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Delco-Remy

ANDERSON, INDIANA, U.S.A.

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G-GENERATORS

Supersedes Bulletin 1G-150

ADJUSTMENTS, TESTS AND MAINTENANCE OF **D.C. GENERATORS**

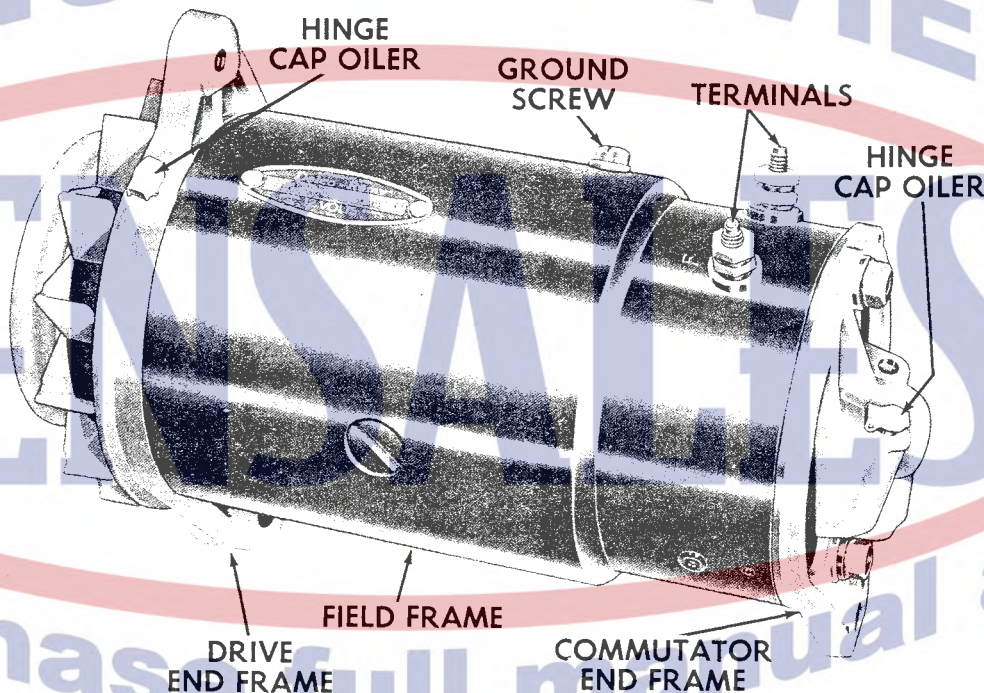


Figure 1—Typical D.C. Generator.

INTRODUCTION

Delco-Remy d.c. generators are manufactured in a wide range of sizes and types, but the basic design of each generator is the same. Regardless of size, each generator has an armature mounted at both ends on bearings. The armature rotates between pole shoes over which are wound field coils. The voltage and current developed in the armature windings is supplied through brushes riding on a commutator to the generator terminals, and then to the battery and other electrical accessories in the circuit. Since all d.c. generators adhere to the same basic design, the maintenance and testing procedures for all sizes are similar. A typical generator is shown in Figure 1.

This bulletin covers the different types and designs of d.c. generators along with recommended service procedures for each. The subject of Operating Principles is covered in Delco-Remy Training Chart Manual DR-5133E.

TYPES AND DESIGNS

The following cross sectional views illustrate the various types of generators manufactured by Delco-Remy.

The extruded frame two-brush two-pole type of generator shown in Figure 2 has a frame diameter size of $4\frac{5}{8}$ inches. Each end frame has hinge cap oilers for periodic lubrication, and the commutator end frame features a bronze bushing and an oil reservoir. Continuous lubrication to the bushing and shaft is provided by a wick which extends through a hole in the bushing to contact the shaft. A special version in the $4\frac{5}{8}$ inch frame diameter size is the generator shown in Figure 3. This assembly features a blast tube for forced air cooling, and sealed ball bearings in each end frame which are lubricated for the life of the bearing.

