ALTERNATOR DISASSEMBLY

BEARING TEST PRIOR TO DISASSEMBLY

Before disassembling the alternator, a simple bearing test should be performed regardless of the reason for alternator removal from the engine. The purpose of the test is to determine whether either of the bearings are a potential noise or failure complaint.

To perform a test for faulty bearings, hold the alternator in one hand and snap-spin the pulley with the other. A defective bearing will be heard or felt. In noisy locations, press the alternator adjusting ear to your ear lobe and snap-spin the pulley a few times.

To determine which bearing is defective, separate the alternator into two major assemblies as illustrated in Step B in the section following. Snap-spin the rotor with only the front bearing supporting the shaft, as a method for determining the condition of the front bearing. The rotor shaft must be held in the vertical plane in order to avoid misleading results caused by unbalanced bearing loading.

Inspect rear bearing surface of rotor shaft for nicks, chatter marks, grooves, and other surface irregularities. Inspect rear bearing for damage to rollers, felt seal, or bearing case. Also look for missing rollers. If grease is hard and dry when smeared or excessively dirty, the bearing should be replaced. As a general rule, a bearing should only be removed when replacement is necessary because of a defect.

ARC MARKS ON TERMINALS

Before disassembling the alternator, the threads on each terminal stud should be inspected for signs of arcing. Diode damage is frequently the side-effect of arcing. Arc marks are usually caused by a loose wire terminal connection resulting from failure to tighten the attaching nut. Arc marks can also be caused by improper service techniques that permit wires to be connected and disconnected while current is flowing. A loose connection at the alternator output (battery) terminal can cause the terminal stud to be burned through in time.

Diode damage can occur because of the inductive voltage spikes (similar to ignition coil sparking action) generated by the make-and-break of a loose terminal connection. EACH DIODE must be tested, before the alternator is returned to service, after exposure to arcing.

Voltage regulator and field relay damage can also be expected because of chattering contacts each time the loose connection makes or breaks. Chattering contacts causes the contacts to arc excessively with consequent rapid contact erosion.

DISASSEMBLY

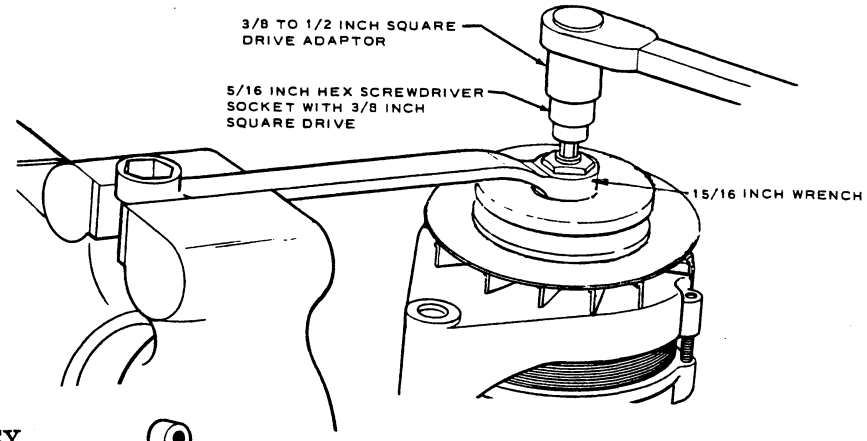
A. Remove pulley

1. 52 AMP MODEL - Two tapped holes are provided on the pulley to accept puller bolts. Install the puller bolts to the full depth of the holes if possible.

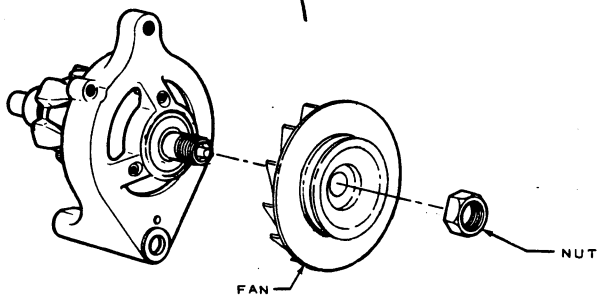
2. 60 AMP PULLEY DRIVEN MODEL - Position alternator on bench next to a vise using the tooling shown. The tooling consists of a standard 15/16 inch, box end wrench; a 5/16 inch, 6 point hex screwdriver (thick wall) socket; and a drive adapter.

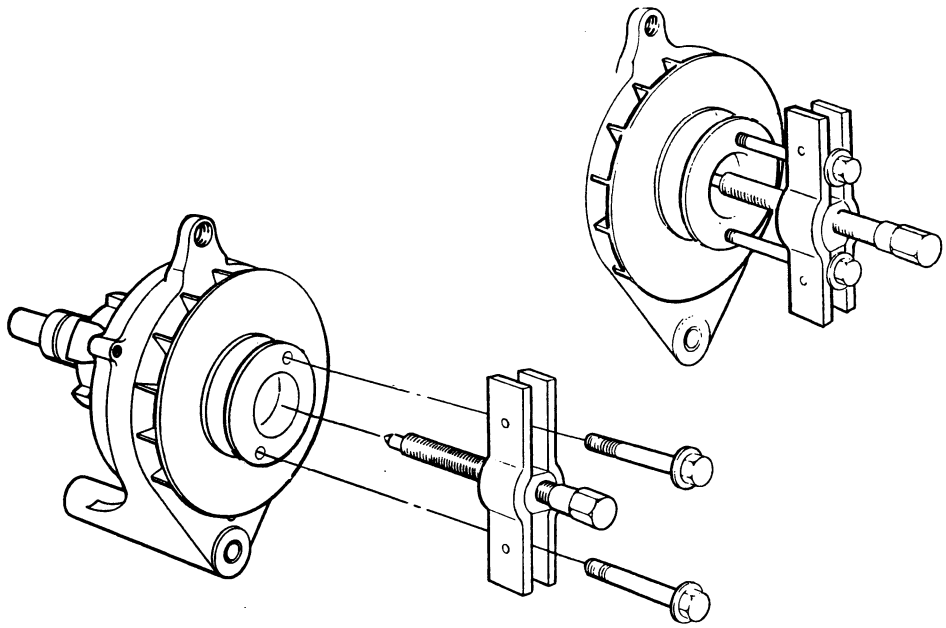
3. Set ratchet to rotate the shaft in a clockwise direction (right-hand thread). Be sure that the hex driver is fully seated into the hex hole in the shaft.

