

CHARGING SYSTEM

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CH

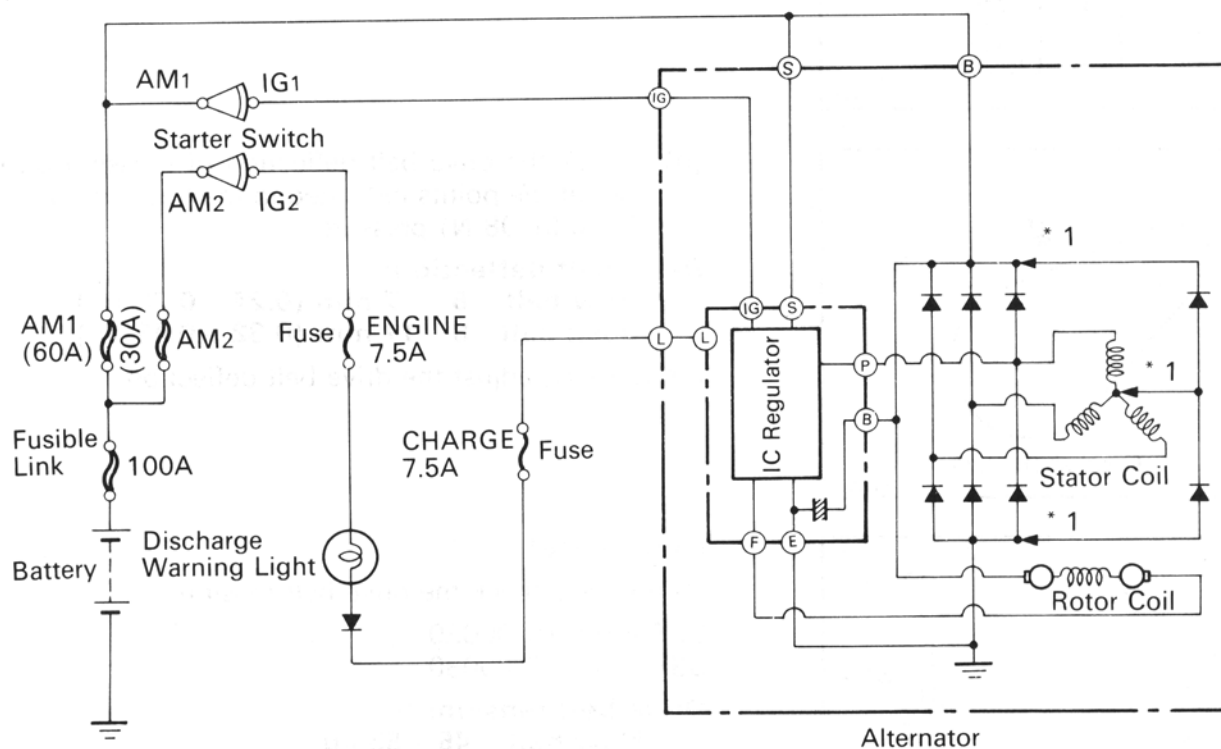
PRECAUTIONS

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

TROUBLESHOOTING

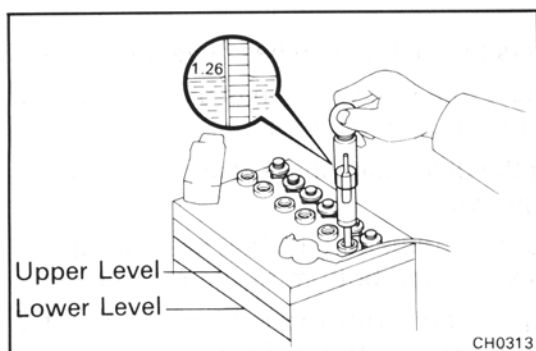
Problem	Possible casue	Remedy	Page
Discharge warning light does not light with ignition ON and engine off	Fuse blow Light burned out Wiring connection loose IC regulator faulty	Check "CHARGE" and "ENGINE" fuses Replace light Tighten loose connections Replace IC regulator	CH-7
Discharge warning light does not go out with engine running (battery required frequent recharging)	Drive belt loose or worn Battery cables loose, corroded or worn Fuse blow Fusible link blown IC regulator or alternator faulty Wiring faulty	Adjust or replace drive belt Repair or replace cables Check "CHARGE" or "ENGINE" fuse Replace fusible link Check charging system Repair wiring	CH-4 CH-5

CHARGING CIRCUIT

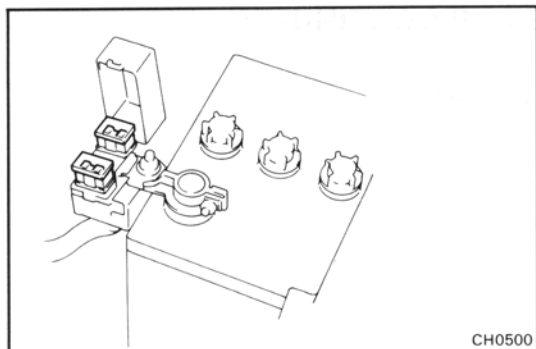


* 1: Ex. Cold Area

CH0499



CH0313



CH0500

ON-VEHICLE INSPECTION

1. CHECK BATTERY SPECIFIC GRAVITY AND ELECTROLYTE LEVEL

(a) Check the specific gravity of each cell.

Standard specific gravity

When fully charged at 20°C (68°F): 1.25 - 1.27

If not within specifications, charge the battery.

