

## GENERATOR

### GENERATOR REMOVAL

#### 22R-E:

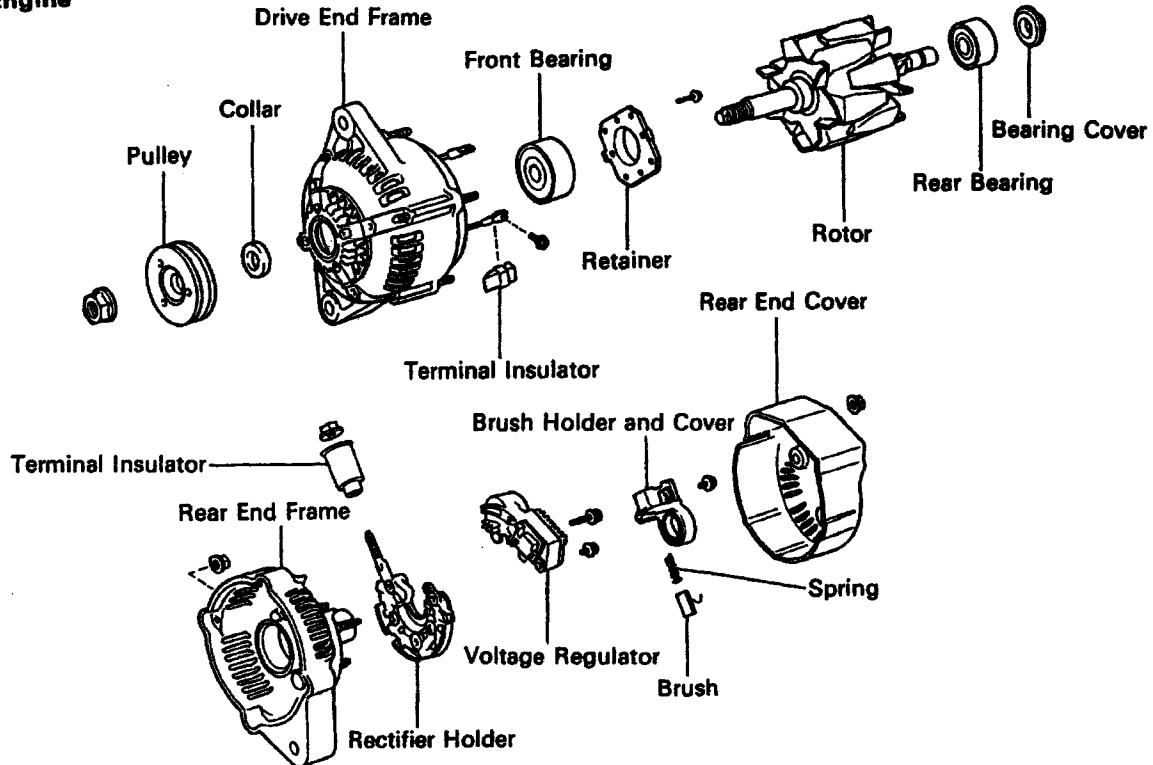
1. **DISCONNECT NEGATIVE TERMINAL CABLE FROM BATTERY**
2. **w/ PS:**  
**DRAIN COOLANT**
3. **DISCONNECT WIRING FROM GENERATOR**
  - (a) Disconnect the connector from the generator.
  - (b) Remove the nut and the wire from the generator.
4. **w/ PS:**  
**REMOVE WATER INLET HOSE**
  - (a) Remove the engine under cover.
  - (b) Remove the water inlet hose.
  - (c) w/ A/C:  
Remove the No.2 fan shroud.
5. **REMOVE GENERATOR DRIVE BELT**
  - (a) Loosen the generator pivot and remove the adjusting bolt.
  - (b) Remove the drive belt.
6. **REMOVE GENERATOR**
  - (a) Hold the generator and remove the pivot.
  - (b) Remove the generator.

