

SECTION 9

OVERHAUL PROCEDURES

ALTERNATOR REMOVAL AND INSTALLATION (T182, R182, TR182, 188, T188, U206, TU206, 207, T207, 210, P210 and T303) (See Figure 9-1.)

1. Remove cowling from engine compartment.
2. Disconnect the battery ground cable.
3. Loosen the alternator mounting bolts and remove the adjustment arm-to-alternator bolt.
4. Remove alternator drive belt.
5. Disconnect the wiring harness from the alternator.
6. Remove the alternator by removing the mounting bolt.

Alternator installation is the reversal of the above procedure. Follow belt tightening information provided in Section 7.

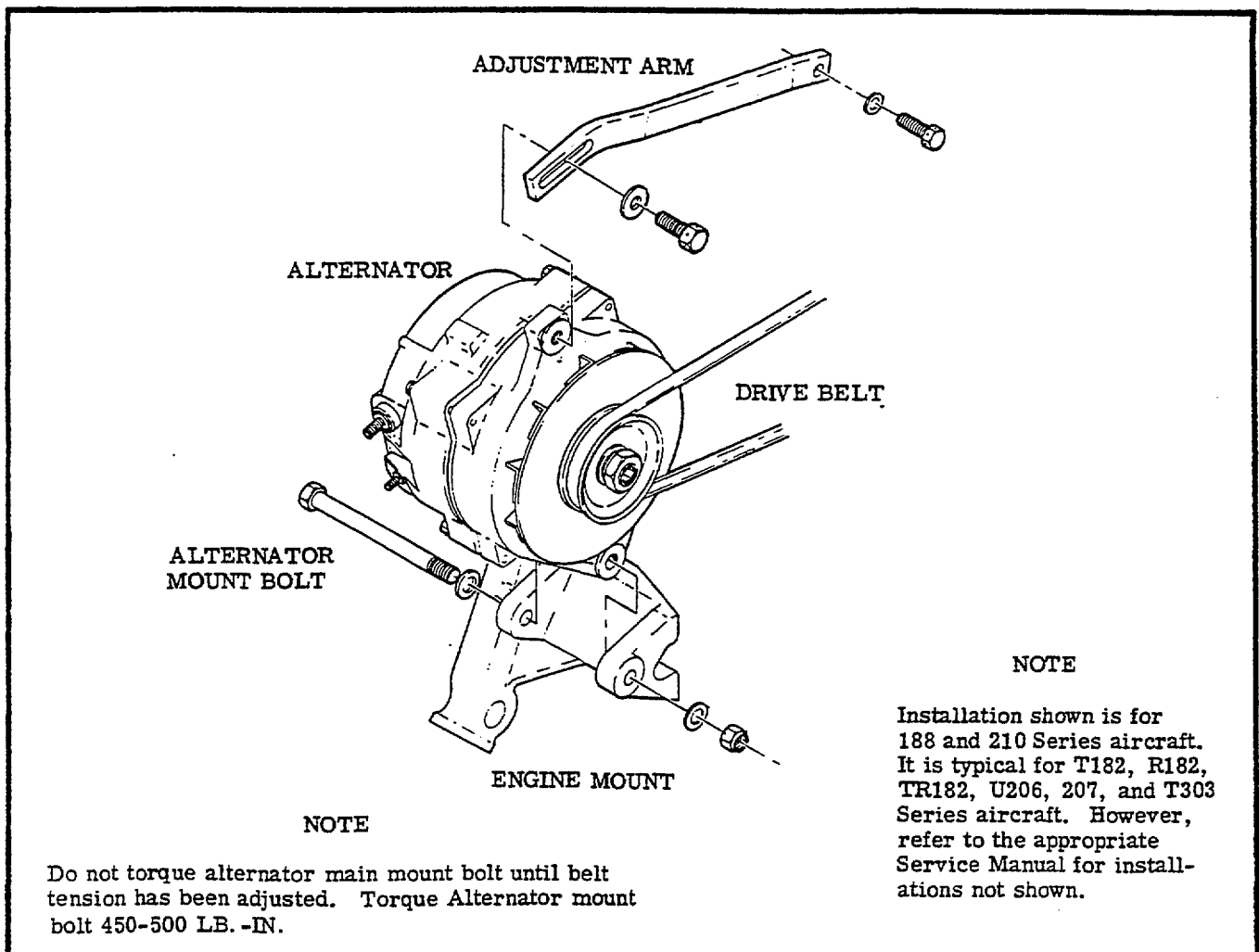


Figure 9-1. Alternator Removal and Installation - T182, R182, TR182, 188, T188, U206, TU206, 207, T207, 210, P210 and T303