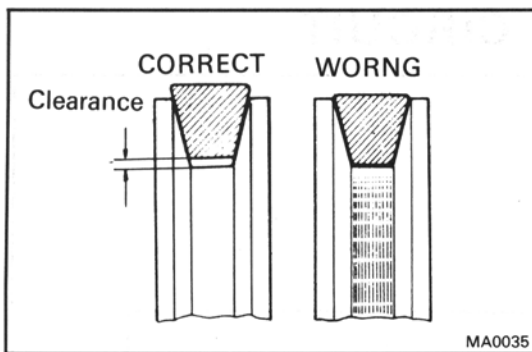
(b) Check the electrolyte quantity of each cell.

If insufficient, refill with distilled (or purified) water.

2. CHECK BATTERY TERMINALS AND FUSIBLE LINK

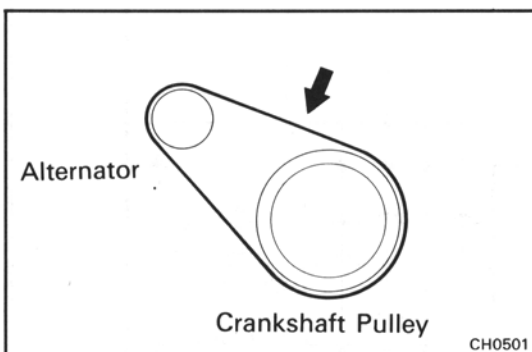
(a) Check that the battery terminals are not loose or corroded.

(b) Check the fusible link for continuity.



3. DRIVE BELT

- (a) Check that the belt does not touch the bottom of the pulley groove.



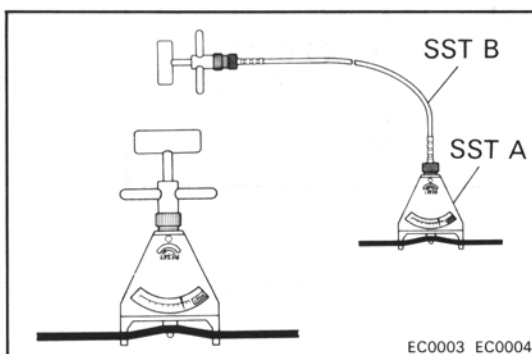
- (b) Check the drive belt deflection of pressing on the belt at the points indicated in the figure with 10 kg (22.0 lb, 98 N) pressure.

Drive belt deflection:

New belt 6 – 7 mm (0.24 – 0.28 in.)

Used belt 8 – 11 mm (0.32 – 0.43 in.)

If necessary, adjust the drive belt deflection.



[Reference]

Using SST, check the drive belt tension.

SST A 09216-00020

SST B 09216-00030

Drive belt tension:

New belt 45 – 55 kg

Used belt 20 – 35 kg

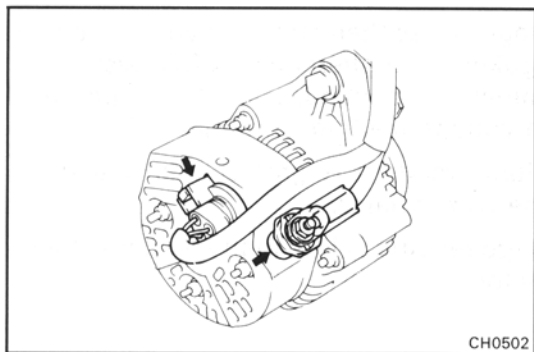
NOTE:

- "New belt" refers to a belt which has never been used.
- "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 by hand to confirm that the belt has not slipped out of the groove on the bottom of the crank pulley.
- After installing the belt, run the engine for about 5 minutes and then recheck the deflection.

4. CHECK FUSES FOR CONTINUITY

CHARGE fuse (7.5 A)

ENGINE fuse (7.5 A)



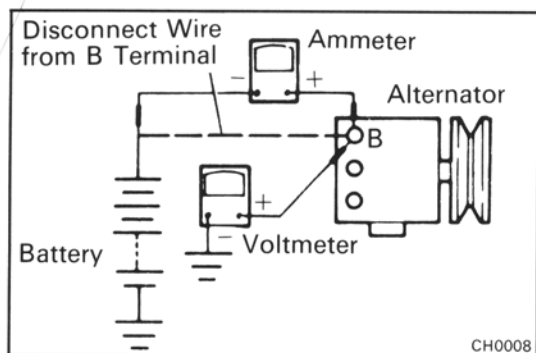
5. VISUALLY CHECK ALTERNATOR WIRING AND LISTEN FOR ABNORMAL NOISES

- (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.

6. CHECK DISCHARGE WARNING LIGHT CIRCUIT

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

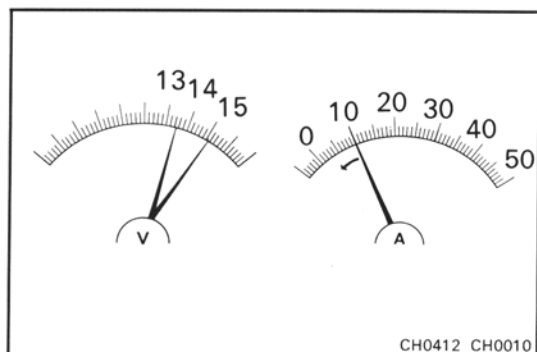
If the light does not function as specified, troubleshoot the warning light circuit.



7. CHECK CHARGING CIRCUIT WITHOUT LOAD

NOTE: If a battery / alternator tester is available, connect the tester to the charging circuit according to the 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 terminal of the ammeter.
 - Connect the test lead from the positive terminal of the ammeter to terminal B of the alternator.
 - Connect the positive lead of the voltmeter to terminal B of the alternator.
 - Connect the negative lead of the voltmeter to ground.

