C 1,2

TM 11-5037

TO 16-35 G 8-5

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

GENERATORS

G-8/GRC and G-8a/GRC

DEPARTMENT OF THE ARMY • MARCH 1951

by present Hm W/p 2 dd 30/6-'66

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TM 11-5037

TO 16-35 G 8-5

GENERATORS

G-8/GRC and G-8a/GRC

DEPARTMENT OF THE ARMY *MARCH 1951*

United States Government Printing Office

Washington : 1951

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *20 March 1951*

TM 11–5037 is published for the information and guidance of all concerned.

[AG 413.44 (16 Mar 51)]

BY ORDER OF THE SECRETARY OF THE ARMY:

J. LAWTON COLLINS
Chief of Staff, United States Army

OFFICIAL:
EDWARD F. WITSELL
Major General, USA
The Adjutant General

DISTRIBUTION:
Tech Svc (2) except 11 (65); Arm & Svc Bd (1); AFF Bd (ea Svc Test Sec) (1); AFF (5); AA Comd (2); Log Comd (5); OS Maj Comd (5); Base Comd (5); MDW (5); A (20); CHQ (2); FC (2); Sch (2) except 11 (25); Gen Dep (2); Dep 11 (20) except Sig Sec, Gen Dep (10); Tng Div (2); PE (10), OSD (2); Lab 11 (5); 4th & 5th Ech Maint Shops 11 (3); Two (2) copies to each of the following T/O & E's: 5–225; 5–226; 6–200; 6–225; 6–226; 6–227; 6–229; 6–235; 6–236; 6–237; 6–416; 6–419; 6–447; 7–11N; 7–31; 7–32; 7–34 7–35; 7–36; 11–107; 11–27; 11–500 CA, CB, CC, CD; 11–557; 11–587; 11–597; 17–32; 17–35N; 17–36N; 17–37N; 17–77; 17–115; 17–116; 17–117; 17–125; 19–97; 44–275; 44–276; 44–277; 71–2; SPECIAL DISTRIBUTION.

For explanation of distribution formula, see SR 310–90–1.

WARNING

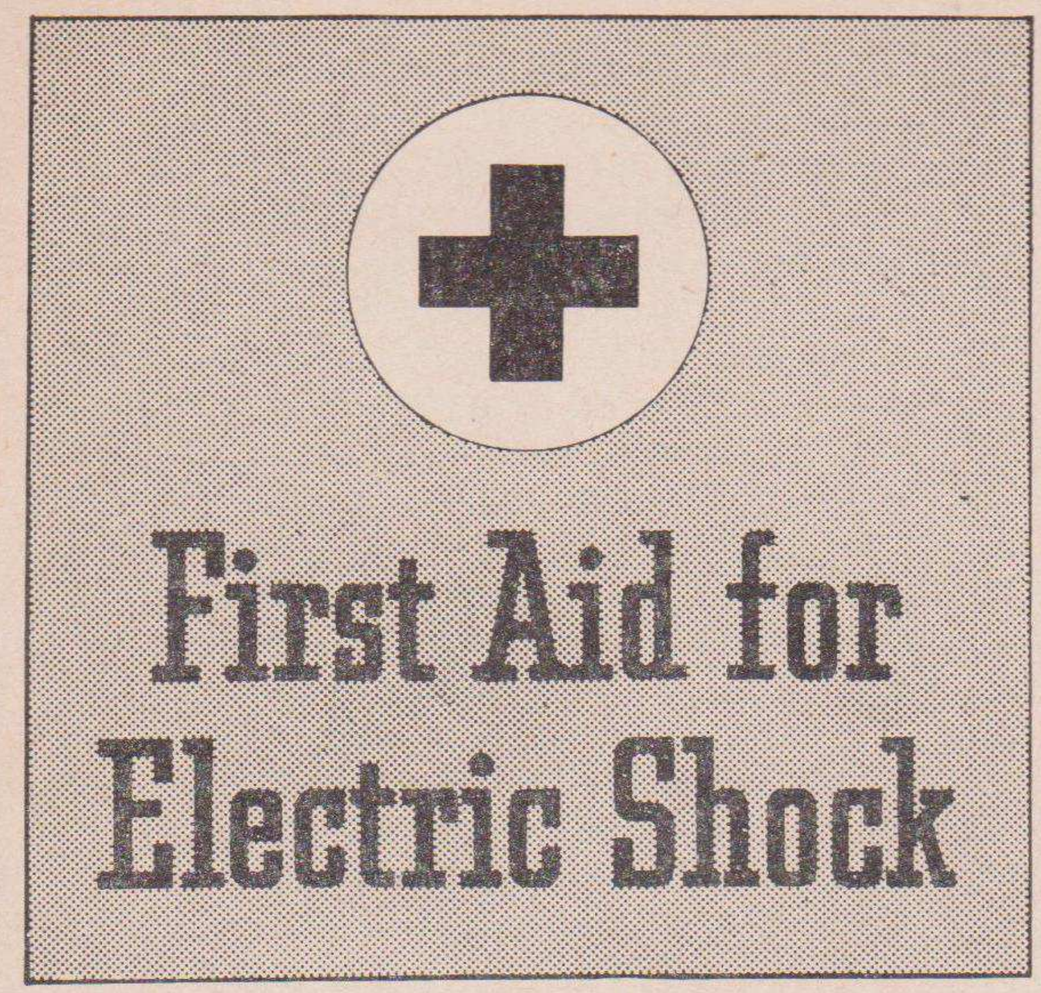
HIGH VOLTAGE

is used in the operation of
this equipment

DEATH ON CONTACT

may result if operating personnel
fail to observe safety precautions

CONTENTS



First Aid for Electric Shock

RESCUE.

In case of electric shock, shut off the high voltage at once and ground the circuits. If the high voltage cannot be turned off without delay, free the victim from contact with the live conductor as promptly as possible. Avoid direct contact with either the live conductor or the victim's body. Use a dry board, dry clothing, or other nonconductor to free the victim. An ax may be used to cut the high-voltage wire. Use extreme caution to avoid the resulting electric flash.

SYMPTOMS.

a. Breathing stops abruptly in electric shock if the current passes through the breathing center at the base of the brain. If the shock has not been too severe, the breath center recovers after a while and normal breathing is resumed, provided that a sufficient supply of air has been furnished meanwhile by artificial respiration.

b. The victim is usually very white or blue. The pulse is very weak or entirely absent and unconsciousness is complete. Burns are usually present. The victim's body may become rigid or stiff in a very few minutes. This condition is due to the action of electricity and is not to be considered rigor mortis. Artificial respiration must still be given, as several such cases are reported to have recovered. The ordinary and general tests for death should never be accepted.

TREATMENT.

a. Start artificial respiration immediately. At the same time send for a medical officer, if assistance is available. Do not leave the victim unattended. Perform artificial respiration at the scene of the accident, unless the victim's or operator's life is endangered from such action. *In this case only*, remove the victim to another location, but no farther than is necessary for safety. If the new location is more than a few feet away, artificial respiration should be given while the victim is being moved. If the method of transportation prohibits the use of the Shaeffer prone pressure method, other methods of resuscitation may be used. Pressure may be exerted on the front of the victim's diaphragm, or the direct mouth-to-mouth method may be used. Artificial respiration, once started, must be continued, without loss of rhythm.

b. Lay the victim in a prone position, one arm extended directly overhead, and the other arm bent at the elbow so that the back of the hand supports the head. The face should be turned away from the bent elbow so that the nose and mouth are free for breathing.

c. Open the victim's mouth and remove any foreign bodies, such as false teeth, chewing gum, or tobacco. The mouth should remain open, with the tongue extended. Do not permit the victim to draw his tongue back into his mouth or throat.

d. If an assistant is available during resuscitation, he should loosen any tight clothing to permit free circulation of blood and to prevent restriction of breathing. He should see that the victim is kept warm, by applying blankets or other covering, or by applying hot rocks or bricks wrapped in cloth or paper to prevent injury to the victim. The assistant should also be ever watchful to see that the victim does not swallow his tongue. He should continually wipe from the victim's mouth any frothy mucus or saliva that may collect and interfere with respiration.

e. The resuscitating operator should straddle the victim's thighs, or one leg, in such manner that:

(*1*) the operator's arms and thighs will be vertical while applying pressure on the small of the victim's back;

(*2*) the operator's fingers are in a natural position on the victim's back with the little finger lying on the last rib;

(*3*) the heels of the hands rest on either side of the spine as far apart as convenient without allowing the hands to slip off the victim;