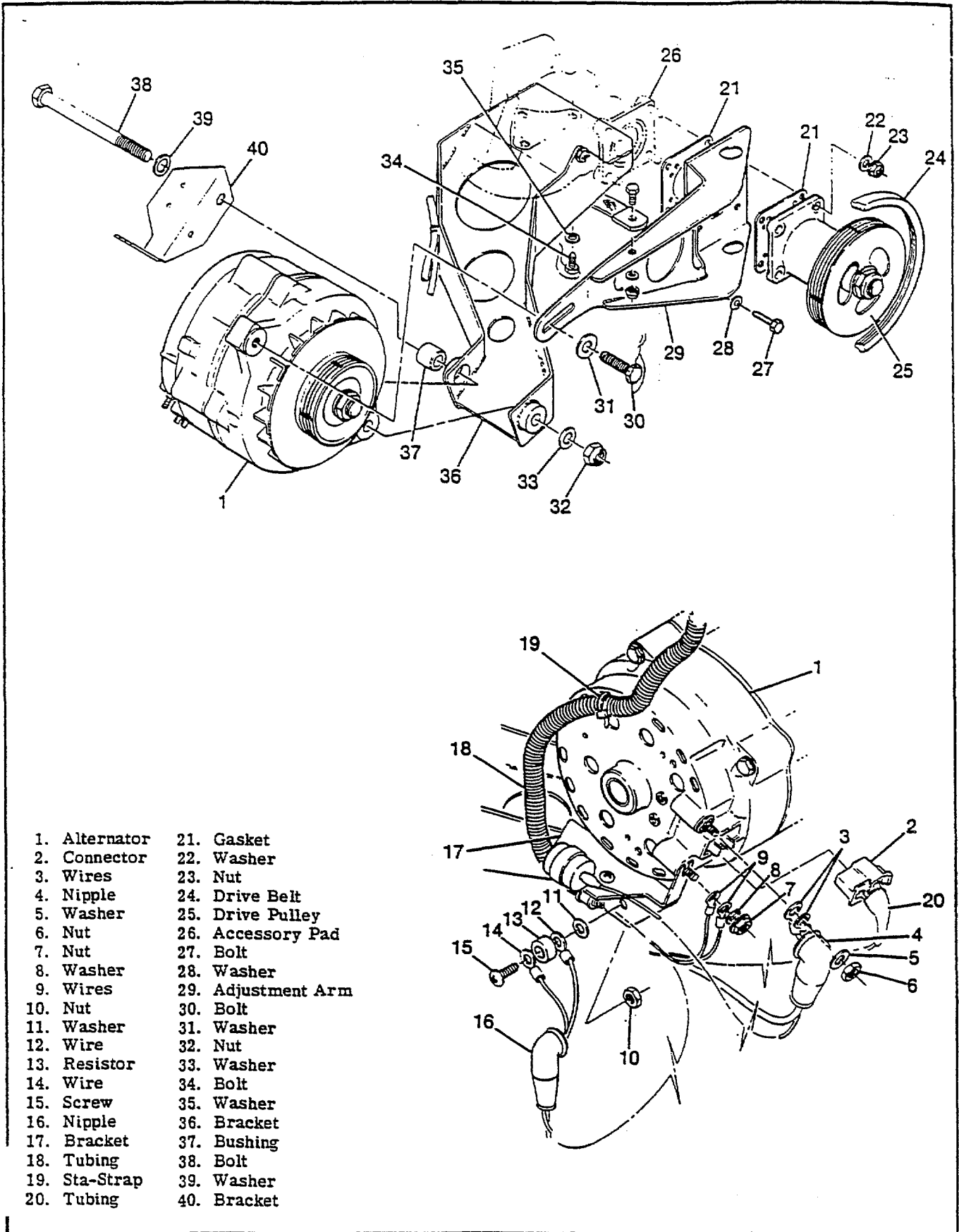


Figure 9-1A. Alternator Removal and Installation - 208, 208A and 208B

ALTERNATOR REMOVAL (208, 208A and 208B) (See Figure 9-1A.)

1. Ensure that airplane electrical power is off.
2. Disconnect the battery connector.
3. Remove connector (2) from alternator (1).
4. Remove nipple (4), nut (6), washer (5) and wires (3) from alternator (1).
5. Remove nut (7), washer (8) and wires (9) from alternator (1).
6. Remove nipple (16), screw (15), wire (14), resistor (13), Wire (12), washer (11) and nut (10) from bracket (17).
7. Remove sta-strap (19) from tubing (18).
8. Remove safety wire from bolt (30) then remove bolt (30) and washer (31).
9. Remove drive belt (24).
10. Remove nut (32), washer (33), bolt (38), washer (39), bracket (40), bushing (37) and alternator (1).

ALTERNATOR INSTALLATION (208, 208A, and 208B) (See Figure 9-1A.)

1. Position alternator (1) on bracket (36), install bushing (37) in mounting hole of bracket (36), position bracket (40), then install bolt (38) with head forward, washer (39), washer (33) and nut (32).
2. Install washer (31) and bolt (30). Do not tighten.
3. Install drive belt (24).
4. Adjust belt tension to obtain .50-inch deflection when measured midway between pulleys, then tighten and safety wire bolt (30).
5. Torque nut (32) on bolt (38) to 450-500 inch pounds.
6. With nipple (16) over wires (12) and (14), install washer (11), wire (12), resistor (13), wire (14), screw (15) and nut (10) on bracket (17), then slide nipple (16) over terminals.
7. Install wires (9), washer (8) and nut (7).
8. With nipple (4) over wires (3), install wires (3), washer (5) and nut (6), then slide nipple (4) over terminals.
9. Install connector (2).
10. Install sta-strap (19) around tubing (18) and secure to alternator (1).

DISASSEMBLY PROCEDURE

1. Scribe a mark across the stator and front and rear housings to facilitate alignment during reassembly.
2. Separate the front housing and rotor from rear housing by removing the four thru bolts between housings and remove rear housing.
3. Remove the retainer nuts and insulators from the "BAT" terminal and "GRD" terminals.

