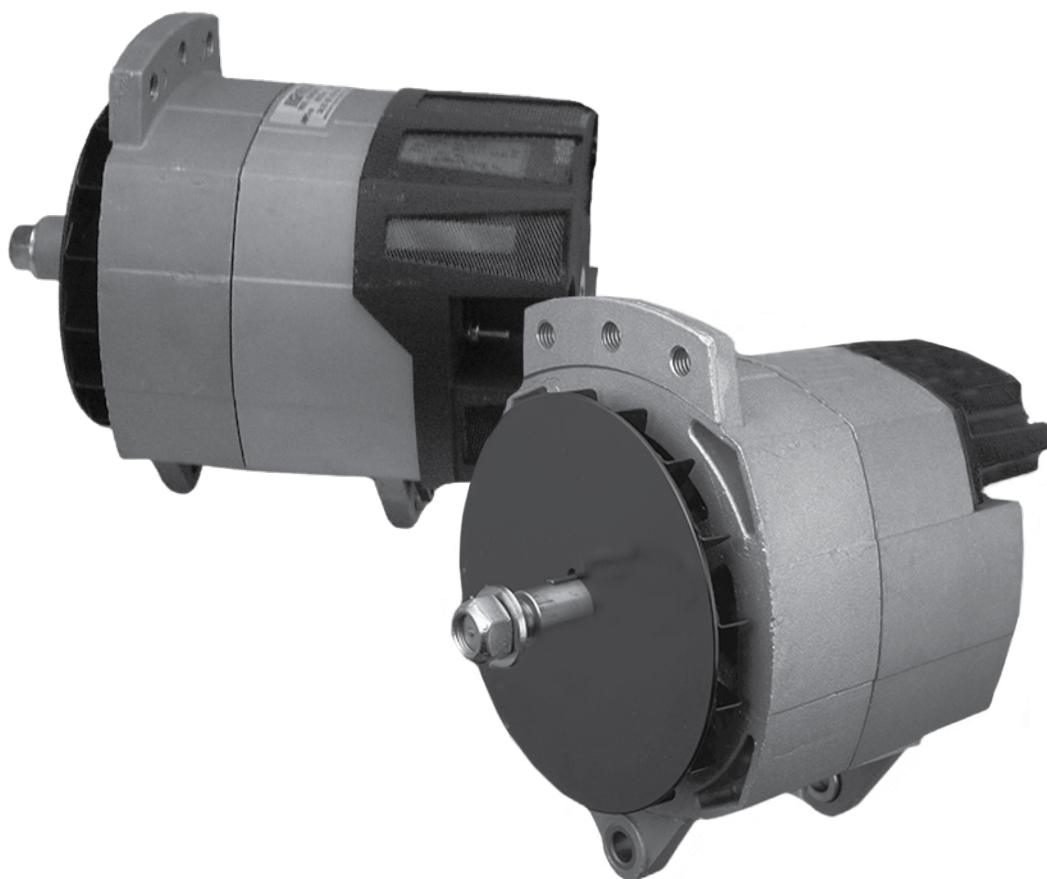




SERVICE MANUAL FOR THE 8SC / SCJ SERIES ALTERNATOR



BASIC SYSTEM TROUBLESHOOTING AND REPAIR

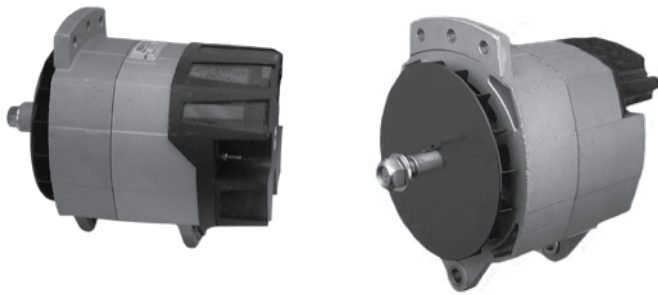
Prestolite
electric

Leece-Neville
HEAVY DUTY SYSTEMS

TSM1002 4/11

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Description:

The 8SC/SCJ series alternators are air cooled, belt driven units designed for heavy duty diesel engine applications.

These units feature an integral voltage regulators, fully enclosed brushes, built-in rectifier assemblies with solid lead frame and extra large heat sinks, a dynamically balanced rotor, and heavy duty stator and bearings. The 8SC/SCJ series comes in a vast array of features which includes, remote sense, self excite, ignition excite, lamp and Multipower Technology™.

Mode of operation:

The vehicle battery supplies excitation to the field coil (rotor coil) through the regulator and brushes, to create a magnetic field around the rotor and through the stator.

When the rotor is set in motion, the moving magnetic field induces an alternating current (AC) in the stator windings. This output current increases with the speed of the rotor.

The (AC) produced in the stator is converted to direct current (DC) by the positive and negative rectifier assemblies. The rectifier assemblies are connected to the alternator output terminals to provide (DC) output for charging the batteries and to satisfy the vehicle electrical loads.

The regulator monitors the output voltage through sensing leads which are connected to the positive and negative rectifier assemblies, or on some models this is done externally through a remote sense (S) terminal. When the output voltage deviates from the set voltage, the regulator takes corrective action to maintain the output voltage at the proper level. For more detailed information on how an alternator works please see our training CD PP-1216.

Causes of Charging System Failure:

Charging system malfunction is identified by the battery

1. OVERCHARGED BATTERIES caused by one or a combination of the following:
 - A. Defective Battery.
 - B. Defective regulator.
 - C. Poor sensing lead contact to regulator or rectifier assembly.

2. UNDERCHARGED BATTERIES caused by one or a combination of the following:
 - A. Loose belts; corroded, broken, loose or dirty terminals; broken wiring; undersize wiring; defective batteries.
 - B. Alternator field circuit malfunction caused by one or a combination of the following:
 - a. Poor contacts between regulator and brushes.
 - b. No residual magnetism in rotor.
 - c. Defective regulator.
 - d. Damaged or worn brushes.
 - e. Damaged or worn slip rings.
 - f. Poor connection between slip ring assembly and field coil leads.
 - g. Rotor coil shorted, open, or grounded.
 - C. Alternator generating section malfunction caused by one of the following:
 - a. Stator phase(s) shorted, open, or grounded.
 - b. Rectifier assembly grounded.
 - c. Rectifier(s) shorted or open.

On- Vehicle or Test Stand Troubleshooting:

Detailed information can be found on our web site at www.prestolite.com.

When on our web site, look up the alternator model you have questions on and you will find hyperlinks that will take you to information pertaining to that model. You can also contact our technical support hot line at 1-866-288-9853.

Good information to reference would be our training manual PP-1127 or our training CD PP-1216.