(*4*) the operator's elbows are straight and locked.

f. The resuscitation procedure is as follows:

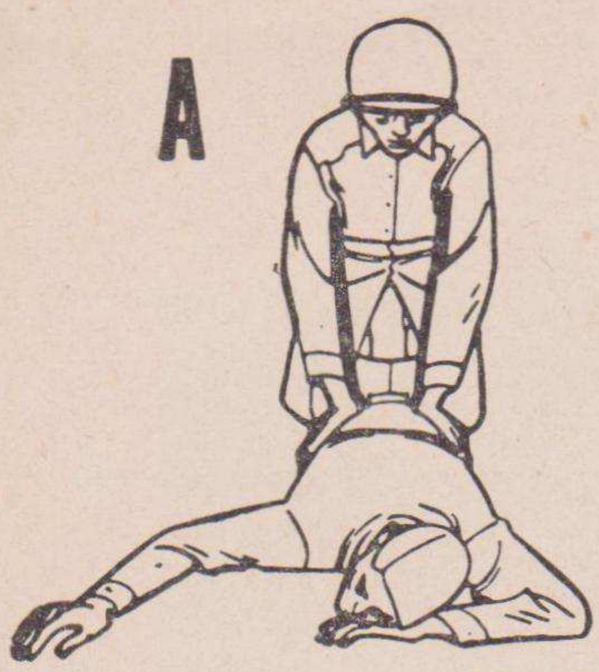
(*1*) Exert downward pressure, not exceeding 60 pounds, for 1 second.

(*2*) Swing back, suddenly releasing pressure, and sit on the heels.

(*3*) After 2 seconds rest, swing forward again, positioning the hands exactly as before, and apply pressure for another second.

g. The forward swing, positioning of the hands, and the downward pressure should be accomplished in one continuous motion, which requires 1 second. The release and backward swing require 1 second. The addition of the 2-second rest makes a total of 4

TL15338-D

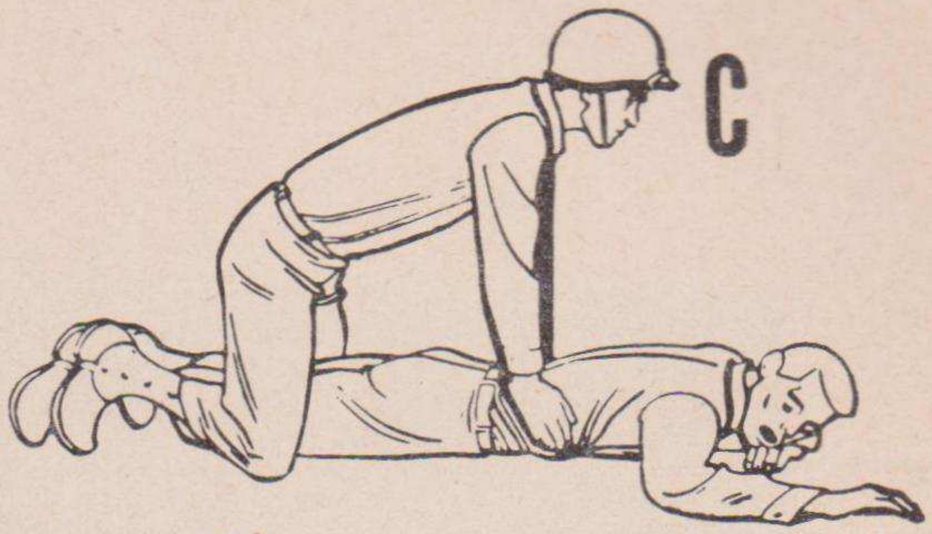


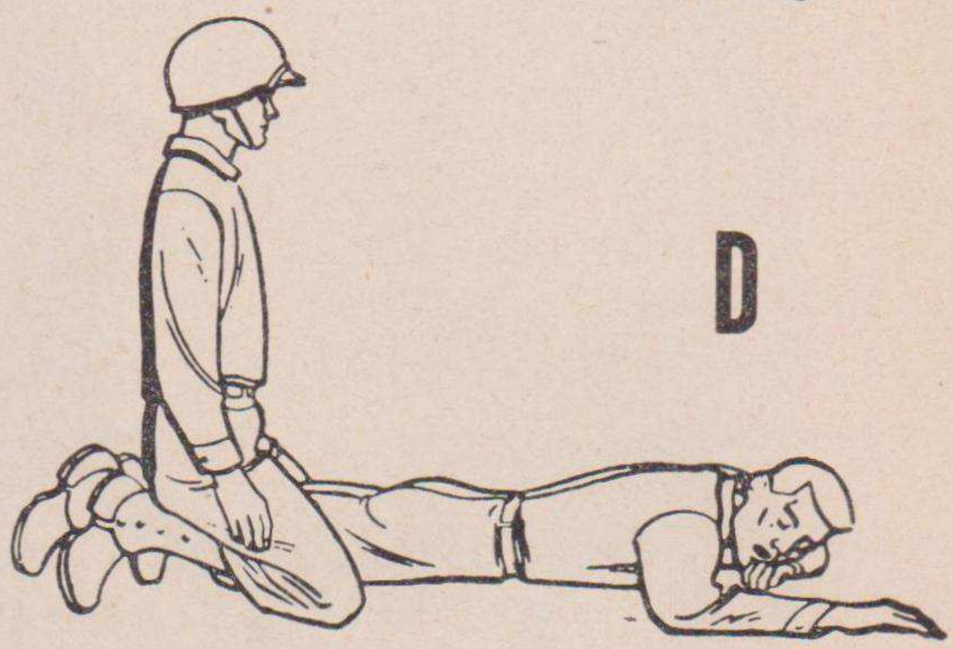
A. *CORRECT POSITION. Operator's elbows straight and locked. Victim's face turned away from bent elbow and resting on back of hand.*

B. *FORWARD SWING AND POSITIONING OF HANDS. Little finger rests on last rib.*

C. *DOWNWARD PRESSURE. Arms and thighs vertical.*

D. *REST POSITION. Operator releases pressure suddenly, swings back on heels, and rests for 2 seconds.*





seconds for a complete cycle. Until the operator is thoroughly familiar with the correct cadence of the cycle, he should count the seconds aloud, speaking distinctly and counting evenly in thousands. Example: one thousand and one, one thousand and two, etc.

h. Artificial respiration should be continued until the victim regains normal breathing or is pronounced dead by a medical officer. Since it may be necessary to continue resuscitation for several hours, relief operators should be used if available.

RELIEVING OPERATOR.

The relief operator kneels beside the operator and follows him through several complete cycles. When the relief operator is sure he has the correct rhythm, he places his hands on the operator's hands without applying pressure. This indicates that he is ready to take over. On the backward swing, the operator moves and the relief operator takes his position. The relieved operator follows through several complete cycles to be sure that the new operator has the correct rhythm. He remains alert to take over instantly if the new operator falters or hesitates on the cycle.

STIMULANTS.

a. If an inhalant stimulant is used, such as aromatic spirits of ammonia, the individual administering the stimulant should first test it himself to see how close he can hold the inhalant to his own nostril for comfortable breathing. Be sure that the inhalant is not held any closer to the victim's nostrils, and then for only 1 or 2 seconds every minute.

b. After the victim has regained consciousness, he may be given hot coffee, hot tea, or a glass of water containing ½ teaspoon of aromatic spirits of ammonia. *Do not give any liquids to an unconscious victim.*

CAUTIONS.

a. After the victim revives, keep him LYING QUIETLY. Any injury a person may have received may cause a condition of shock. Shock is present if the victim is pale and has a cold sweat, his pulse is weak and rapid, and his breathing is short and gasping.

b. Keep the victim lying flat on his back, with his head lower than the rest of his body and his hips elevated. Be sure that there is no tight clothing to restrict the free circulation of blood or hinder natural breathing. Keep him warm and quiet.

c. A resuscitated victim must be watched carefully as he may suddenly stop breathing. *Never leave a resuscitated person alone until it is CERTAIN that he is fully conscious and breathing normally.*

TL15338-E

937113°—50——2

Figure 1. Generator G–8/GRC.

x

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

This technical manual contains instructions for the installation, operation, maintenance, and repair of Generator G–8/GRC (fig. 1). In addition to these instructions there are two appendixes covering a list of references and an identification table of parts.