4. Remove nut, pulley and fan.



60 AMP PULLEY
DRIVEN MODELS





52 AMP MODEL

FIGURE 34

B. Remove drive gear and coupling assembly.

1. Remove cotter key.
2. Set ratchet to rotate the rotor shaft nut in a counterclockwise direction.
3. Use a cresent wrench to prevent the rotor shaft and drive gear assembly from turning. Be sure that the cresent wrench is on the drive gear and not the drive gear coupling assembly.
4. Remove nut, drive gear and coupling assembly.

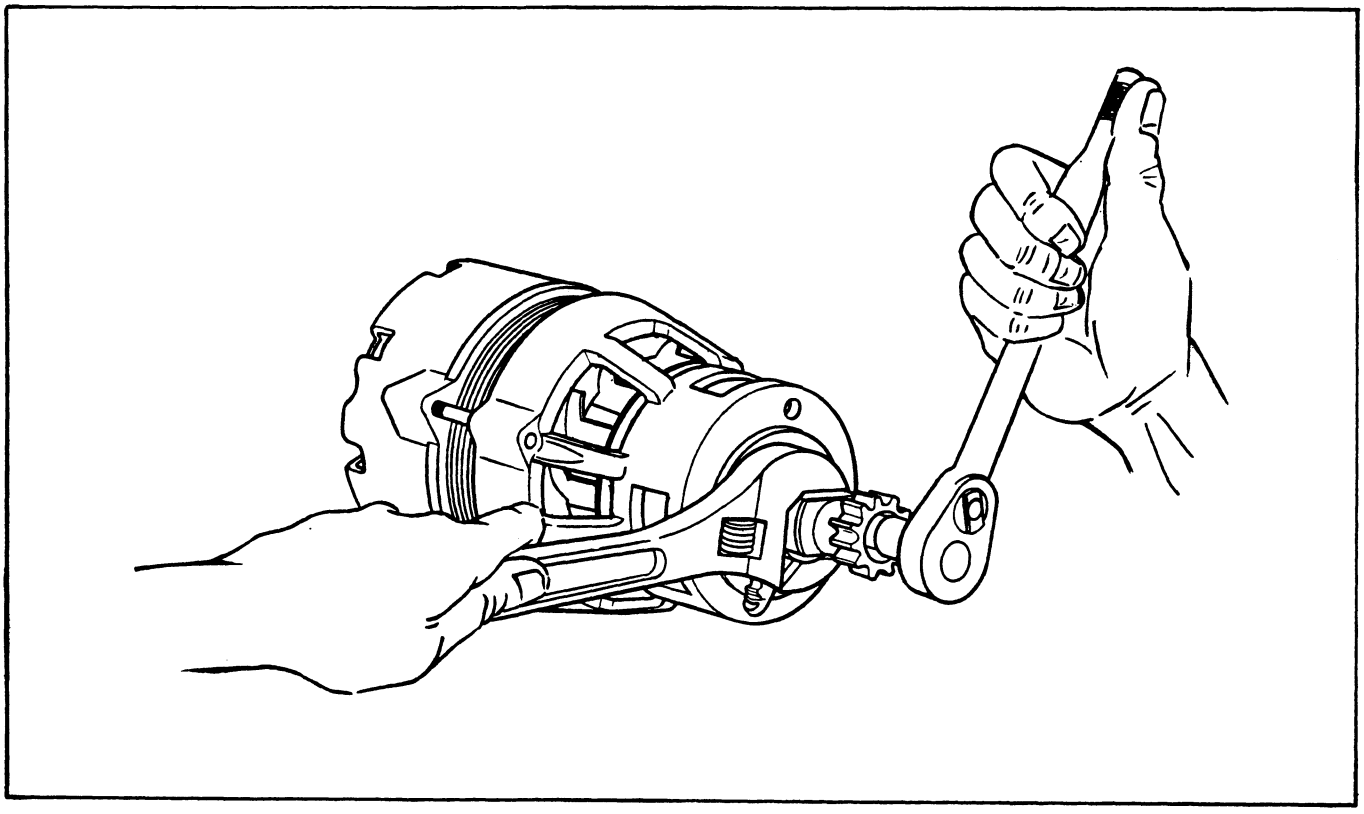


FIGURE 35

C. Remove Rear Housing, Stator and Rectifier Assembly

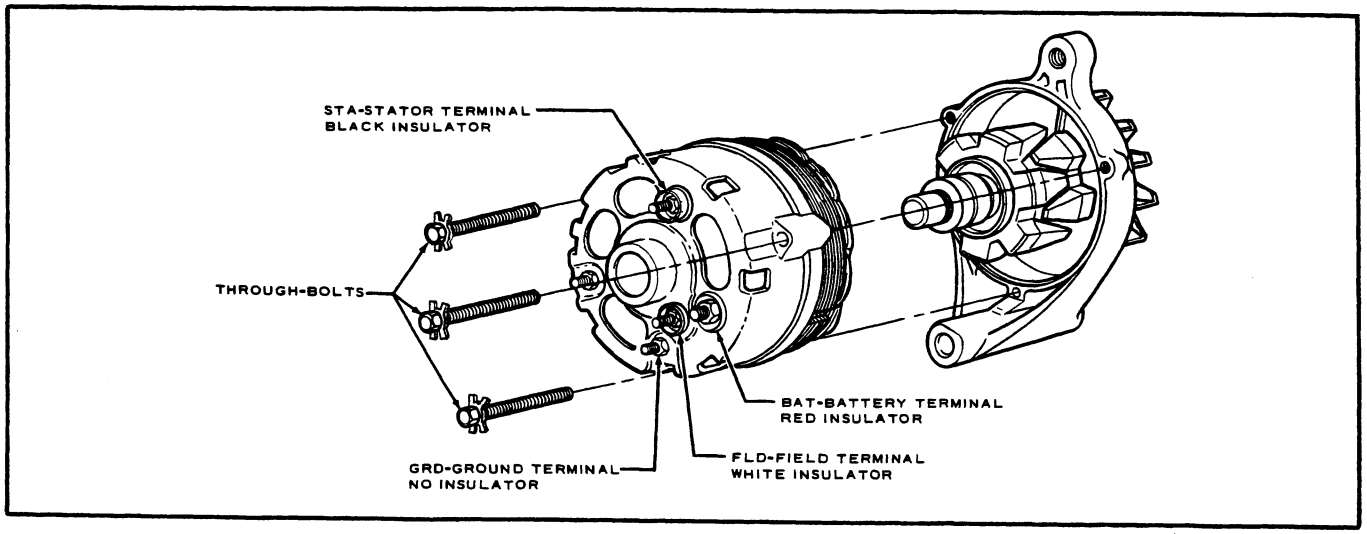


FIGURE 36

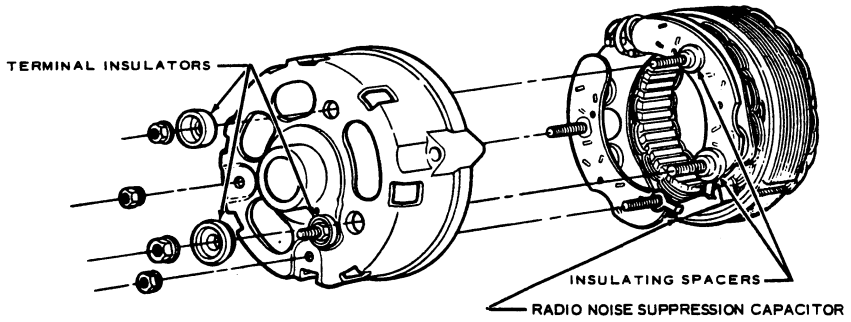
1. Bend the retainer tabs to facilitate removal of bolts. (Use new retainers when reassembling.) Remove three hex head screws (through bolts) that attach the rear housing to front housing. Separate stator core from front housing. (Use a screwdriver in one of the three core slots for stubborn cases.) Slide stator over rotor using a continuous motion to reduce possibility of breaking the grounded brush against the slip-rings.