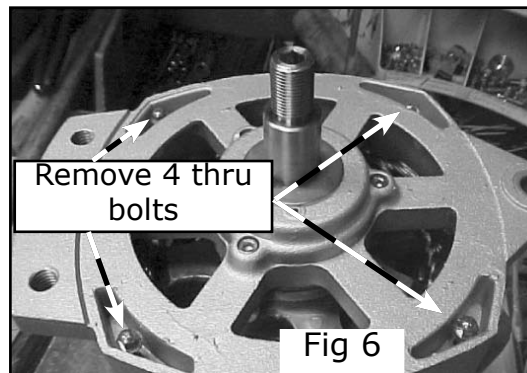
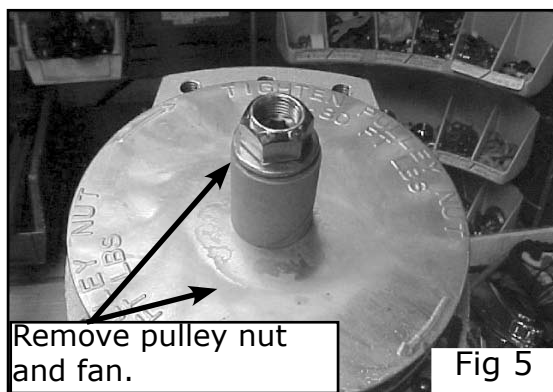
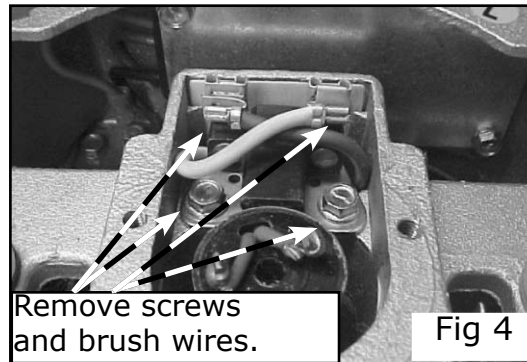
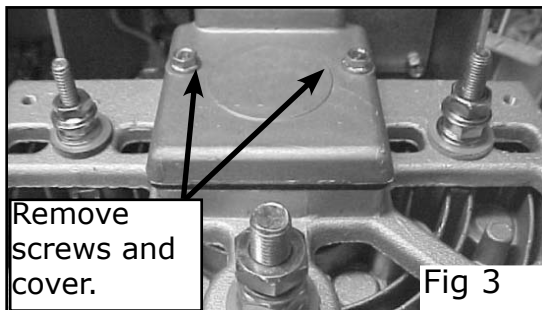
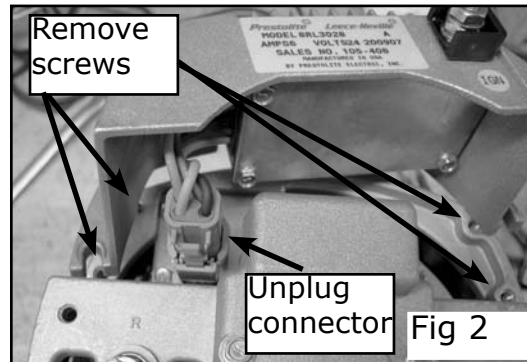
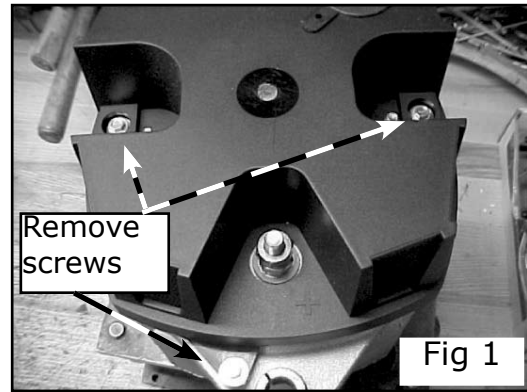
Alternator Disassembly

Step 1: Remove trash screen from alternator if equipped. (Fig 1)

Step 2: Remove regulator by removing 4 screws and unplug connector. (Fig 2)

Step 3: Remove brush holder cover, brush wires and brush holder. (Fig 3 and 4)

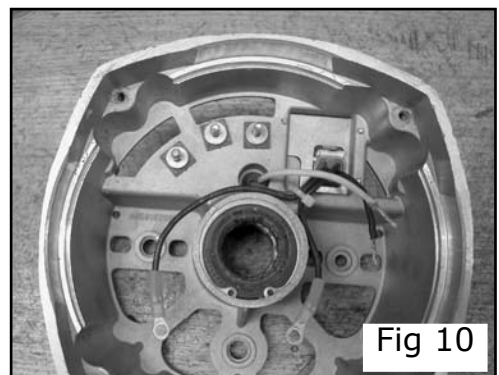
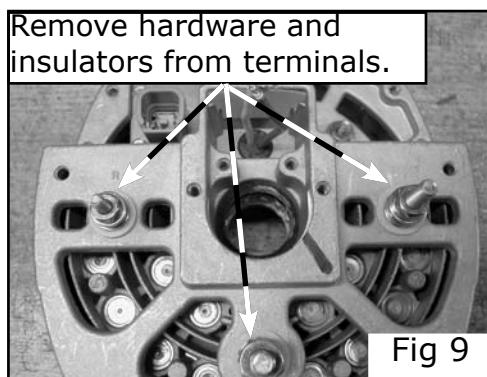
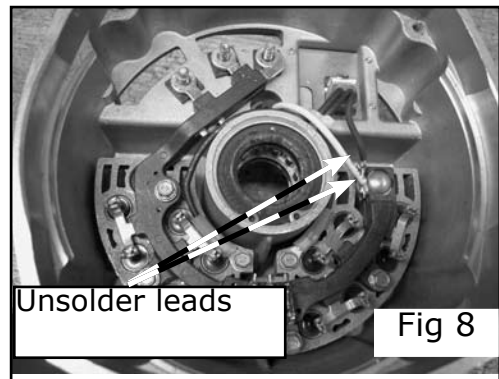
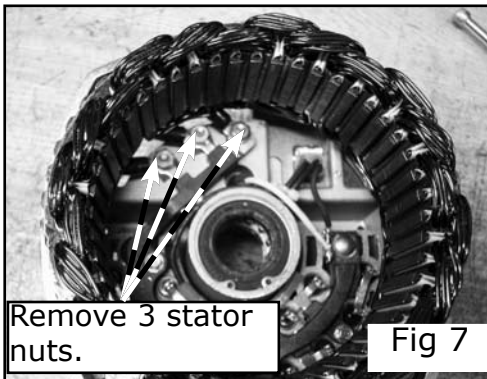
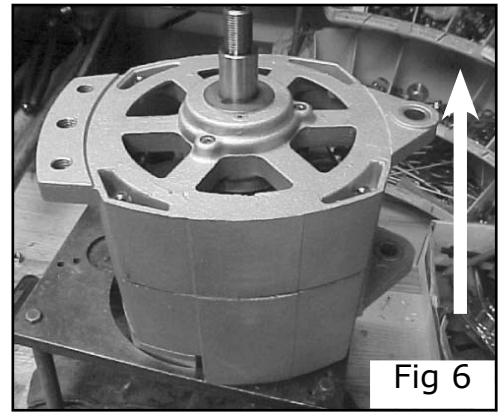
Step 4: Flip unit over and remove the pulley nut, fan and four thru bolts. (5 and 6)



Step 5: Lift front housing splitting alternator. (Fig 6)

Step 6: Remove three stator nuts then remove stator from rear housing (Fig 7)

Step 7: On certain models unsolder leads from rectifier. (Fig 8)



Step 8: Flip the rear housing over and remove all hardware and insulators from the three terminals. (Fig 9)

Step 9: Remove rectifier from rear housing (Fig 10)