2. Forms and Records

The following forms will be used for reporting unsatisfactory conditions of Army matériel and equipment.

a. DD Form 6, Report of Damaged or Improper Shipment, will be filled out and forwarded as prescribed in SR 745–45–5.

b. DA AGO Form 468, Unsatisfactory Equipment Report, will be filled out and forwarded to the Office of the Chief Signal Officer as prescribed in SR 700–45–5.

c. DA AGO Form 419, Preventive Maintenance Checklist for Signal Corps Equipment, will be prepared in accordance with instructions on the back of the form.

d. Use other forms and records as authorized.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Generator G–8/GRC is a hand-operated generator intended for use as an auxiliary power source for Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC. The generator furnishes the input power for these receiver-transmitters at slightly lower levels than are delivered by the vehicular power supplies ordinarily used as power sources. The generator makes possible the use of the above named vehicular radio equipment as portable ground equipment for foot troops. When hand-cranked at speeds between 50 and 70 rpm (revolutions per minute), the generator is capable of delivering an approximate output of 85 watts at the voltages required for receiver and transmitter operation.

4. System Application

A simplified block diagram of a communication system using Generator G–8/GRC is shown in figure 2. When the generator is connected to Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC and its cranks turned at 50 to 70 rpm, communications are possible. To transmit, push the button on the microphone and talk. To receive, release the microphone button and listen to the signals coming over the headset. Two actions of cranking the generator and pushing the button will energize all the proper circuits for communication.

5. Technical Characteristics

Crank speed: 50 to 70 rpm.
Power output: .075 ampere at 400 volts.
.016 ampere at 250 volts.
.038 ampere at 145 volts.
.076 ampere at 90 volts.
2.3 amperes at 6.3 volts.
.002 ampere at −30 volts.
Weight: 25 pounds.
Ambient operating temperature range: −40° F. to +150°F.
Allowable immersion: 6 feet of water.

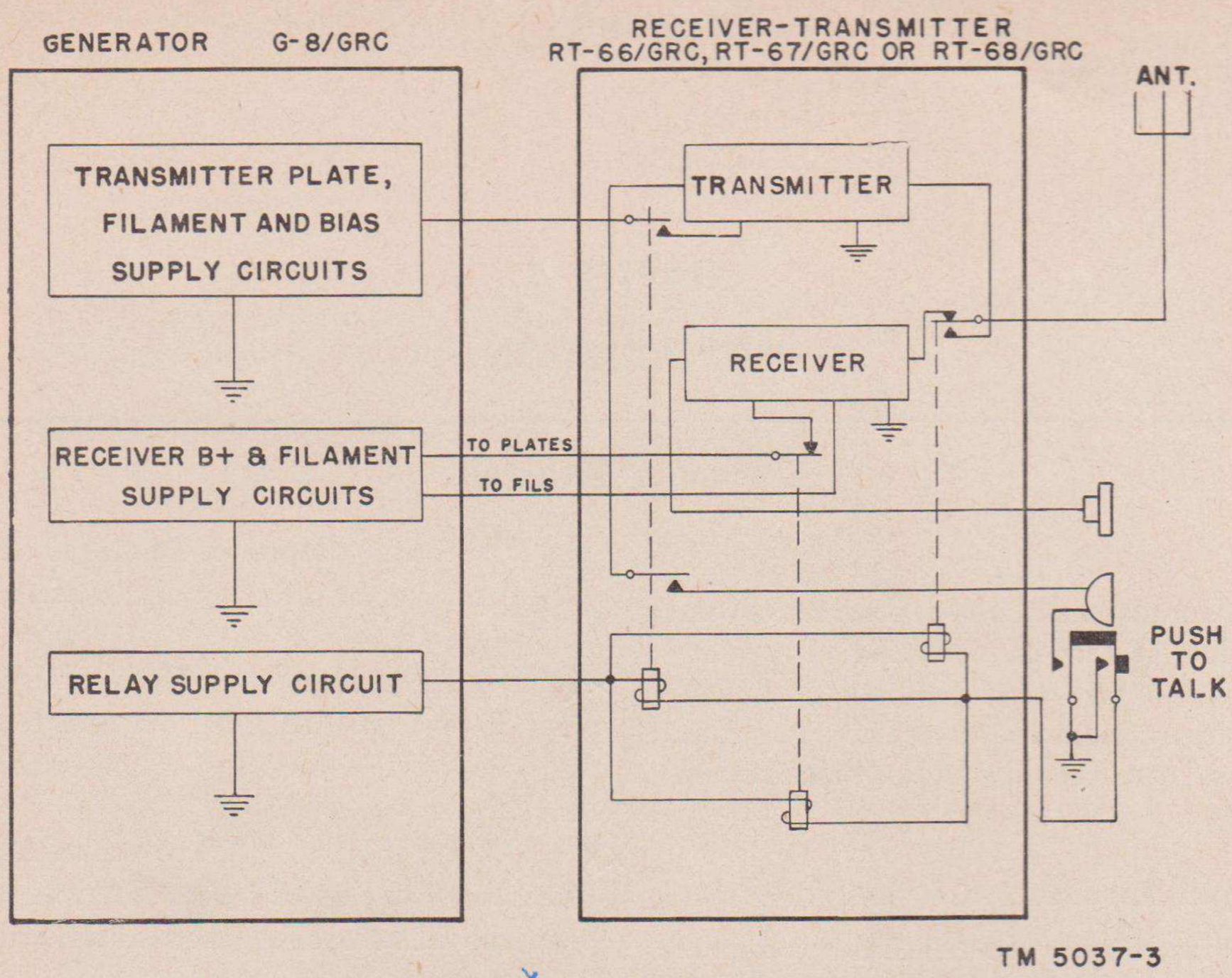


Figure 2. Generator G–8/GRC system, simplified block diagram.

Capable of being operated under water in emergency.

6. Packaging Data

When packaged for domestic shipment, the components of Generator G–8/GRC are placed in two corrugated fiberboard containers. The following list indicates the contents of each box. See the packing list attached to each box for exact contents.

No. of boxes	Box dimensions (in.)	Volume (cu ft)	Unit weight (lb)	Contents
1	10¼ x 9¼ x 6½	.36	22	1-Generator G–8/GRC.
1	33½ x 6½ x 3½	.44	6	1-Leg LG–2–B. 2-Legs LG–3–B. 2-Cranks GC–7.

7. Table of Components (fig. 3)

The components of Generator G–8/GRC are listed in the following table:

Component	Required No.	Height (in.)	Depth (in.)	Length (in.)	Volume (cu ft)	Unit weight (lb)
Generator G–8/GRC.	1	10	6¼	8⅞	.32	21
Leg LG–2–B	1	6	3	33	.35	3
Leg LG–3–B	2	3½	1½	24	.07	½
Crank GC–7	2	4½	1⅛	8	.03	½

8. Description of Generator G–8/GRC

a. Generator G–8/GRC consists of the generator proper, one Leg LG–2–B, two Legs LG–3–B, and two Cranks GC–7 (fig. 3). The generator is a three-commutator unit with an actuating gear train, a radio noise filter, and a voltage regulator. These components are shock-mounted inside a waterproof cast magnesium case. The outside of the case contains openings for the operating cranks, the power connector, and the straps necessary for attachment of the mounting legs. The generator is intended for operation by a single operator seated on the seat leg and turning the operating crank at the required speed. The generator

