

# CHARGING SYSTEM

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## CHARGING SYSTEM CIRCUIT

Fig. 9-1

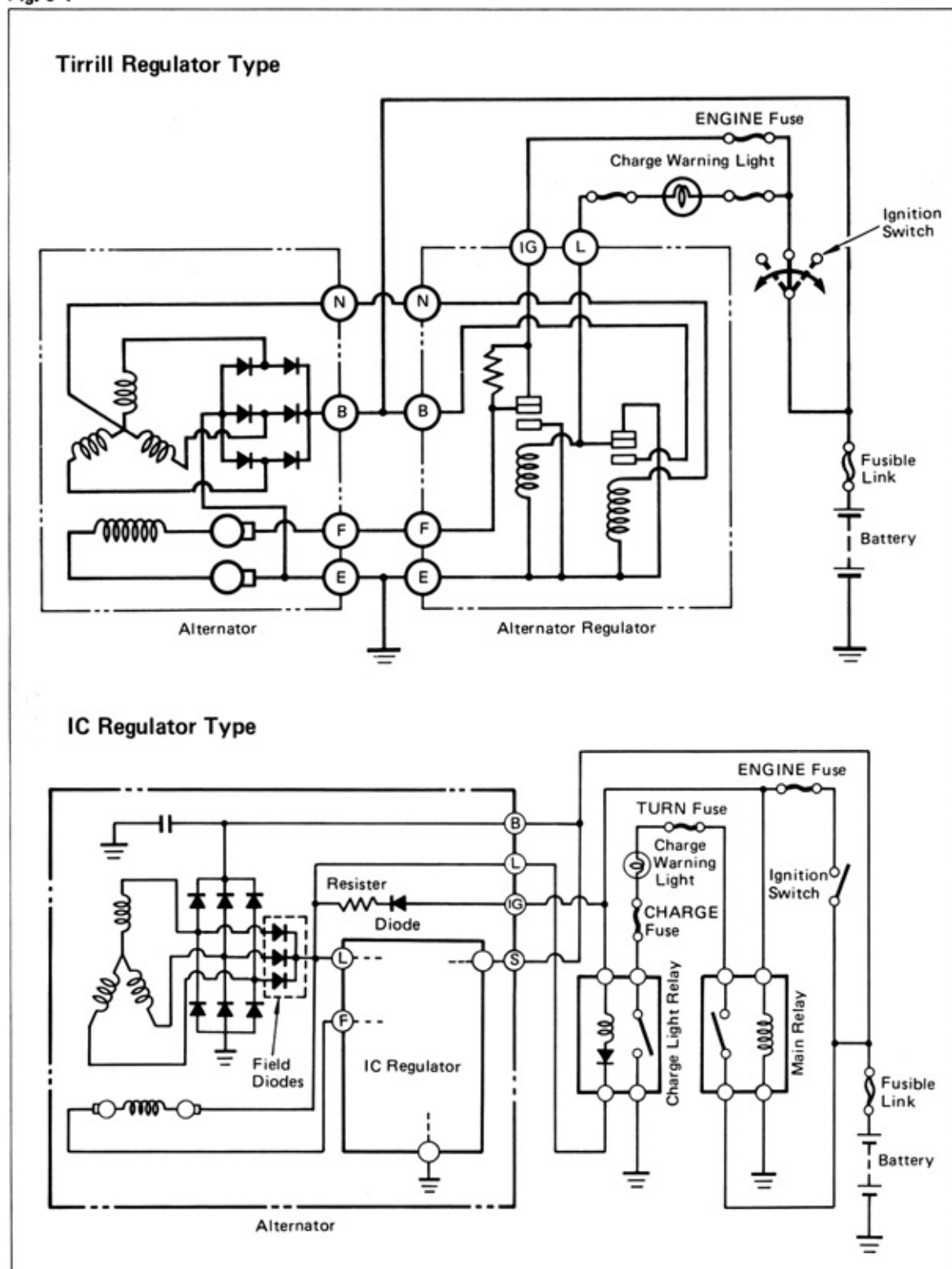
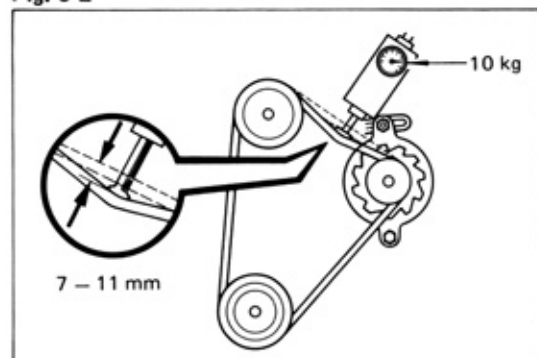


Fig. 9-2



## ON-VEHICLE INSPECTION

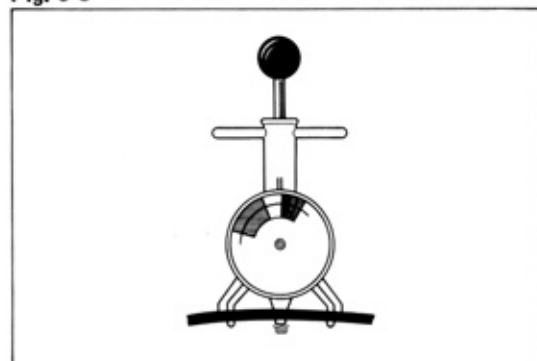
Check the following system components:

1. Drive belt deflection  
(Except USA & Canada)

**Drive belt deflection:**

**7 – 11 mm at 10 kg**  
**(0.28 – 0.43 in.) (22 lb)**

Fig. 9-3



(USA & Canada)

Using a borroughs tension gauge, BT-33-73F

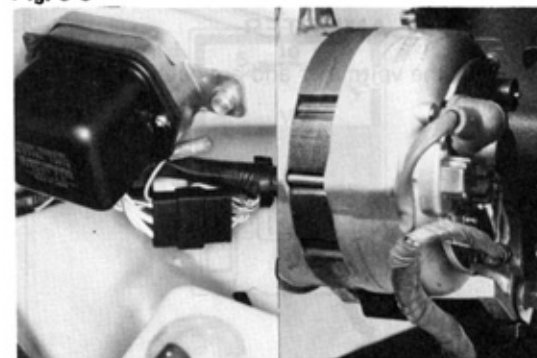
**Driven belt deflection: 80 ± 20 lbs.**

Fig. 9-4



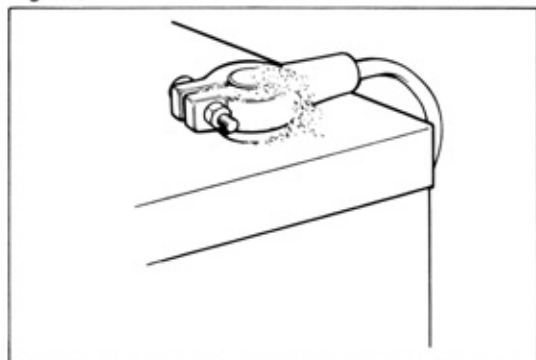
2. Fuses

Fig. 9-5



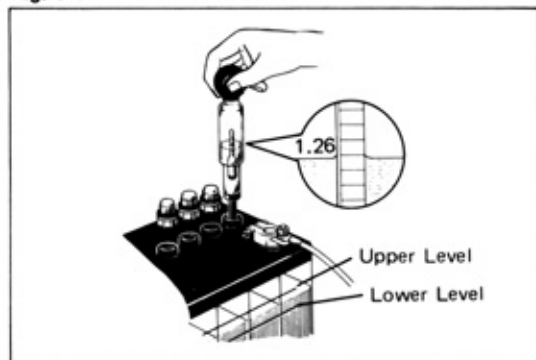
3. Installation of the alternator and regulator wiring.