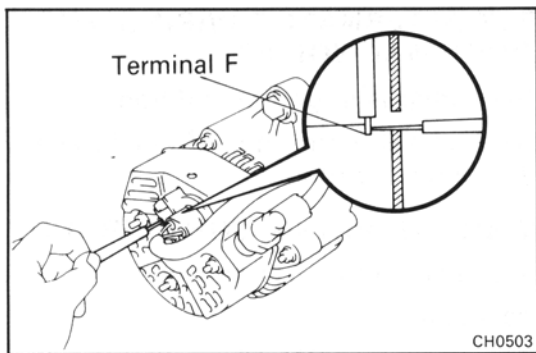


- (b) Check the charging circuit as follows:

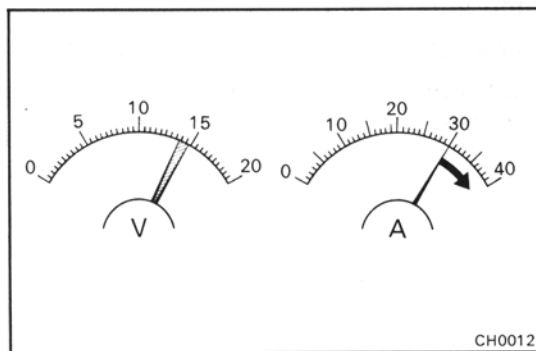
Run the engine from idle to 2,000 rpm, and check the reading on the ammeter and voltmeter.

Standard amperage: Less than 10 A
Standard voltage: 13.5 – 15.1 V (25°C or 77°F)
 13.5 – 14.3 V (115°C or 239°F)

- If the voltage reading is greater than standard voltage, replace the IC regulator.



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



8. CHECK CHARGING CIRCUIT WITH LOAD

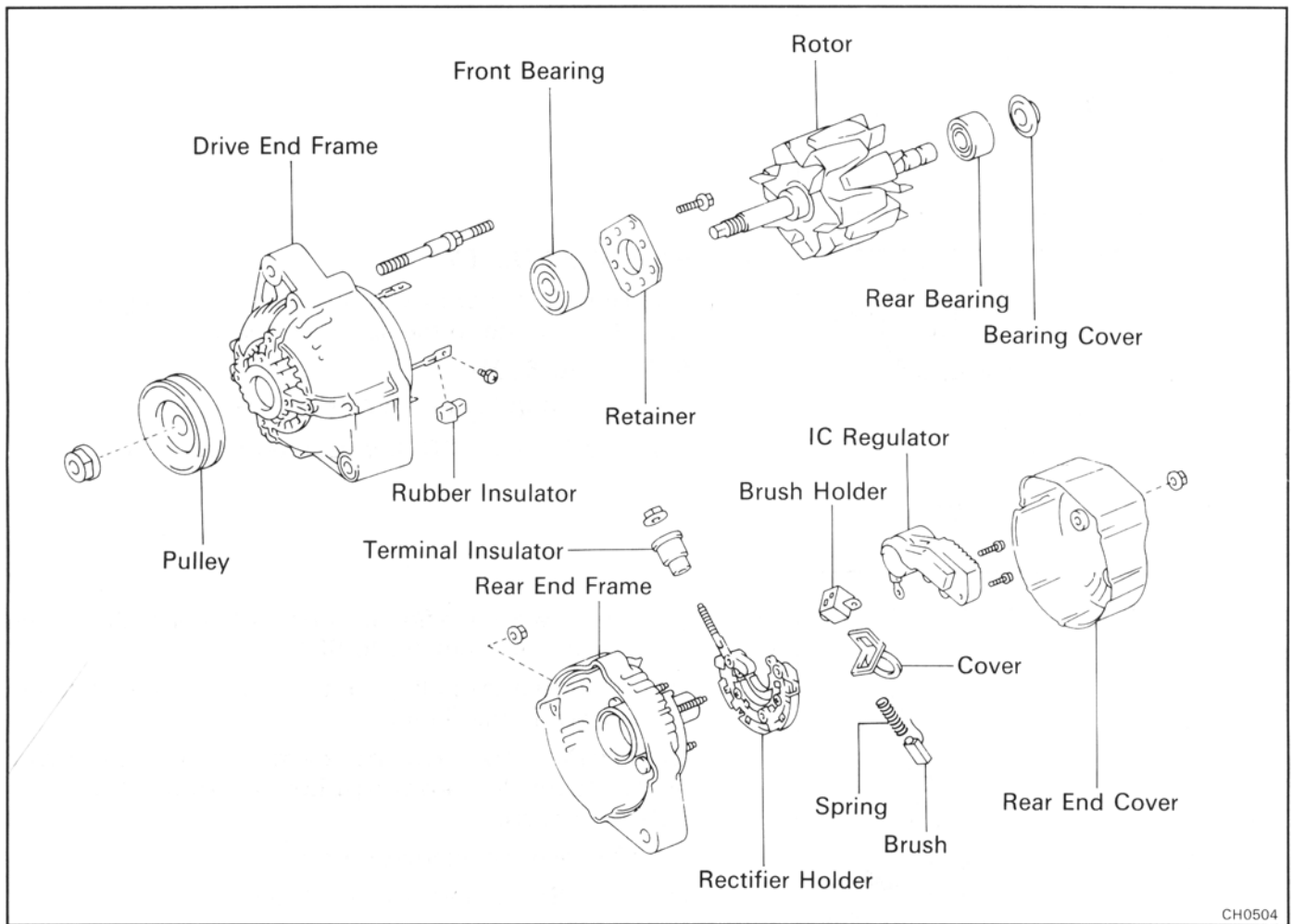
- With the engine running at 2,000 rpm, turn on the high beam headlights and place the heater fan control switch at HI.
- Check the reading on the ammeter.