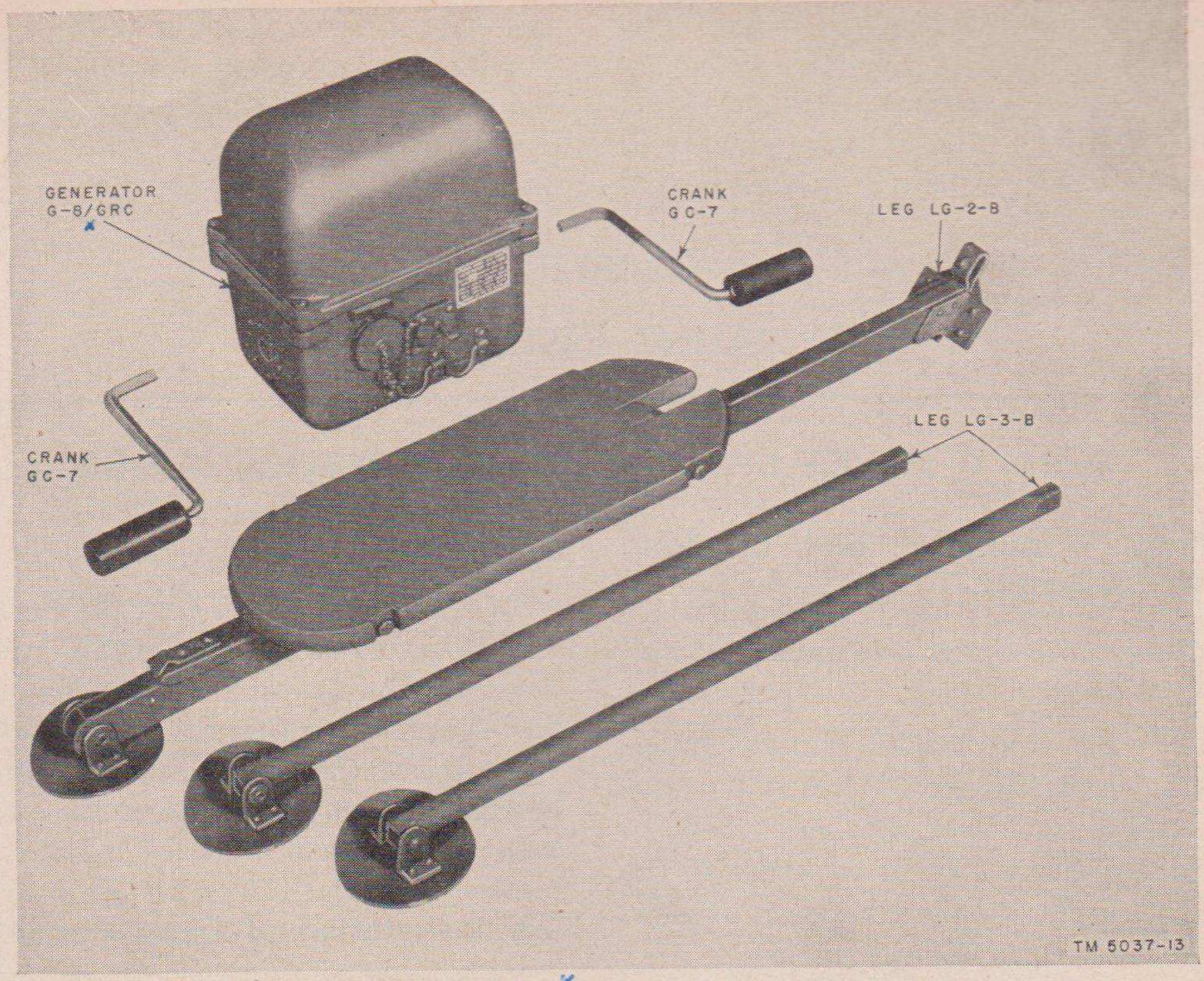


Figure 3. Generator G–8/GRC, operating components.

should be operated only when properly connected to its intended radio set.

b. Leg LG–2–B consists of a rectangular aluminum tube with a wooden seat and suitable adapters on the end to attach it to the generator. Leg LG–2–B together with Legs LG–3–B form a tripod to support both the operator and the generator.

c. Cranks GC–7 are the means of supplying hand power to the generator. One crank is inserted in each end of the generator crankshaft and turned by the operator's hands.

9. Running Spares

A spare set of brushes is located in a bag inside the generator. The brushes are identified as follows:

Voltage	*Quantity*	*Symbol No.*
High	1	E–2
High	1	E–3
Medium	1	E–4
Medium	1	E–5
Low	1	E–6
Low	1	E–7

10. Additional Equipment Required

Power Cable Assembly CX–1209/U or Power Cable Assembly CX–1210/U is used to connect the generator to the radio set. They are not supplied as a part of Generator G–8/GRC equipment. Power Cable Assembly CX–1209/U is used between the generator and the battery box (Case CY–590/GRC) when the combination of generator and batteries is used to power Receiver-Transmitter RT–66/GRC, RT–67/GRC, or RT–68/GRC. Power Cable Assembly CX–1210/U is used between the generator and one of the receiver-transmitters when the generator is used as the sole source of power.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF GENERATOR G–8/GRC

11. Uncrating, Unpacking, and Checking New Equipment

Note. For used or reconditioned equipment, refer to paragraph 15.

a. General. The equipment is shipped in domestic packing cases (fig. 4). When new equipment is received, select a location where the equipment may be unpacked without exposure to the elements and convenient to the permanent or semipermanent installation of the equipment.

b. Step-By-Step Instructions For Unpacking.

(1) Place the cartons as near the operating position as convenient.
(2) Open the cartons, remove the equipment, and place it on the workbench or near its final location.
(3) Inspect the equipment for possible damage incurred during shipment.
(4) Check the contents of the packing case against the master packing slip.

12. Siting

Locate the generator near the radio equipment. Choose as flat a spot as possible, with sufficient space for the operator to brace his feet. Position the equipment so that the operator of the generator is facing the operator of the radio set and has sufficient room for free and unhampered movements of his arms.

13. Installation of Generator G–8/GRC

To mount the generator on its legs, proceed as follows:

a. Insert the two Legs LG–3–B upward through the metal loops and under the retaining spring on the receptacle side of the generator.

b. Rest the generator on the two legs and insert the attachment of Leg LG–2–B into the strap on the opposite side of the generator. Rotate this leg upward until the attachment at the end of the leg rests firmly against the side of the generator, and swing the metal loop over this attachment.

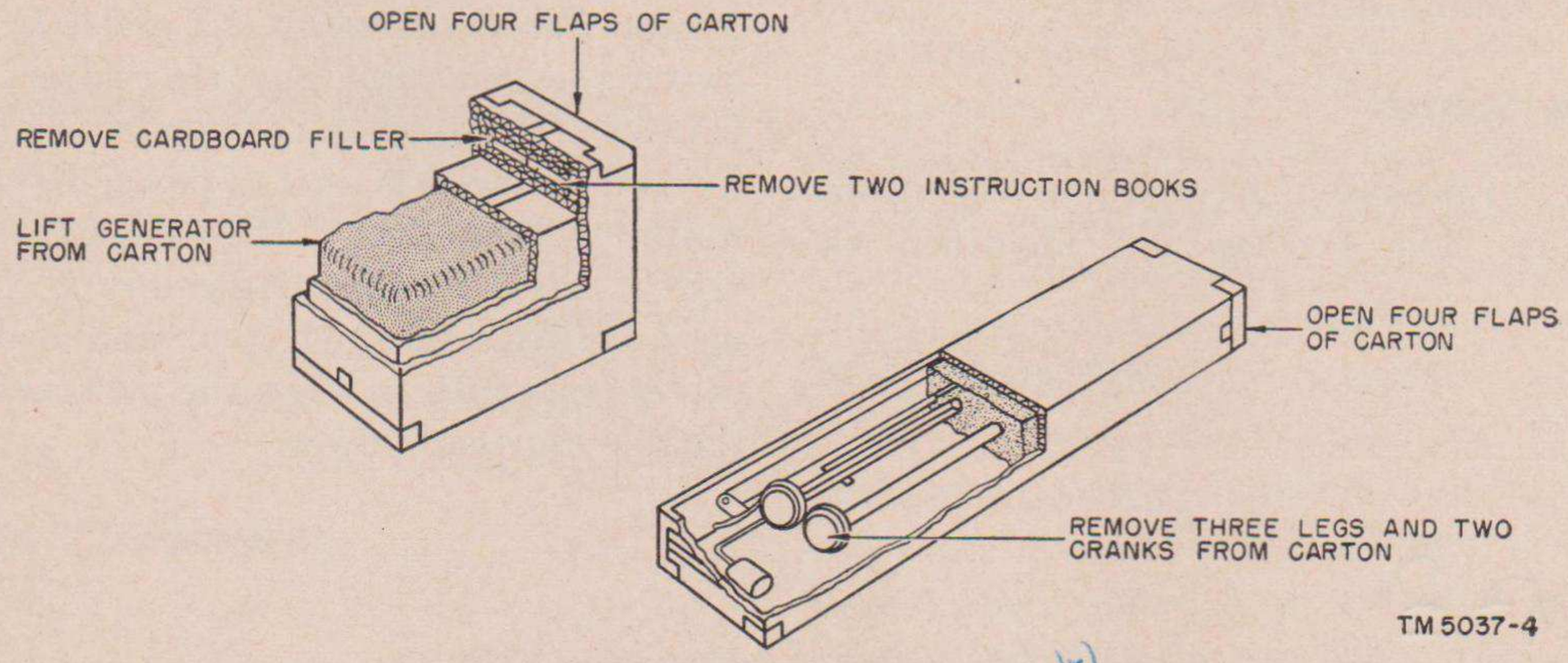


Figure 4. Packaging of Generator G–8/GRC.

c. Raise the wooden seat and the seat brace on Leg LG–2–B. Then lower the seat until the brace firmly engages the spring attachment on the under side of the seat.

d. Insert one Crank GC–7 into the crankshaft socket at each end of the generator. The long shaft on one crank should be at an angle of 180° to the other.

