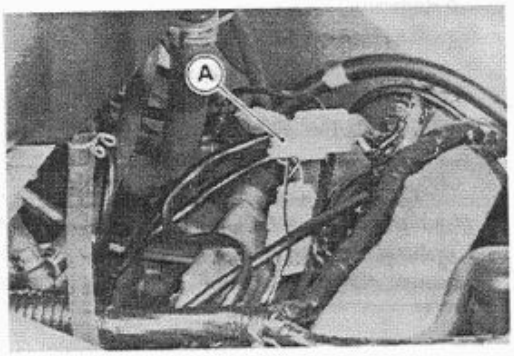
Alternator

Alternator Removal

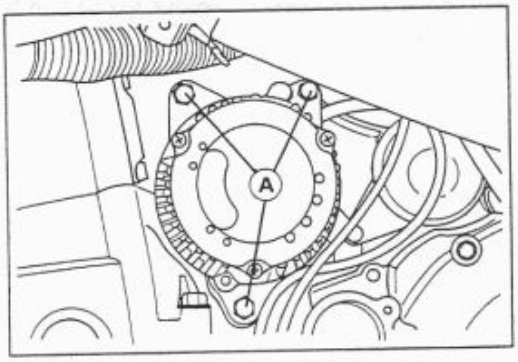
NOTE

○ *Do not remove the alternator to remove the rectifier, regulator, and carbon brush assembly. They can be removed after removing the alternator cover.*

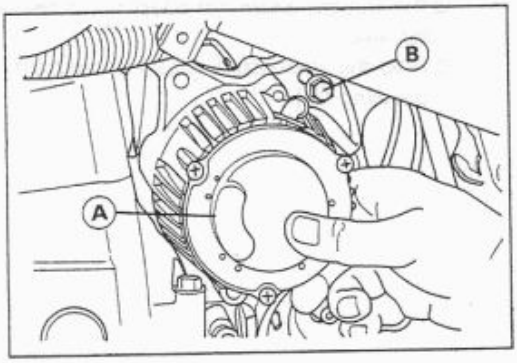


● Remove the following.
Fuel Tank (see Fuel System chapter)
Left Lower Fairing (see Frame chapter)
Alternator Lead Connector [A]
Water Pump Pipe and Hose
Clutch Slave Cylinder (see Clutch chapter)

● Remove the alternator mounting bolts [A].



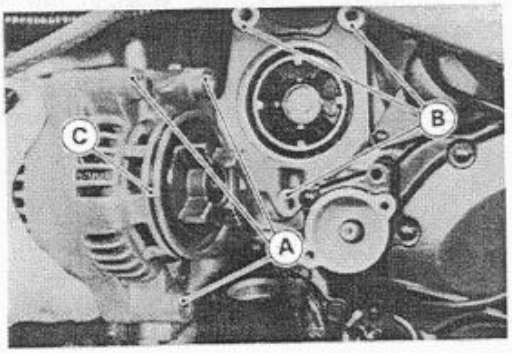
● Detach the alternator [A] from the engine and then pull out the upper right mounting bolt [B].



Alternator Installation

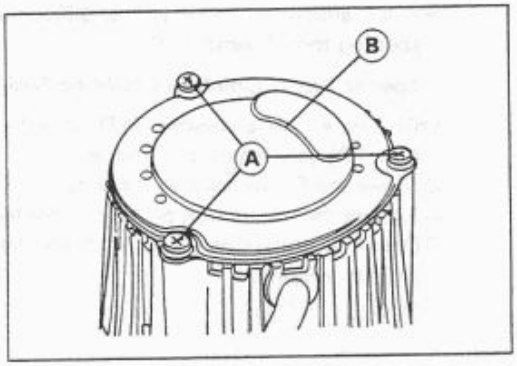
● When installing the alternator, clean the alternator legs [A] and crankcase [B] where the alternator is grounded.
● Apply a small amount of engine oil to the O-ring [C].
● Tighten the alternator mounting bolts.
○ The lower mounting bolt is shorter than the two upper mounting bolts.