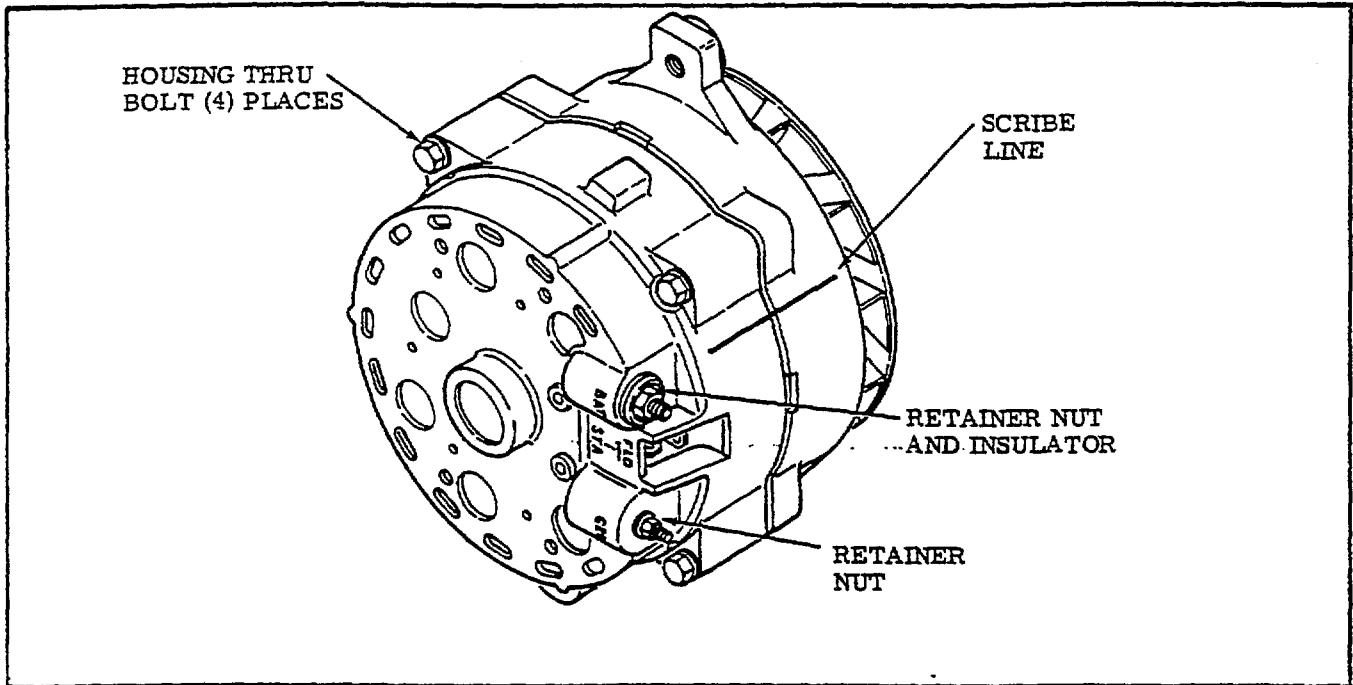


Figure 9-2. Alternator Housing Disassembly

4. It is not necessary to disassemble the complete rear housing to replace the brush assembly only. Unsolder the stator lead, remove two screws securing the brush holder assembly. (Refer to the Assembly Section for installation procedure.
5. Remove 4 retainer bolts from rectifier assembly and 2 retainer bolts from brush assembly, remove 1 screw from radio suppression capacitor lead and remove stator, rectifier assembly and brush assembly from rear housing.
6. If the rear shaft bearing requires replacement support the housing on the inner bearing boss and press the bearing from the housing.
7. If the rectifier is to be replaced, or, if the stator and diodes are to be bench checked, separate the rectifier from the stator by unsoldering the terminal connections of stator windings and rectifier assembly. (Use 100 Watt soldering iron to prevent excessive heat buildup).
8. Unsolder stator terminal from rectifier.