Fig. 9-6



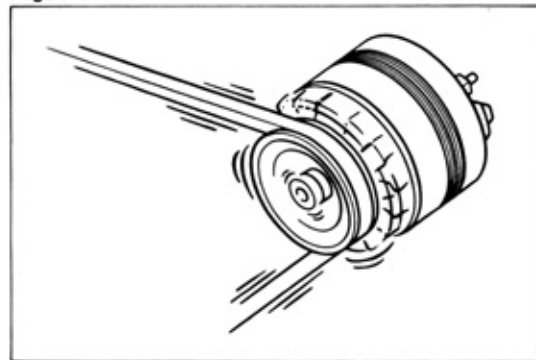
4. Battery terminal and fusible link.  
Loose  
Corrosion  
Burnt

Fig. 9-7



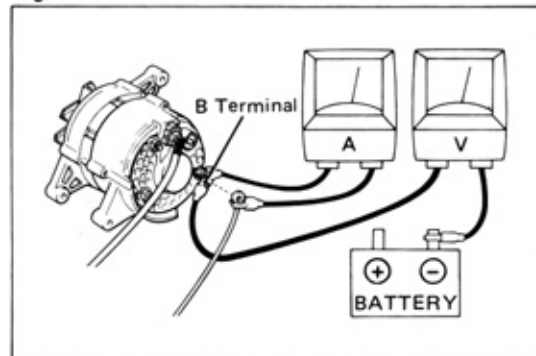
5. Specific gravity: 1.25 – 1.27 at 20°C  
(68°F)

Fig. 9-8



6. Alternator on-vehicle condition.  
Abnormal noise from the alternator when  
the engine is running.

Fig. 9-9



### PERFORMANCE TEST USING VOLT- METER & AMMETER

Connect the voltmeter and ammeter as shown in  
the figure.

— Note —  
Be careful not to cause a short.

Fig. 9-10

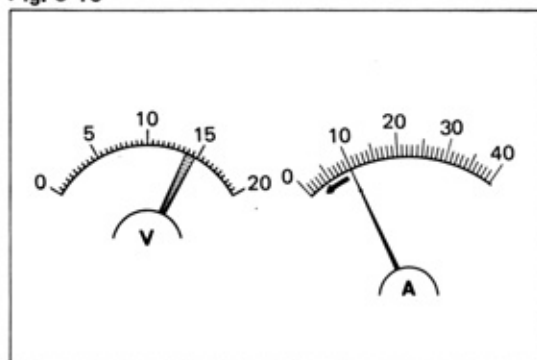
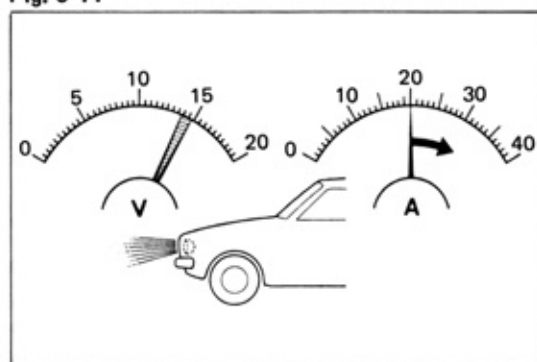
**No-load Performance Test****Regulated voltage:** 13.8 – 14.8 V**Current:** Less than 10 A**Engine speed:** Idling to 2,000 rpm

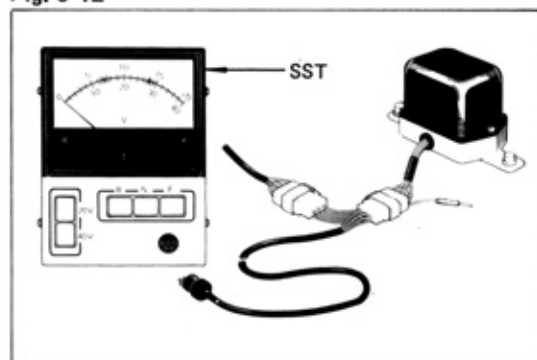
Fig. 9-11

**Load Performance Test**

1. Run the engine at 2,000 rpm.
2. Turn on the headlights and all accessories.

**Regulated voltage:****13.8 – 14.8 V****Current:** More than 20 A

Fig. 9-12

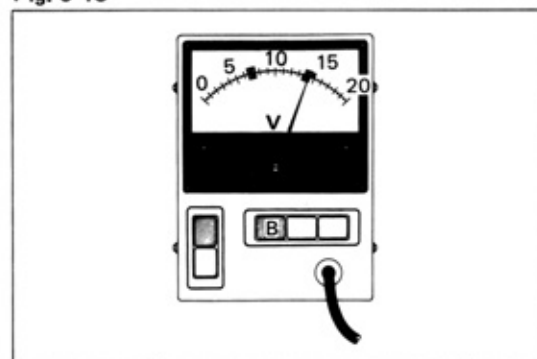
**PERFORMANCE TEST BY ALTERNATOR CHECKER**

Disconnect the alternator regulator connector and connect SST.

SST [09081-00011]

**Push 20 V switch.**

Fig. 9-13



1. Check voltage at terminal B.

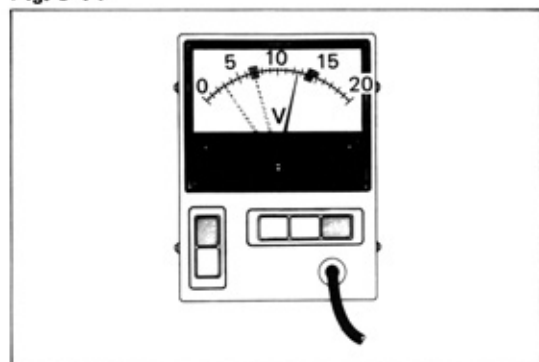
**Push B switch.**

Raise engine speed from idling to 2,300 rpm.

**Voltage:****STD 13.8 – 14.8 V**

If not within standard, probable cause is the alternator regulator.

Fig. 9-14



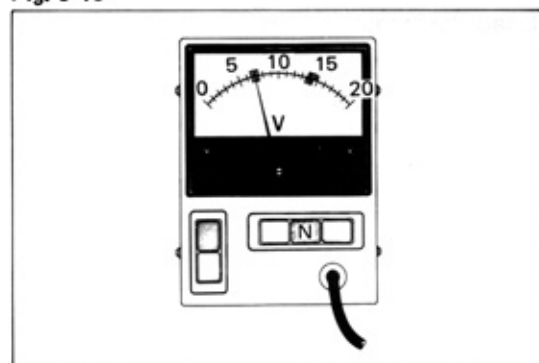
2. Check voltage at terminal F.

**Push F switch.**

Raise engine speed from idling to 2,000 rpm. The checker reading should gradually decrease from 12 to 3 volts.

If decrease is not registered, probable cause is alternator regulator.

Fig. 9-15



3. Check voltage at terminal N.

**Push N switch.**

Maintain engine speed at approximately 1,500 rpm. The pointer should be at a half of terminal B voltage.