The generator shown in Figure 4 has a frame diameter size of $5\frac{1}{8}$ inches. It features ball bearings

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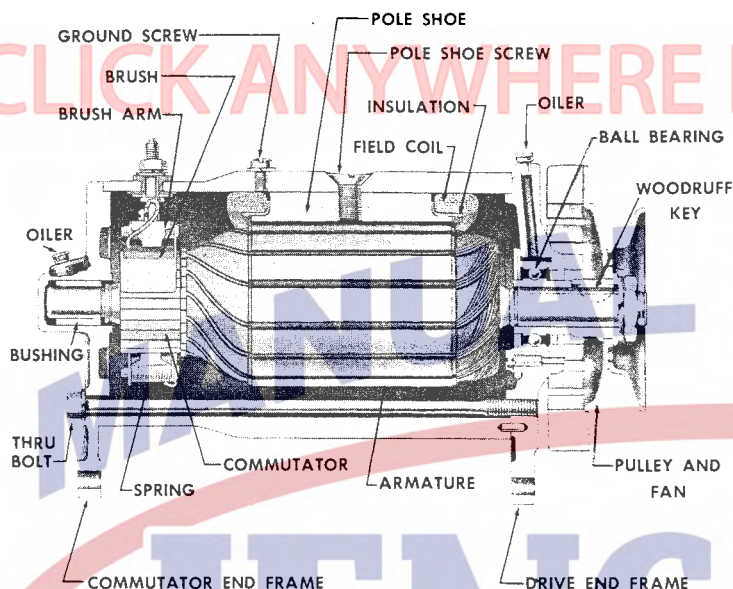


Figure 2—Cross sectional view of typical 4 $\frac{5}{8}$ " frame diameter generator.

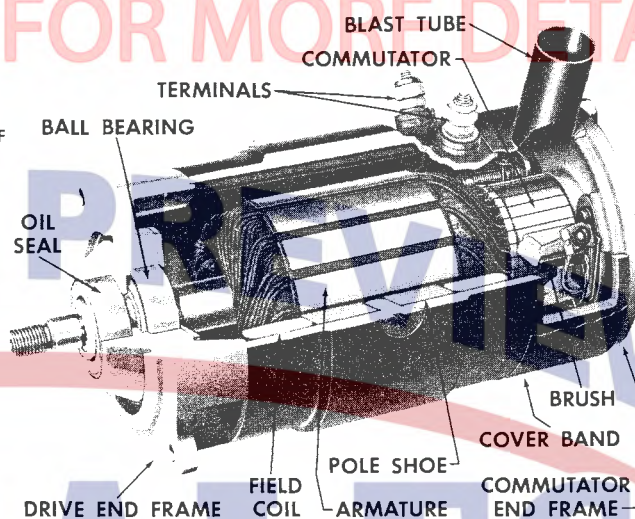


Figure 3—Cutaway view of typical 4 $\frac{5}{8}$ " frame diameter generator with provision for forced air cooling.

and hinge cap oilers in each end frame, and a cover band which can be removed for easy inspection of the brushes and commutator. This generator is of the two-brush two-pole type.

In Figure 5 is illustrated a two-brush two-pole generator which is similar in construction but larger in size than the assembly shown in Figure 4. This generator has a frame diameter of 5 $\frac{5}{8}$ or

5 $\frac{3}{4}$ inches and a cover band that can be removed to permit easy inspection of the brushes and commutator.

The generator illustrated in Figure 6 has two brushes, two poles, and a frame diameter size of 5 $\frac{5}{8}$ or 5 $\frac{3}{4}$ inches. This type generator features grease reservoirs providing permanent-type lubri-

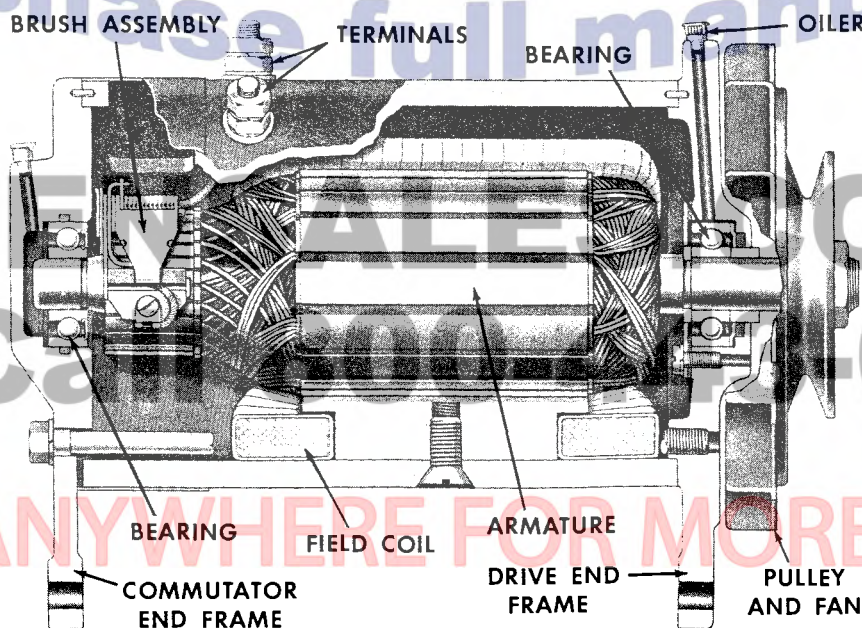


Figure 4—Cross sectional view of typical 5 $\frac{1}{8}$ " frame diameter generator.