14. Connections

The generator may be used alone as a power source for one of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC, or it may be used in conjunction with battery box (Case CY–590/GRC) to power these same receiver-transmitters.

a. When the generator is used alone, connect Power Cable Assembly CX–1210/U between the generator and the receiver-transmitter. The cable connectors are keyed so that, when proper connections are made, the cable will enter the generator vertically from below the generator connector, and it will enter the receiver-transmitter horizontally from the right of the receiver-transmitter connector.

b. When both the generator and the battery box are used, connect Power Cable Assembly CX–1209/U between the battery box and the generator.

15. Service Upon Receipt of Used or Reconditioned Equipment

a. Follow the instructions in paragraph 11 for unpacking and checking the equipment.

b. Check the used or reconditioned equipment for tags or other indications pertaining to changes in the wiring of the equipment. If any changes in wiring have been made, note the change in this manual, preferably on the schematic diagram.

c. Mount the generator on its legs as instructed in paragraph 13. Insert one operating crank in each end of the generator. Without connecting the output cable, rotate the cranks at a very slow speed. The cranks of the generator should turn very easily. If this is not so, perform the lubrication instructions listed in paragraphs 26 and 27.

d. Perform the siting and connection procedures given in paragraphs 12 and 14.

Section II. OPERATION UNDER USUAL CONDITIONS

16. Starting and Stopping Procedures

a. Crank the generator at a steady speed of approximately 1 revolution per second. Do not attempt to rotate the generator crank in the reverse direction to that indicated by the rotation arrow.

b. When power for the radio is not required simply stop cranking the generator. There are no switches for stopping.

17. Types of Operation

a. The radio set can be powered by a combination of hand generator and battery, with the generator supplying power only for transmitting, and the battery supplying the power for receiving. For this arrangement, power generation does not require as much manual energy. Make arrangements between the generator operator and the radio operator so that the generator operator may know immediately when power is not required for the transmitter. In this way he can conserve his strength and provide power only when absolutely necessary for transmitting the signals.

b. When battery power is not available, it will be necessary for the generator operator to crank the hand generator while receiving as well as while transmitting. The cranks of the generator will turn very easily for receiver power and can be operated continuously for long periods of time with little effort. Do not crank at excessive speeds for this type of operation.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

18. General

The operation of Generator G–8/GRC may be difficult in regions where extreme cold, heat, humidity and moisture, sand conditions, etc., prevail. In paragraphs 19, 20, and 21, instructions are given on procedures for minimizing the effect of these unusual operating conditions.

19. Operation in Arctic Climates

Subzero temperatures and climatic conditions associated with cold weather affect the efficient operation of the equipment. Instructions and precautions for operation under such adverse conditions follow:

a. Handle the equipment carefully.

b. Keep the equipment as warm and dry as possible.

c. In extremely low temperatures the generator cranks will turn with extreme difficulty for the first few minutes of operation. This is normal and is due to the thickness of the grease in the gear case. Do not use abnormal force to make the cranks turn fast.

d. When the equipment has been exposed to the cold and is brought into a warm room, it will start to sweat and will continue to do so until it reaches room temperature. When the equipment has reached room temperature, dry it thoroughly. This condition also arises when equipment warms up during the day after exposure during a cold night. It may be necessary to remove the top cover (fig. 5) from the generator to examine the commutator for an accumulation of excess moisture.

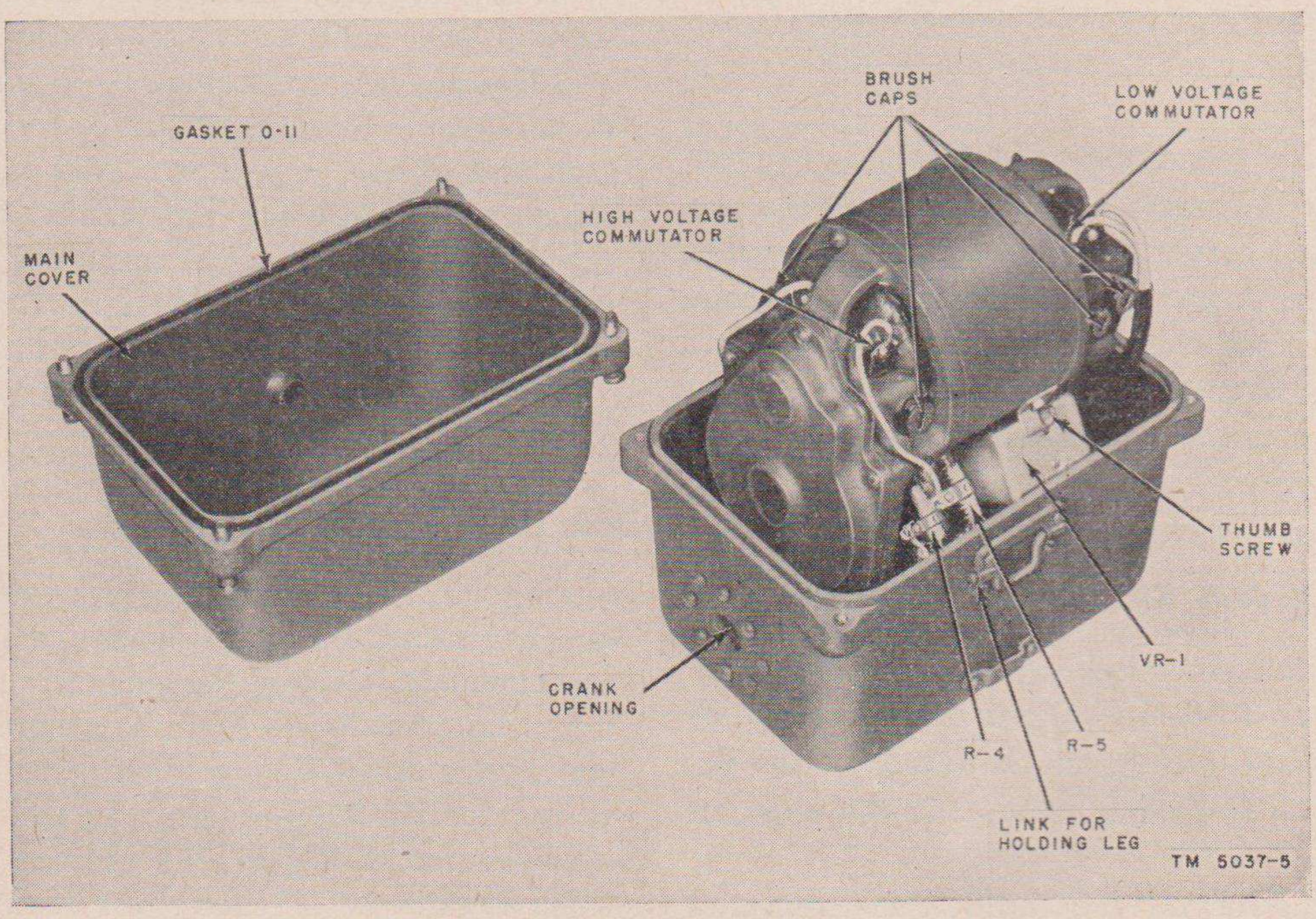


Figure 5. Generator G–8/GRC, top cover removed.

20. Operation in Tropical Climates

The equipment is thoroughly protected with a moistureproof coating and should require little attention at any time. However, because of extreme changes in temperature there may be excessive condensation on the inside of the generator and the treatment mentioned in paragraph 19*d* will be necessary.

21. Operation in Desert Climates

a. Conditions similar to those encountered in tropical climates often prevail in desert areas. Use the same measures to insure proper operation of the equipment.

b. The main problem which arises with equipment operation in desert areas is the large amount of sand or dust and dirt which enters the moving parts of the generator. Protect the generator as much as possible from the entrance of dirt, and remove all dirt which accumulates on the outside. Pay particular attention to the condition of the lubrication of the equipment. Excessive amounts of dust, sand, or dirt that come into contact with oil and grease result in grit which will damage the equipment.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE SERVICES

22. Tools and Materials Required

Tools and materials required for organizational maintenance of Generator G–87/GRC are listed in *a* and *b* below. The tools contained in Tool Equipment TE–41 are listed in the Department of the Army Supply Catalog SIG 6–TE–41.

a. Tools.