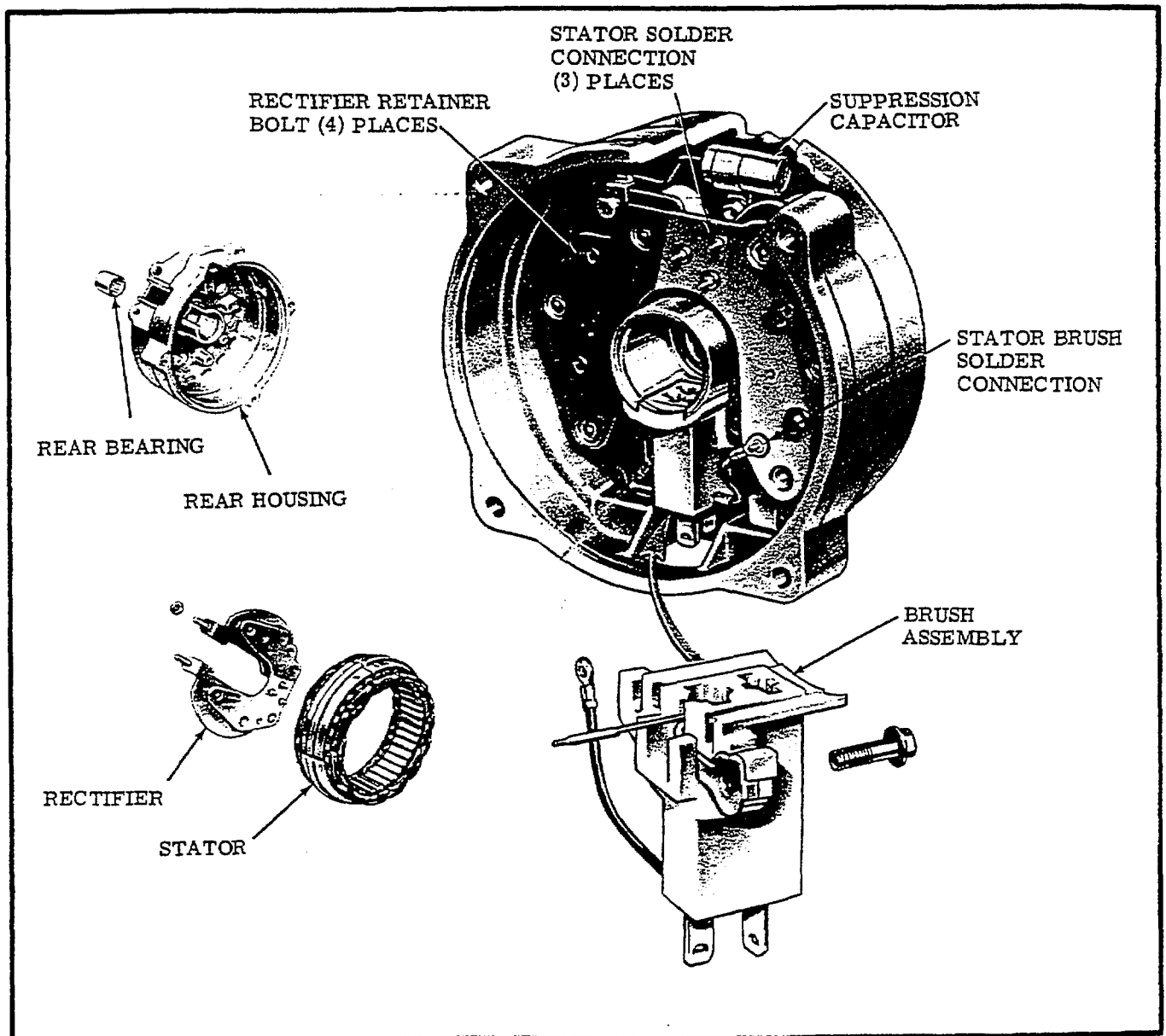


Figure 9-3. Rear Housing Components

- Separate the rotor, fan and pulley from the front housing by removing the hex nut. A special tool similar to figure 9-4 is required to remove nut. Remove pulley, fan and rotor.