#### 3VZ – E:

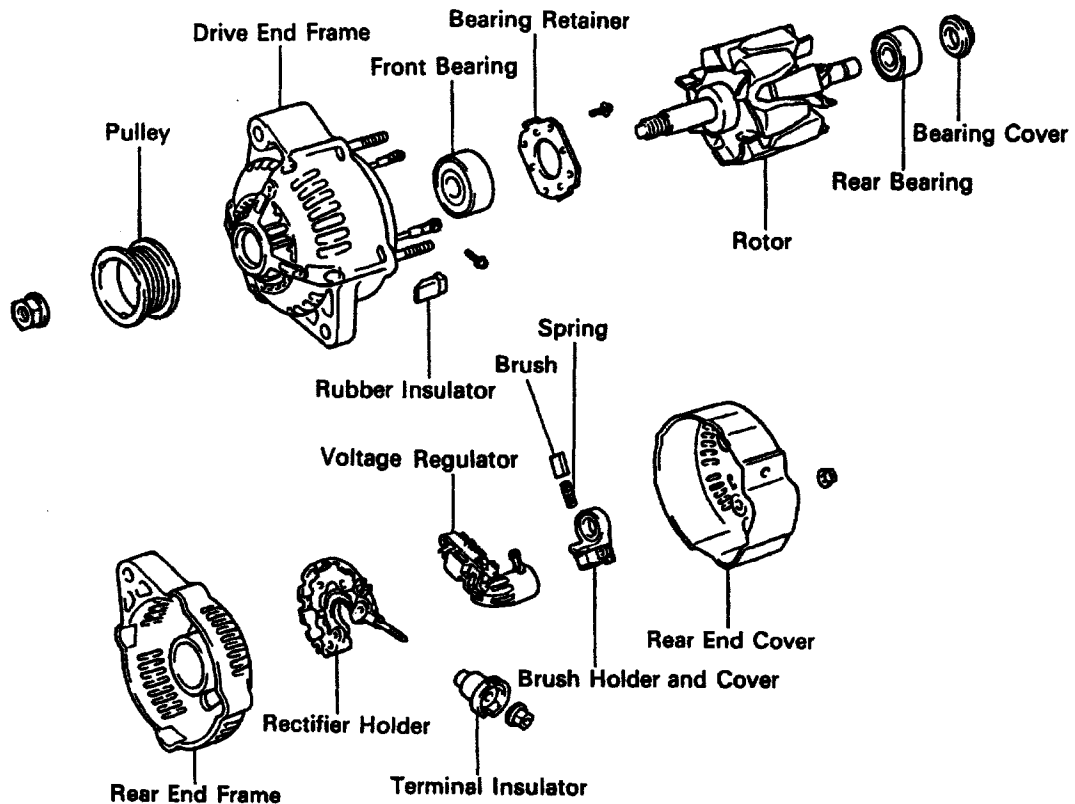
1. **DISCONNECT NEGATIVE TERMINAL CABLE FROM BATTERY**
2. **DISCONNECT WIRING FROM GENERATOR**
  - (a) Disconnect the connector from the generator.
  - (b) Remove the nut and disconnect the wire from the generator.
3. **REMOVE GENERATOR DRIVE BELT**  
Loosen the generator pivot bolts, adjusting lock bolt and remove the generator drive belt.
4. **REMOVE GENERATOR**
  - (a) Remove the pivot bolt and adjusting lock bolt.
  - (b) Remove the generator.

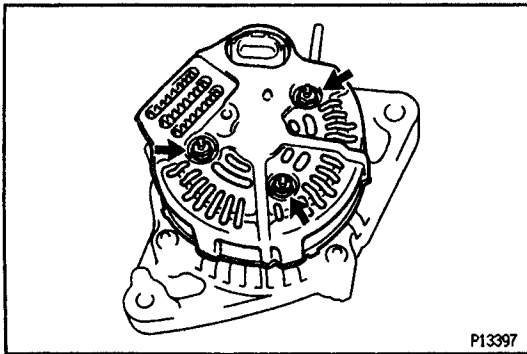
## COMPONENTS FOR DISASSEMBLY AND ASSEMBLY

### 22R-E Engine



### 3VZ-E Engine



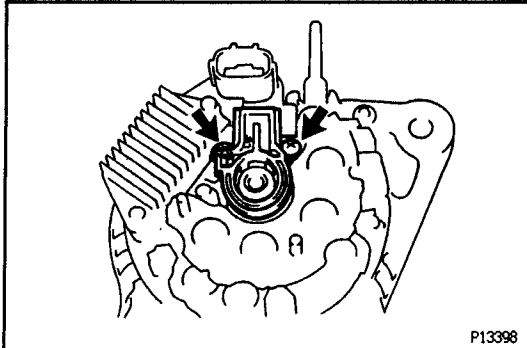


## GENERATOR DISASSEMBLY

(See Components for Disassembly and Assembly)