Standard amperage: More than 30 A

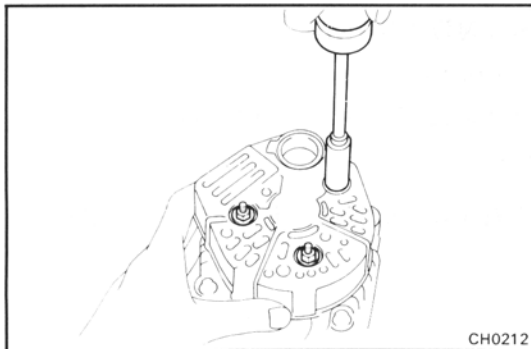
If the ammeter reading is less than 30 A, repair the alternator. (See page CH-7)

NOTE: If the battery is fully charged, the indication be less than 30 A.

ALTERNATOR COMPONENTS



CH0504

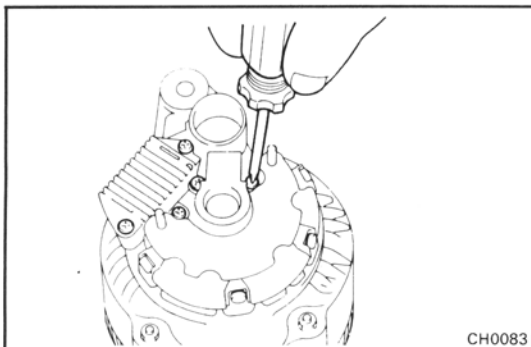


CH0212

DISASSEMBLY OF ALTERNATOR

1. REMOVE REAR END COVER

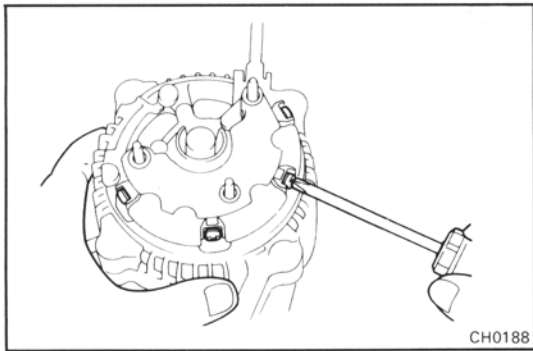
- Remove the nut and terminal insulator.
- Remove the three nuts and end cover.



CH0083

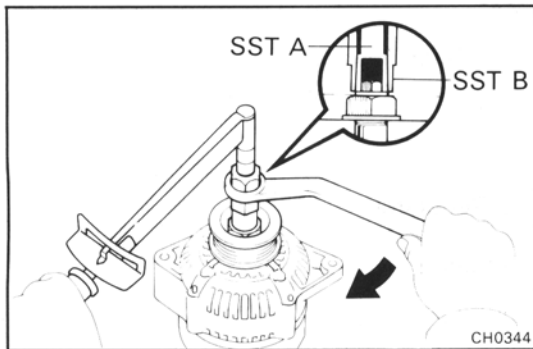
2. REMOVE BRUSH HOLDER AND IC REGULATOR

Remove the five screws, brush holder and IC regulator.



3. REMOVE RECTIFIER HOLDER

Remove the four screws, rectifier holder and rubber, insulators.



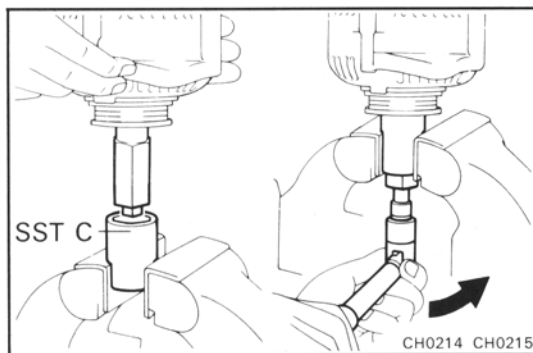
4. REMOVE PULLEY

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

SST 09820-63010

Torque: 400 kg-cm (26 ft-lb, 39 N·m)

- (b) Confirm that SST A is secured to the pulley shaft.

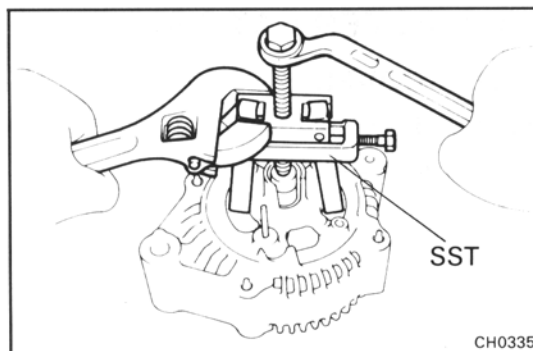


- (c) As shown in the figure, grip SST C in a vise and then install the alternator to SST C.

- (d) To loosen the pulley nut turn SST A in the direction shown in the figure.