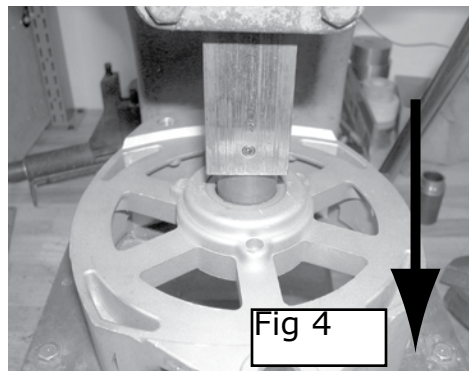
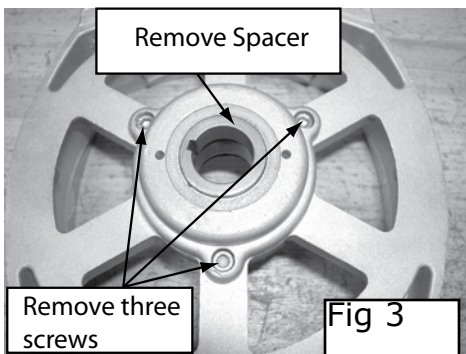
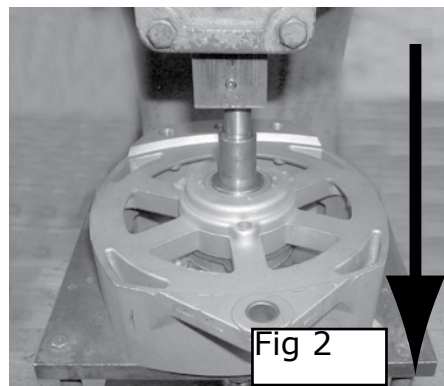
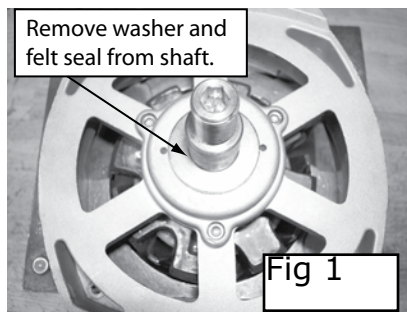
Front bearing change:

Step 1: Remove steel washer and felt seal from shaft. (Fig 1)

Step 2: Press rotor from front housing. (Fig 2)

Step 3: Remove spacer and three front bearing retaining screws. (Fig 3)

Step 4: Press front bearing and seals from front housing. (Fig 4)



Step 5: Remove seal from front housing.
(Fig 5)

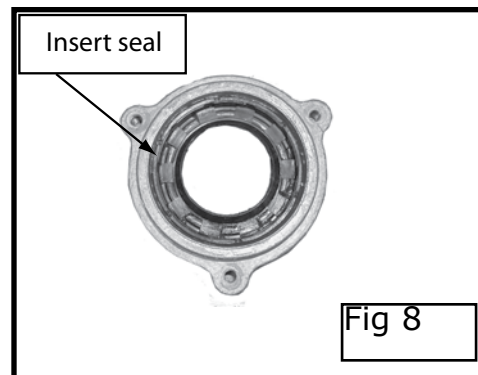
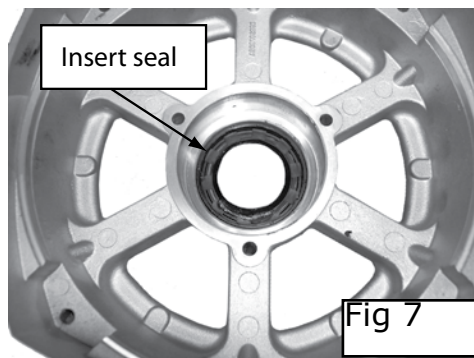
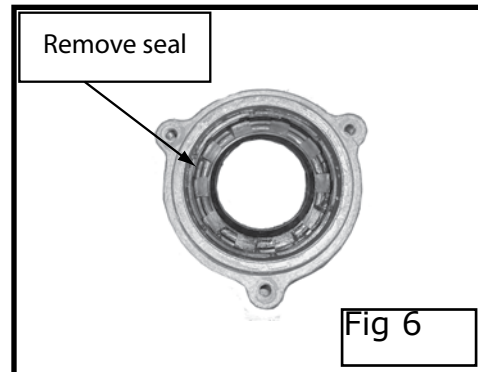
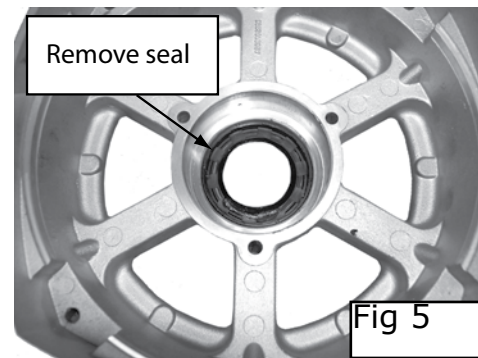
Step 6: Remove seal from front bearing
retainer. (Fig 6)

Note: On opposite sides of the front housing
and bearing retainer are two holes. Insert a
punch into these holes and tap with a ham-
mer to remove the seals.

Step 7: Insert front housing seal. (Fig 7)

Step 8: Insert front bearing retainer seal.
(Fig 8)

Note: When installing seals, press on the
outer diameter. Failure to do this can cause
damage to the seals.



Step 9: Press bearing into front housing. (Fig 9)

Note: When installing bearings, press on the outer diameter. Failure to do this can cause damage to the bearing.

Step 10: Install front bearing retainer. (Fig 10)

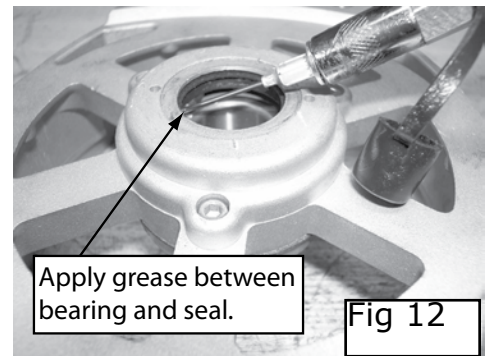
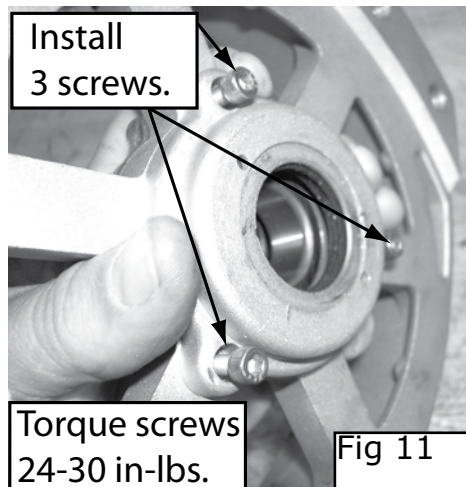
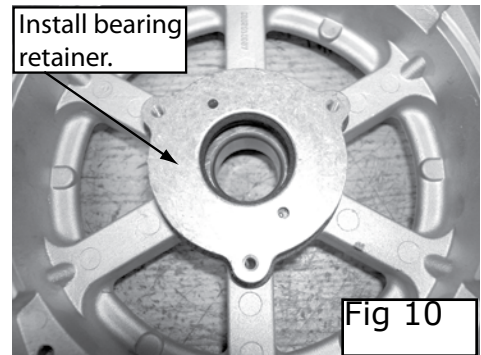
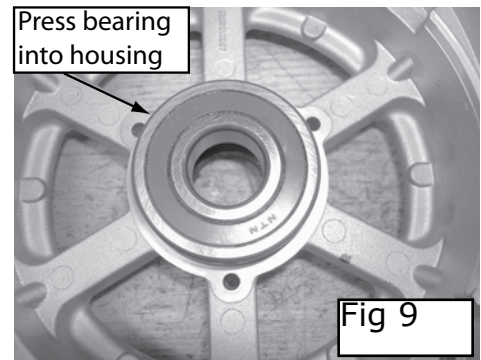
Step 11: While holding front bearing retainer in place, turn over housing. Apply blue locktite to three mounting screws and install into front housing. (Fig 11)

Step 12: With a grease needle, inject grease between the seal and the bearing. (Fig 12)

Note: Grease needle can be purchased at any auto parts store.