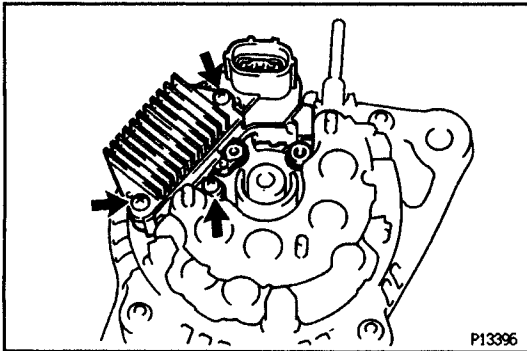
### 1. REMOVE REAR END COVER

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



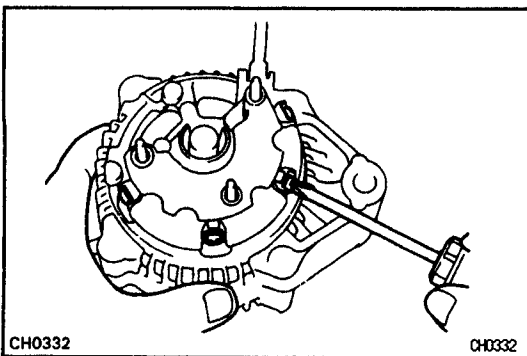
### 2. REMOVE BRUSH HOLDER

Remove the 2 screws, brush holder and cover.



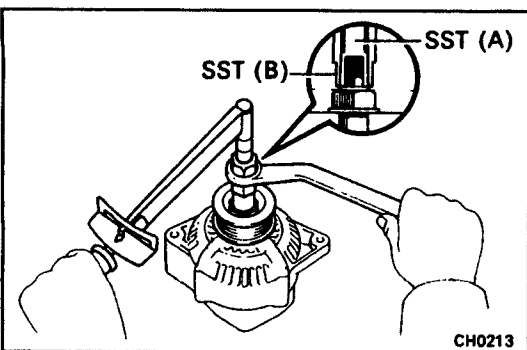
### 3. REMOVE VOLTAGE REGULATOR

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.



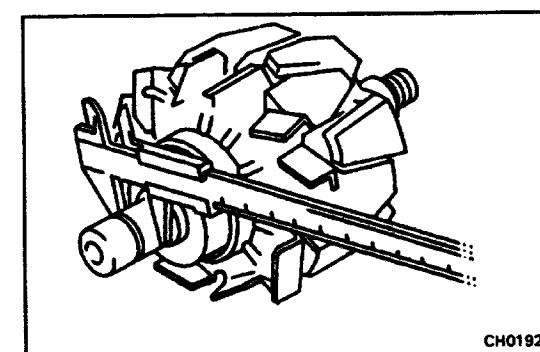
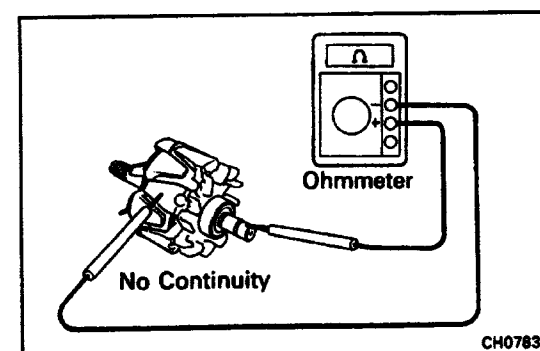
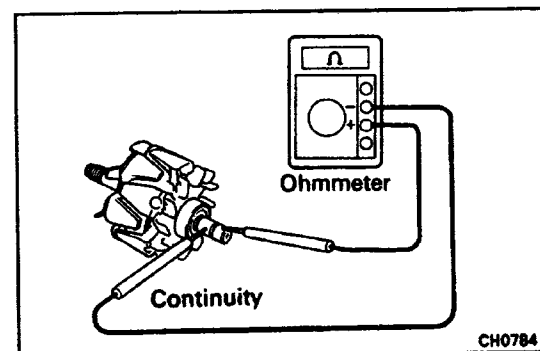
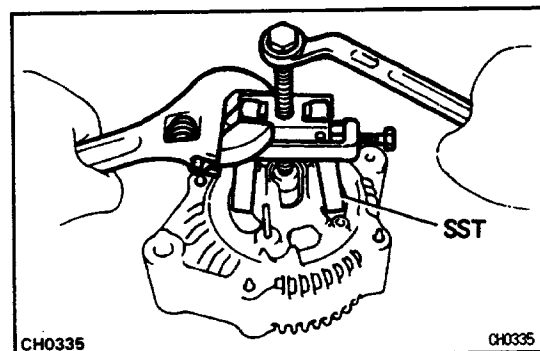
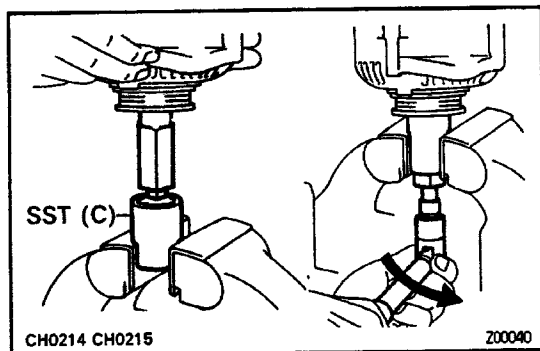
### 5. REMOVE PULLEY

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

SST 09820-63010

**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 REAR END FRAME

(a) Remove the 4 nuts.