Torque – Alternator Mounting Bolts: 25 N-m(2.5 kg-m, 18.0 ft-lb)

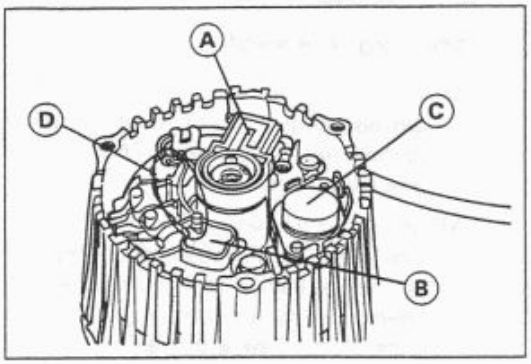


Alternator Disassembly

● Remove:
Alternator (see Alternator Removal)
Screws [A] and Alternator Cover [B]



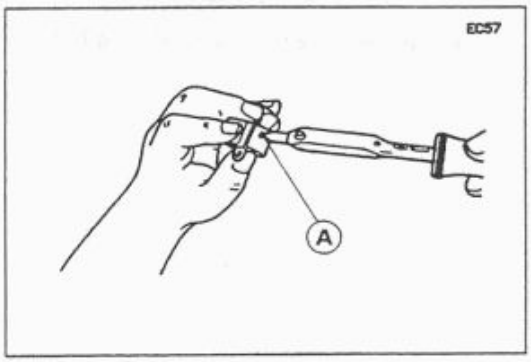
● Remove:
Brush Assembly [A]
Rectifier [B]
Regulator [C]
○ Unsolder [D] the leads on the rectifier.



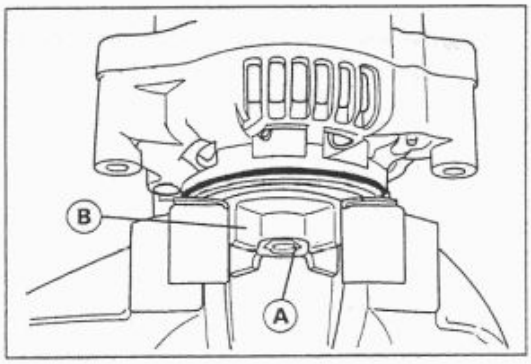
CAUTION

When unsoldering the alternator leads on the rectifier terminals, do it quickly. If high temperatures are applied for more than a few seconds, the rectifier's diodes may be damaged.

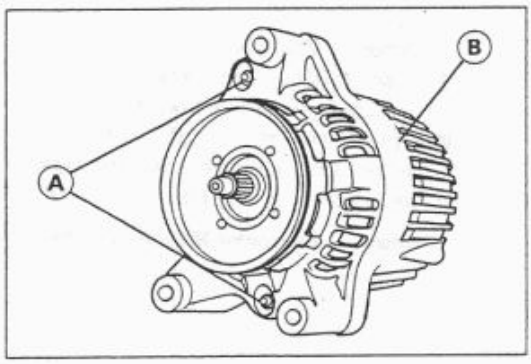
● If it is necessary to remove the carbon brush, unsolder the brush lead [A].



● Remove the alternator coupling to disassemble the rest of the parts as follows.
○ Hold the alternator with a vise and remove the coupling nut [A] and coupling [B].



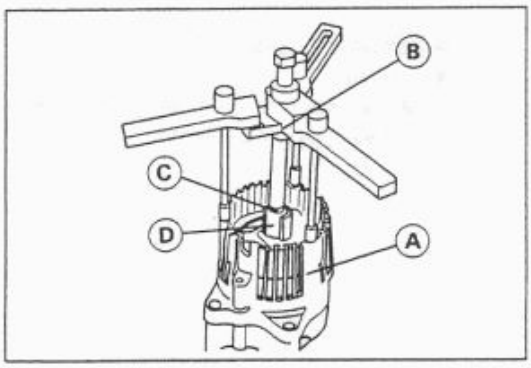
○ Unscrew the alternator assembly nuts [A].
○ Remove the alternator frame [B].