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

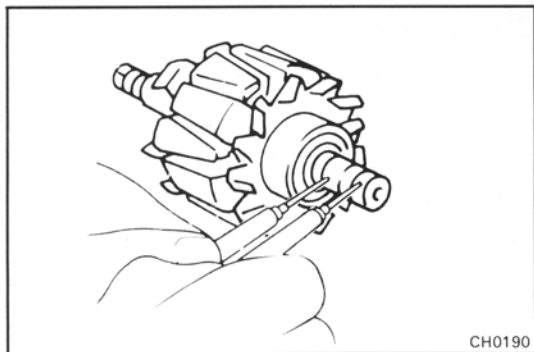
- (e) Remove the alternator from SST C.
(f) Turn SST B and remove all SSTs.
(g) Remove the pulley nut and the pulley.



5. REMOVE REAR END FRAME

- (a) Remove the four nuts.
(b) Using SST, remove the rear end frame.
SST 09286-46011

6. REMOVE ROTOR FROM DRIVE END FRAME



INSPECTION AND REPAIR OF ALTERNATOR

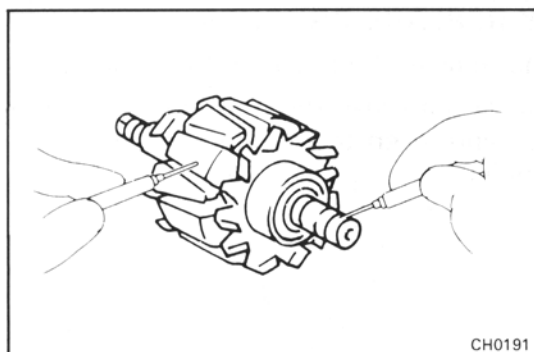
Rotor

1. INSPECT ROTOR FOR OPEN CIRCUIT

Using an ohmmeter, check for continuity between the slip rings.

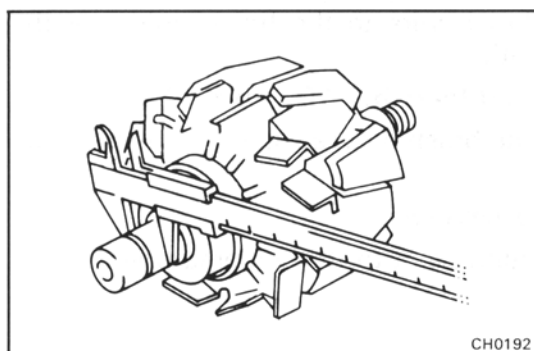
Standard resistance: Less than 3Ω

If there is no continuity, replace the rotor.



2. 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.



3. INSPECT SLIP RINGS

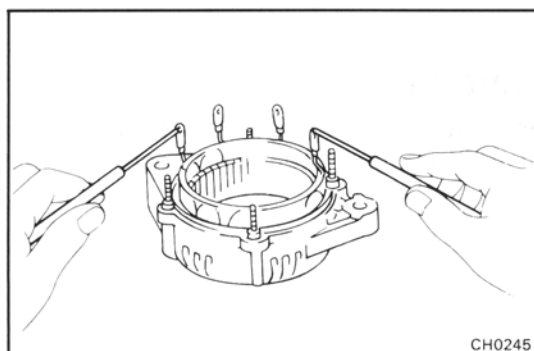
- Check that the slip rings are not rough or scored. If rough or scored, replace the rotor.
- Using calipers, measure the slip ring diameter. If the diameter of the slip ring is less than the minimum, replace the rotor.

Standard diameter:

14.2 – 14.4 mm (0.559 – 0.567 in.)

Minimum diameter:

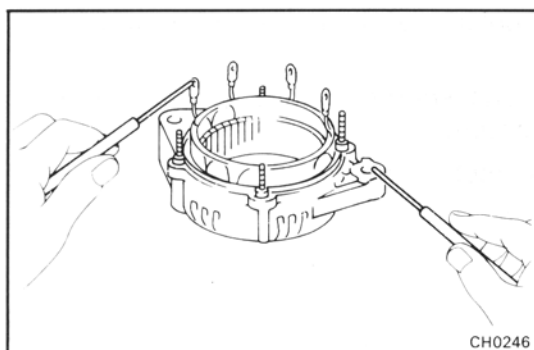
12.8 mm (0.504 in.)



Stator

1. INSPECT STATOR FOR OPEN CIRCUIT

Using an ohmmeter, check all leads for continuity. If there is no continuity, replace the drive end frame assembly.



2. INSPECT THAT STATOR IS NOT GROUNDED

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.

Brush and Brush Holder

1. MEASURE EXPOSED BRUSH LENGTH

Using a scale, measure the exposed brush length.

Standard exposed length: 10.5 mm (1.413 in.)

Minimum exposed length: 1.5 mm (0.059 in.)

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

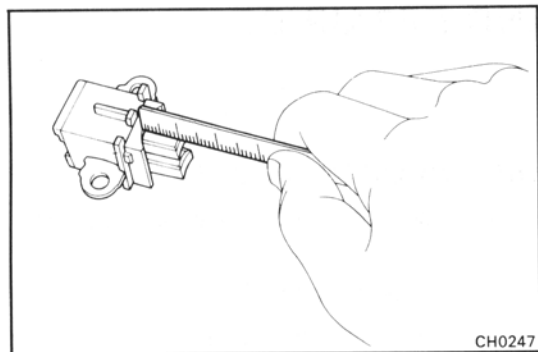
2. IF NECESSARY REPLACE BRUSHES

- (a) Unsolder and remove the brush and the 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.