(b) Using SST, remove the rear end frame.

SST 09286-46011

## 7. REMOVE ROTOR FROM DRIVE END FRAME

# GENERATOR INSPECTION AND REPAIR

## Rotor

### 1. INSPECT ROTOR FOR OPEN CIRCUIT

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

**Standard resistance (Cold):**

**2.8-3.00**

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 the rotor.

If there is continuity, replace the rotor.

### 3. 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.

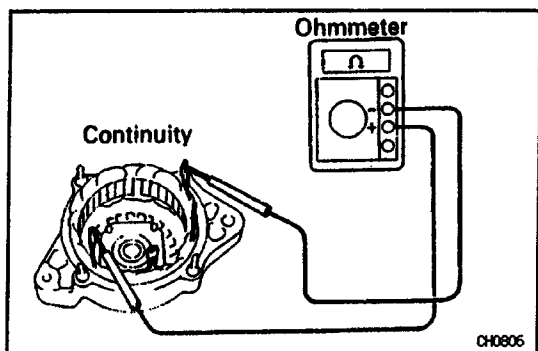
**Standard diameter:**

**14.2 - 14.4 mm (0.559 - 0.567 in.)**

**Minimum diameter:**

**12.8 mm (0.504 in.)**

If the diameter is less than minimum, replace the rotor

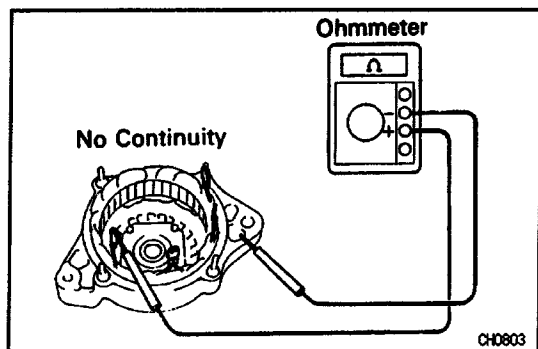


## Stator (Drive End Frame)

### 1. INSPECT STATOR FOR OPEN CIRCUIT

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

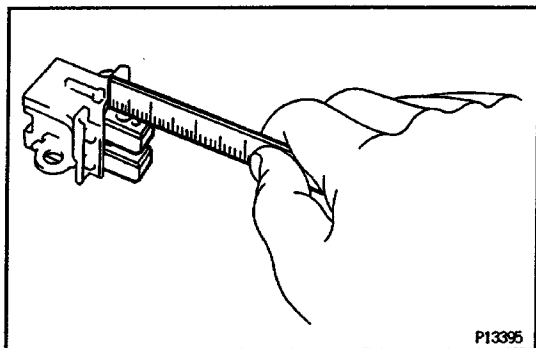
If there is no continuity, replace the drive end frame assembly.



### 2. 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.



## Brushes

### 1. INSPECT EXPOSED BRUSH LENGTH

Using a scale, measure the exposed brush length.

**Standard exposed length:**

**10.5 mm (0.413 in.)**

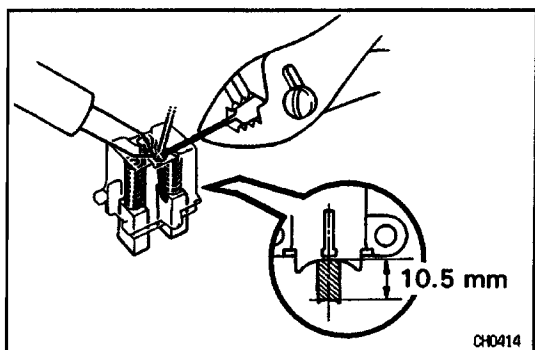
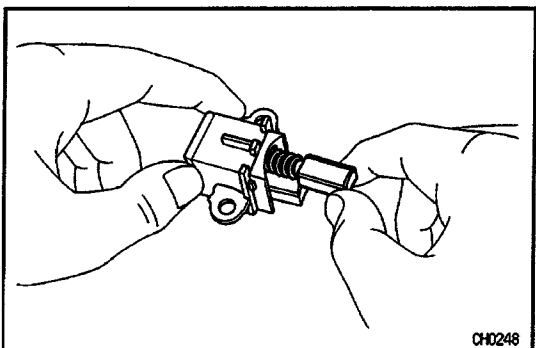
**Minimum exposed length:**

**1.5 mm (0.059 in.)**

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

### 2. IF NECESSARY, REPLACE BRUSHES

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

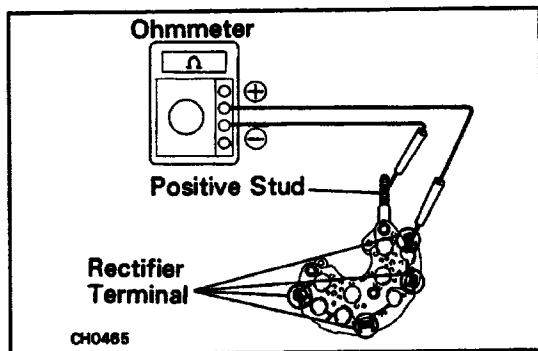


- Solder the brush wire to the brush holder at the exposed length.