NOTE

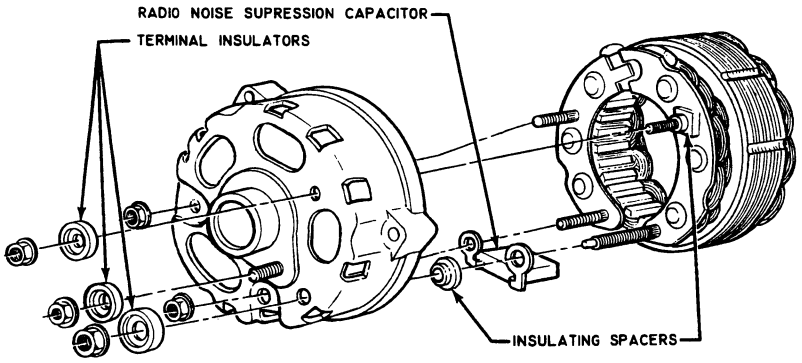
On 52 AMP MODELS use a small screwdriver to raise brushes utilizing a ventilation hole on the rear surface of the housing for accessibility. Hold the brushes in the retracted position by installing a short length of 1/8 to 3/32 inch brazing rod, or stiff wire, through the hole in the bracket provided for the purpose.

2. Retrieve brush springs from rear housing. Wipe away any bearing grease that brushes may have acquired during removal.

D. Remove Stator and Rectifier Assembly From Rear Housing Assembly



ALTERNATOR SHOWN WITH DISCRETE RECTIFIER ASSEMBLY INSTALLED



ALTERNATOR SHOWN WITH INTEGRAL RECTIFIER ASSEMBLY INSTALLED

38 AMP & 60 AMP MODELS

FIGURE 37

1. Remove nut and washer assemblies from studs protruding through rear housing. Remove three terminal insulators on 38 amp and 60 amp models.