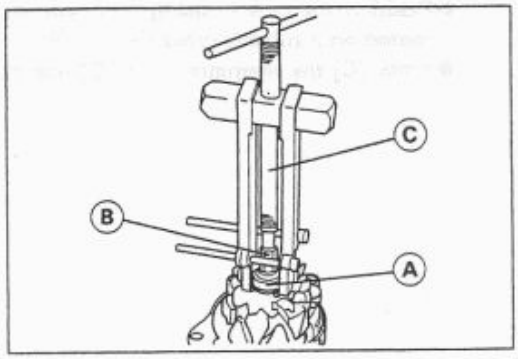
★ If the alternator frame [A] is difficult to remove, use the crankcase splitting tool assembly [B].

Special Tool – Crankcase Splitting Tool Assembly: 57001-1362

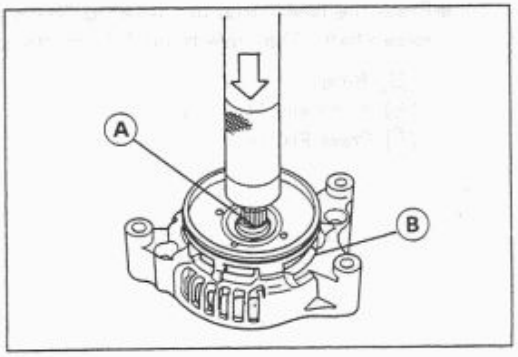
○ Be sure to put a washer (O.D.12 × I.D. 6 mm) [C] on the alternator rotor [D] to prevent its damage.
○ Screw the 5 mm bolts all the way.
○ Tighten the center bolt on the special tool to split the alternator halves.
○ Once the alternator is split, remove the special tool, and remove the alternator frame.



● To remove the frame ball bearing [A] from the alternator rotor [B], use a suitable bearing puller [C].
● Discard the frame ball bearing.



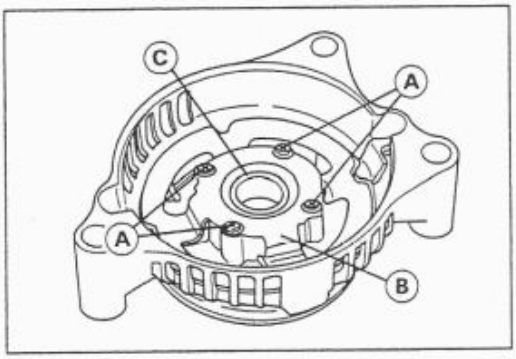
● Press out the alternator rotor [A] from the alternator housing [B].



● Remove:
Screws [A] and Bearing Retainer [B]
Housing Bearing [C]
Bearing Holder
● Remove the oil seal using the bearing driver set.

Special Tool – Bearing Driver Set: 57001-1129

● Discard the housing bearing and oil seal.

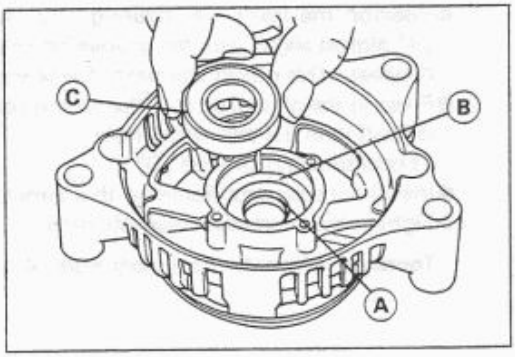


Alternator Assembly

● Install the oil seal [A] using the bearing driver set.

Special Tool – Bearing Driver Set: 57001-1129

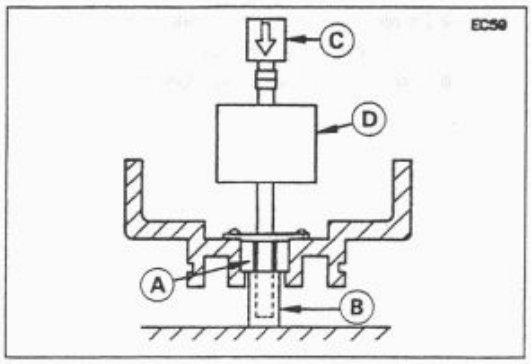
● Install:
Bearing Holder [B]
Housing Bearing [C]



● Install the bearing retainer with its mounting screws.