**Voltage:**

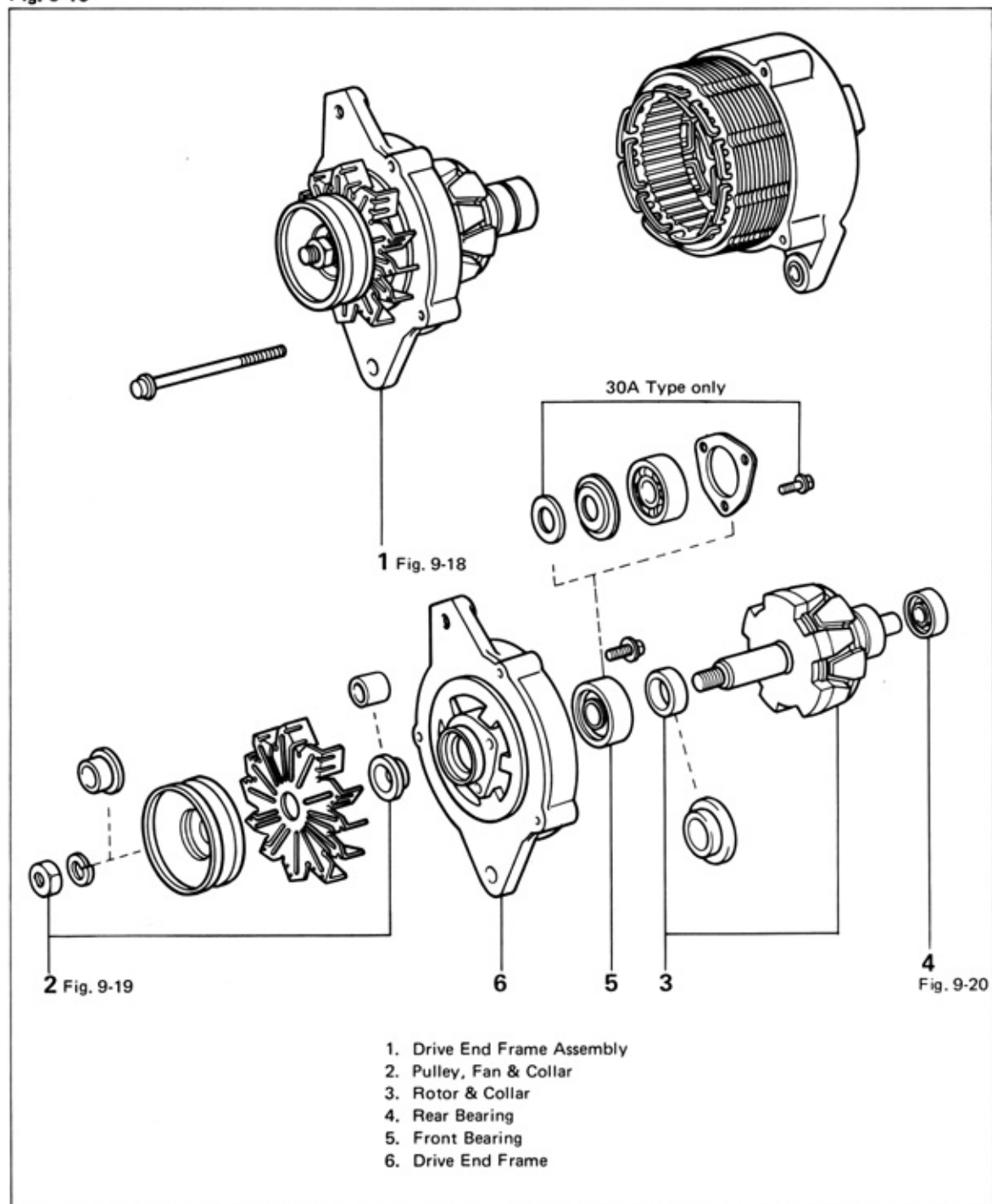
**STD 6.9 – 7.4 V**

If the voltage is higher, the cause is the positive (+) rectifier.

If the voltage is lower, the cause is the negative (–) rectifier.

**ALTERNATOR****DISASSEMBLY**

1. Disassemble the parts in the numerical order shown in the figure.

**Fig. 9-16**

2. Disassemble the parts in the numerical order shown in the figure.

Fig. 9-17

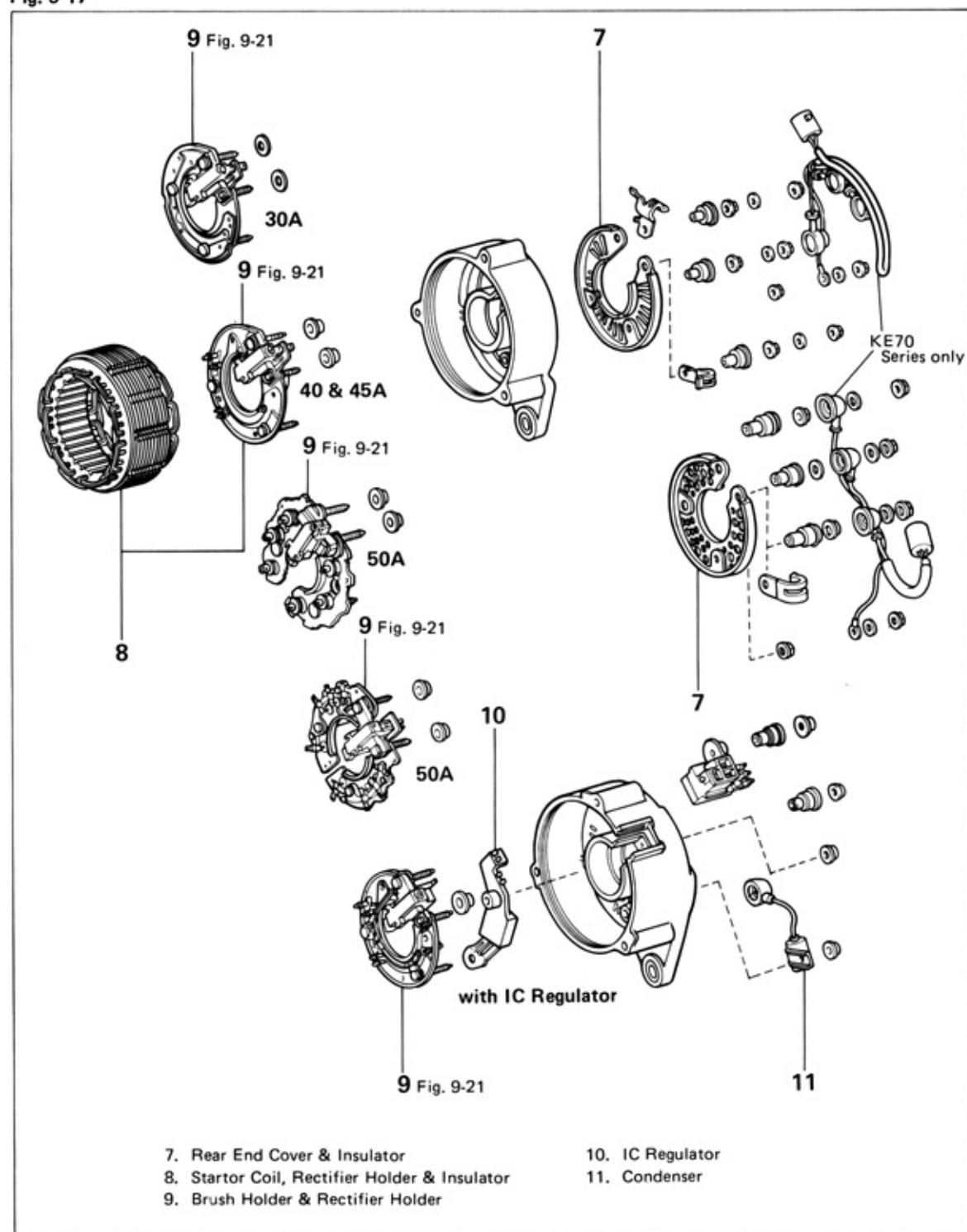
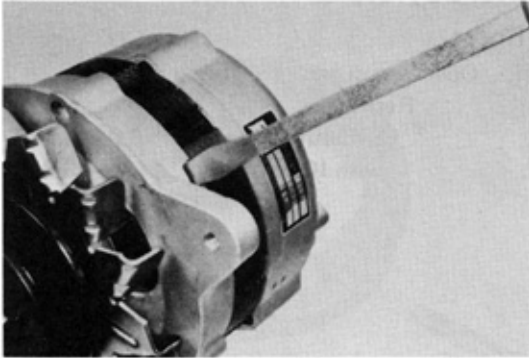




Fig. 9-18

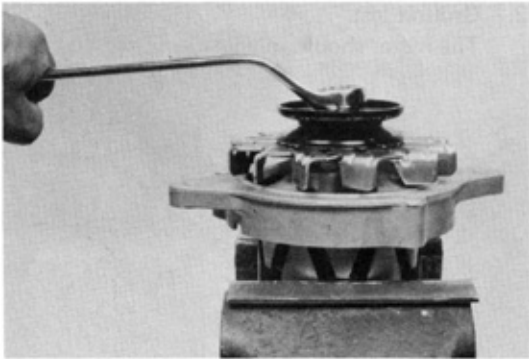


Pry the drive end frame from the stator and tap it off.

— Note —

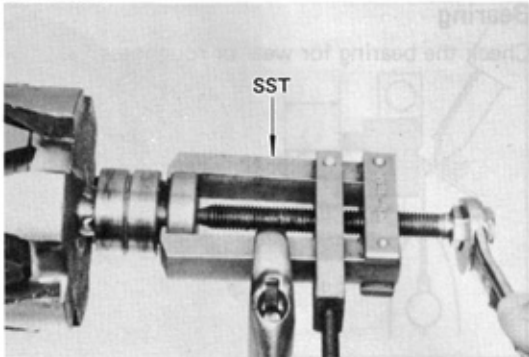
Be carefull not to pry on the stator coil.

Fig. 9-19



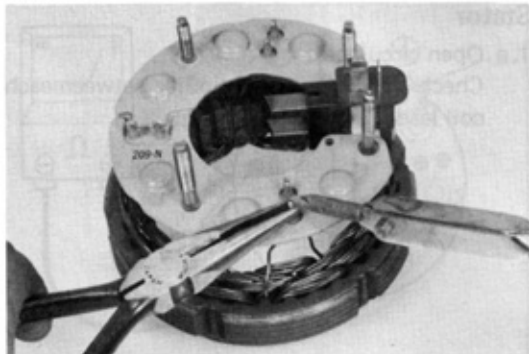
Remove the pulley nut.

Fig. 9-20



Remove the bearing with SST.  
SST [09286-46011]

Fig. 9-21

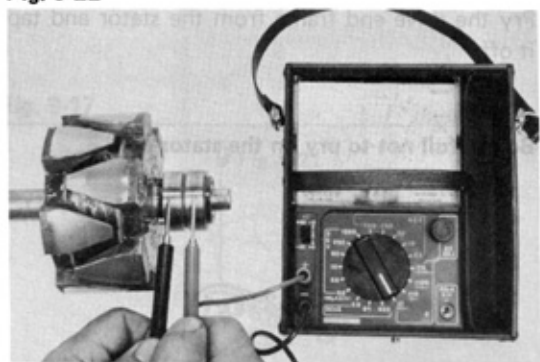


Unsolder each stator lead to the rectifier.