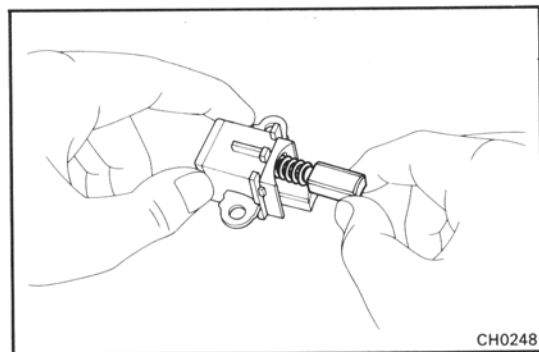
- (c) Solder the brush wire to the brush holder at the exposed length.

Standard exposed length: 10.5 mm (0.413 in.)

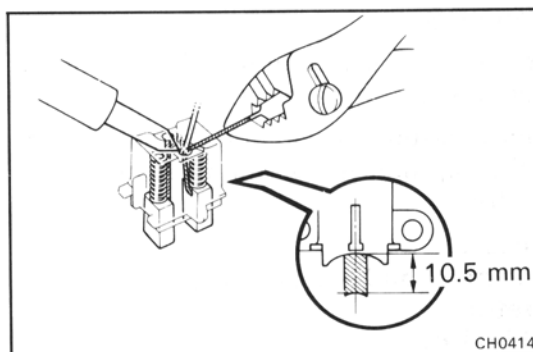
- (d) Check that the brush moves smoothly in the brush holder.
- (e) Cut off the excess wire.
- (f) Apply insulation paint to the soldered point.



CH0247



CH0248



CH0414

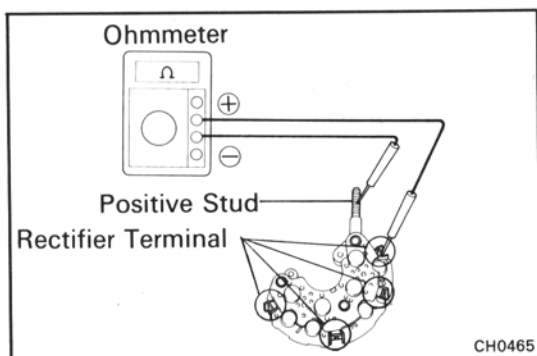
Rectifier

1. INSPECT POSITIVE SIDE RECTIFIER

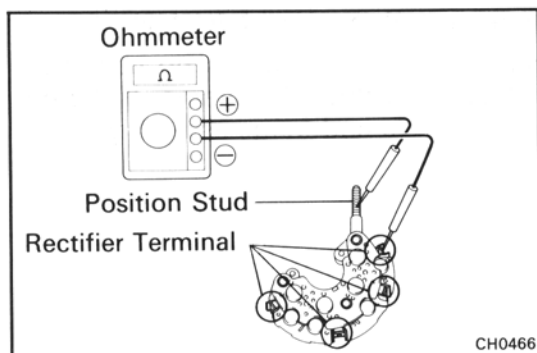
- (a) Using an ohmmeter, connect one tester probe to the positive stud and the other to each rectifier terminal.

- (b) Reverse the polarity of the tester probes and repeat step (a).
- (c) Check that one shows continuity and the other shows no continuity.

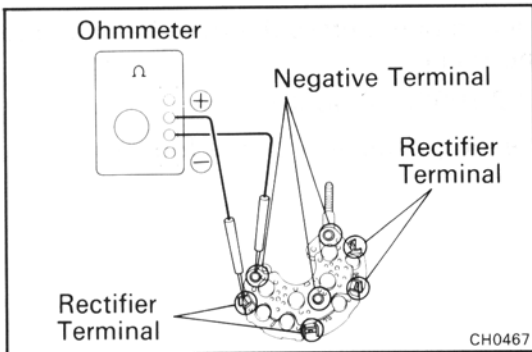
If not, replace the rectifier holder.



CH0465

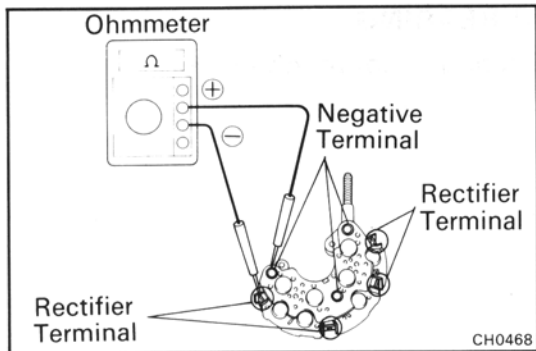


CH0466



2. INSPECT NEGATIVE SIDE RECTIFIER

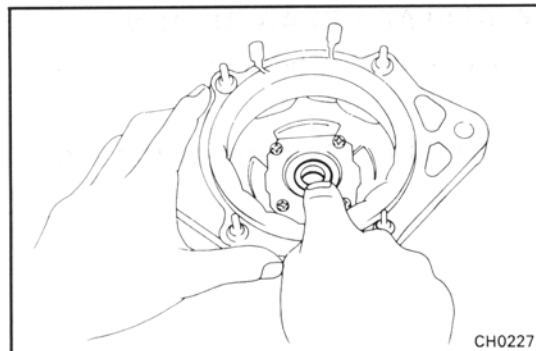
- (a) Connect one tester probe to each rectifier terminal and the other to each rectifier negative terminal.



- (b) Reverse the polarity of the tester probes.

- (c) Check that one shows continuity and the other shows no continuity.

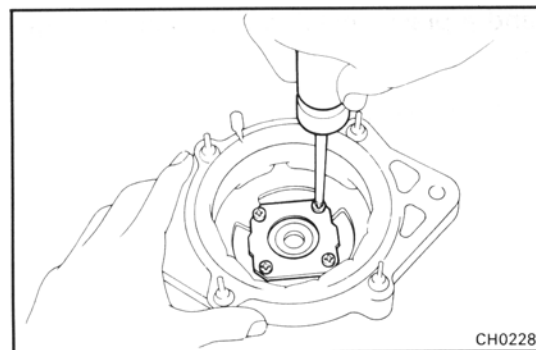
If not, replace the rectifier holder.