Tool Equipment TE–41.

b. Materials.

Cheesecloth,* bleached, lint-free.
Carbon tetrachloride.*
Paper,* sand, flint No. 0000.
Solvent, dry-cleaning (SD) (Federal spec No. P–S–661a).

23. Definition of Preventive Maintenance

Preventive maintenance is work performed on equipment (usually when the equipment is not in use) to keep it in good working order so that breakdowns and needless interruptions in service will be kept to a minimum. Preventive maintenance differs from trouble shooting and repair since its object is to prevent certain troubles before they can occur. See TM 38–650.

24. General Preventive Maintenance Techniques

a. Use No. 0000 sandpaper to remove corrosion.

b. Use a clean, dry, lint-free cloth or a dry brush for cleaning.

(1) Moisten the cloth or brush with solvent (SD) when necessary (except when cleaning electrical contacts); then wipe the parts dry with a cloth.

(2) Clean electrical contacts (voltage regulator, connector, commutators and brushes) with a cloth moistened with carbon tetrachloride; then wipe them dry with a dry cloth.

Caution: Use carbon tetrachloride as a cleaning fluid only in the following cases: on equipment where inflammable solvents cannot be used because of fire hazard, and on electrical contacts.

c. If available, dry compressed air may be used at a line pressure not exceeding 60 pounds per square inch to remove dust from inaccessible places; be careful, however, or mechanical damage from the air blast may result.

d. For further information on preventive maintenance techniques, refer to TB SIG 178.

25. Performing Preventive Maintenance

The following preventive maintenance operations should be performed by organizational personnel at the intervals indicated, unless these intervals are reduced by the local commander.

Caution: Screws, bolts, and nuts should not be tightened carelessly. Fittings tightened beyond the pressure for which they are designed will be damaged or broken.

Weekly

1. Lubricate the hand-crank bearing and tripod hinges of the generator with oil, lubricating, preservative, special (PL-Special).

2. Clean any accumulated dirt from the connector terminals and the hand-crank openings.

Monthly

1. Check the brushes and commutator for wear. See that brushes are long enough to make firm contact with

*Part of Tool Equipment TE–41.

the commutator. See that the brush springs have adequate tension and are in firm contact with the brushes. Check the brush caps for tightness.

2. Remove the top cover from the generator and unscrew all brush caps. Slide out the brushes and replace if worn excessively. Carefully note the position of each brush before removal so that replacement of the original brush may be made correctly if a new brush is not to be used.

3. Press a piece of canvas folded to the exact width of the commutator against the commutator while the armature is being turned by hand.

4. If the commutator has been burned or pitted, hold a piece of No. 0000 sandpaper against the commutator and turn the armature by hand.

5. If necessary, a cloth moistened in carbon tetrachloride may be used to remove the accumulated dirt and grease.

6. Polish the commutator with a piece of canvas (step 3 above) ; wipe with a clean, dry cloth.

7. Blow all accumulated brush dust out of the generator.

Section II. LUBRICATION

26. Preliminary Instructions

a. Do not use excessive amounts of grease and do not allow connections to become greasy.

b. Do not use gasoline as a cleaning fluid for any purpose. When the unit is overhauled or repairs are made, clean parts with solvent (SD) (except as noted in paragraph 24*b*).

c. Make certain that lubricants and points to be lubricated are clean and free from sand, grit, or dirt. These abrasives are the chief cause of bearing wear and thus often necessitate bearing replacements. Use solvent (SD) to clean all parts. Before lubrication, wipe clean all surfaces to be lubricated; use a lint-free cloth dampened with solvent (SD). Keep solvent off surrounding parts. Observe the caution noted in paragraph 24*b*.

d. Never attempt to lubricate brushes or commutators.

e. Refer to figures 5, 6, and 7 for location of parts; refer to paragraph 47 for disassembly instructions.

27. Detailed Lubrication Instructions

Parts of Generator G–8/GRC which require lubrication are indicated in the following chart. Intervals given are maximum for normal 8-hour day operation. For abnormal conditions or operations, intervals should be shortened to compensate. Refer to paragraph 47 for disassembly procedures necessary to permit lubrication.

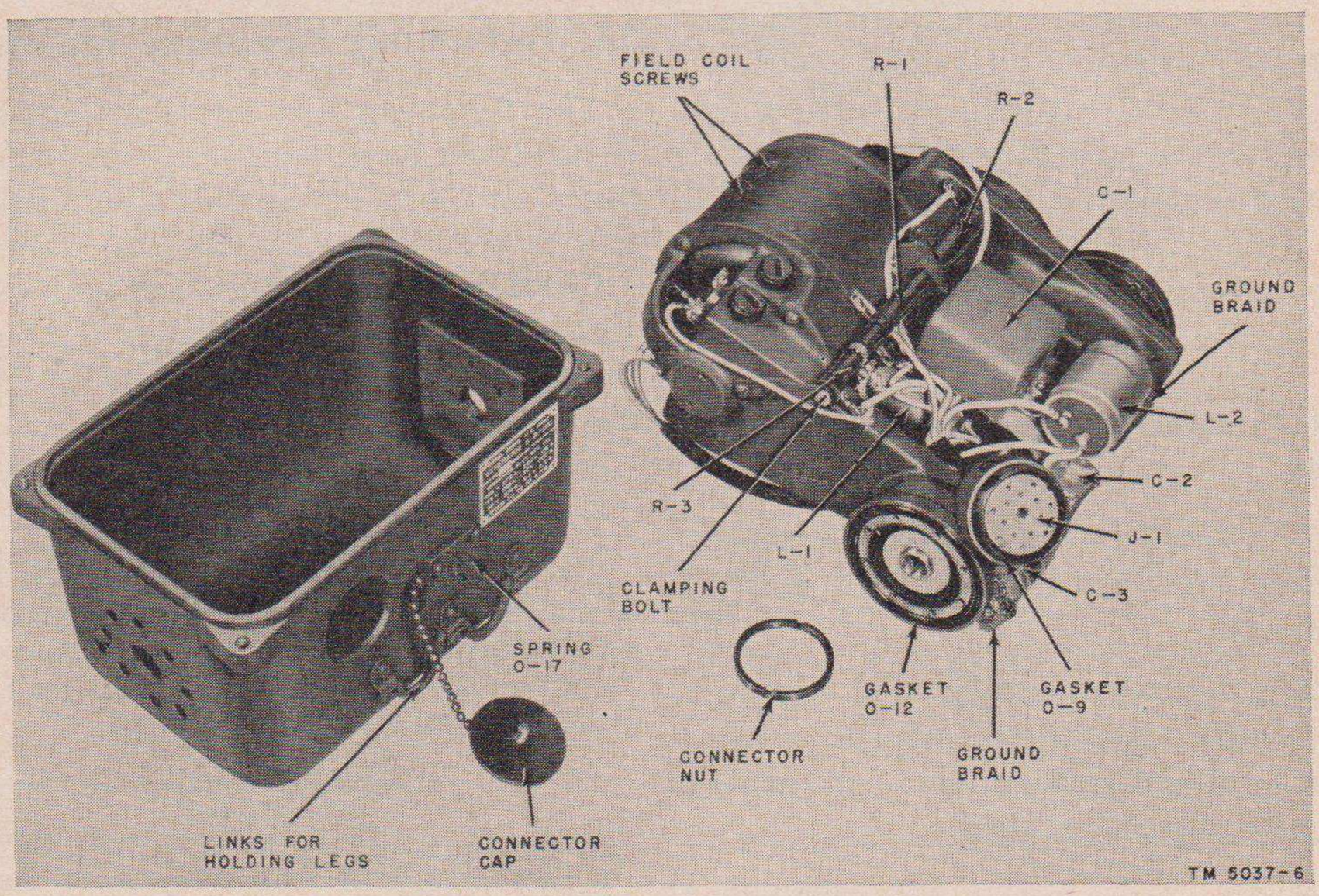


Figure 6. Generator G–8/GRC, case removed.