— Caution —

Protect the rectifier from heat.

Fig. 9-22

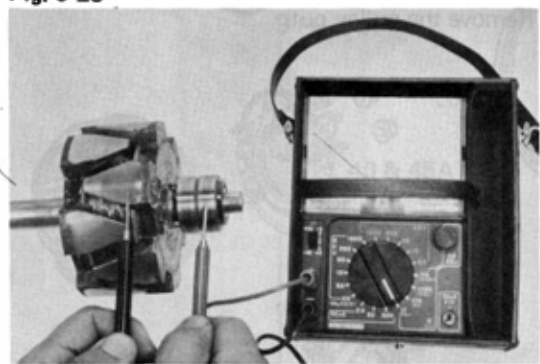
**INSPECTION & REPAIR****Rotor**

1. Open circuit test

**Resistance:**

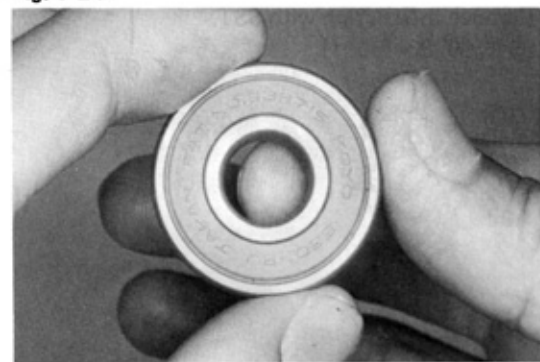
without IC regulator	3.9 – 4.1 $\Omega$
with IC regulator	2.8 – 3.0 $\Omega$

Fig. 9-23



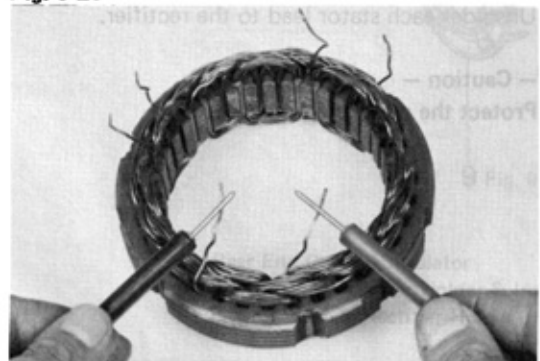
2. Ground test  
The meter should indicate infinity.

Fig. 9-24

**Bearing**

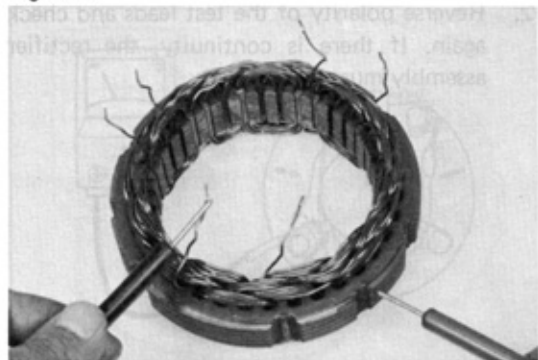
Check the bearing for wear or roughness.

Fig. 9-25

**Stator**

1. Open circuit test  
Check that there is continuity between each coil lead.

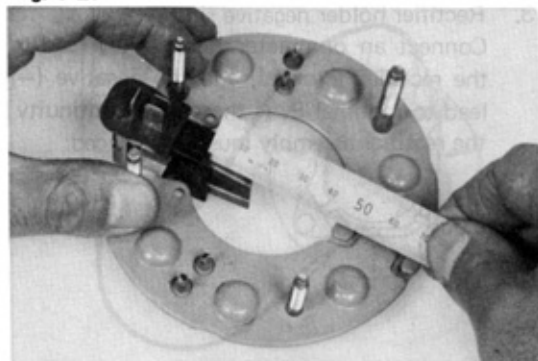
Fig. 9-26



## 2. Ground test

Check that there is no continuity between each coil lead and stator core.

Fig. 9-27

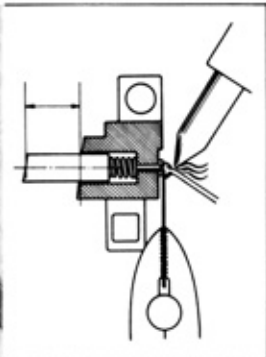
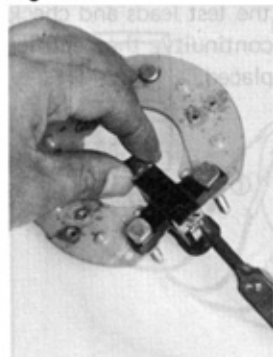
**Brush & Brush Holder**

1. Measure the exposed brush length.

**Exposed length:**

**Minimum 5.5 mm**  
**(0.217 in.)**

Fig. 9-28



2. Replace the brush.

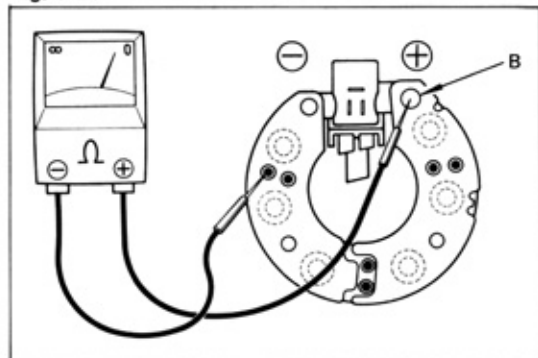
(1) Unsolder and remove the brush and the spring.

(2) Install and solder the spring and the brush.



**Exposed length: 12.5 mm**  
**(0.492 in.)**

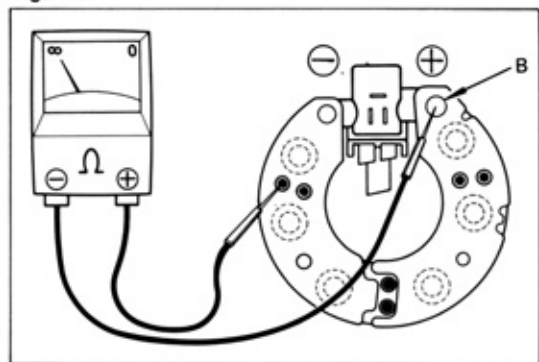
Fig. 9-29

**Rectifier (30, 40 & 45A Type)**

1. Rectifier holder positive side

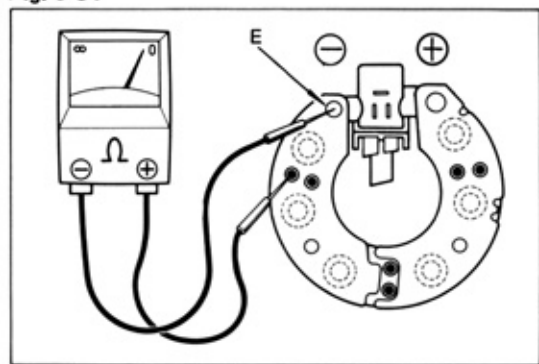
Connect an ohmmeter positive (+) lead to terminal B, and the negative (–) lead to the rectifier terminal. If there is no continuity, the rectifier assembly must be replaced.

Fig. 9-30



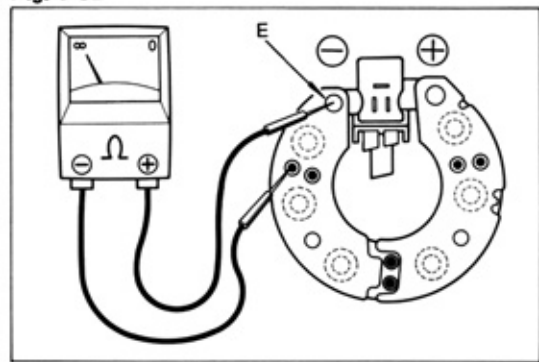
2. Reverse polarity of the test leads and check again. If there is continuity, the rectifier assembly must be replaced.