Bearings

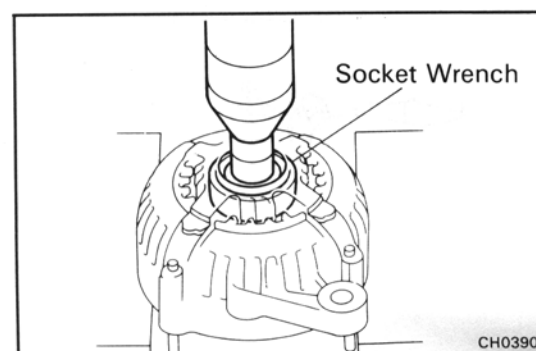
1. INSPECT FRONT BEARING

Check that the bearing is not rough or worn.

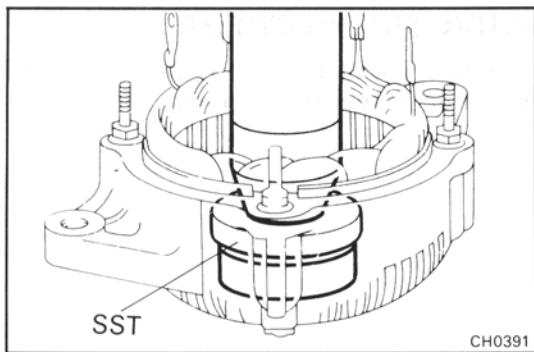


2. IF NECESSARY, REPLACE FRONT BEARING

- (a) Remove the four screws and bearing retainer.



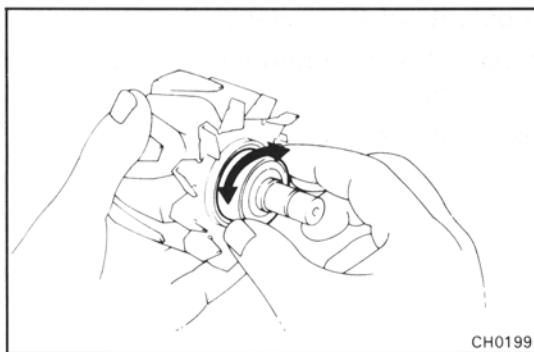
- (b) Using a press and socket wrench, press out the front bearing.



(c) Using SST and a press, press the front bearing into the drive end frame.

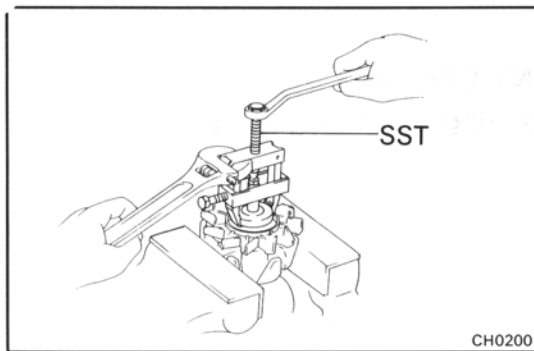
SST 09608-20012 (09608-00030)

(d) Install the bearing retainer with the four screws.



3. INSPECT REAR BEARING

Check that the bearing is not rough or worn.

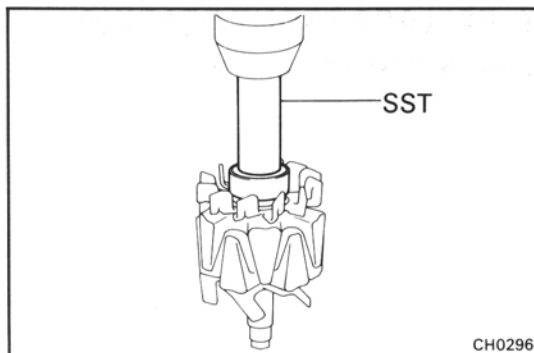


4. IF NECESSARY, REPLACE REAR BEARING

(a) Using SST, remove the rear bearing and covers.

SST 09820-00021

CAUTION: Be careful not to damage the fan.



(b) Using SST and a press, install a new rear bearing.

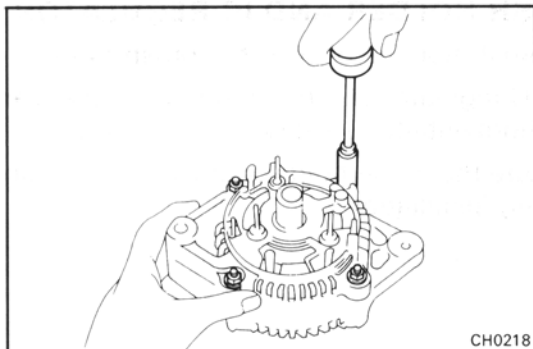
SST 09820-00030

(c) Install the bearing cover.

ASSEMBLY OF ALTERNATOR

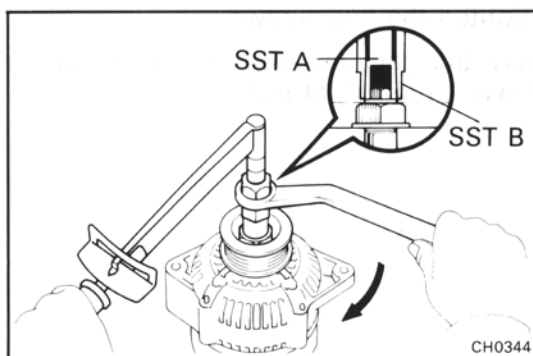
(See page CH-7)

1. INSTALL ROTOR TO DRIVE END FRAME



2. INSTALL REAR END FRAME

- (a) Using a plastic hammer, lightly tap the rear end frame on the drive end frame.
- (b) Install the four nuts.