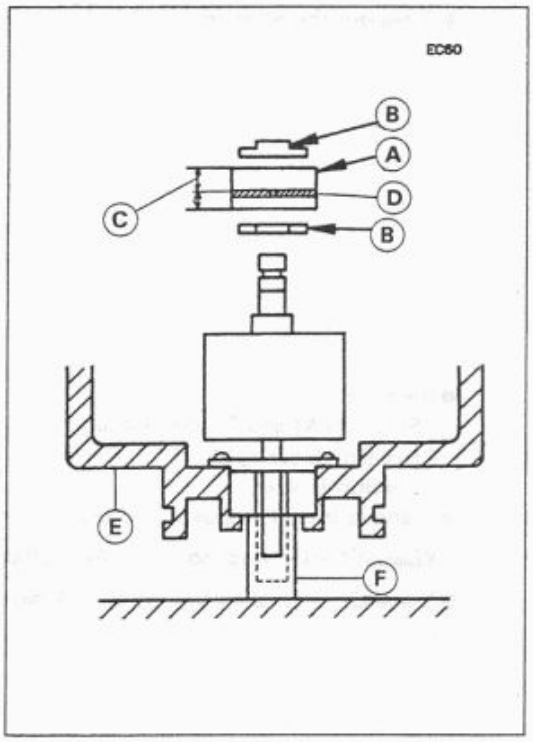
Torque – Alternator Bearing Retainer Screws: 2.5 N-m (0.25 kg-m, 22 in-lb)

● Position the new housing ball bearing [A] so that the inner race is seated on a suitable press fixture [B].
● Press [C] the alternator rotor [D] into the housing ball bearing.



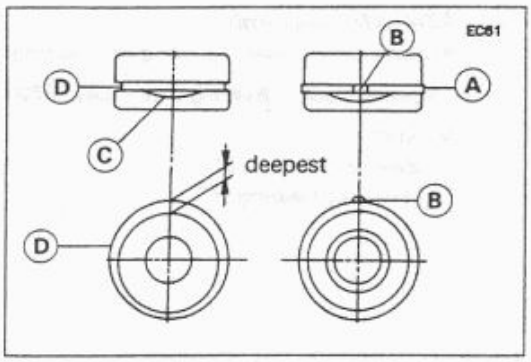
● Press the new frame ball bearing [A] and bearing covers [B] onto the rotor shaft. The wide band [C] on the outer race goes up.

[D] Ring
[E] Alternator Housing
[F] Press Fixture

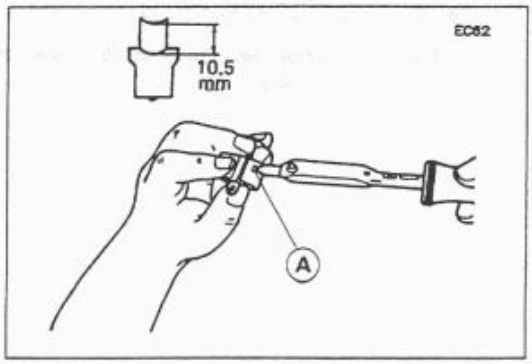


● Position the frame ball bearing ring [A] so that the ring projection [B] almost aligns with the groove chamfer [C] where the groove is the deepest. This makes alternator frame installation easier.
● Press in the oil seal so that the spring band faces out and the seal end is flush with the end of the hole.
Eccentric Ring Groove [D]
● Install the alternator frame on th alternator rotor.
● Tighten the alternator assembly nuts.

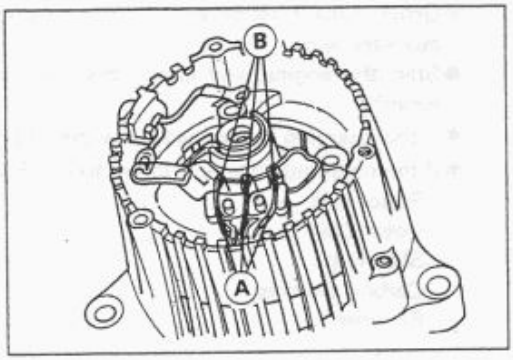
Torque – Alternator Assembly Nuts: 4.4 N-m (0.45 kg-m, 39 in-lb)



● Solder the carbon brush lead [A] with the brush holder as shown.