Part	Ref symbol	Lubricant	Interval
Gear train teeth	O–20, O–21, O–22, O–23	Grease, lubricating, special (GL).	Semiannually.
Sprockets	O–18, O–19	Greese (GL)	Semiannually.
Chain	H–1	Grease (GL)	Semiannually.
Links (for holding legs)		Oil (PL-Special)	Weekly.
Seal	O–15, O–16	Grease, silicon, medium	Upon assembly.
Gaskets	O–9, O–10, O–11, O–12	Grease, silicon, medium	Upon assembly.
Ball bearings (without seal and with single seal).	O–1, O–2, O–3, O–5	Grease (GL)	Semiannually.
Ball bearing (double seal)	O–4	None	No lubrication required.

28. Lubrication Under Unusual Conditions

a. The lubricants used in Generator G–8/GRC will be satisfactory under most Arctic and tropical weather conditions. It will be unnecessary to change the lubricant when going from one temperature zone to another.

b. Operation in desert regions will require only the inspection of the equipment daily to eliminate the accumulation of grit and dirt in the crank holes and in the connector. Be careful that grit and dirt do not accumulate in the crank handle bearings.

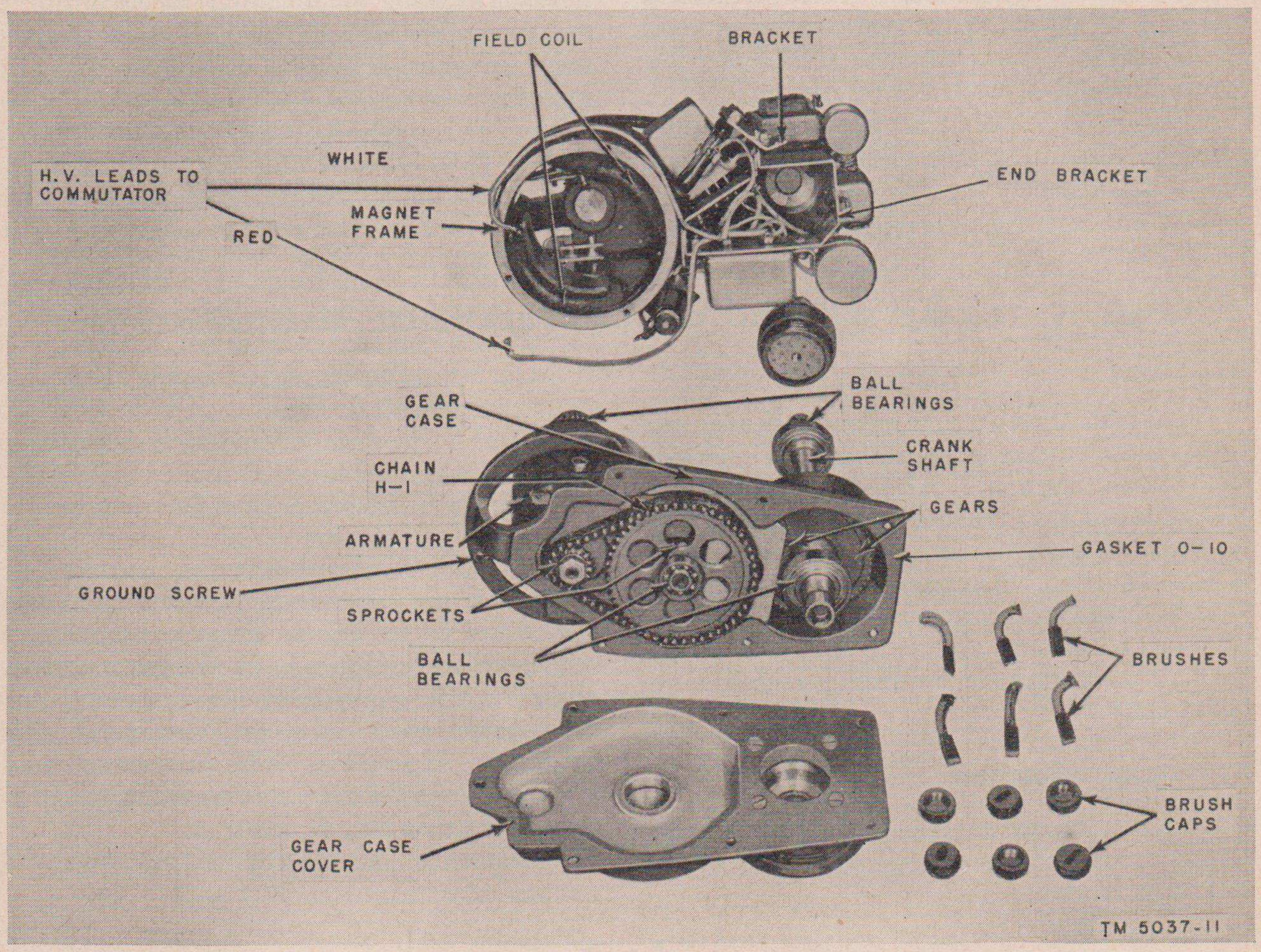


Figure 7. Generator G–8/GRC, disassembled for lubrication.

Section III. WEATHERPROOFING

29. Weatherproofing

a. General. Signal Corps equipment, when operated under severe climatic conditions such as prevail in tropical, Arctic, and desert regions, requires special treatment and maintenance. Fungus growth, insects, dust, corrosion, salt spray, excessive moisture, and extreme temperatures are harmful to most materials.

b. Tropical Maintenance. A special moistureproofing and fungiproofing treatment has been devised, which, if properly applied, provides a reasonable degree of protection. This treatment is explained in TB SIG 13 and TB SIG 72. Generator G–87/GRC has been moistureproofed and fungiproofed by the manufacturer. It will not be necessary to repeat these treatments except after extremely long use.

c. Winter Maintenance. Special precautions necessary to prevent poor performance or total operational failure of equipment in extremely low temperatures are explained in TB SIG 66.

d. Desert Maintenance. Special precautions necessary to prevent equipment failure in areas subject to extremely high temperatures, low humidity, and excessive sand and dust are explained in TB SIG 75.

e. Lubrication. The effects of extreme cold and heat on materials and lubricants are explained in TB SIG 69. Observe all precautions outlined in TB SIG 69 and pay strict attention to all lubricant instructions when operating equipment under conditions of extreme cold or heat. Refer to paragraph 27 for detailed instructions.

30. Rustproofing and Painting

a. When the finish on the case has been badly scarred or damaged, rust and corrosion can be prevented by touching up bared surfaces. Use No. 00 or No. 000 sandpaper to clean the surface down to the bare metal; obtain a bright smooth finish.

Caution: Do not use steel wool. Minute particles frequently enter the case and cause harmful internal shorting or grounding of circuits.

b. When a touch-up job is necessary, apply paint with a small brush. Remove rust from the case by cleaning corroded metal with solvent (SD). In severe cases it may be necessary to use solvent (SD) to soften the rust, and sandpaper to complete the preparation for painting. Paint used will be authorized and consistent with existing regulations.

Section IV. TROUBLE SHOOTING ON ORGANIZATIONAL MAINTENANCE LEVEL

31. Scope

The trouble shooting and repair work that can be performed at the organizational maintenance level (operators and repairmen) is necessarily limited in scope by the tools, test equipment, and replacement parts issued, and by the existing tactical situation. Accordingly, trouble shooting must be based on the performance of the equipment and the use of the senses in determining such troubles as burned-out resistors, cracked insulators, etc.

32. Visual Inspection

a. Failure of this equipment to operate properly will usually be caused by one or more of the following faults:

(1) Worn, broken, or disconnected cords or plugs.
(2) Voltage regulator contacts burned due to long use.
(3) Wires broken because of excessive vibration.
(4) Worn out brushes or dirty commutators.
(5) Worn out or broken chain in gear case.

b. When failure is encountered and the cause is not immediately apparent, check as many of the above items as is practicable before starting a detailed examination of the component parts of the generator. If possible, obtain information from the operator of the generator regarding performance at the time trouble occurred.

c. Crank the generator by hand to observe its mechanical operation.

CHAPTER 4

THEORY OF GENERATOR G–8/GRC

33. General

Generator G–8/GRC supplies six outputs which are normally used for auxiliary operation of Receiver-Transmitter RT–66/GRC, RT–67/GRC, or RT–68/GRC. High voltages (400, 250, and 145 volts) and bias voltage (−30 volts) are obtained from one of three independent windings on a single lap-wound armature. A second winding provides a medium-voltage (90 volts) output, and a third winding provides a low-voltage (6.3 volts) output. Each winding is connected to its individual commutator. A voltage regulator is incorporated in the generator to maintain constant output voltages.