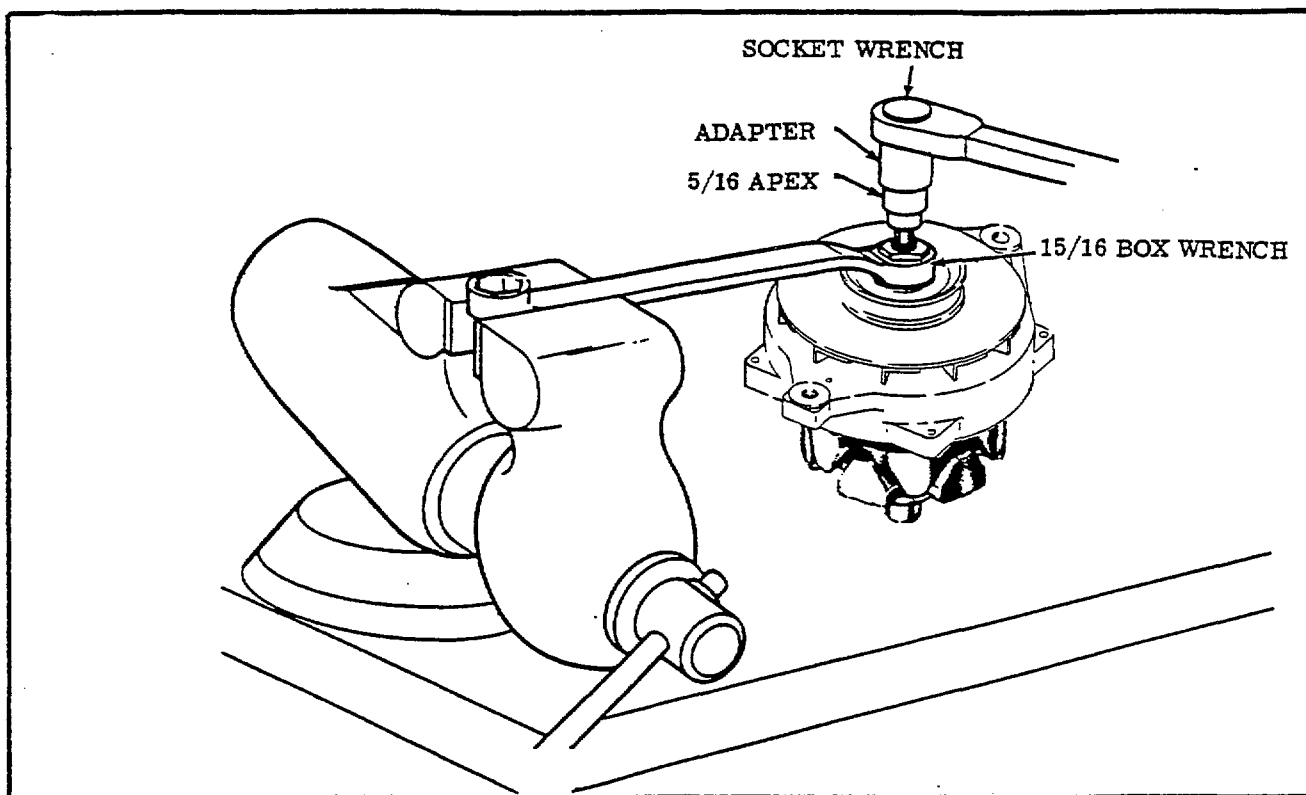


Figure 9-4. Front Housing Disassembly

- Remove the front bearing from the housing by removing the bearing retainer screws. The bearing is normally a slip-fit, however, if stuck, support housing and press bearing from the housing.

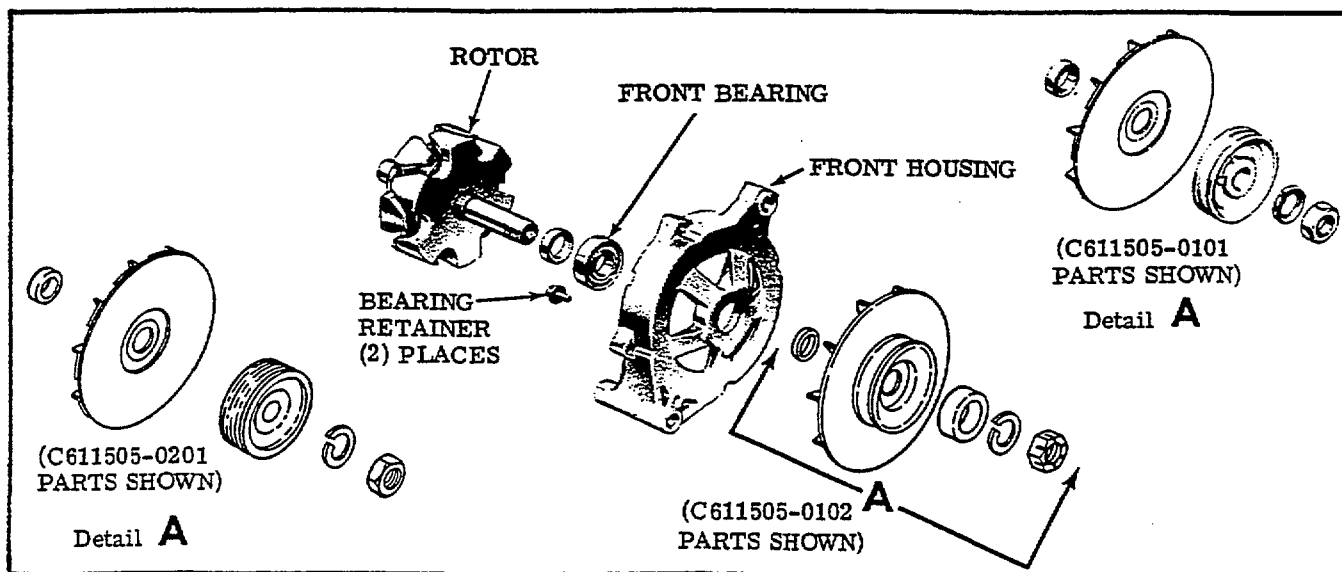


Figure 9-5. Front Housing Components

CLEANING AND INSPECTION

1. Clean the rotor, stator and bearings with a clean cloth. Do not clean these parts with solvent.
2. Rotate the front bearing on the drive end of the rotor shaft. Check for any scraping noise, looseness, or roughness. Look for excessive lubricant leakage. If any of the conditions exist, replace bearing.
3. Inspect the rotor shaft rear bearing surface for roughness or severe chatter marks. Replace the rotor assembly if the shaft is not smooth.
4. Place the rear bearing on the slip-ring end of the rotor shaft and rotate the bearing. Make the same check for noise, looseness, or roughness as was made for the front bearing. Inspect the rollers and cage for damage. Replace the bearing if these conditions exist, or if the lubricant is lost or contaminated.
5. Check the pulley and fan for excessive looseness on the rotor shaft. Replace any pulley or fan that is loose or bent out of shape.
6. Check both the front and rear housings for cracks, particularly in the webbed areas and at the mounting ear. Replace damaged or cracked housings.
7. Check all wire leads on both the stator and rotor assemblies for loose or broken soldered connections and for burned insulation. Resolder poor connections. Replace parts that show signs of burned insulation.
8. Check the slip-rings (brush contacts) for nicks and surface roughness. Nicks and scratches may be removed by turning down the slip rings.

CAUTION

Do not turn slip-rings beyond a minimum diameter of 1.22 inches.
If the rings are badly damaged, replace the rotor assembly.

9. Replace brush assembly if brushes are worn beyond 5/16 inch minimum length.

SEMBLY PROCEDURE

1. Clean all parts with a lint free cloth.
2. Position the front bearing in the front housing and install the bearing retainer screws.
3. Install spacer on rotor shaft and slide rotor shaft through housing and bearing.
4. On (C611505-0101 and C611505-0201) install spacer, fan, pulley, lockwasher and nut.
On (C611505-0102) install spacer, fan and pulley assembly, pulley spacer, lockwasher and nut. Tighten the nut to 60-100 ft. lbs. A special tool similar to figure 9-8 is required to torque nut.