**Exposed length:**

**10.5 mm (0.413 in.)**

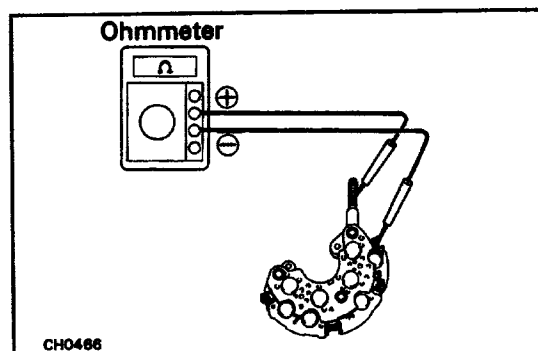
- Check that the brush moves smoothly in the brush holder.
- Cut off the excess wire.
- Apply insulation paint to the soldered point.



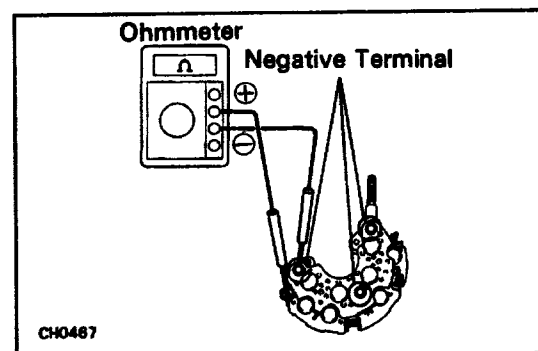
## Rectifier

### 1. INSPECT POSITIVE SIDE RECTIFIER

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

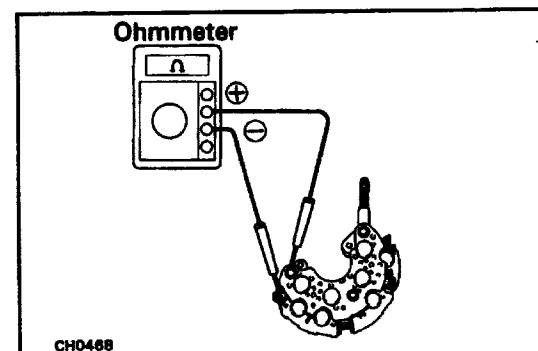


- Reverse the polarity of the tester probes.
  - Check that one shows continuity and the other shows no continuity.
- If not, replace the rectifier holder.

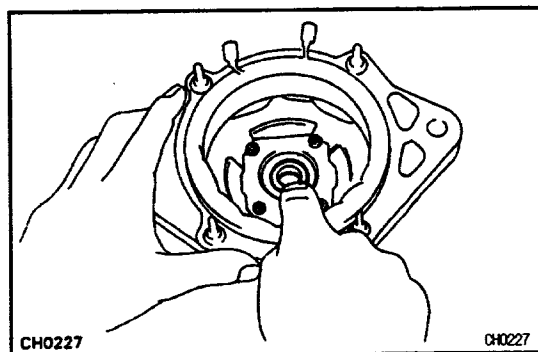


### 2. INSPECT NEGATIVE SIDE RECTIFIER

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



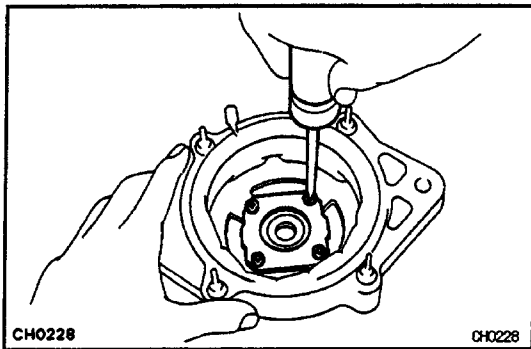
- Reverse the polarity of the tester probes.
  - Check that one shows continuity and the other show; no continuity.
- If not, replace the rectifier holder.