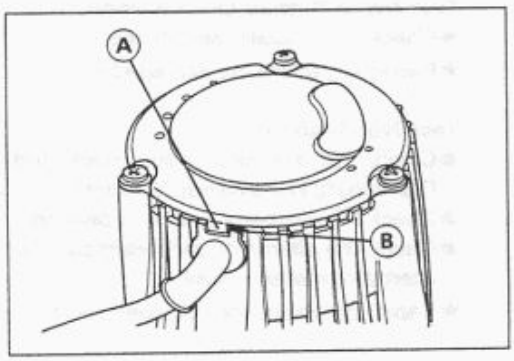
● Run the alternator leads [A] into the grooves [B] as shown.



CAUTION
When soldering the alternator leads to the rectifier terminals, do it quickly. If high temperatures are applied for more than a few seconds, the rectifier's diodes may be damaged.

Torque – Alternator Regulator Screws, Alternator Brush Screws, and Alternator Lead Terminal Screws: 3.4 N-m (0.35 kg-m, 30 in-lb)

● Fit the projection [A] of the alternator cover in the alternator frame groove [B].



Torque – Alternator Cover Screws: 3.4 N-m (0.35 kg-m, 30 in-lb)
Alternator Coupling Nut: 54 N-m (5.5 kg-m, 40 ft-lb)

Operational Inspection

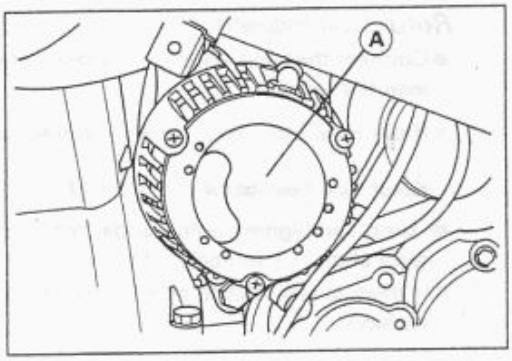
For any charging system problems, always check the charging system wiring first (see Wiring Inspection), and then check the system with the following tests shown in the troubleshooting guide.

Troubleshooting Guide

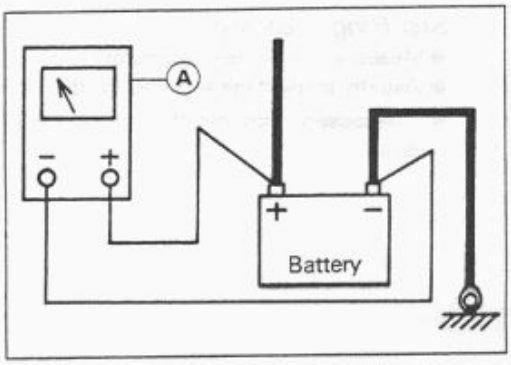
Test No.	Trouble	Symptoms
1	Battery discharged	Starter not rotating
2	Battery overcharged	Electrolyte level lowering quickly
3	Noise	Alternator or alternator chain noise

Test No. 1-Battery Discharged

● Remove:
Left Lower Fairing (see Frame chapter)
● Remove the screws holding the alternator cover [A], and take off the cover.
● Check that the alternator leads and connectors are in good condition.
★ If not, repair or replace the damaged parts.
● Replace the discharged battery with a good battery.

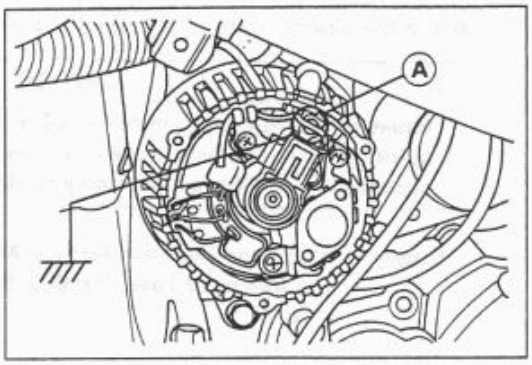


● Connect the hand tester [A] to the battery leads as shown.
● Check charging voltage with the engine running.
★ If the charging voltage is higher than 13.5 V, the charging system is in good condition.
★ If the charging voltage is lower than 13.5 V, check the following.