Recommended grease:

High temperature synthetic bearing grease.

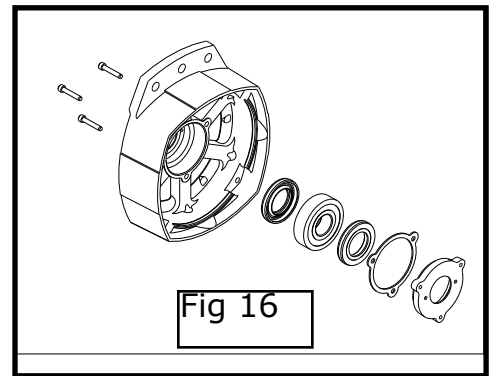
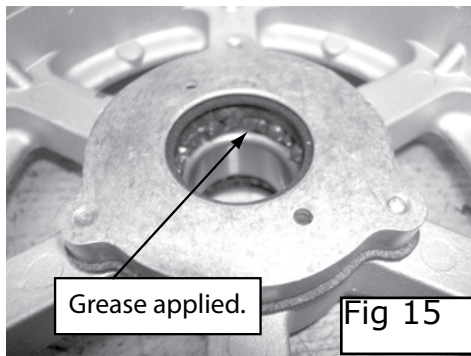
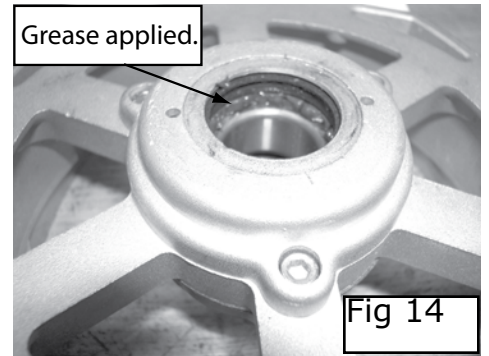
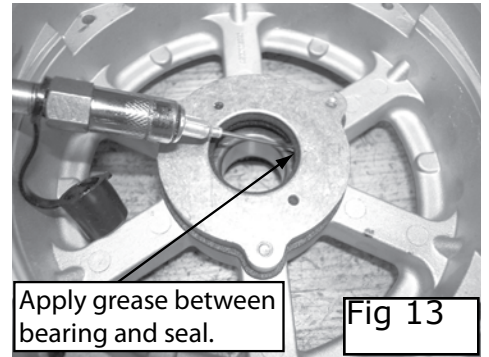


Step 13: Turn housing over and with the grease needle inject grease between the seal and the bearing. (Fig 13)

Step 14: Figure 14 and 15 shows the proper amount of grease that needs to be applied.

Note: The grease added between the bearing and the seals adds an additional protective measure in preventing dust from penetrating the bearing. This grease provides no lubricating properties to the front bearing.

Figure 16 shows you the proper arrangements of components in the front housing.



Slip ring/ rear bearing inner race change:

Inspect rotor and measure key items in Fig 1.

If Dim A or B is out of tolerance a new rotor will need to be purchased. Refer to SP-1017 to determine correct replacement part number.

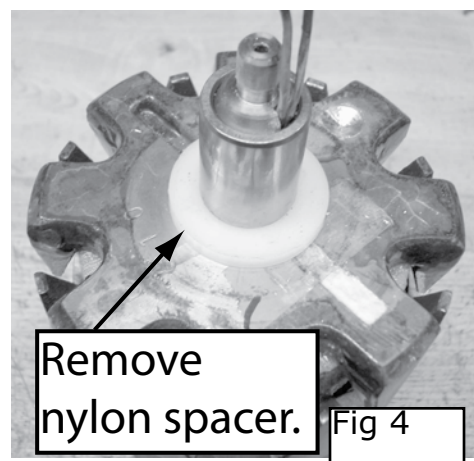
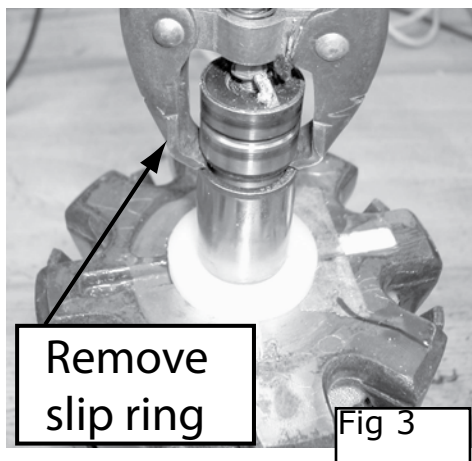
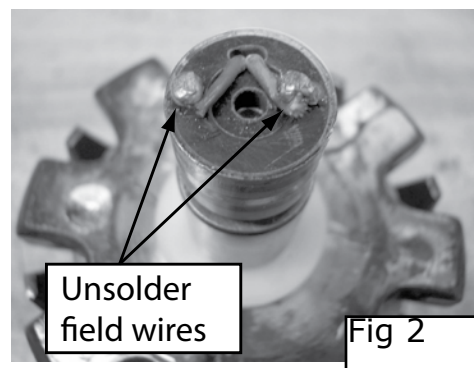
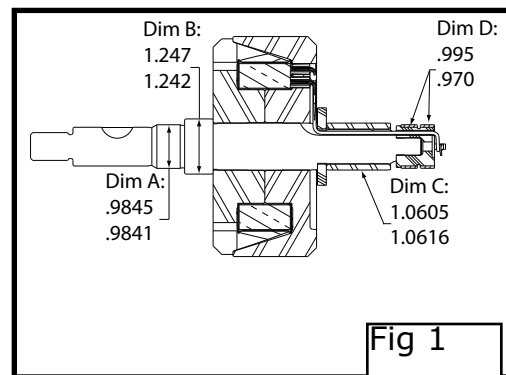
If Dim C or D is out of tolerance or excessive wear is present then proceed with this procedure.

Note: Use caution not to damage field wires during the following procedures.

Step 1: Unsolder field wires from slip ring.
(Fig 2)

Step 2: Remove slip ring from shaft. (Fig 3)
Note: Use caution not to damage end of shaft during slip ring removal.

Step 3: Cut nylon spacer off shaft and discard.
(Fig 4)



Step 4: Clamp on bearing separator and press bearing inner race off shaft. (Fig 5)