## Bearings

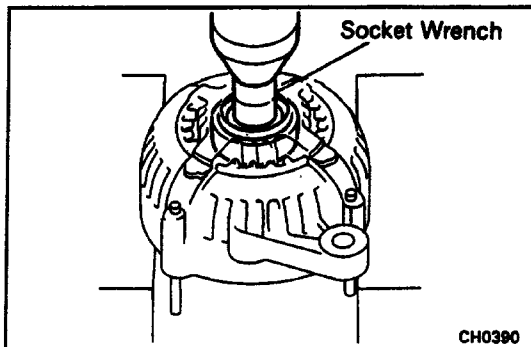
### 1. INSPECT FRONT BEARING

Check that the bearing is not rough or worn.

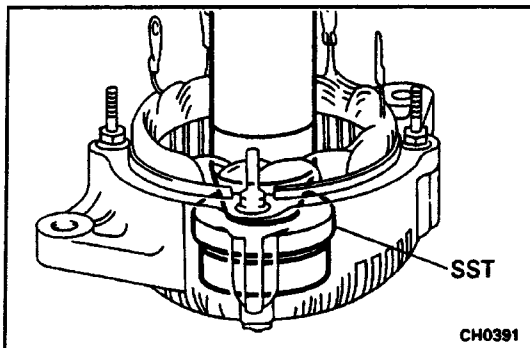


## 2. IF NECESSARY, REPLACE FRONT BEARING

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



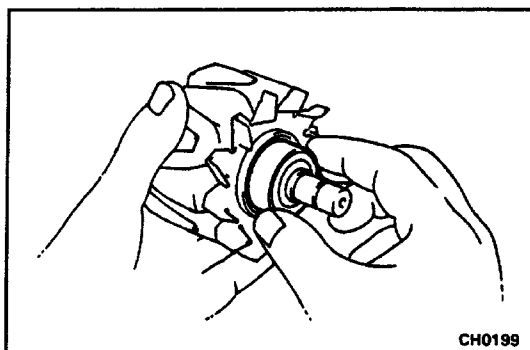
- (b) Using a press and socket wrench, press out the front bearing.



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

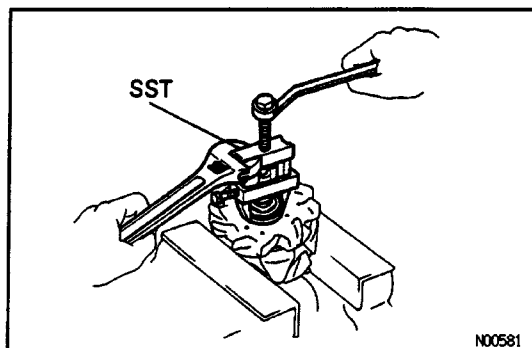
SST 09608-20012 (09608-00030)

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



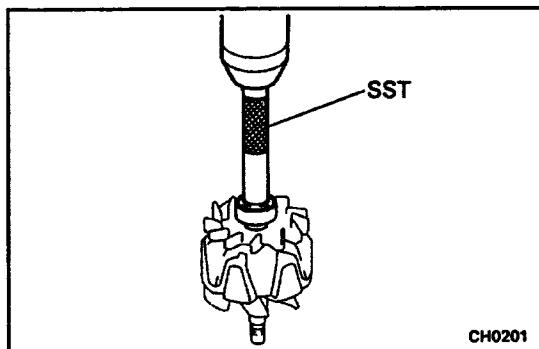
## 3. INSPECT REAR BEARING

Check that the bearing is not –rough or worn.



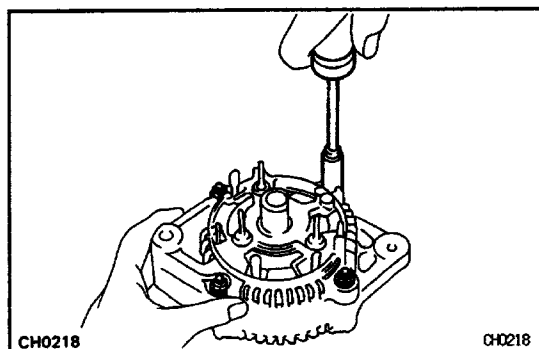
## 4. IF NECESSARY, REPLACE REAR BEARING

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



- (b) Using SST and a press, press in a new bearing and the bearing cover.