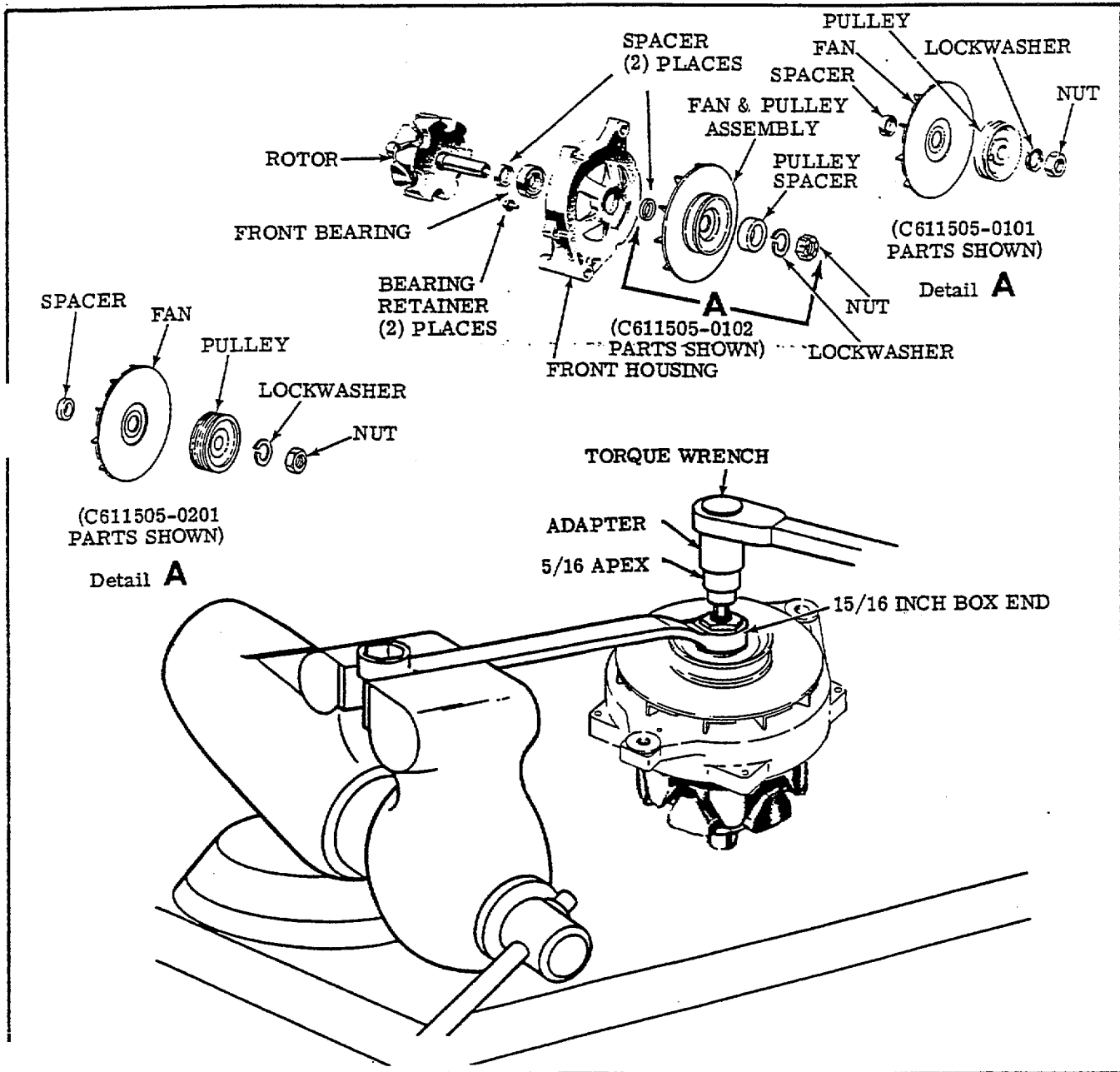


Figure 9-8. Front Housing Assembly

5. If the rear bearing was removed, press a new bearing into place from inside the housing. Apply pressure to the outer race only. Install dust cover over bearing end of housing.
6. Install radio suppressor capacitor in rear housing and install retainer screw.
7. Install springs and brushes into brush holder. Install short length of .040 wire through brush holder to retain brushes in place. Wire should be long enough to extend through hole in housing for removal after housings are assembled.
8. Install two retainer screws in brush assembly and housing. Hold down on brush assembly while tightening screws, to prevent breaking brush assembly attachment brackets.