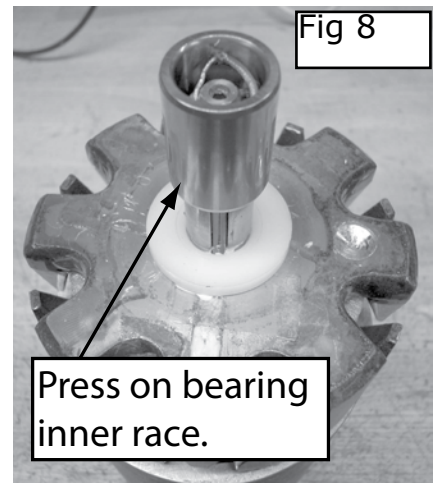
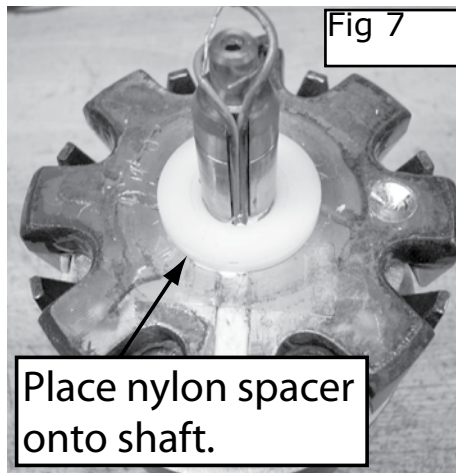
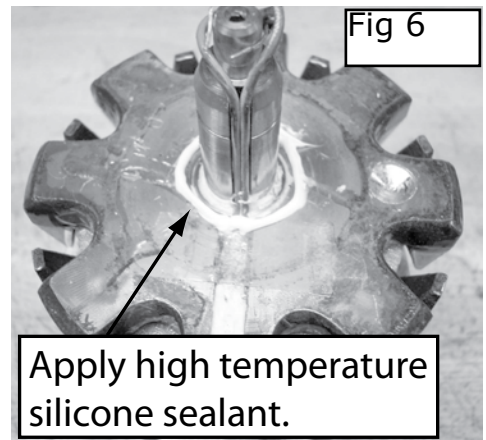
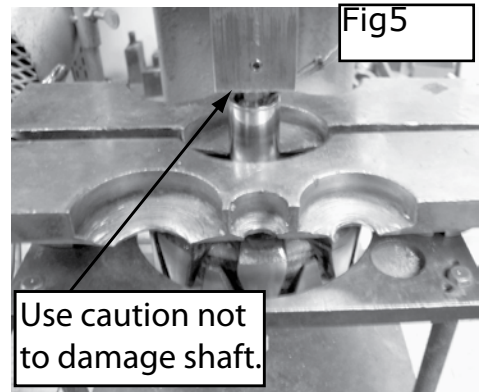
Note: Use caution not to damage shaft or field wires.

Step 5: Apply high temperature silicone sealant on rotor. (Fig 6)

Step 6: Place new nylon spacer on shaft. (Fig 7)

Step 7: Press bearing inner race onto shaft. (Fig 8)

Note: Use caution not to damage field wires during installation.



Step 8: Insert field wires through slip ring.
(Fig 9)

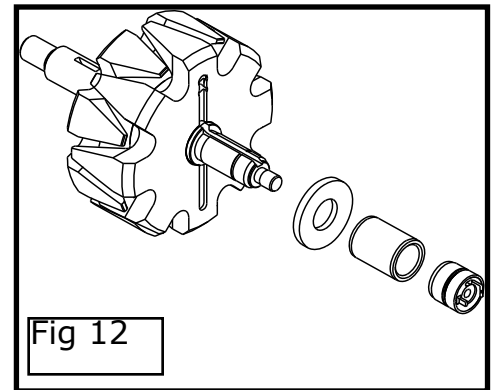
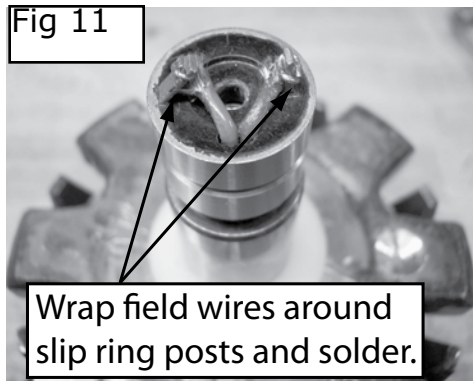
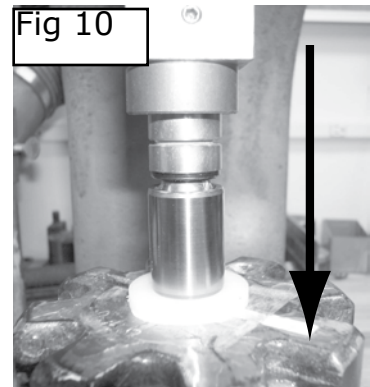
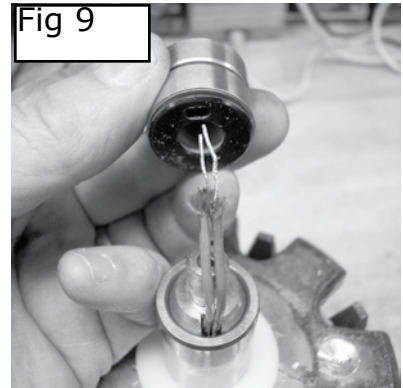
Step 9: Press slip ring onto shaft. (Fig 10)

Note: Use caution not to damage field wires while performing Step 9 and press on slip ring outer diameter to prevent damage.

Step 10: Wrap field wires around slip ring posts and solder. (Fig. 11)

Recommended solder: SN15PB85

Figure 12 shows you the proper arrangements of components in the rotor.



Rear bearing change:

Step 1: Remove snap ring from rear housing. (Fig 1)

Step 2: Press old seals and bearing from rear housing. (Fig 2)

Step 3: Pack new bearing and seal cavities with grease. (Fig 3)

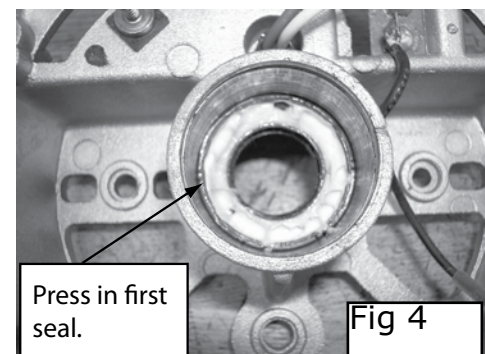
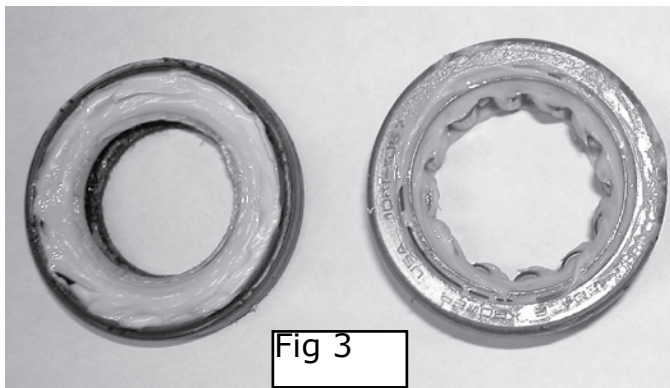
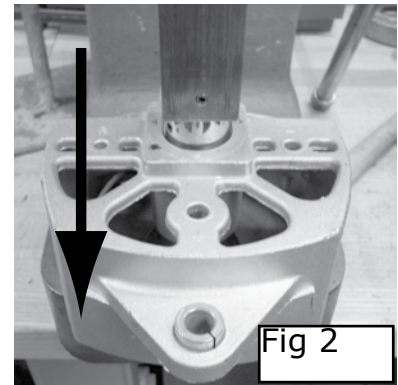
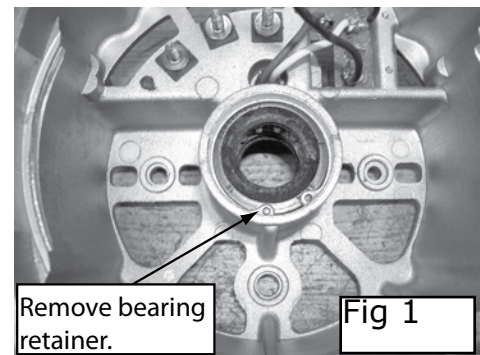
Recommended grease:

High temperature synthetic bearing grease.

Step 4: Press seal into rear housing. (Fig 4)

Note: When installing seals, press on the outer diameter. Failure to do this can cause damage to the seals.

Use caution not to contaminate grease.