2. Separate stator core from rear housing. (Use a screwdriver in one of the three core slots for stubborn cases.)

3. Push rectifier studs through holes in rear housing and remove housing.

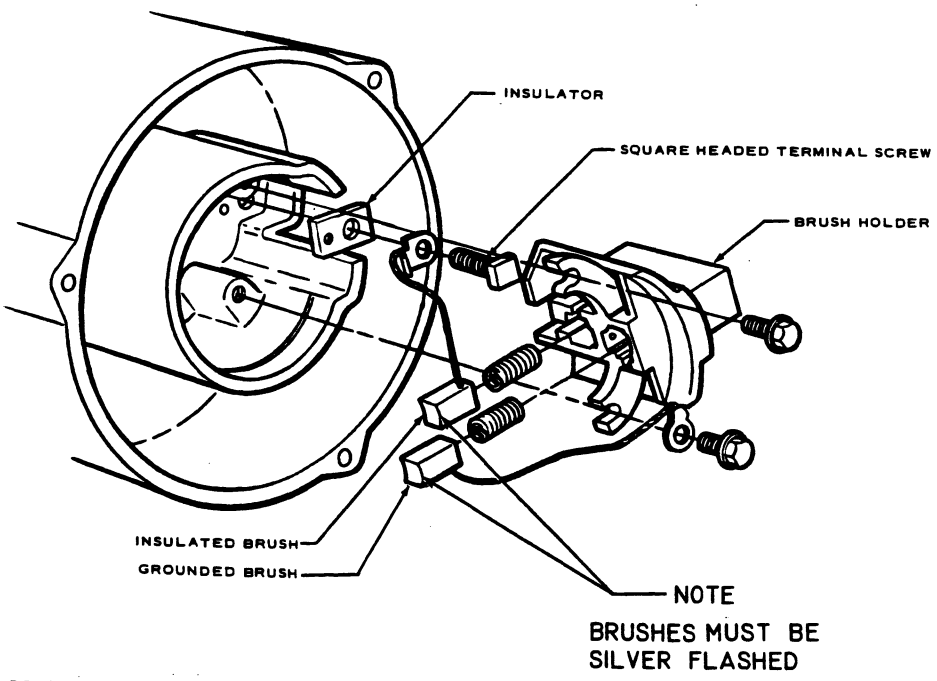
4. Remove two insulating spacers from rectifier studs.

5. Remove radio noise suppression capacitor on 38 amp and 60 amp models.

E. Remove Brush Holder From Rear Housing (38 amp and 60 amp models.)

NOTE

Replace brushes when brushes have been worn down to .25" remaining.



38 AND 60 AMP MODELS

FIGURE 38

1. Remove two screws that attach the brush holder and grounded brush wire terminal to rear housing. Remove brush holder from rear housing.

2. Remove square headed terminal screw, brush, and insulator from rear housing. Separate brushes from attaching hardware.

F. Remove Rear Bearing

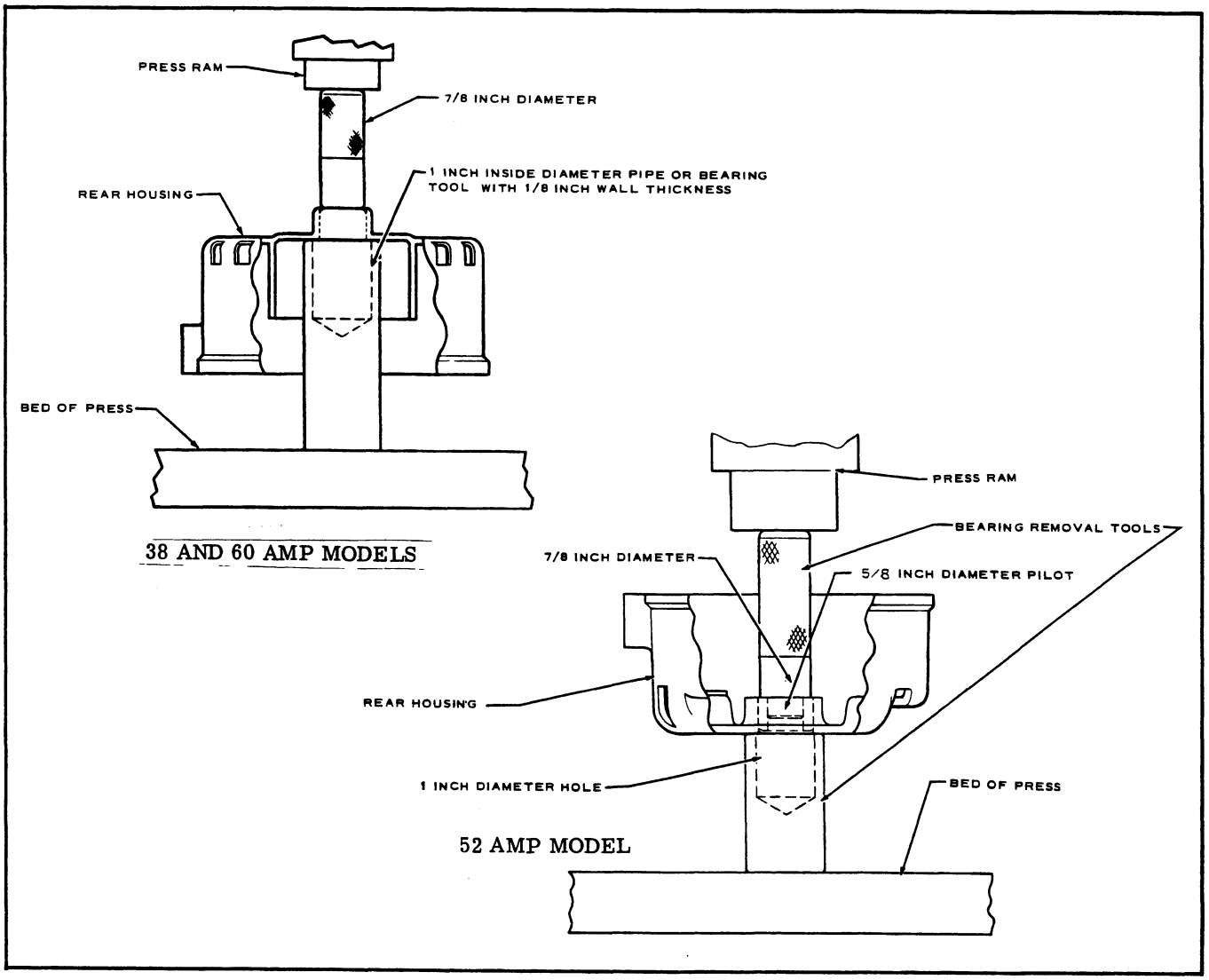


FIGURE 39

1. Position rear housing in arbor press. Use the special tools shown or fabricate tools to the dimensions indicated. Remove bearing only if replacement is indicated by hand spin prior to disassembly of alternator or visual evidence such as hard dry grease or excessively dirty grease.