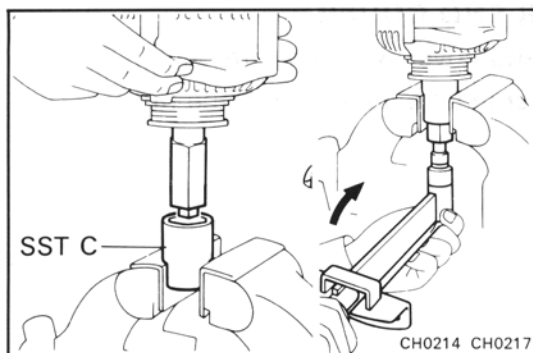


3. INSTALL PULLEY

- (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: 400 kg-cm (29 ft-lb, 39 N·m)



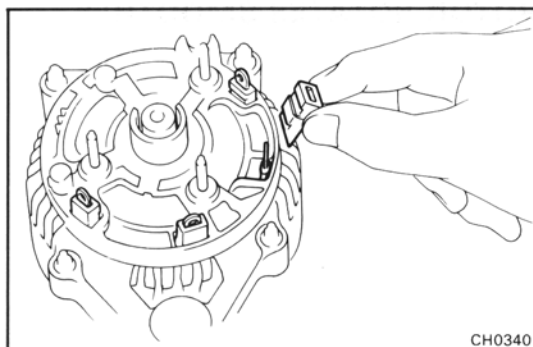
- (c) Check that SST A is secured to the pulley shaft.
- (d) As shown in the figure, mount SST C in a vise and then install the alternator to SST C.
- (e) To torque the pulley, nut turn SST A in the direction shown in the figure.

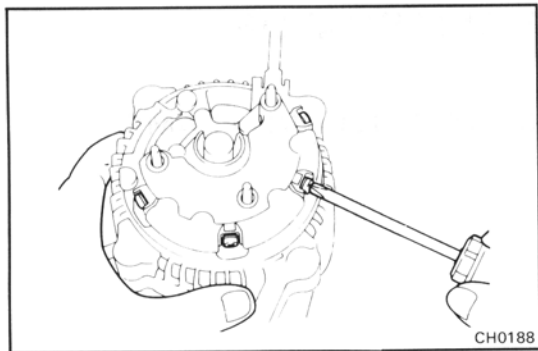
Torque: 1,125 kg-cm (81 ft-lb, 110 N·m)

- (f) Remove the alternator from SST C.
- (g) Turn SST B and remove SSTs A and B.

4. INSTALL RECTIFIER HOLDER

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





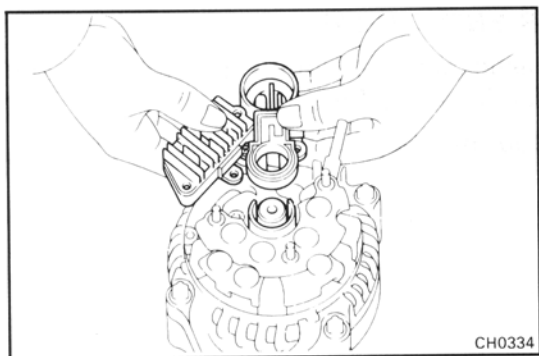
(b) Install the rectifier with four screws.

5. INSTALL BRUSH HOLDER AND IC REGULATOR

(a) Place the brush holder cover to the brush holder.

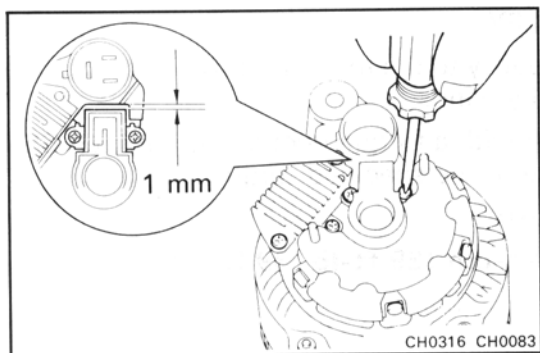
(b) Install the IC regulator and brush holder to the rear end frame horizontally as shown in the figure.

NOTE: Make sure the brush holder's cover doesn't slip to one side during installation.



(c) Install and tighten the five screws.

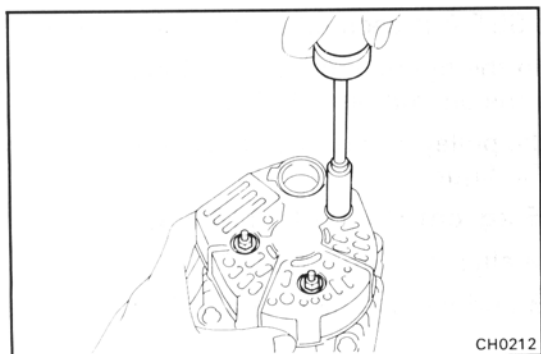
NOTE: Make sure the gap between the brush holder connector is at least 1 mm (0.04 in.).



6. INSTALL REAR END COVER

(a) Install the end cover with the three nuts.

(b) Install the terminal insulator with the nut.



7. MAKE SURE ROTOR ROTATES SMOOTHLY