Charging Voltage 14.2 ~ 14.8 V @engine speed 4000 r/min(rpm)

●Ground the F terminal [A] of the regulator to the engine with an auxiliary wire.
●Start the engine, and check the charging voltage with the engine running.
★If the charging voltage is higher than 13.5 V, check the regulator.
★If the charging voltage is lower than 13.5 V, check the following.
Stator Coil
Rotor Coil
Slip Rings
Carbon Brushes
Rectifier



Test No. 2-Battery Overcharged
●Check the regulator and/or rotor.
★Repair or replace the damaged parts.

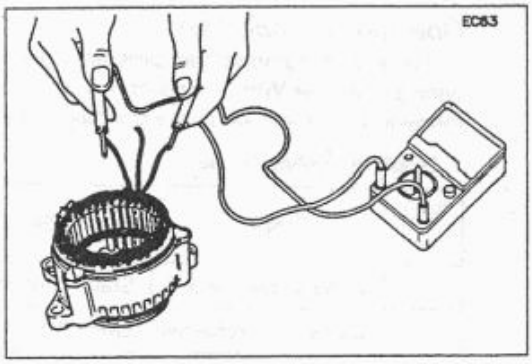
Test No. 3-Noise
●Check the alternator chain slack and adjust it if necessary (see Crankshaft/Transmission chapter).
●Check the alternator shaft ball bearings.
●Check the alternator ball bearings, stator coil, and/or rectifier if the alternator makes a noise.
★Repair or replace the damaged parts.

Stator Coil Inspection

●Connect the hand tester (× 1 Ω range) between the coil leads and read the tester.
★If the tester does not read as specified, replace the alternator frame.

Stator Coil Resistance : 1.0 Ω or less

●Using the highest hand tester range, measure the resistance between the stator coil core and each of the coil windings.
★If there is any reading at all, the stator coil winding has a short and the alternator frame must be replaced.

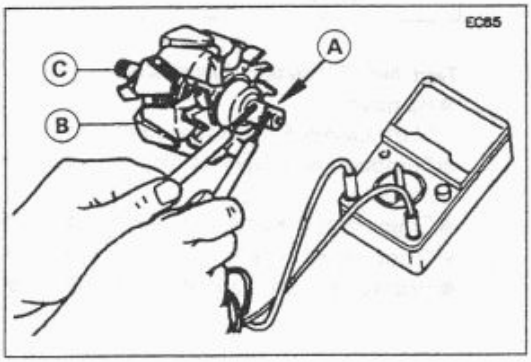


Rotor Coil Inspection

●Connect the hand tester (x 1 Ω range) between the slip rings [A] and read the tester.
★If the tester does not read as specified, replace the rotor [B].

Rotor Coil Resistance: 2.3 ~ 3.5 Ω

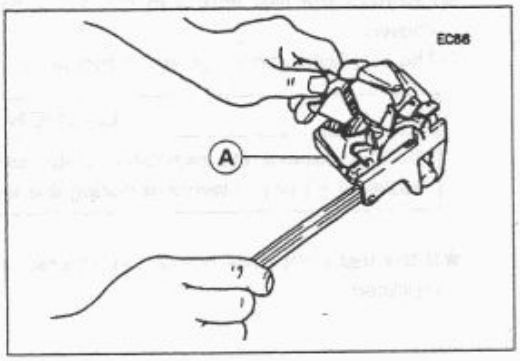
●Using the highest tester range, measure the resistance between the rotor shaft [C] and each of the slip rings.
★If there is any reading at all, the rotor coil has a short and must be replaced.



Slip Ring Cleaning

●Measure the slip ring diameter.
●Visually inspect the slip ring for dirt or pitting.
★If necessary, smooth the slip ring with No. 300 ~ No. 500 emery cloth.

Slip Ring Diameter

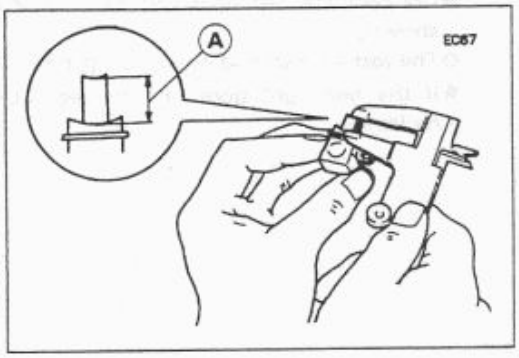


- Measure the slip ring diameter.
- ★If the measurement is less than the service limit, replace the rotor [A].