NOTE

Support the rear housing at the area directly below the bearing boss, as shown, to prevent breakage or distortion of the housing.

2. Press bearing from housing.

G. Remove Rectifier Assembly & Brushes - 52 Amp Model

1. Remove stator wires from diode lead wires. Melt solder, open hook and remove stator wire from hook. Use long nose pliers between hook and diode to conduct heat away from diode. Too much heat can destroy diodes.

NOTE

If only the positive diode plate is to be replaced, only the positive plate diodes need be disconnected. All diodes must be disconnected when the negative (upper) plate is to be replaced.

2. Remove three screws, and six insulators attaching the positive plate to the negative plate.

3. Slide terminal spacer off the studs.

NOTE

If terminal spacer or stator assembly is to be replaced, unsolder neutral wire from blade terminal at this time.

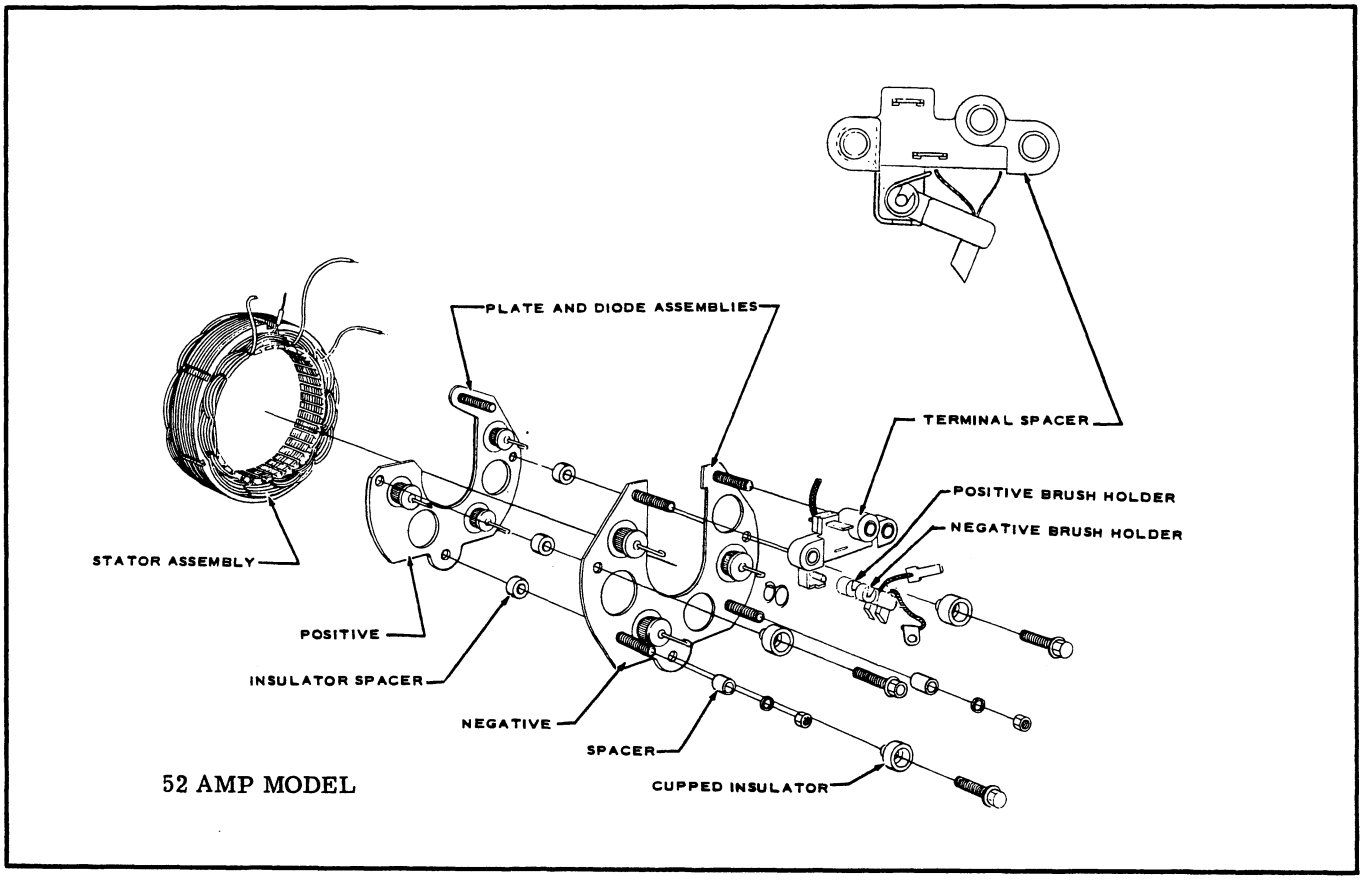


FIGURE 40

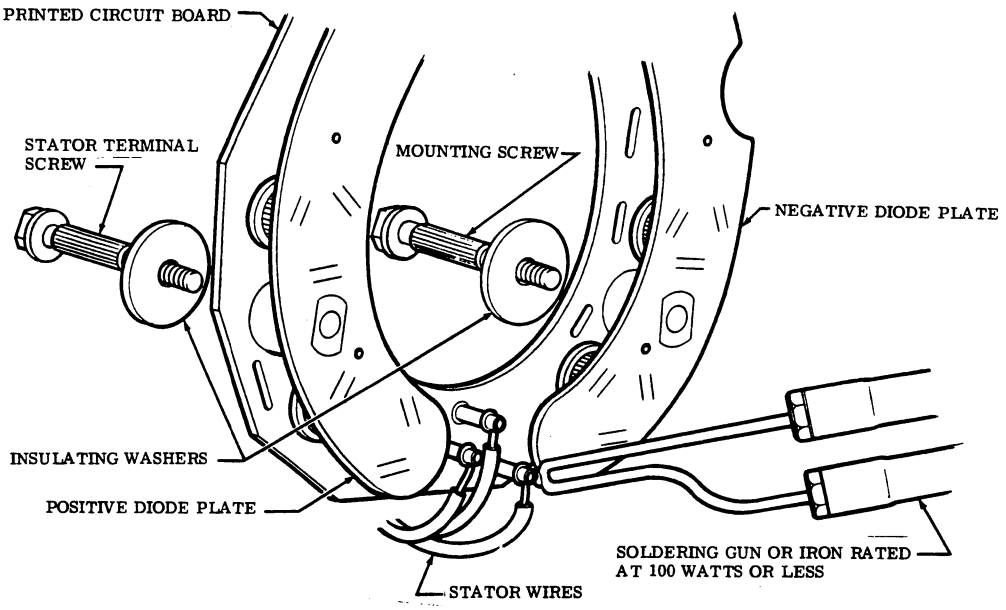
4. Slide both brushes out of brush holders.

5. Use pliers to straighten locking tabs to permit removal of the terminal blade (with brush attached).

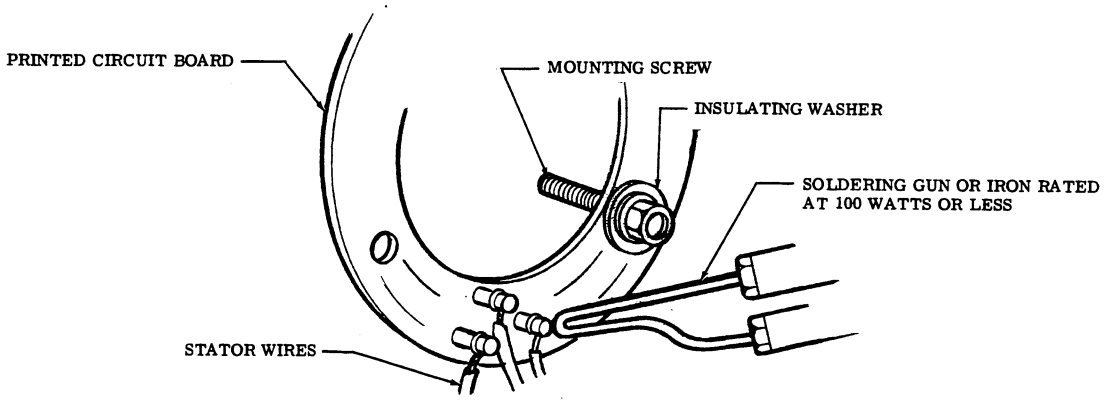
6. Use small screwdriver to unhook spring from each brush holder.

7. Slide brush holders off terminal spacer.

H. Remove Rectifier Assembly From Stator Assembly - 38 Amp & 60 Amp Models.



DISCRETE RECTIFIER ASSEMBLY



INTEGRAL RECTIFIER ASSEMBLY

38 AND 60 AMP MODELS

FIGURE 41

1. Unsolder three stator lead wires from rectifier circuit board. Use a small soldering iron or gun rated at 100 watts or less. Melt solder and open wire loop then remove wire from terminal pin. Excessive heat can damage the circuit board.