SST 09285-76010



## GENERATOR ASSEMBLY

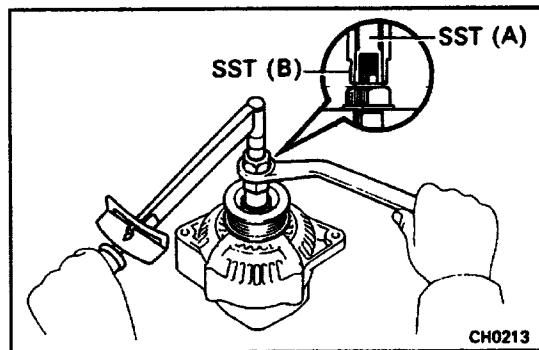
(See Components for Disassembly and Assembly)

1. **INSTALL ROTOR TO DRIVE END FRAME**
2. **INSTALL REAR END FRAME**

- (a) Using a plastic-faced hammer, lightly tap in the rear end frame.

- (b) Install the 4 nuts.

**Torque: 4.5 N-m (45 kgf-cm, 39 in.-lbf)**



3. **INSTALL PULLEY**

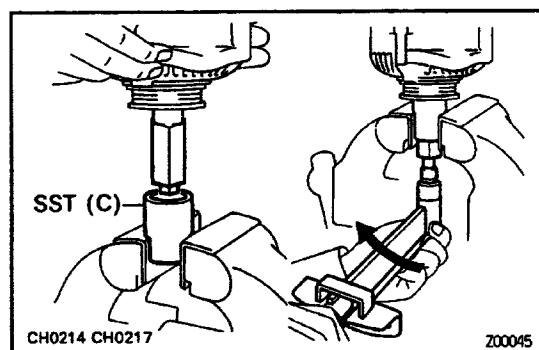
- (a) Install the pulley to the rotor shaft by tightening the pulley nut by hand.

- (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.



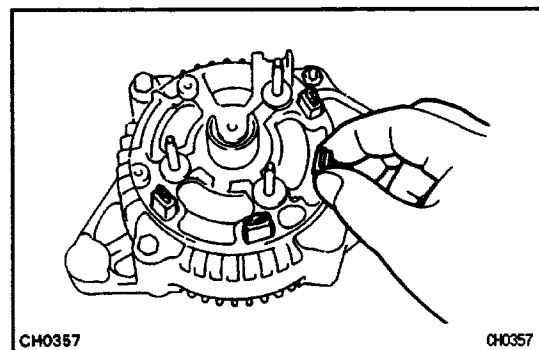
- (d) As shown in the illustration, mount SST C in a vise, and install the generator with SST (A and B) to SST C.

- (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 ftYbf)**

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

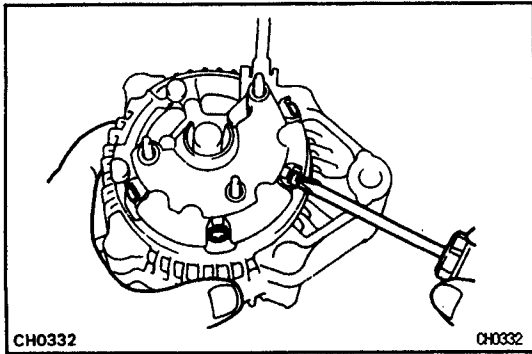
- (g) Turn SST B and remove SST A and B.



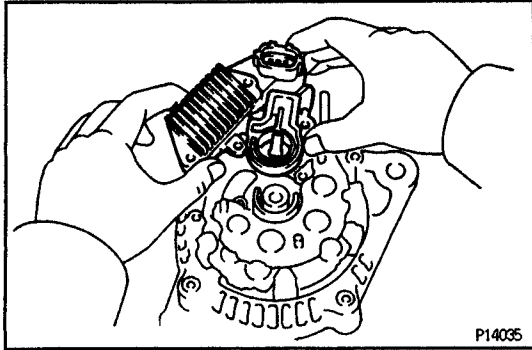
4. **INSTALL RECTIFIER HOLDER**

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





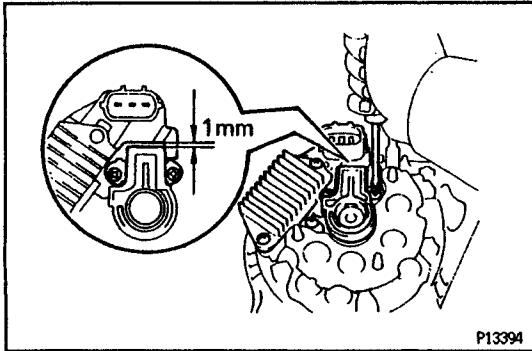
- (b) Install the rectifier with the 4 screws.  
**Torque: 2.0 N-m (20 kgf-cm, 18 in.-lbf)**



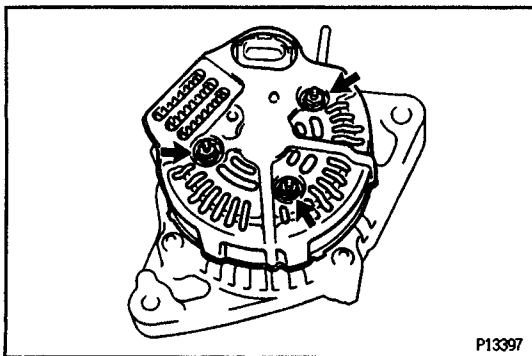
## 5. INSTALL BRUSH HOLDER AND VOLTAGE REGULATOR

- (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.