Fig. 9-31



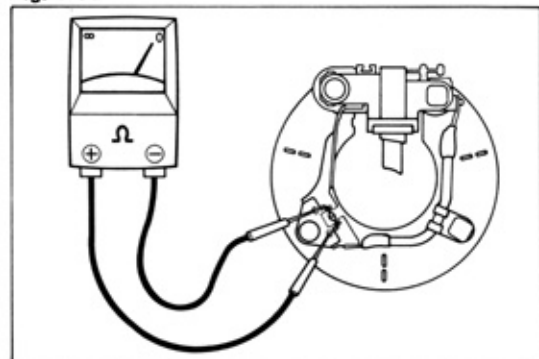
3. Rectifier holder negative side  
Connect an ohmmeter positive (+) lead to the rectifier terminal, and the negative (-) lead to terminal E. If there is no continuity, the rectifier assembly must be replaced.

Fig. 9-32



4. Reverse polarity of the test leads and check again. If there is continuity, the rectifier assembly must be replaced.

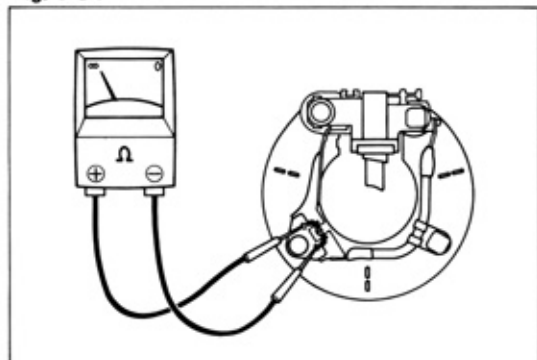
Fig. 9-33



#### Diode (with IC Regulator)

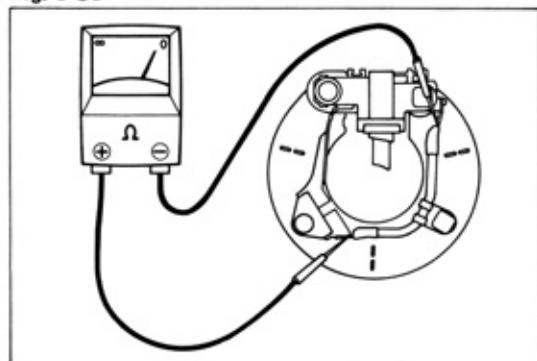
1. Connect an ohmmeter positive (+) lead to the resistor side, and the negative (-) lead of the meter to the diode other side. If there is no continuity, the rectifier assembly must be replaced.

Fig. 9-34



2. Reverse polarity of test leads and check again. If there is continuity, the rectifier assembly must be replaced.

Fig. 9-35

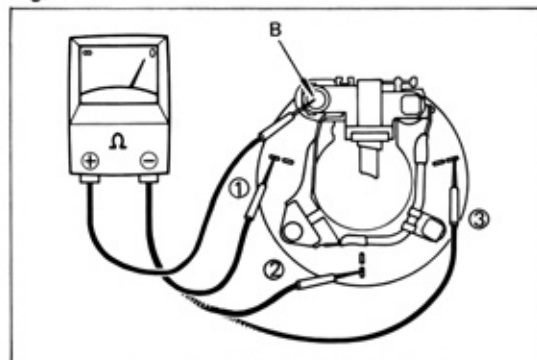


### Resistor (with IC Regulator)

Check the resistor wire resistance using an ohmmeter. If there is no continuity, rectifier assembly must be replaced.

**Resistance: 1.0 – 2.0  $\Omega$**

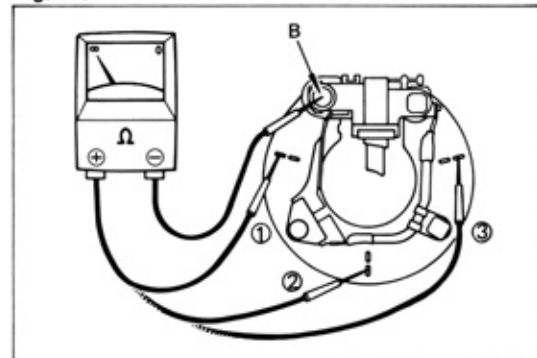
Fig. 9-36



### Field Diodes (with IC Regulator)

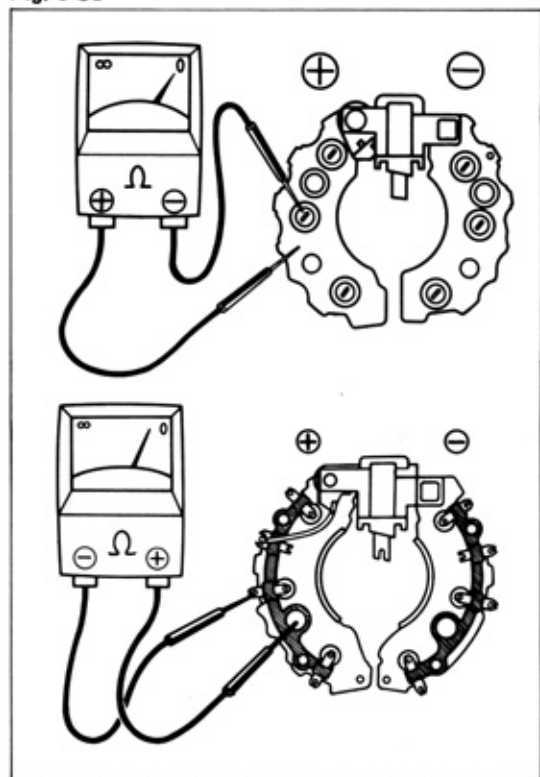
1. Connect an ohmmeter positive (+) lead to terminal B, and the negative (-) lead of the meter to the rectifier terminal. If there is no continuity, the rectifier assembly must be replaced.

Fig. 9-37



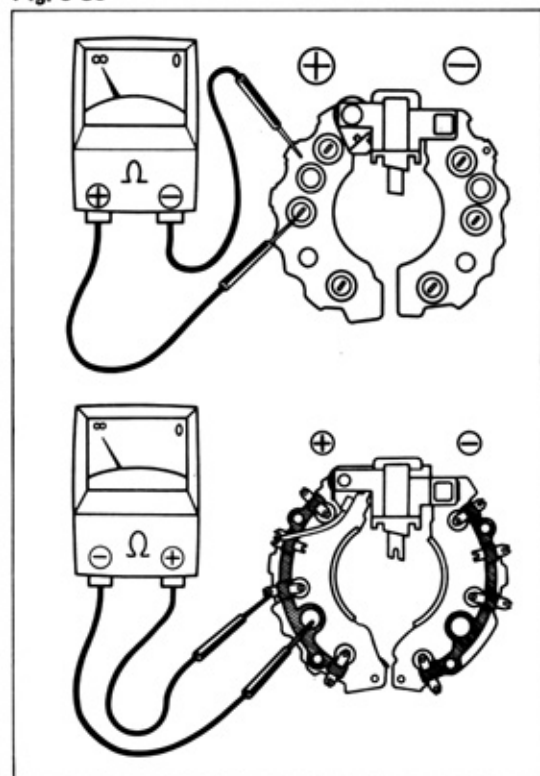
2. Reverse polarity of test leads and check again. If there is continuity, the rectifier assembly must be replaced.

Fig. 9-38

**Rectifier (50A Type)**

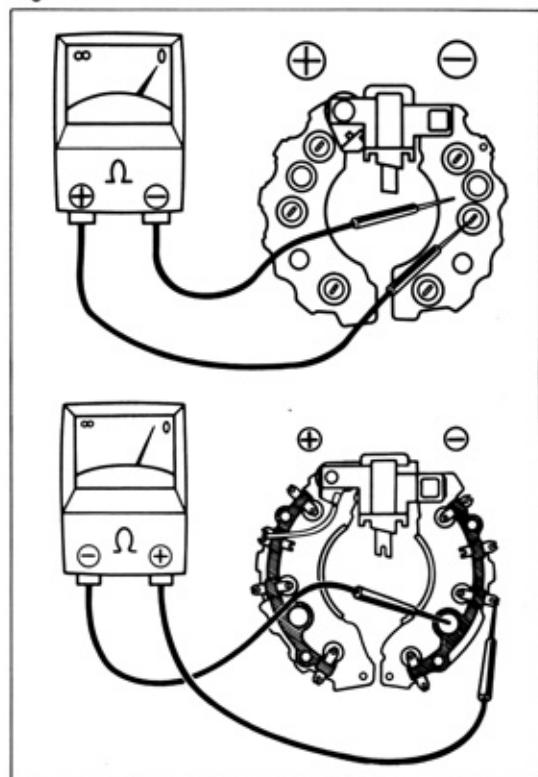
1. Rectifier holder positive side  
Connect an ohmmeter positive (+) lead to the rectifier holder, and the negative (-) lead of the meter to the rectifier terminal. If there is no continuity, the rectifier assembly must be replaced.