Slip Ring Diameter

Standard:	**14.4 mm**
Service Limit:	**14.0 mm**

Carbon Brush Length

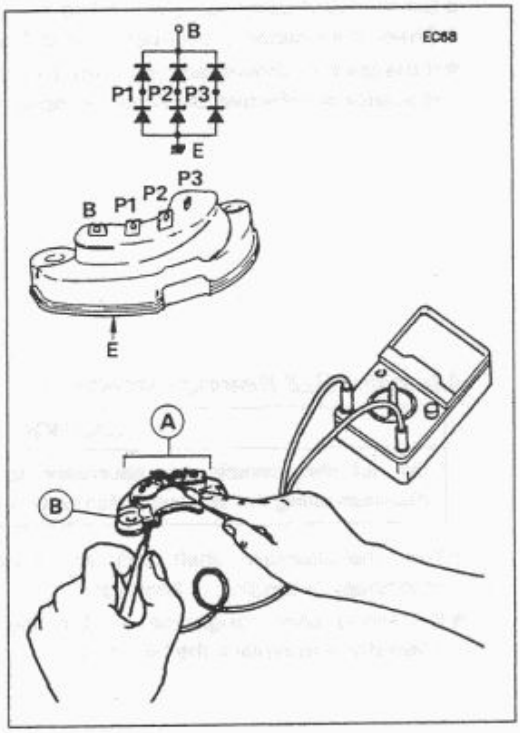


- Measure the length [A] of both carbon brushes that stick out of the holder.
- ★If either one is worn down to less than the service limit, replace it.

Carbon Brush Length (projected portion)

Standard:	**10.5 mm**
Service Limit:	**4.5 mm**

Rectifier Inspection



- Set the hand tester to the 1 kΩ range.
- Zero the hand tester, and connect it to each terminal [A] to check the resistance in both directions.
- ○The resistance should be low in one direction and more than ten times as much in the other direction. If the rectifier [B] shows low or high in both directions, the rectifier is defective and the rectifier must be replaced.

NOTE

○*The actual meter reading varies with the meter used and the individual rectifier, but, generally speaking, the lower reading should be from zero to one half the scale.*

CAUTION
If a megger or a meter with a large-capacity battery is used, the rectifier will be damaged.

Regulator Inspection

- Prepare testing tools.

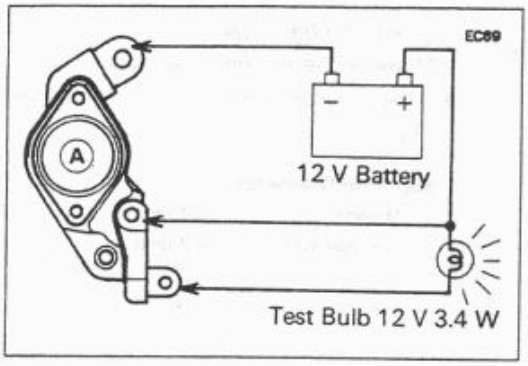
Test light:	Bulb rated 12 V 3.4 W
Batteries:	Two 12 V batteries
Test wires:	Three auxiliary wires

CAUTION
The test light works as an indicator and also a current limiter to protect the regulator from excessive current. Do not use an ammeter instead of a test light.

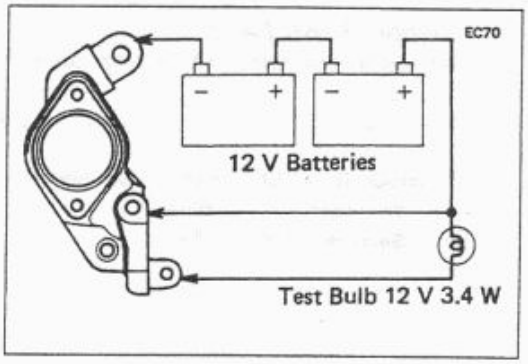
●Connect the test light and the 12 V battery to the regulator [A] as shown.
○The test light should go on at this time.

