TM 9-1825A

WAR DEPARTMENT TECHNICAL MANUAL

ORDNANCE MAINTENANCE

ELECTRICAL EQUIPMENT (DELCO-REMY)

WAR DEPARTMENT *12 JANUARY 1944*

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TM 9-1825A, Ordnance Maintenance: Electrical Equipment (Delco-Remy), is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

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(For explanation of symbols, see FM 21-6)

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CHAPTER 1

INTRODUCTION

1. SCOPE.

a. The instructions contained in this manual are for the information and guidance of personnel charged with the maintenance and repair of Delco-Remy electrical equipment. These instructions are supplementary to field and technical manuals prepared for the using arms. This manual does not contain information which is intended primarily for the using arms, since such information is available to ordnance maintenance personnel in 100-series TM's or FM's.

b. This manual contains a description of, and procedure for disassembly, inspection, repair, assembly, and test of Delco-Remy electrical equipment used on ordnance applications.

2. CONTENTS AND ARRANGEMENT OF MANUAL.

a. The chapters in the manual deal with the various electrical units used on ordnance applications. Thus, chapter 2 covers Generators; chapter 3, Regulators, and so on, as listed in the table of contents. Each chapter is broken down into sections, which deal with various constructions and designs of the electrical unit covered in the chapter. Thus, chapter 2, Generators, is divided into five sections, the first of which is general. Section II covers third-brush standard-duty generators; section III covers Shunt, standard-duty generators; section IV covers Third-brush, heavy-duty generators, while section V covers Shunt, heavy-duty generators. The specifications for each type of generator are covered in the particular section that deals with that type generator. All other chapters are similarly arranged.

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CHAPTER 2

GENERATORS

Section I

BASIC PRINCIPLES OF OPERATION

3. CONSTRUCTION.

a. The generator is a machine used to convert mechanical energy into electrical energy. The generator is so mounted as to be driven by the engine, and it uses some of the mechanical energy from the engine to create electrical energy. The generator consists of a field frame with field coils which produce a magnetic field, an armature to support

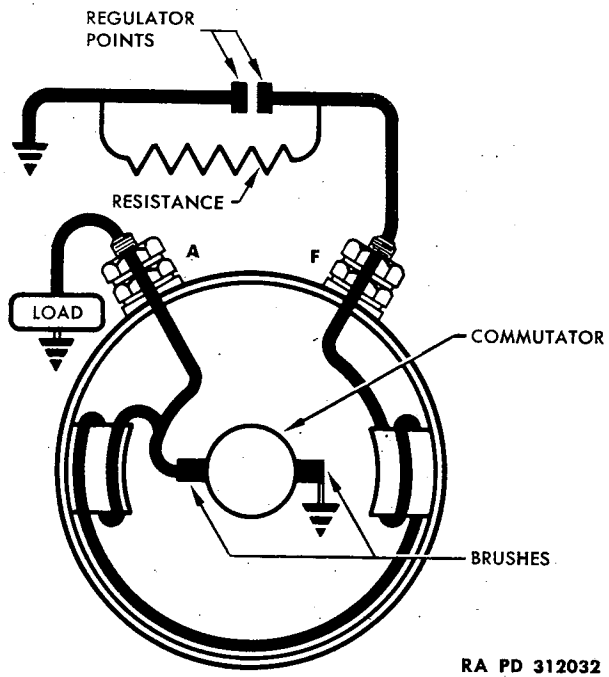

Figure 1—Type One Generator—Externally Grounded Field Circuit

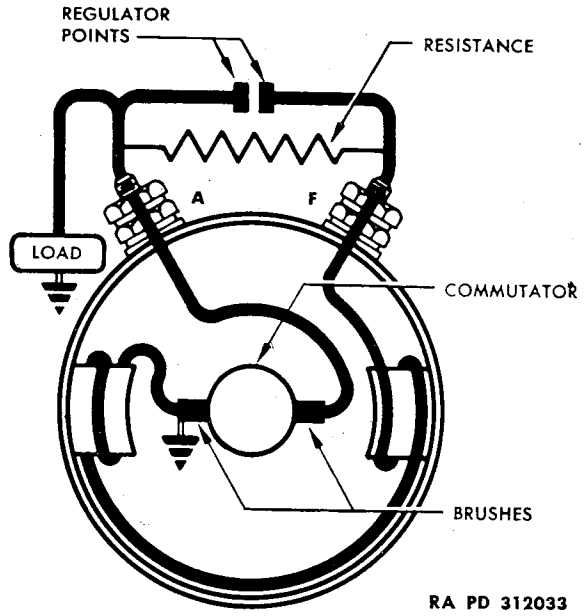

Figure 2—Type Two Generator—Internally Grounded Field Circuit

conductors in and rotate conductors through the magnetic field, a commutator on the armature and stationary brushes on the commutator end head to carry away current induced in armature conductors, and bearings to support the armature.

4. FUNCTION.

a. The generator has two jobs. It restores to the battery the current withdrawn during cranking, thus maintaining the battery in a charged condition. Secondly, it carries the connected electrical load up to the capacity of the generator, when the generator is operating at speeds at which substantial or maximum generator output is available, thus preventing undue or prolonged draining of the battery.