Fig. 9-39



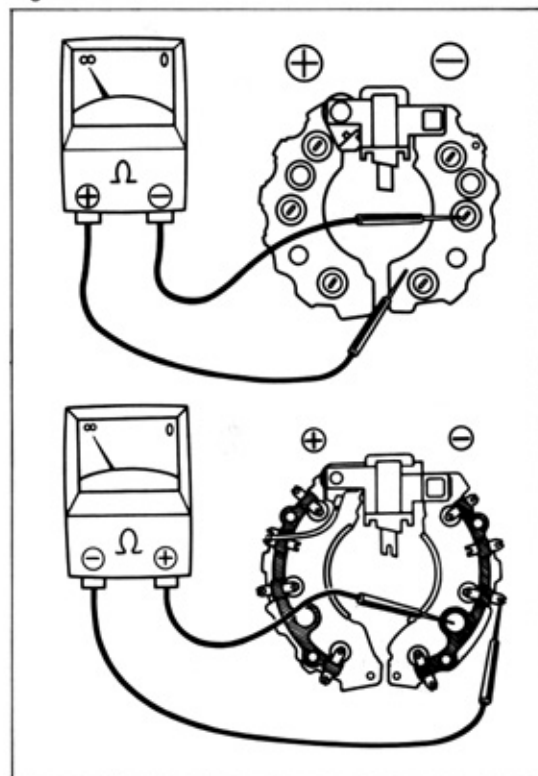
2. Reverse polarity of test leads and check again. If there is continuity, the rectifier assembly must be replaced.

Fig. 9-40



3. Rectifier holder negative side  
Connect an ohmmeter positive (+) lead to the rectifier terminal, and the negative (–) lead of the meter to the rectifier holder. If there is no continuity, the rectifier assembly must be replaced.