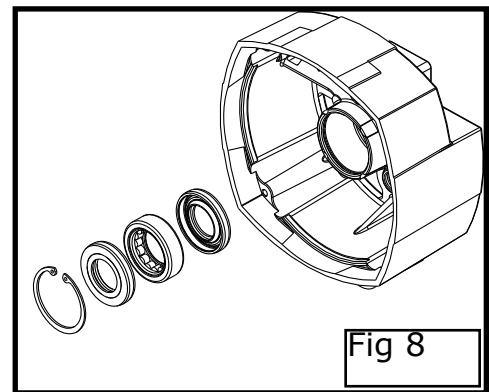
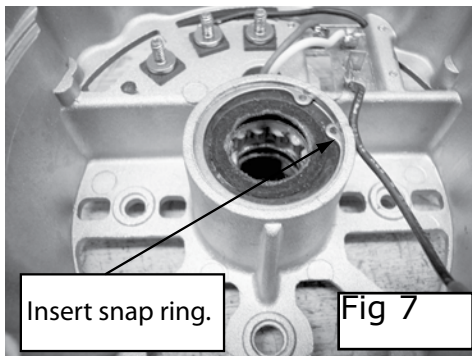
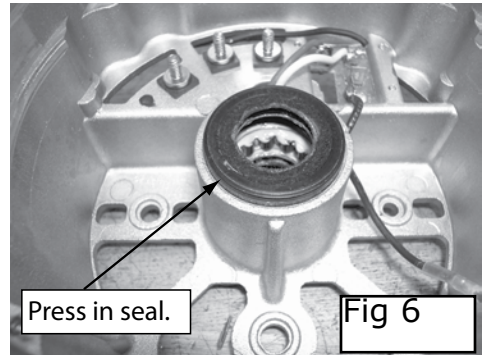
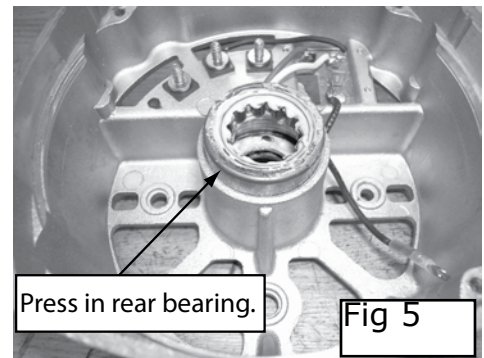
Step 5: Press bearing into rear housing.
(Fig 5)

Note: When installing bearings, press on the outer diameter. Failure to do this can cause damage to the bearing.

Step 6: Press seal into rear housing. (Fig 6)

Step 7: Install snap ring into rear housing.
(Fig 7)

Figure 8 shows you the proper arrangements of components in the rear housing.



Installing rotor into front housing:

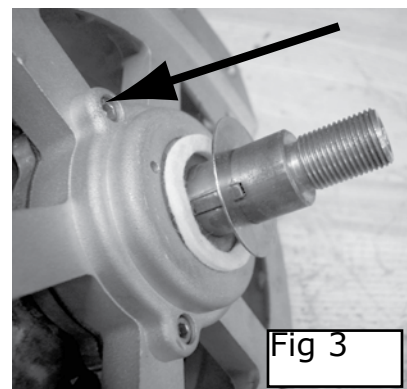
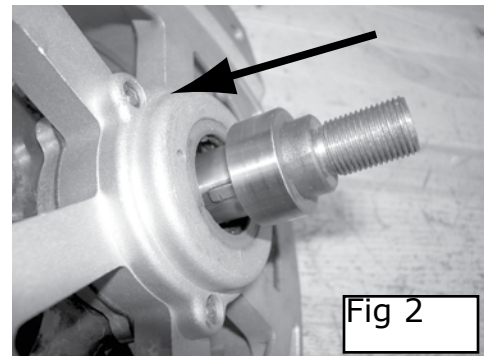
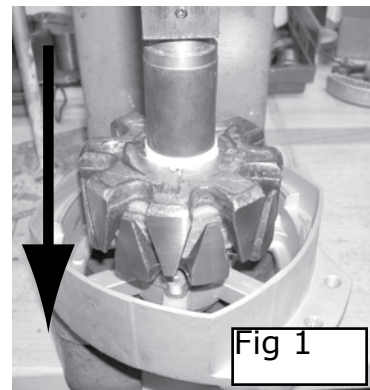
Step 1: Press rotor into front housing. (Fig 1)

Note: When pressing rotor support front housing as close to the bearing as possible to prevent damage to the front housing.

Use caution not to damage slip ring when pressing rotor into front housing.

Step 2: Slide spacer onto shaft. (Fig 2)

Step 3: Slide felt and steel washer on shaft. (Fig 3)



Alternator Assembly Instructions

Alternator Assembly

Step 1: If replacing rectifier, remove screw and wire furnished with replacement rectifier. (Fig 1)

Step 2: Slide #10 carriage bolt into replacement rectifier and insert black insulating sleeve over the bolt. (Fig 2)

Step 3: Insert insulators into rear housing. (Fig 3)

Step 4: Insert rectifier ring into rear housing making sure the insulating sleeve (Fig 2) doesn't fall off. While holding the rectifier in the housing, flip the housing and install the terminal hardware. (Fig 4)

Step 5: Flip housing over, route regulator sense leads per figure and attach to rectifier ring. (Fig 5)

Note: To determine polarity of regulator sense leads, look at the regulator wire colors connecting to the alternator. Trace these wires through the connector to determine correct polarity.

Red: Positive
Black: Negative

Step 6: On certain models solder leads to rectifier. (Fig 6)
Recommended solder: SN15PB85