5. WIRING CIRCUITS.

a. Generators are connected internally in two different ways. It is necessary to understand the two types of wiring circuits, because each type has its own checking procedure. The checking procedure for type one does not apply to the checking procedure for type two.

b. Generator output is controlled by varying the field strength. In third-brush generators the third brush is shifted toward or away from a main brush to increase or lower the field strength and thus increase or lower generator output. In shunt generators (and on many

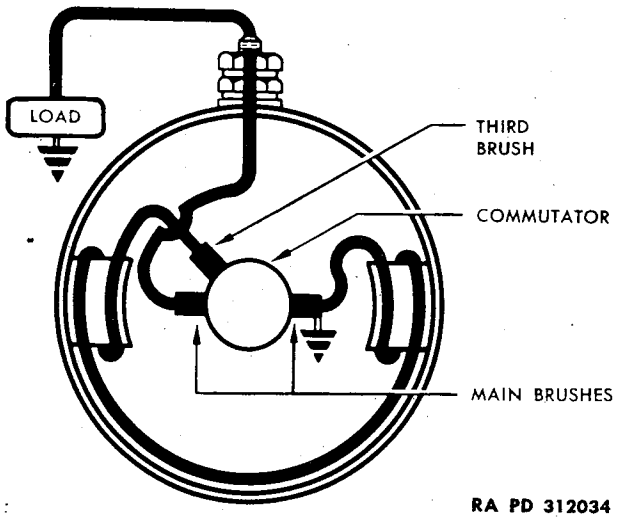

Figure 3—Third-brush Generator Wiring Circuit

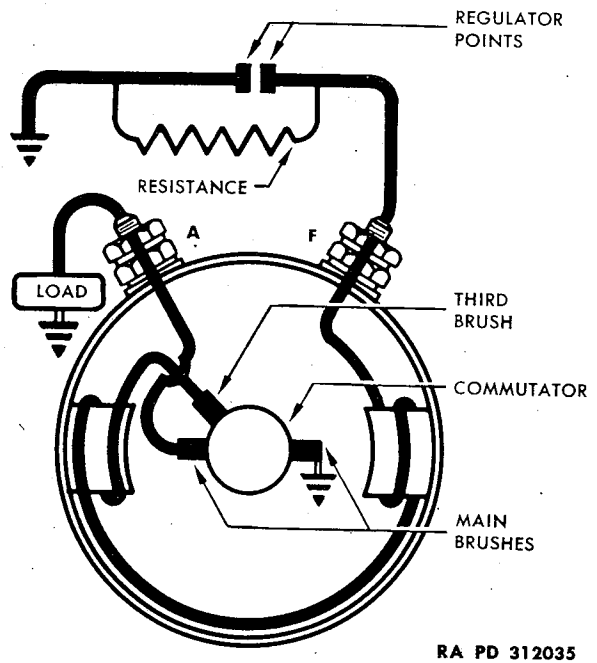

Figure 4—Third-brush Generator Using External Regulation

third-brush generators) the field strength is varied by inserting or removing resistance in the generator field circuit. Inserting resistance reduces field strength, cuts down generator output. Removing the resistance increases field strength, permits increased generator output.

c. The part of the circuit in which the resistance is inserted determines whether the generator is type one or type two. Figure 1 illustrates a simplified wiring circuit for type one generator. The field circuit is connected inside the generator to the insulated brush. Outside the generator, the other end of the field circuit is connected to ground (the return circuit) through a resistance, or through a set of points. The resistance and set of points are in the regulator, the operation of which will be detailed in chapter 3.

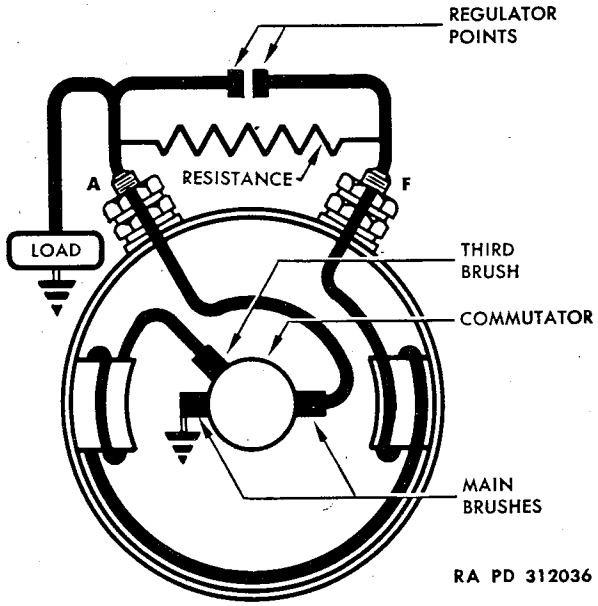

Figure 5—Type Two Third-brush Generator with External Regulation

d. Figure 2 illustrates a simplified wiring circuit for type two generator. The field circuit is connected inside the generator to the grounded brush. Outside the generator, the other end of the field circuit is connected to the insulated brush through a resistance or through a set of points.

e. Since the field circuit of type one generator is normally insulated inside the generator (when used with external control or regulator), while the field circuit of type two generator is normally grounded inside the generator, two different checking procedures are required in checking the generators.