2. Remove the stator terminal screw and insulating washer, and the mounting screw and insulating washer.

J. Remove Rotor

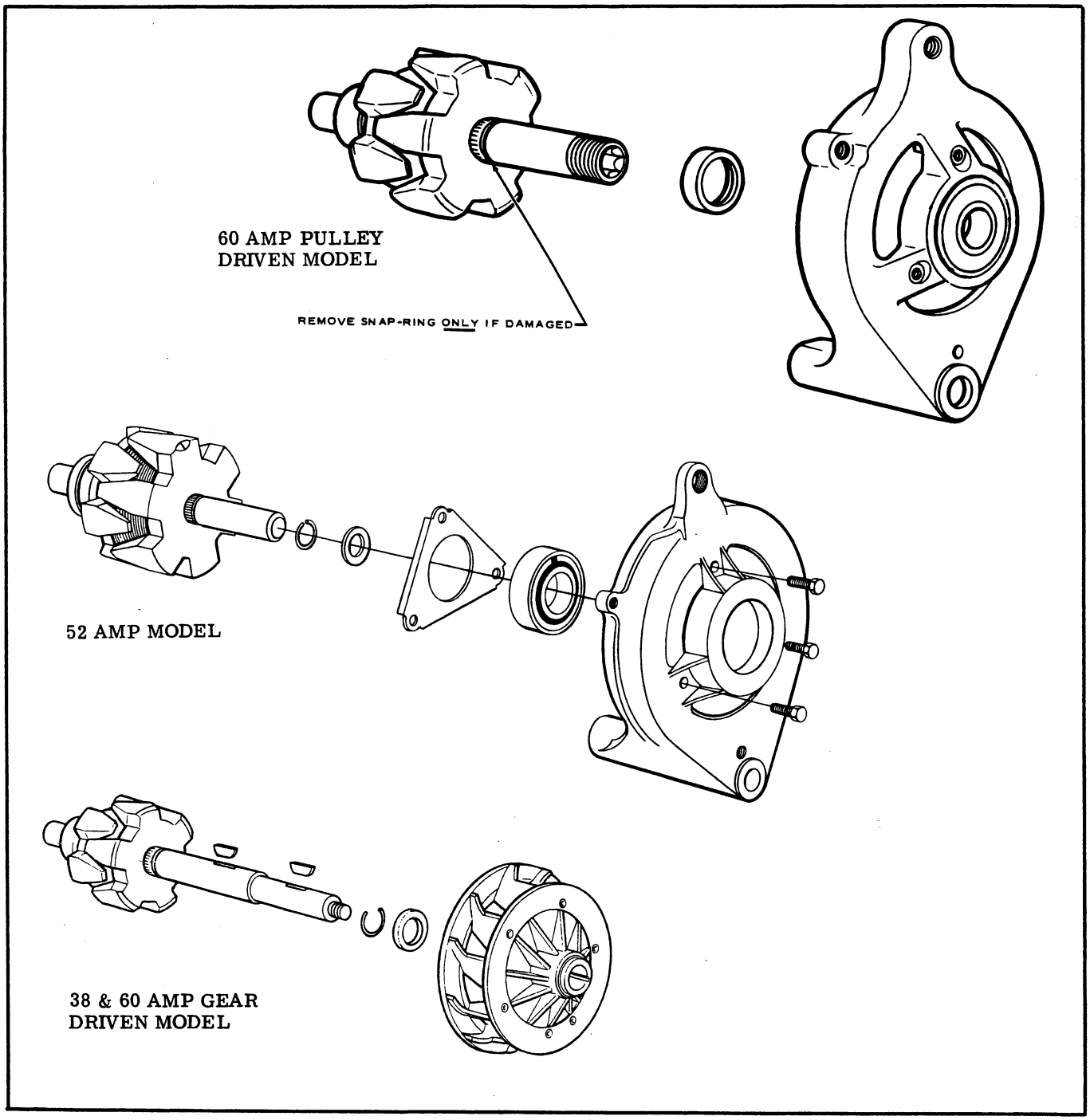


FIGURE 42

1. The rotor shaft is slip-fit in the front bearing on 38 and 60 amp models. An application of penetrating oil will permit ease in removal when rust or corrosion has caused shaft to stick. On 52 amp units the bearing is press fit to the shaft.

2. Remove rotor stop spacer from shaft. Do not remove the snap-ring unless it has been damaged and must be replaced.

GEAR DRIVEN MODELS - After removal of the drive gear and drive gear coupling assembly, remove the oil seal, woodruff key, spacer and "O" ring from the front housing assembly. Remove the rotor and fan assembly

from the front housing and slide the fan from the rotor.

CAUTION

Do not remove the seal unless it has been damaged and must be replaced.