Fig. 9-41

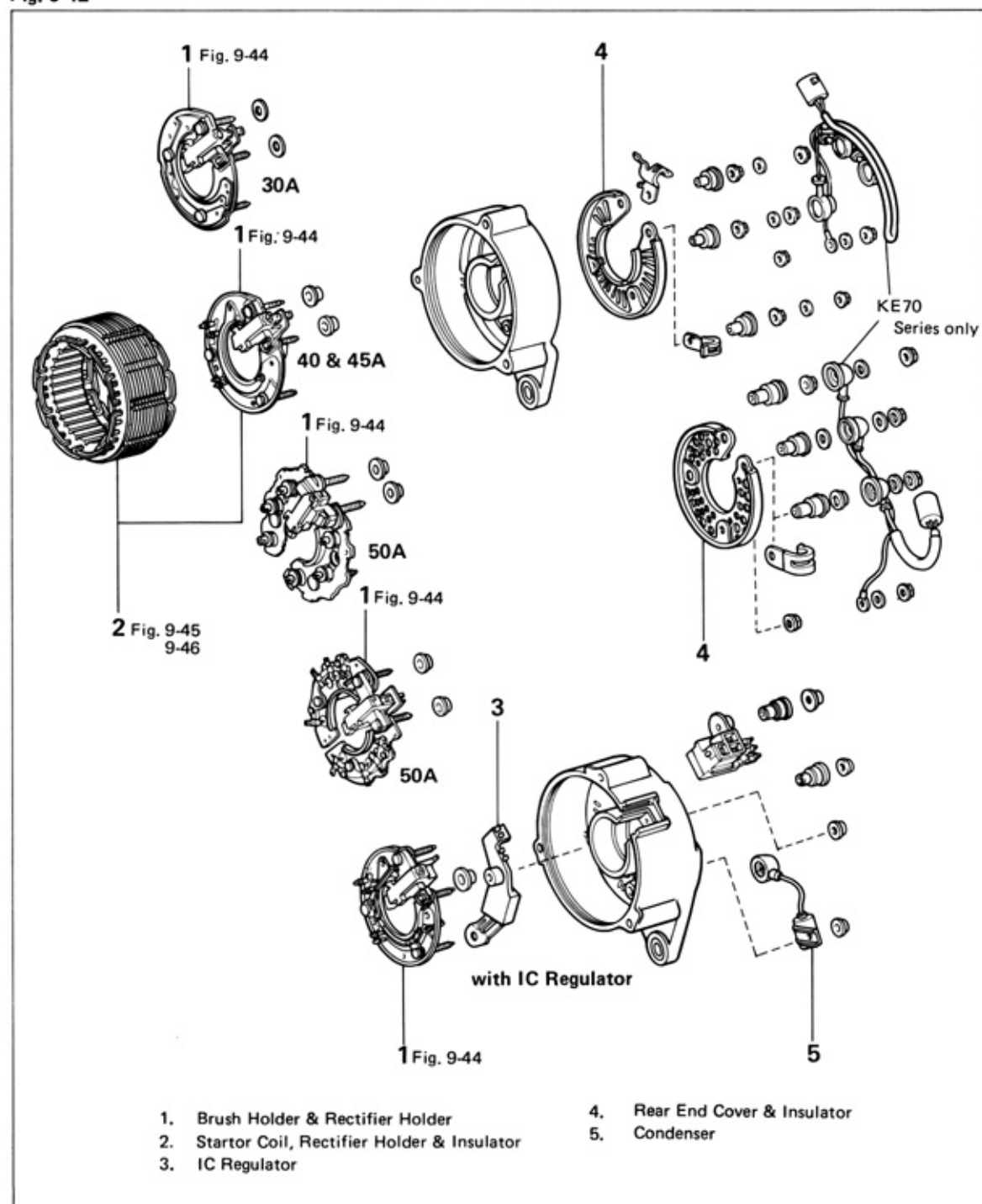


4. Reverse polarity of test leads and check again. If there is continuity, the rectifier assembly must be replaced.

## ASSEMBLY

1. Assemble the parts in the numerical order shown in the figure.

Fig. 9-42





2. Assemble the parts in the numerical order shown in the figure.

Fig. 9-43

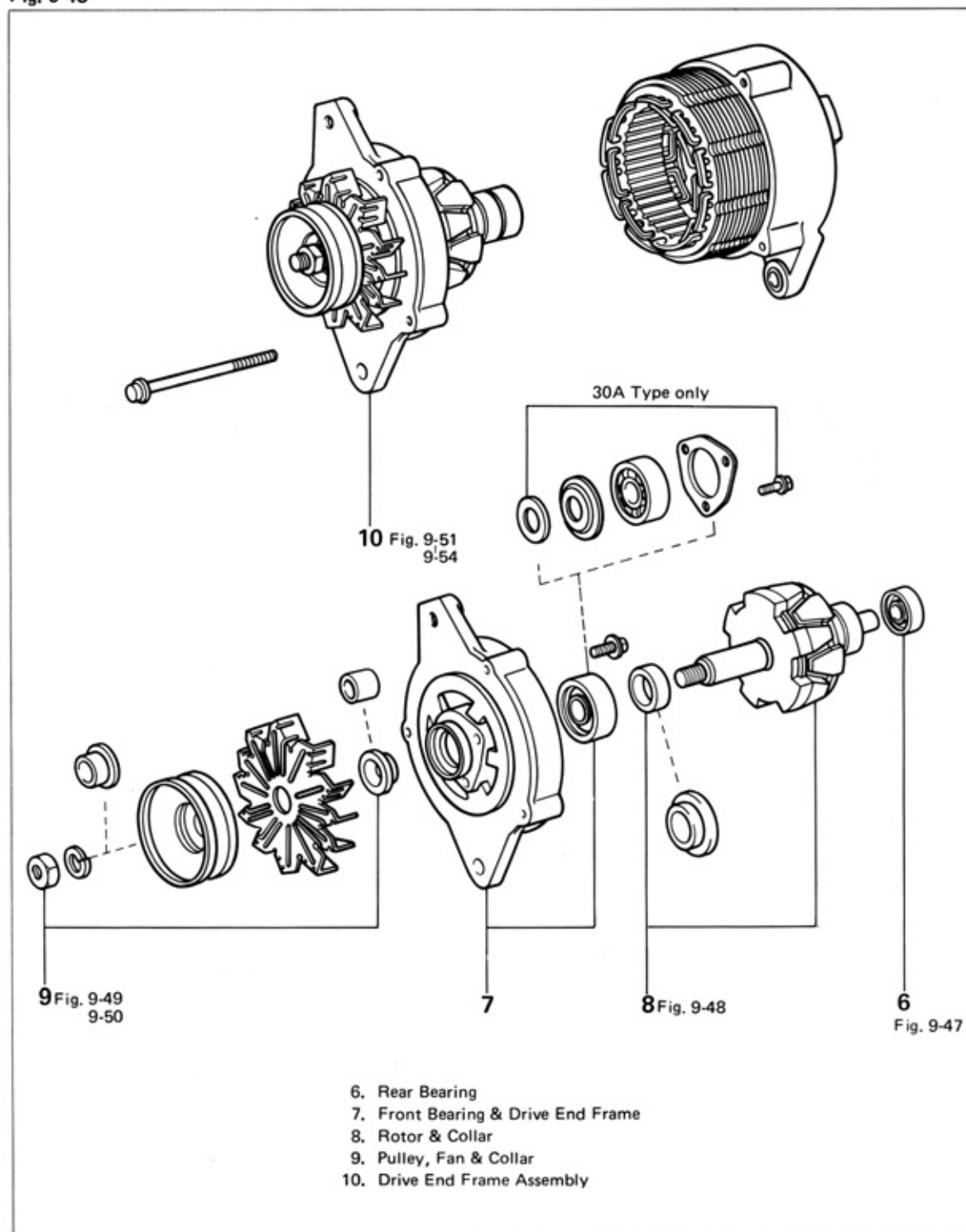
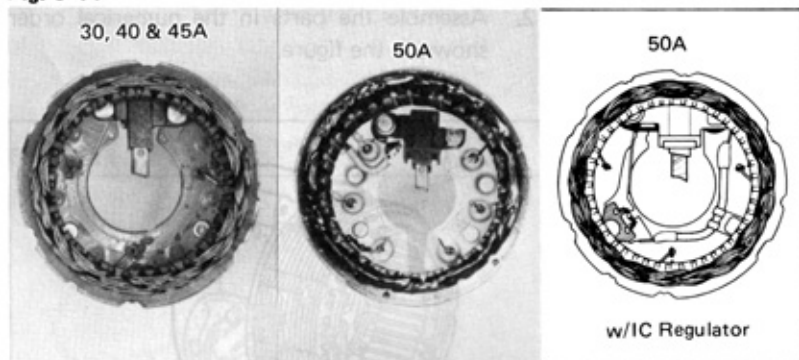
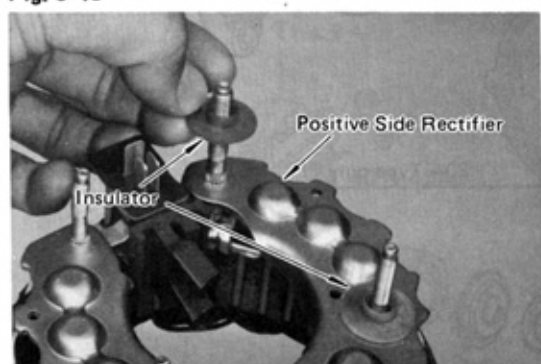


Fig. 9-44



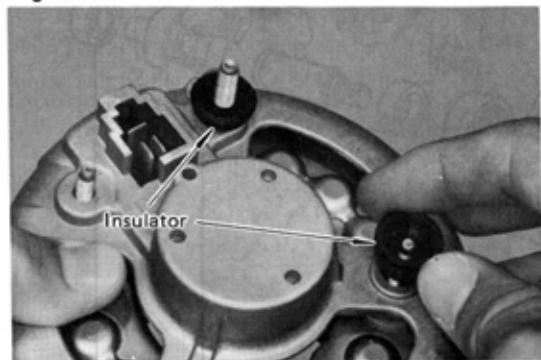
Solder each lead wire onto the rectifier or terminal as shown in the figure.

Fig. 9-45



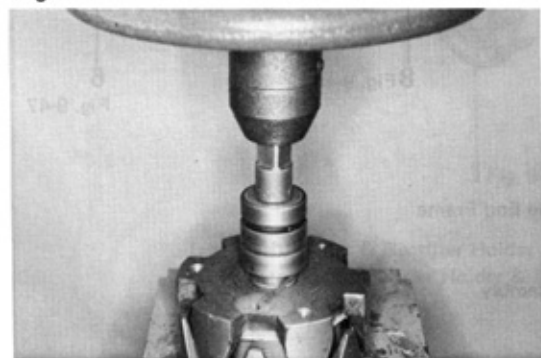
Assemble the rear end frame and rectifier holder with insulators.

Fig. 9-46



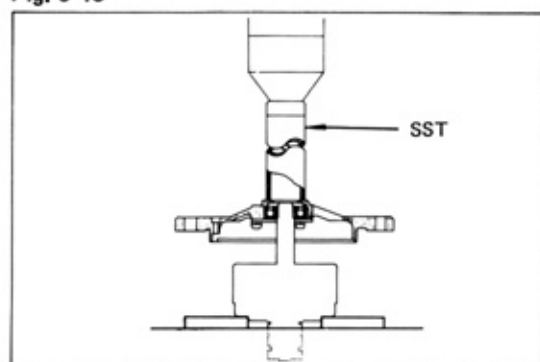
Assemble the rear end cover with the insulators.

Fig. 9-47



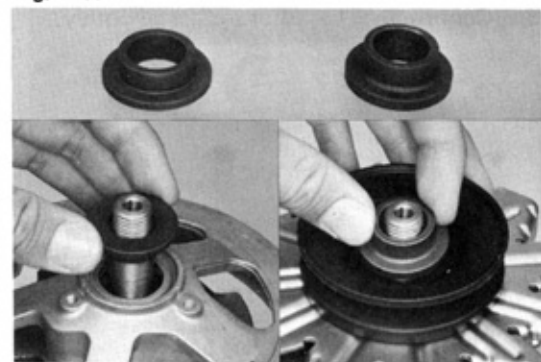
Using a press, press the rear bearing onto the rotor shaft.

Fig. 9-48



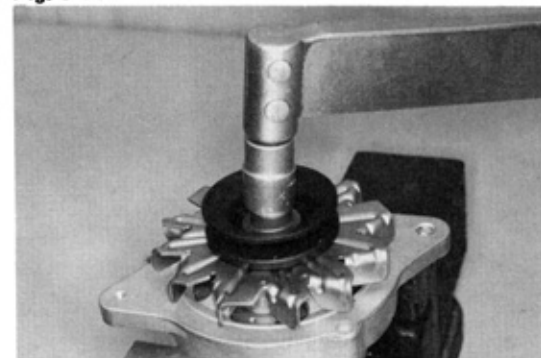
Using SST, press and drive the end frame assembly onto the rotor shaft.  
SST [09612-22010]

Fig. 9-49



Install the collars as is shown in the figure.

Fig. 9-50



Tighten the nut to specified torque.

**Tightening torque: 5.0 – 6.5 kg-m  
(37 – 47 ft-lb)**

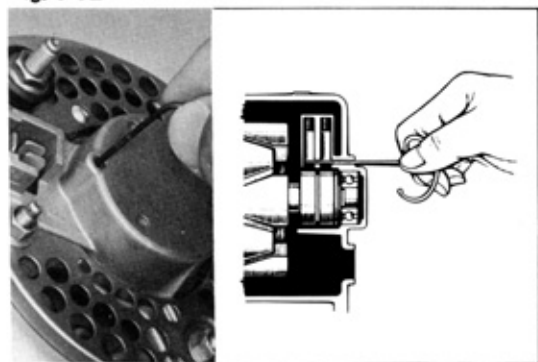
Fig. 9-51



Install the rotor shaft.

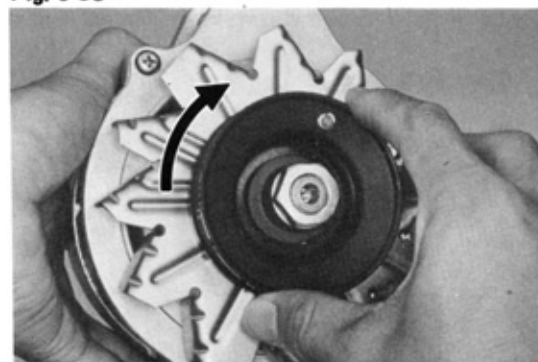
1. Bend back the rectifier lead wires away from the rotor.

Fig. 9-52



2. Push in the brushes and temporarily lock them in place with a wire inserted through the access hole in the rear end frame.