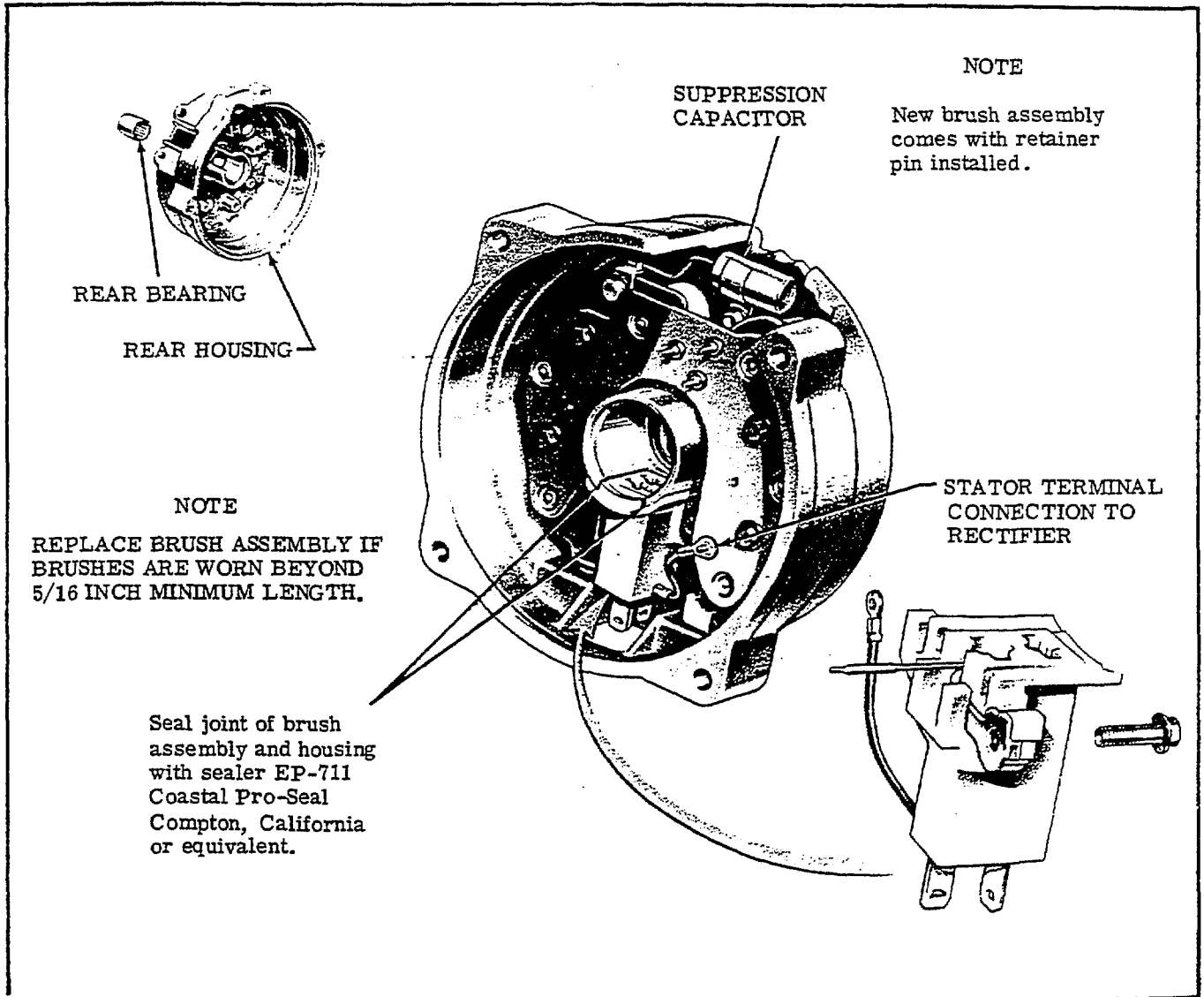


Figure 9-6. Rear Housing Bearing and Brush Assembly Installation

9. Install insulator on "BAT" post of rectifier assembly and install insulators (2) in place in the rear housing for mounting bolts in positive "BAT" side of rectifier.
10. Carefully install rectifier and stator into rear housing, assure insulators are in place. Install "BAT" post insulator and nut and "GRD" post retainer nut, finger tight.
11. Install the 4 rectifier retainer bolts (check insulators on positive side) finger tight, and install suppression capacitor lead to rectifier and tighten screw.
12. Tighten "BAT" and "GRD" retainer nuts then 4 rectifier retainer bolts.
13. If stator has been separated from the rectifier, install the 3 stator winding leads to rectifier posts and solder with 100 watt iron (to prevent overheating of connection) and resin core solder. Solder the stator terminal lead to diode assembly.