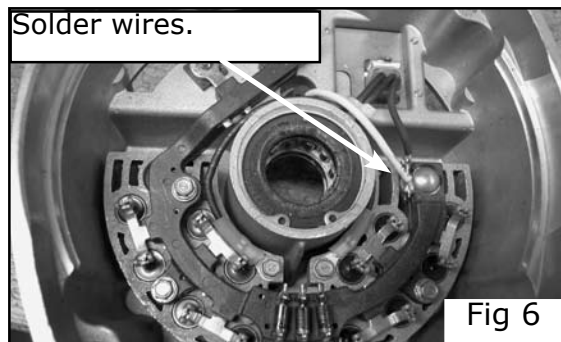
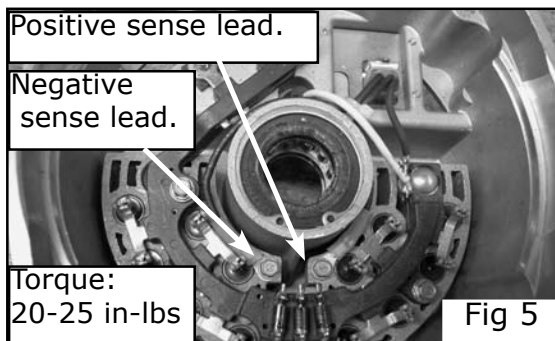
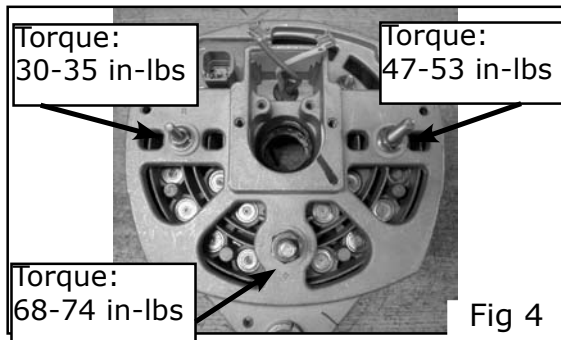
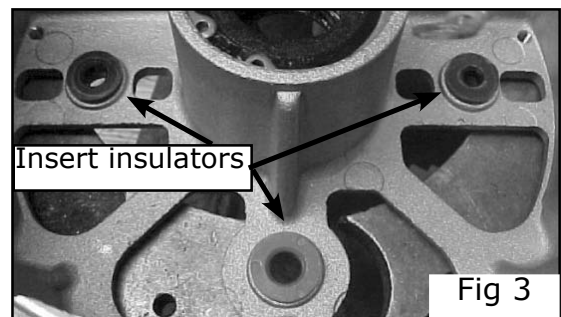
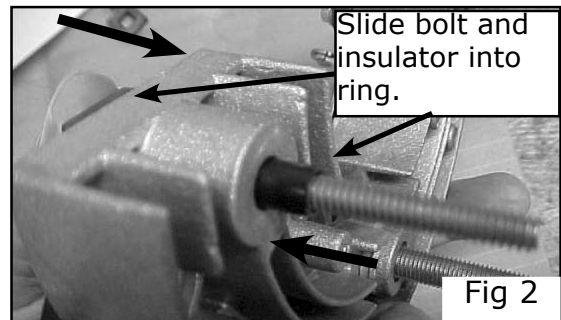
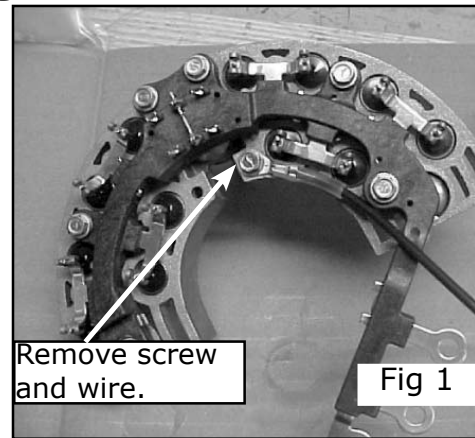
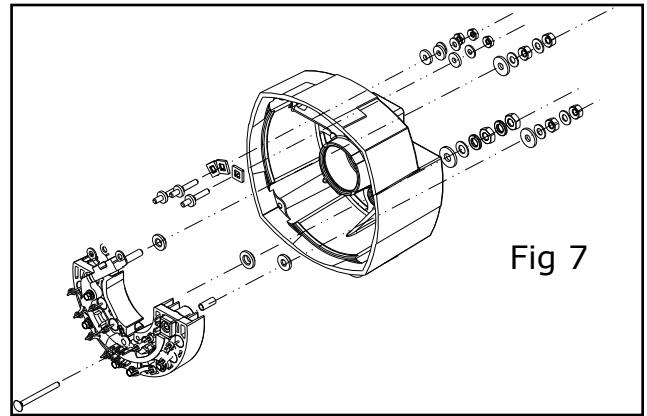


Figure 7 gives you an isometric view of the rear housing to show correct placement of components.

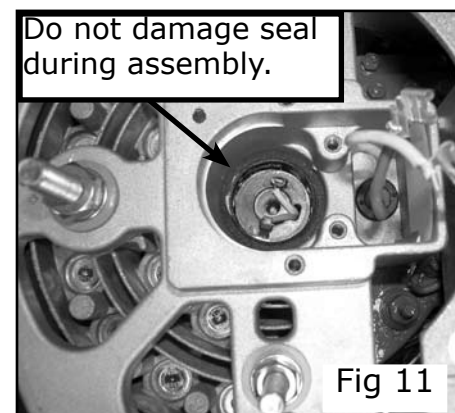
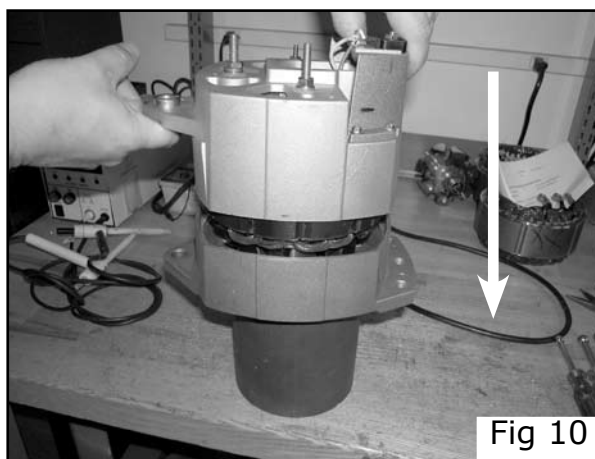
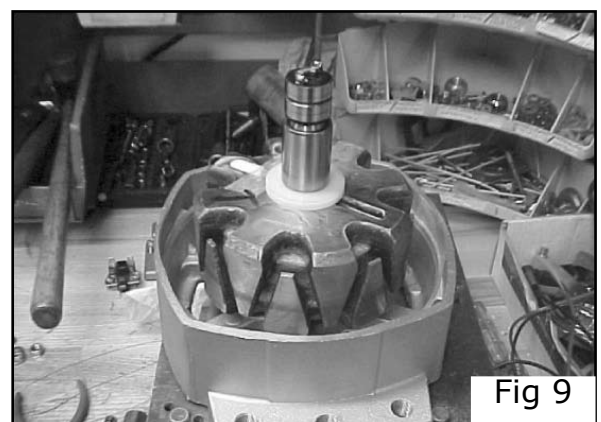
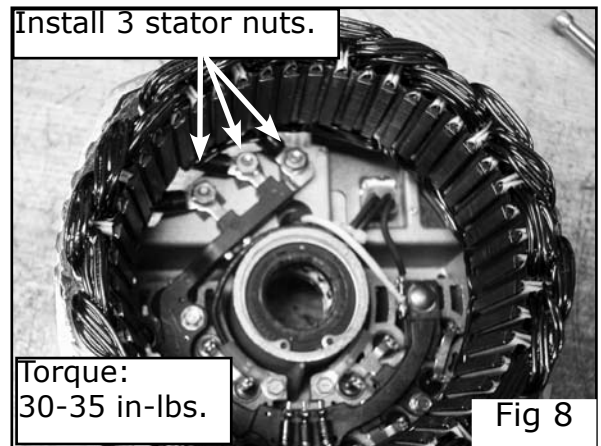


Step 7: Place stator into rear housing and attach three AC nuts.
Torque nuts to 35-30 in-lbs. (Fig 8)

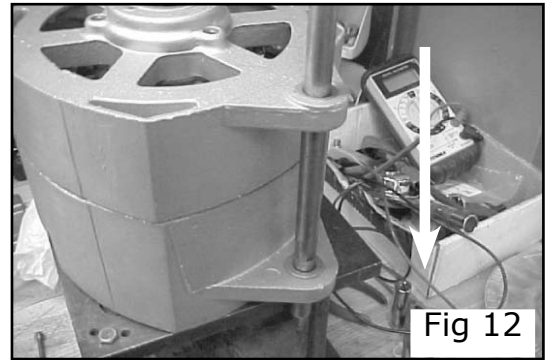
Step 8: Place front housing/ rotor assembly onto a flat surface. (Fig 9)

Step 9: Gently lower rear housing assembly onto front housing assembly.
Wipe any grease contamination off the slipring. (Fig 10)