CAUTION
Do not contact the regulator metal case with the wires from the battery (+) or (−) terminal during the test.

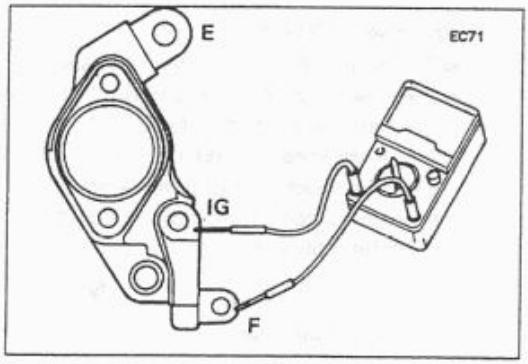
★If the test light does not go on, the regulator is damaged and must be replaced.



●Connect the test light and two 12 V batteries to the regulator as shown.
○The test light should not go on at this time.
★If the test light goes on, the regulator is damaged and must be replaced.



●Set the hand tester (special tool) to the 1 kΩ range.
●Check the resistance between IG and F terminals in both directions.
★If the reading shows zero or infinity (no reading) in both directions, the regulator is defective and must be replaced.

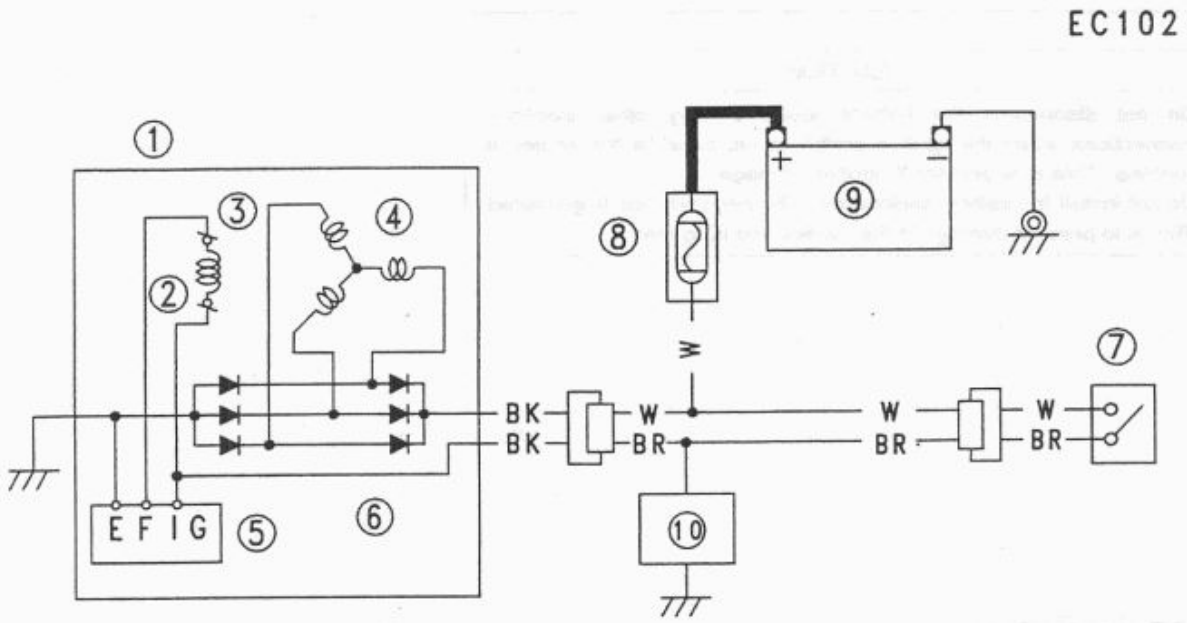


Alternator Ball Bearing Inspection

CAUTION
Do not disassemble the alternator for bearing inspection since disassembling the alternator damages the bearings.

●Turn the alternator shaft back and forth while checking for plays, roughness or binding of bearings.
★If bearing play, roughness, or binding is found, disassemble the alternator and replace the bearings.

Alternator Circuit



1. Alternator
2. Rotor
3. Carbon Brush
4. Stator Coil
5. Regulator
6. Rectifier
7. Ignition Switch
8. Main Fuse 30A
9. Battery
10. Load