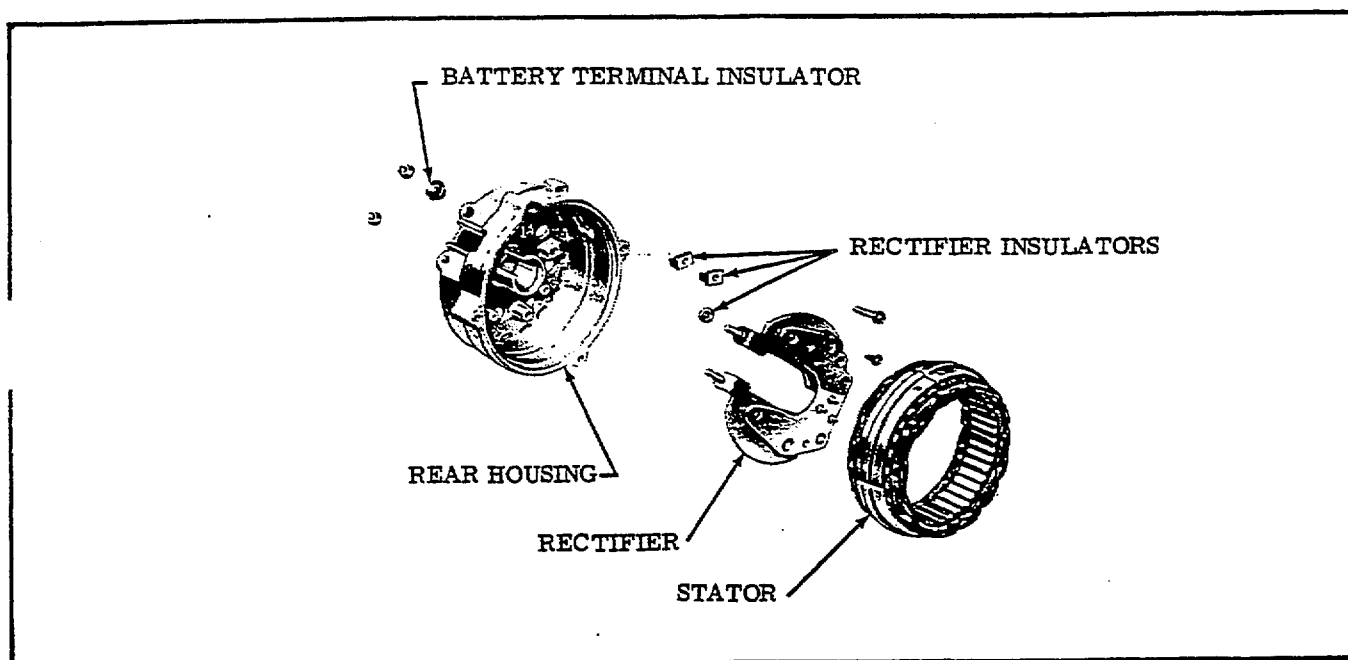


Figure 9-7. Rear Housing Components

14. Position the front and rear housings together, align scribe marks on housings and stator, and install four thru-bolts in housings. Alternately tighten each thru-bolt around alternator until a preliminary torque of 15 to 25 inch pounds is reached for each bolt. Final torque each thru-bolt alternately around the alternator until each bolt is torqued 45 to 60 inch pounds.
15. Spin pulley to ensure that alternator is free of binding or noise.
16. Pull retainer wire from brush assembly and seal hole in housing with EP-711 Coast Pro-Seal Compton, California or equivalent.

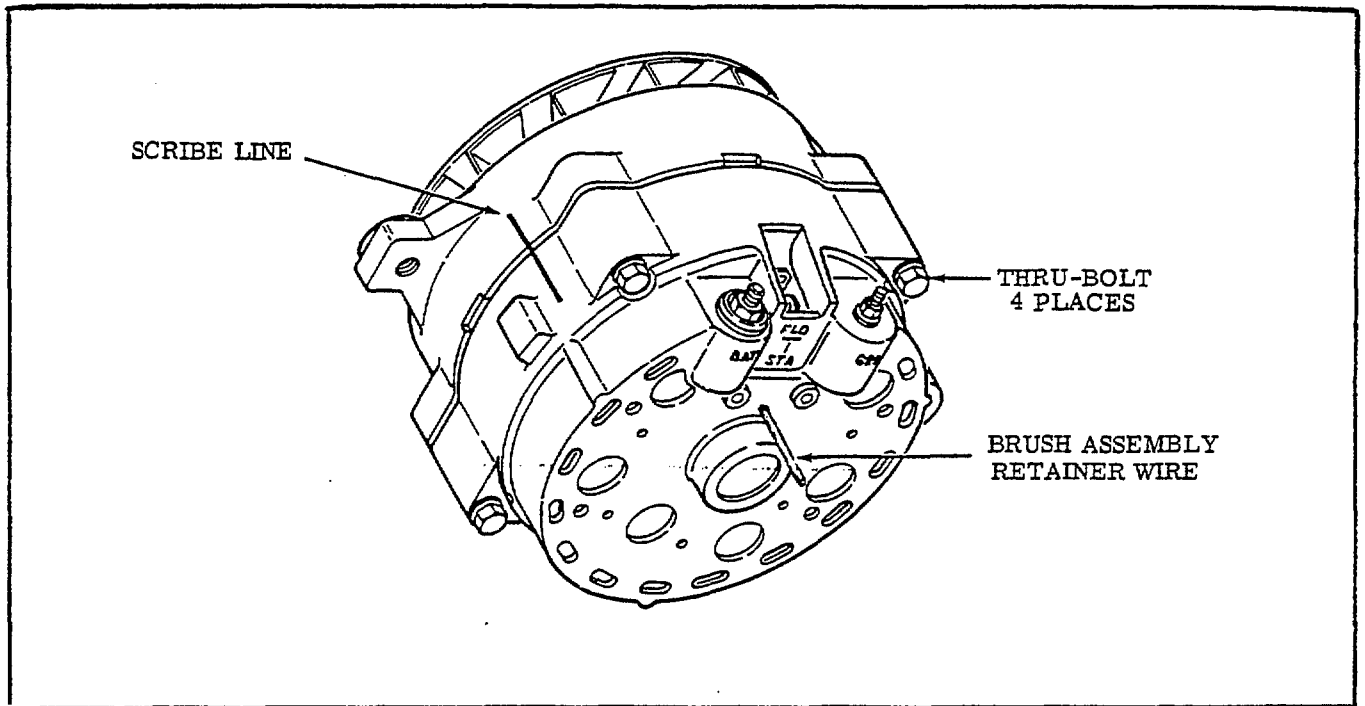


Figure 9-9. Housings Assembly