K. Remove Bearing Retainer (ONLY IF FRONT BEARING IS TO BE REPLACED).

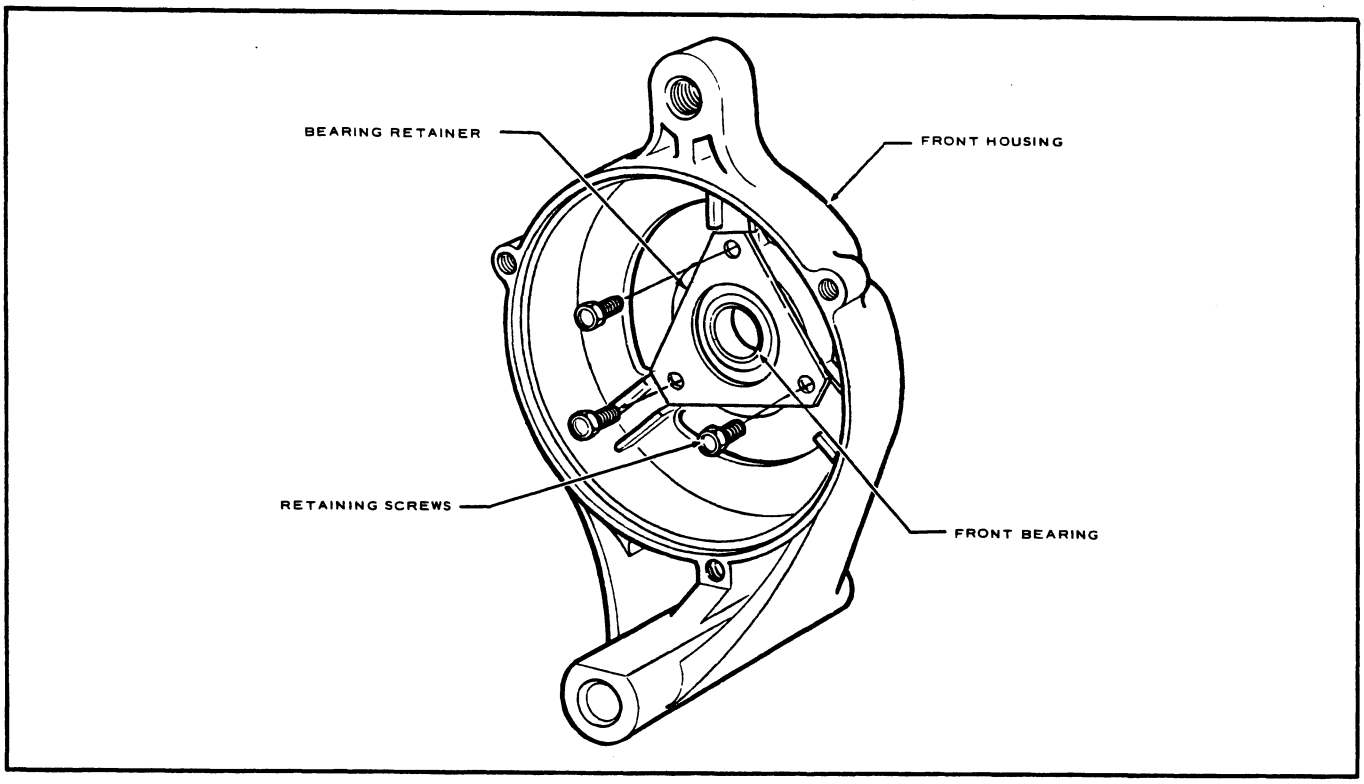


FIGURE 43

1. Remove three screws that secure corners of retainer.
2. Remove retainer from housing.

L. Remove Front Bearing - 38 and 60 Amp Models

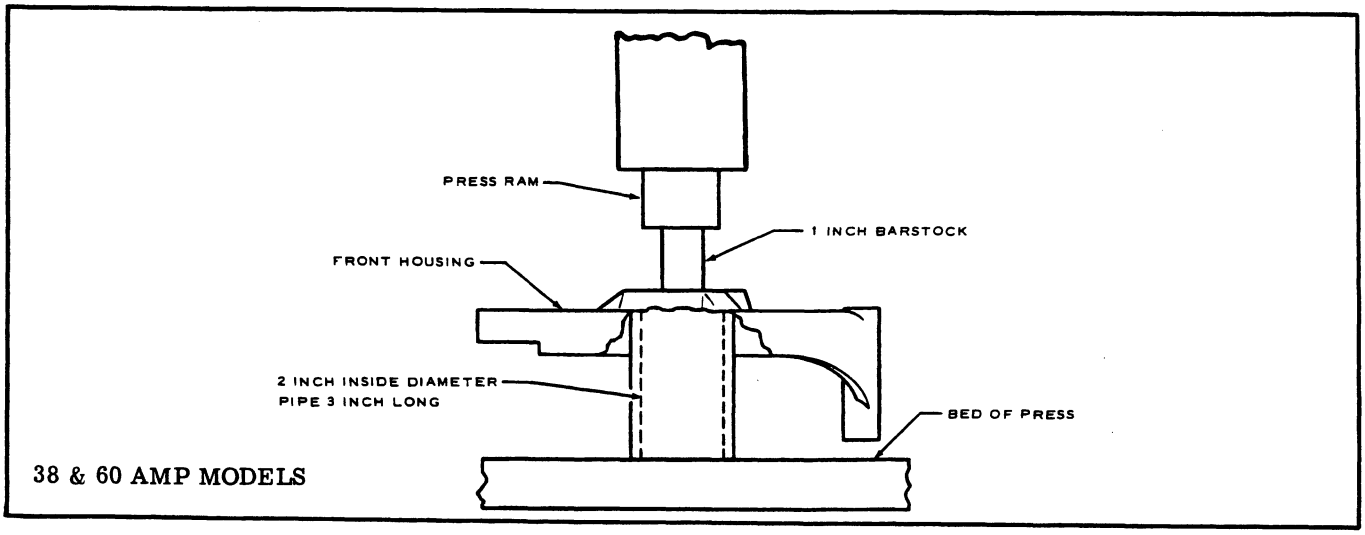


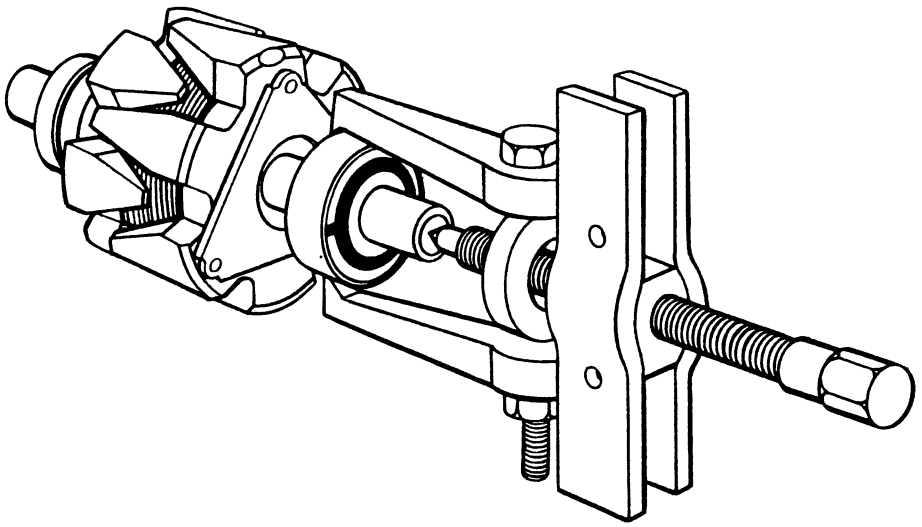
FIGURE 44

1. Remove front bearing only if it must be replaced. The front bearing is a slip fit into the front housing. Under normal circumstances, only thumb pressure will be required to remove bearing. However, if the bearing sticks in the housing, damage to the races will result from the removal pressure.

2. Position front housing in a press as shown. Use a two inch diameter pipe to back up the bearing area of the casting. A bent or broken casting will result from failure to back-up the bearing area.

3. Use a one inch diameter length of bar stock against the bearing inner race to press bearing from housing.

M. Front Bearing Removal - 52 Amp Model



52 AMP MODEL

FIGURE 45

NOTE

BEARING WILL BE DAMAGED WHEN REMOVED. DO NOT REMOVE UNLESS IT IS TO BE REPLACED.

1. Position the bearing retainer against rotor core and the puller to bearing outer race. Remove and discard bearing.

2. Remove bearing retainer. Slide stop off shaft.

3. Use brake service lockwasher pliers to remove stop ring from groove.