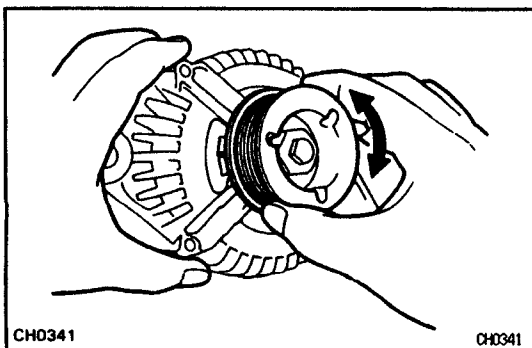


- (c) Tighten the 5 screws until there is a clearance of at least 1 mm (0.04 in.) between the brush holder cover and connector.

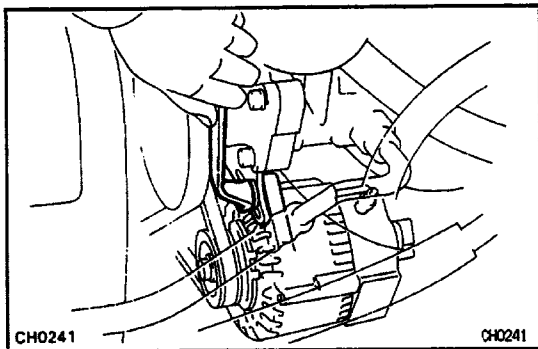


## 6. INSTALL REAR END COVER

- (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)**



## 7. MAKE SURE ROTOR ROTATES SMOOTHLY



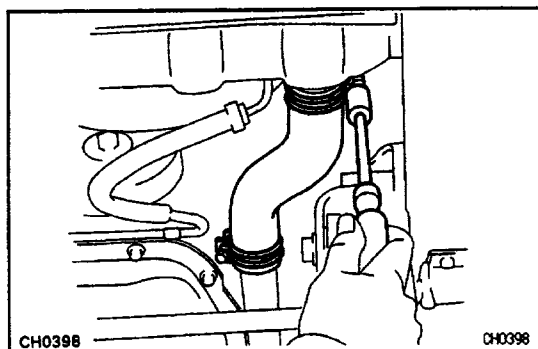
## GENERATOR INSTALLATION

### 22R– E:

#### 1. INSTALL GENERATOR

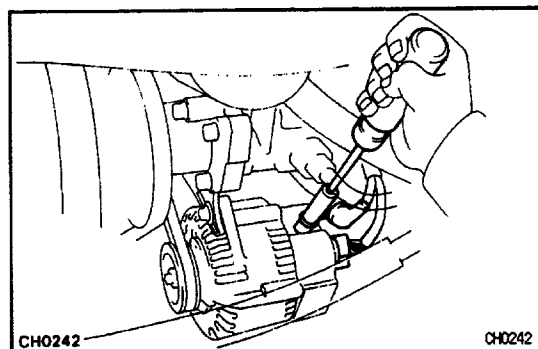
Mount the generator on the generator bracket with pivot bolt and adjusting bolt.

#### 2. INSTALL AND ADJUST DRIVE BELT (See step 4 in on-vehicle inspection)



#### 3. INSTALL WATER INLET HOSE

- (a) Install the water inlet hose.
- (b) Install the engine under cover:
- (c) w/ A/C:  
Install the No.2 fan shroud.



#### 4. CONNECT WIRING TO GENERATOR

- (a) Connect the wire to the generator and install the nut.
- (b) Connect the connector to the generator.

#### 5. FILL WITH COOLANT

Close the radiator drain plug and fill with coolant.

#### 6. CONNECT NEGATIVE TERMINAL CABLE TO BATTERY

#### 7. DO ON-VEHICLE INSPECTION (See on-vehicle inspection)

### 3VZ – E:

#### 1. INSTALL GENERATOR

Mount the generator on the generator bracket with pivot bolt and adjusting lock bolts.

#### 2. INSTALL DRIVE BELT

(See step 4 in on – vehicle inspection)

#### 3. CONNECT WIRING TO GENERATOR

- (a) Connect the wire to the generator and install the nut.
- (b) Connect the connector to the generator.

#### 4. CONNECT NEGATIVE TERMINAL CABLE TO BATTERY

#### 5. DO ON-VEHICLE INSPECTION (See on –vehicle inspection)