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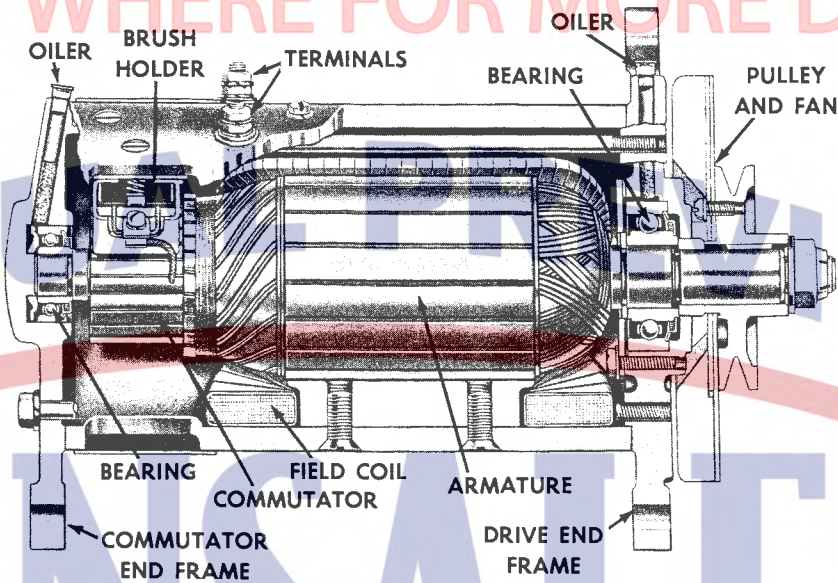


Figure 5—Cross sectional view of typical generator having frame diameter of 5 $\frac{3}{8}$ " or 5 $\frac{1}{4}$ ".

cation, and extra long brushes with special constant-tension brush springs. These design features eliminate the need for periodic lubrication and brush replacement between engine overhaul periods. Cover plates which are mounted over windows in the field frame can be easily removed for inspection of the brushes and commutator.

The assembly shown in Figure 7 has a frame diameter size of 6 $\frac{1}{8}$ inches. The ball bearings in each end frame in this generator are sealed for life, and no periodic generator lubrication is required. Generators in this frame size have four poles, and some models have two brushes whereas others have four brushes.