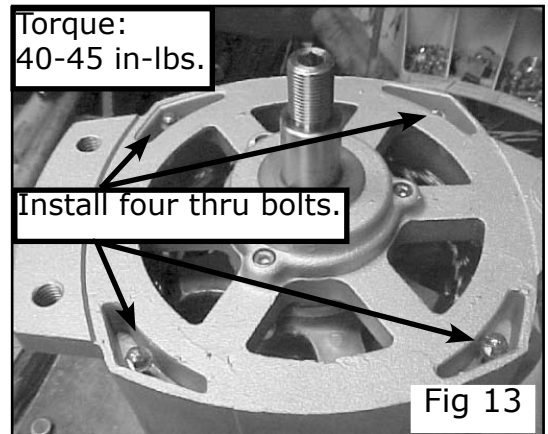
Note: Use caution not to damage the rear bearing seal when performing Step 9.
(Fig 11)



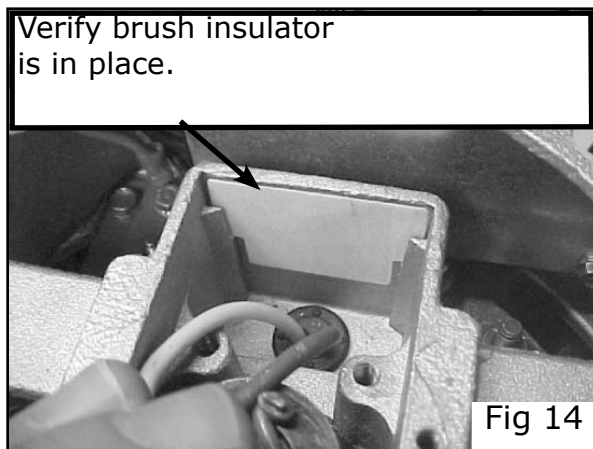
Step 10: Flip alternator over.
Insert 1/2" alignment rod into mounting holes.
(Fig 12)



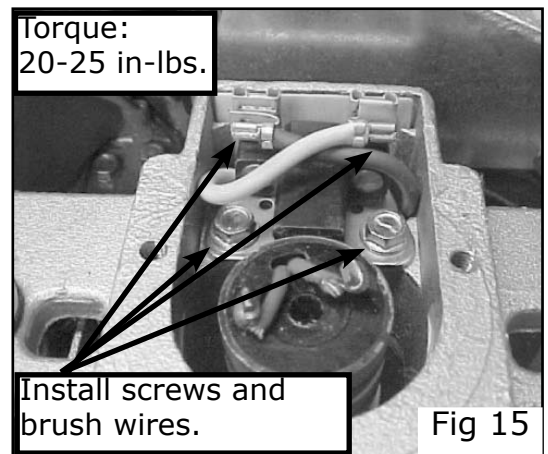
Step 11: Apply 242 locktite to alternator thru bolts.
Install thru bolts and tighten to 45-40 in-lbs.
Remove alignment rod. (Fig 13)



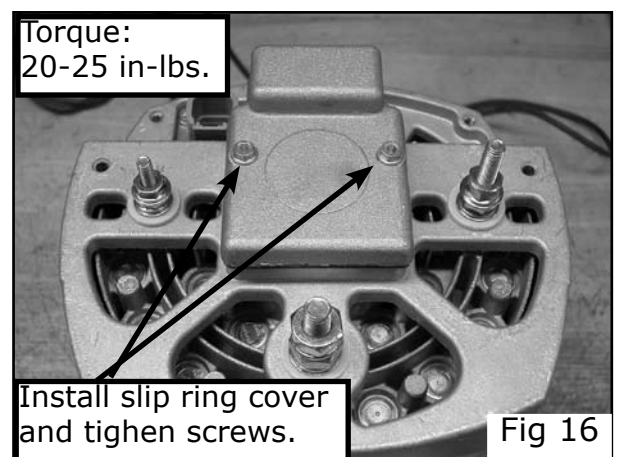
Step 12: Flip alternator over. Verify that the brush insulator shield is in place. (Fig 14)



Step 13: Install brushes and tighten screws.
Connect field wires to brushes. (Fig 15)



Step 14: Install slip ring cover and gasket.
Tighten screws. (Fig 16)



Step 15: Plug regulator into alternator and tighten mounting screws. (Fig. 17)

Step 16: Install trash screen if equipped. (Fig 18)

Step 17: Install fan.

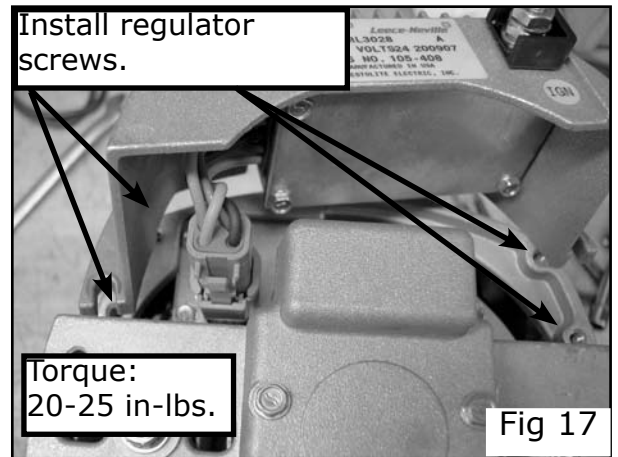
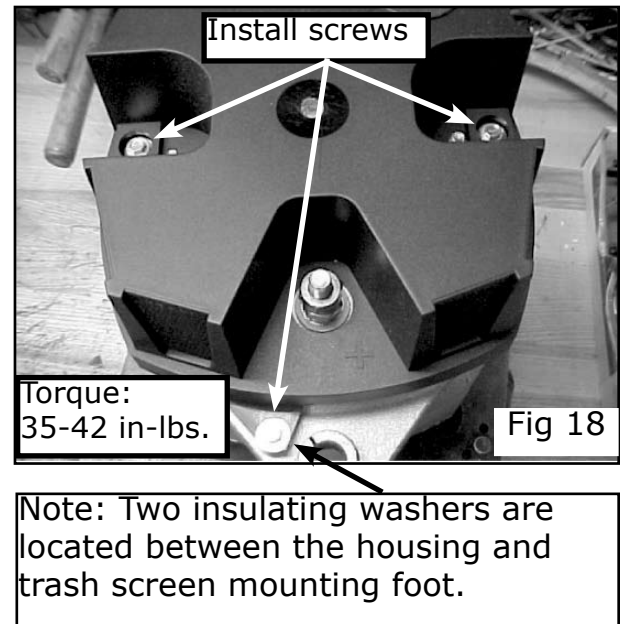
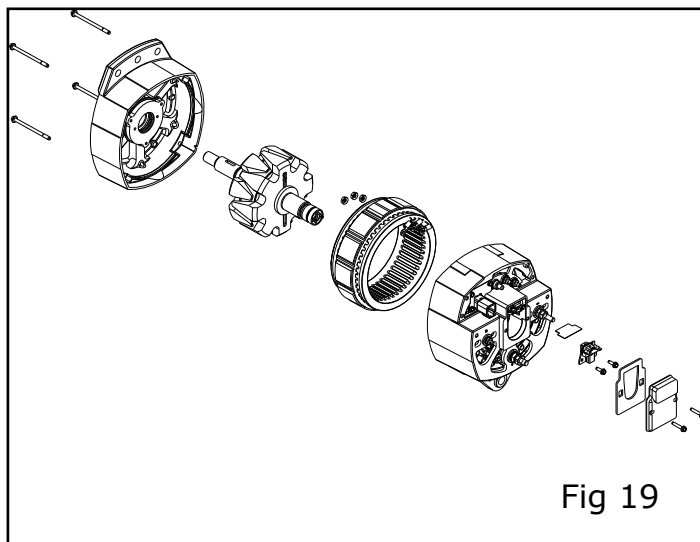


Figure 19 gives you an isometric view of the rear housing to show correct placement of components.



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