1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.

If there is no continuity, replace the relay.

(2) Check that there is no continuity between terminals 3 and 5.

If there is continuity, replace the relay.



(b) Inspect the relay operation.

(1) Apply battery positive voltage across terminals 1 and 2.

(2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

3. REINSTALL IGNITION RELAY