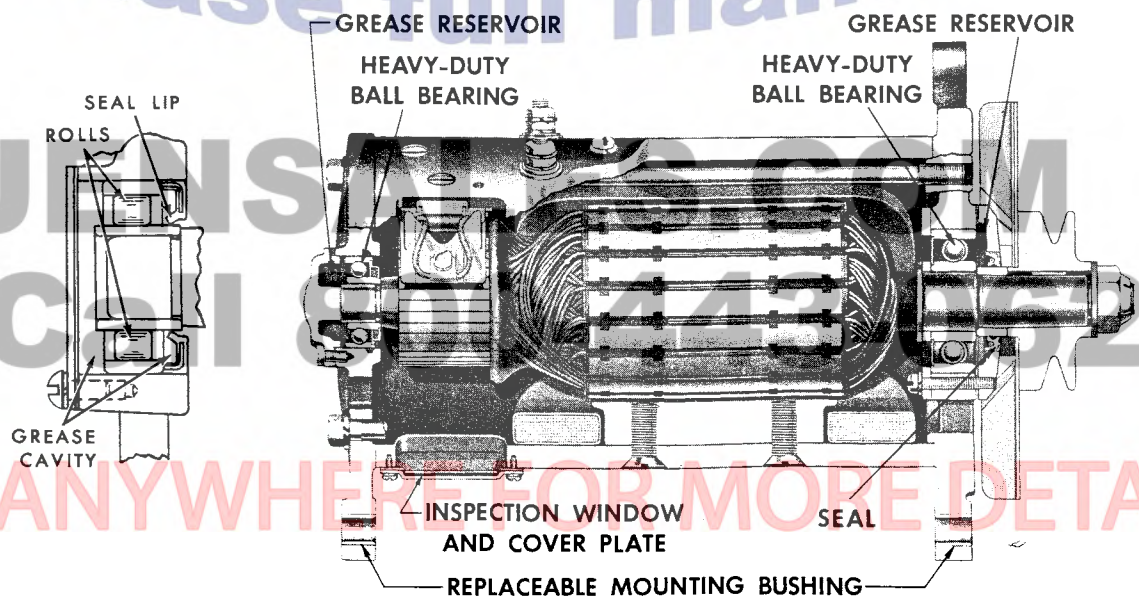


Figure 6—Cross sectional view of 5 $\frac{3}{8}$ " or 5 $\frac{1}{4}$ " frame diameter generator with special brushes and permanent bearing lubrication. Some models use a roller bearing with both types of end frames illustrated.



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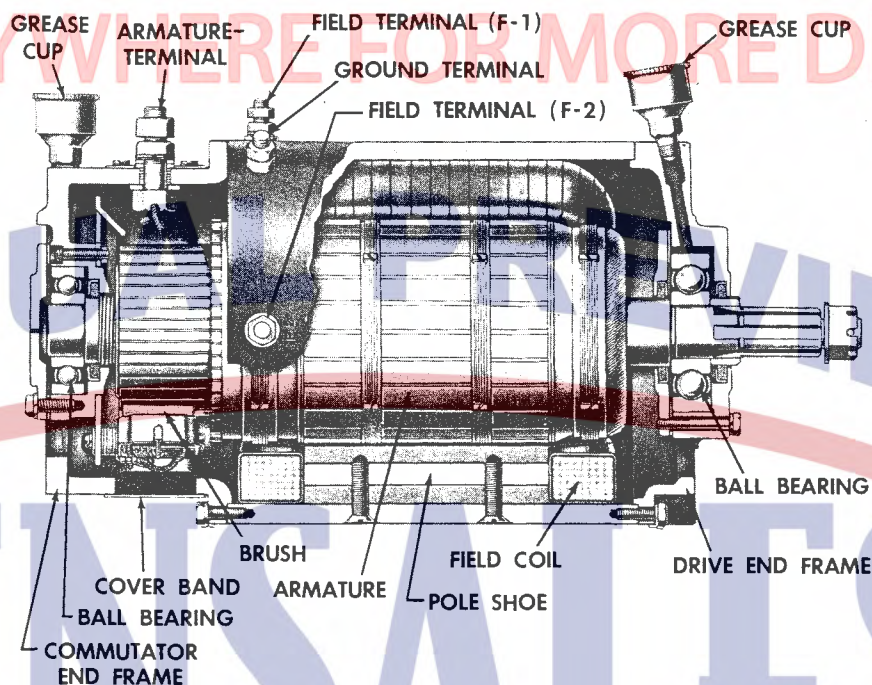


Figure 9—Cross sectional view of typical $8\frac{3}{16}$ " frame diameter generator with split fields.

through the generator by the fan. Ball bearings are used in each end frame, and lubrication is provided by grease cups.

The generator shown in Figure 10 is also of the $8\frac{9}{16}$ inch frame diameter type, but the frame length is shorter as compared to the assembly pictured

in Figure 9. This type generator also has grease cups and a filter cover, but uses a roller bearing in the drive end frame with a ball bearing in the commutator end frame. This type assembly features six brushes and six poles, along with three interpoles connected in series with each other. (See Figure 15.)