Fig. 9-53

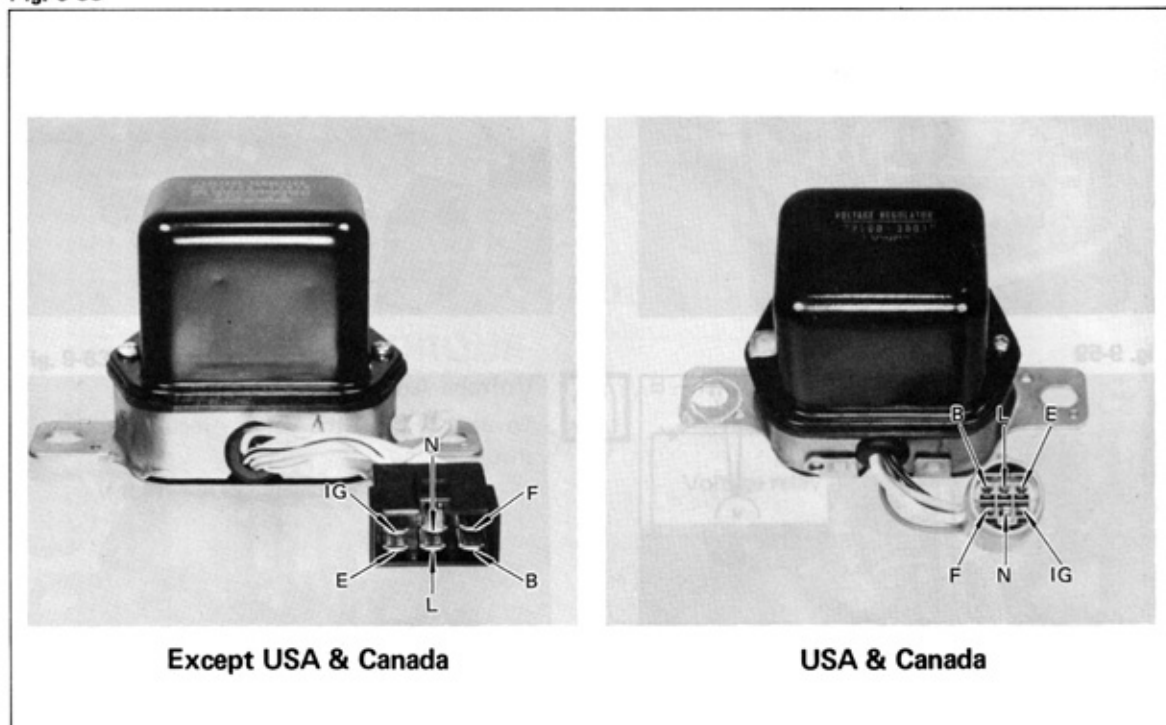


3. Confirm that the rotor rotates smoothly.

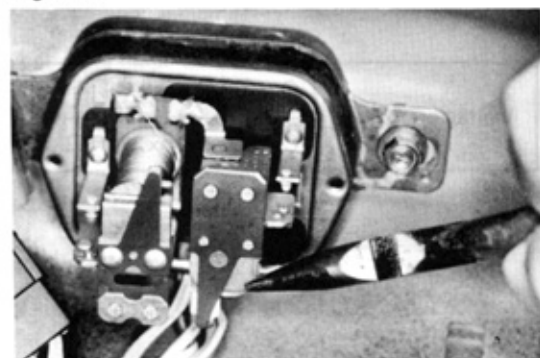
Fig. 9-54



- Seal the brush service hole.

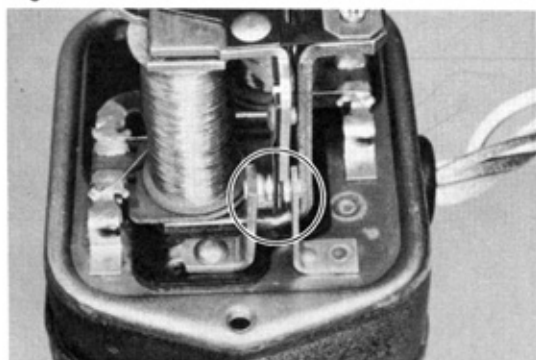
**ALTERNATOR REGULATOR****Fig. 9-55****Fig. 9-56****INSPECTION & ADJUSTMENT**

Check the connector fitting condition before inspecting the regulator.

**Fig. 9-57**

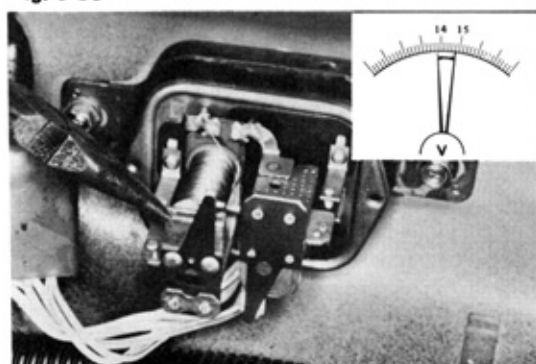
Always be sure to have the regulator connector pulled out when inspecting and adjusting.

Fig. 9-58



Check each point surface for burns or excessive damage. Replace if defective.

Fig. 9-59

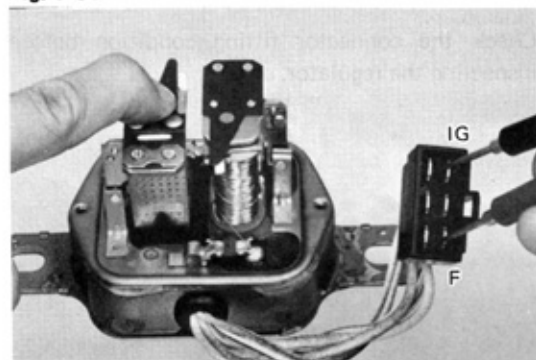


### Voltage Adjustment

To adjust, bend the voltage regulator adjusting arm.

**Regulated voltage: 13.8 – 14.8 V**

Fig. 9-60

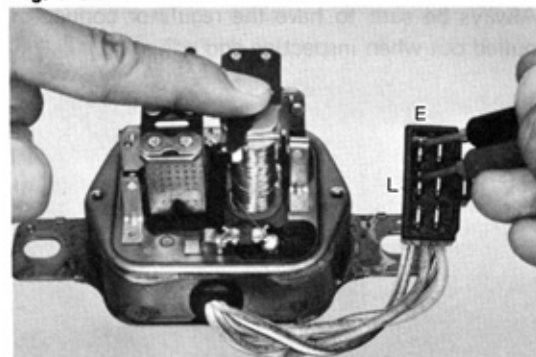


Resistance measurement between terminals.

IG – F

Voltage regulator	Open 0 $\Omega$
	Closed approx. 11 $\Omega$

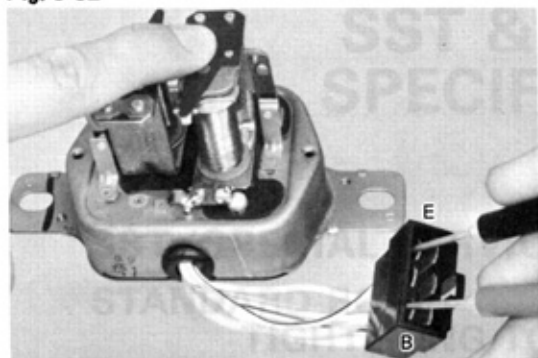
Fig. 9-61



L – E

Voltage relay	Open 0 $\Omega$
	Closed approx. 100 $\Omega$

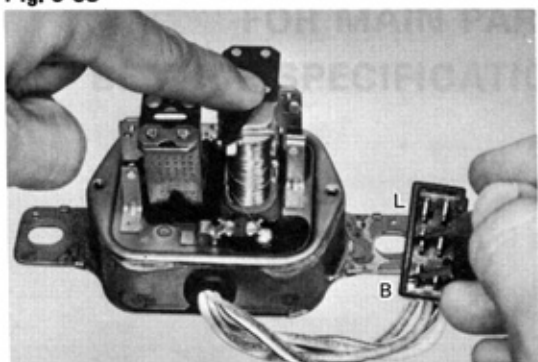
Fig. 9-62



B – E

Voltage relay	Open infinity
	Closed approx. 100 $\Omega$

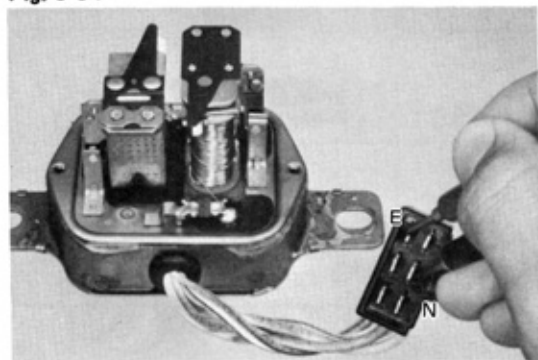
Fig. 9-63



B – L

Voltage relay	Open infinity
	Closed 0 $\Omega$

Fig. 9-64



N – E

Approx. 23  $\Omega$