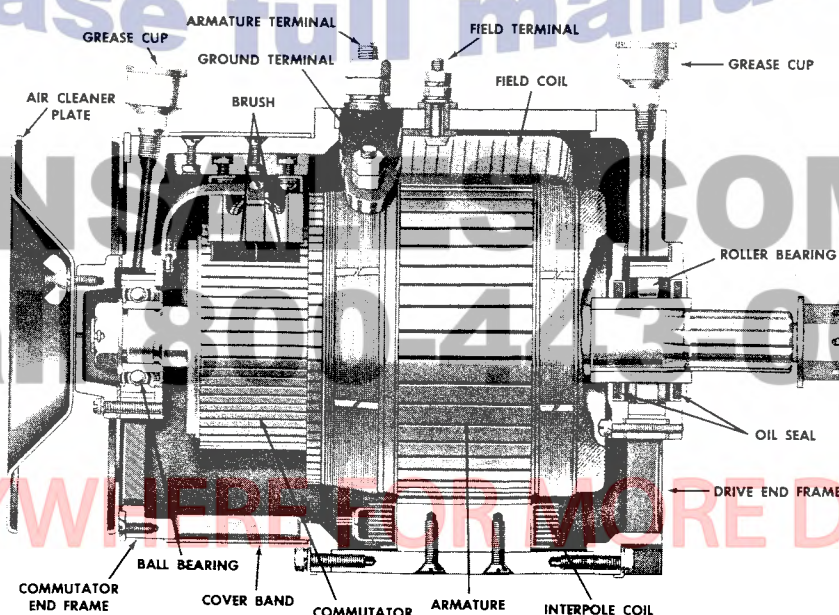


Figure 10—Cross sectional view of typical $8\frac{9}{16}$ " frame diameter generator having six poles.

D.C. GENERATORS



MAINTENANCE

Maintenance procedures may be divided into two sections—Lubrication and Inspection.

Lubrication

It is very important that proper lubrication procedures be followed in order to obtain maximum life from the generator.

All bearings used in generators use grease to retain the oil which bleeds to the bearing surfaces to provide proper lubrication. On some generator models hinge cap oilers are used so that the oil supply in the grease can be replenished. Other models feature grease cups which permit direct application of additional grease to the bearing as the original supply becomes exhausted. Some generators contain a built-in reserve supply of grease in a reservoir located in the generator end frame, and others use bearings which are sealed on both sides to retain the original grease supply.

On generators having hinge cap oilers, a few drops of SAE No. 20 oil should be added at vehicle or engine lubrication periods. Generators with grease cups should have the grease cups turned down one full turn at vehicle or engine lubrication periods. Generators having sealed bearings, and those with grease reservoirs in the end frames, require no periodic lubrication, and are designed to operate between engine or generator overhaul periods without lubrication attention.

There are two types of grease recommended for bearings in d.c. generators. For generators of the type shown in Figures 2 and 4, any high grade grease of reputable manufacture is satisfactory. On these types of generators, the bearing should be refilled only one-quarter full, so that the balls are completely covered but the separator remains exposed. Also grease reservoirs should be only half filled with grease so that when the generator is reassembled, the reservoir will be only half-filled.

CAUTION: Overfilling will cause the bearing to overheat, resulting in premature failure. Keep lubricants perfectly clean, as the smallest amount of dirt or other foreign matter in a bearing will cause premature failure.

For other d.c. generators such as those shown in Figures 5, 6, 8, 9 and 10, Delco-Remy lubricant No. 1948791 is recommended. On these types of generators, the bearing may be reused if the service mileage is low and if a reasonable amount of the grease supply in the bearing remains, and if the bearing is otherwise not defective. However, if the grease supply in the bearing is nearly or completely exhausted, it should be replaced with a new bearing. **CAUTION:** Do not add grease to a bearing used on these types of generators. Always

replace with a new bearing instead of adding grease to the old bearing. On these generators, No. 1948791 grease may be added to the grease cups and to the reservoirs in the end frames as required.

CAUTION: Add only enough grease to the reservoirs so that when the generator is reassembled, the reservoir will be only half-filled. Overfilling will cause the bearing to overheat, resulting in premature failure. Keep lubricants perfectly clean, as the smallest amount of dirt or other foreign matter in a bearing will cause premature failure.

The generators shown in Figures 3 and 7 have sealed bearings. On this type of assembly, no periodic lubrication is required, and the bearings should be replaced at engine overhaul periods.

Inspection

Inspection procedures are limited mostly to visual checks for loose mounting bolts, a loose drive belt, damaged wiring, and worn commutator brushes.

All mounting bolts should be kept tight, and the belt tension should be adjusted to conform with engine or vehicle manufacturer's recommendations.

Wiring with frayed insulation should be replaced, and all connections should be checked for tightness and cleanliness.

If the commutator is dirty, it may be cleaned with No. 00 sandpaper, or with a brush seating stone, with the generator in operation. Blow away all dust after the cleaning operation. If the commutator is rough, out of round, or has high mica, the armature must be removed so the commutator can be turned down in a lathe and the insulation between bars undercut. Remove only enough material to make the commutator smooth and round, and undercut the insulation 1/32 inch deep and



Figure 11—Measuring brush spring tension on generators of the type shown in Figure 1.