34. Voltage Generation

The three-winding lap-wound armature E–1 is shown physically in figure 7 and schematically in figure 11 and is designated by the reference symbol E–1. The armature is rotated between the field coil, E–8, (shown in figs. 7 and 11) by means of the hand cranks and a step-up gear train. When the cranks are first turned, the magnetic field present is weak because the residual magnetism in the core of the field coil is low. The field is sufficiently strong, however, to induce a low voltage in the armature. This induced voltage causes a current to flow through the field coil, thereby increasing the strength of the magnetic field. A stronger magnetic field results in an increased induced voltage in the armature so that a cumulative effect is obtained. The induced voltage continues to build up until it reaches its rated value at a hand-crank speed of 50 to 70 rpm.

35. Voltage Outputs

(fig. 11 and 12)

a. High-Voltage Winding. The voltage induced in the high-voltage winding of the armature is commutated and made available to the output circuits of the generator through brushes E–2 and E–3. Filter capacitor C–1 is connected across the brushes to remove the a-c (alternating-current) ripple. The positive side of the winding (brush E–2) is connected through r-f (radio-frequency) filter choke L–1 to terminals H and P of output connector J–1. During operation of the generator, the external load connected to terminal H is returned to ground, and the circuit is completed to the negative terminal of the generator (brush E–3) through terminal E of J–1 (ground) and potentiometer R–3. Potentiometer R–3 is adjusted (par. 55) so that the negative terminal of the generator is approximately 30 volts negative with respect to ground. When this condition exists, the potential at terminals H and P of J–1 is approximately 400 volts positive with respect to ground. The negative 30-volt potential is made available at terminal R of J–1 for use as a bias supply. The 400-volt lead is connected through dropping resistors R–1 and R–2 to terminals F and C, respectively, of connector J–1. When the normal load is connected to these terminals, the potentials at these terminals will be 250 volts and 145 volts, respectively.

b. Medium-Voltage Winding. The voltage induced in the medium-voltage winding is commutated and made available to the output circuits of the generator through brushes E–4 and E–5. The negative side of the winding (brush E–4) is grounded, and the positive side (brush E–5) is connected through filter choke L–2 to terminal B of connector J–1. Choke L–2 supplements the filtering action of capacitor C–2 which is connected directly across the winding. Terminal B of J–1 is approximately 90 volts positive with respect to ground.

c. Low-Voltage Winding. The voltage induced in the low-voltage winding is commutated

and made available to the output circuits of the generator through brushes E–6 and E–7. The negative side of the winding (brush E–6) is grounded, and the positive side (brush E–7) is connected through filter choke L–3 to terminals A, L, and N of connector J–1. Choke L–3 supplements the filtering action of capacitor C–3 which is connected directly across the winding. Terminals A, L, and N of J–1 are approximately 6.3 volts positive with respect to ground.

36. Voltage Regulator (fig. 11)

a. Purpose and Principle of Operation. A voltage regulator is included in the generator to maintain the output voltages constant despite changes in load conditions, variations in cranking speed, and changes in temperature. The regulator is connected in series with the field across the low-voltage commutator and affects the field current so as to maintain a constant armature voltage. The regulator is set so as to maintain a 6.3-volt output from the low-voltage circuit. Since the high-, medium-, and low-voltage armature windings all revolve in the same field, controlling the voltage on the low-voltage commutator also provides control of the outputs on the high- and medium-voltage commutators.

b. Circuit Components. The voltage regulator is designated VR–1 and is plugged into a 14-contact socket, X–1. An operating coil, which controls 10 switch fingers or contacts, and a negative temperature coefficient resistor (R–8) are contained in the regulator proper. Regulating and temperature-compensating resistors, indicated as R–6 and R–7, respectively, on figure 11, are an integral part of socket X–1. Resistor R–6 is tapped at 11 points (fig. 11) and the taps are connected to contacts of socket X–1. The normally closed contacts of the voltage regulating mechanism are shunted across the various taps of R–6 when the regulator is plugged into the socket so that, when the generator is not being cranked, the entire resistor is short-circuited. Two additional resistors (potentiometers R–4 and R–5) are connected in series between contact 15 of X–1 and ground. Potentiometers R–4 and R–5 are fine and coarse adjustments, respectively, for setting the regulator operating voltage.

c. Theory of Operation. The field winding (E–8) of the generator is connected in series with the normally closed contacts of the voltage regulator across the low-voltage commutator. The operating coil of the voltage regulator, the paralleled compensating resistors (R–7 and R–8), and potentiometers R–4 and R–5 are also connected in series across the low-voltage commutator. As the generator is cranked, the voltage across the commutator builds up as described in paragraph 34. As the voltage builds up, the current through the field and through the operating coil of the regulator increases. The regulator is set by means of potentiometers R–4 and R–5, so that the armature of the operating coil will be activated when the cranking speed of the generator exceeds 50 rpm. When the armature is activated, it successively opens the series of 10 contacts which normally short-circuit the 10 sections of R–6. As the short circuit across each section is removed, the resistance of that section is placed in series with the field coil so that the current through the field, and hence the voltage induced in the armature winding, is controlled. As the cranking speed is increased, additional resistance is inserted in series with the field coil until, at 70 rpm, all of the resistance of R–6 is in series with the field coil. The voltage regulator thus limits changes in the current through the field coil produced by variations in cranking speed between 50 and 70 rpm. This limits changes in the output voltage of the three armatures. Changes in field coil current produced by different loads on the generator are limited by the voltage regulator in the same way. A small load causes the voltage regulator to throw in more series resistance than a large load. Therefore, changes in field coil current and in output voltage of the three armatures are limited. The above regulation maintains output voltages close enough to the nominal values to insure good receiver and transmitter operation.

Note. Voltage regulation will occur only when cranking speeds between approximately 50 and 70 rpm are maintained.

d. Temperature Compensation. Changes in temperature would normally affect the resistance of the voltage regulator coil so as to cause variation in output voltages. To offset this effect, a temperature-compensating network (resistors R–7 and R–8) is included in the regulating circuit.

Resistor R–7 has a slight positive temperature coefficient which adds to the effect of the operating coil and potentiometers R–4 and R–5 which also have positive temperature coefficients. Resistor R–8 has a negative temperature coefficient which cancels the positive coefficient of the other circuit components. This cancellation effect is maintained for any temperature within the operating range of −40° F. to +150° F., so that a substantially constant resistance is maintained. The regulated voltage, therefore, is substantially independent of temperature changes.

CHAPTER 5

FIELD MAINTENANCE INSTRUCTIONS

Note. This chapter contains information for field maintenance. The amount of repair that can be performed by units having field maintenance responsibility is limited only by the tools and test equipment available, and by the skill of the repairmen.

Section I. PREREPAIR PROCEDURES

37. Tools and Test Equipment

Tools, materials, and test equipment needed for performing the prerepair procedures mentioned in this section are listed below.

a. Tool Equipment TE–113.

b. Multimeter TS–352/U or equivalent volt-ohmmeter.

c. Electronic Multimeter ME–6/U.

38. Removal of Pluck-out Parts (fig. 5)

a. Removing Voltage Regulator. Unscrew the four corner screws that hold the main top cover of the generator (fig. 5). Unscrew the thumbscrew and remove the stop which holds the voltage regulator in its socket. Grasp the regulator firmly and rock it back and forth, pulling until it comes out of its socket.

b. Removing Generator Brushes. After removal of the main top cover (*a* above), unscrew each of the six black bakelite caps on the brush holders and slide each of the brushes out for examination. Carefully note the position of each brush before removal so that replacement of the original brush may be made correctly if a new brush is not to be used.

39. Cleaning and Testing Voltage Regulators

a. Cleaning. Clean the voltage regulator with a cloth moistened with solvent (SD); if necessary, wipe off the prongs of the regulator.

b. Testing. Using Multimeter TS–352/U, check for continuity between pin 1 and each of the other pins on the voltage regulator.

40. Cleaning and Inspecting Generator Brushes

a. Cleaning. Wipe off the brushes with a clean cloth and remove the burrs from the brush edge contacting the commutator.

b. Inspecting. Compare the length of the brushes with the running spare brushes in the spare brush bag contained inside the generator case. Insert the brush into the brush holder and compare the spring tension of it and of the corresponding brush from the running spare. If there is a noticeable difference either in the length or the spring tension, replace the brush with its spare.

41. Cleaning and Inspecting Generator Assembly

a. Cleaning. Thorough cleaning of the generator is necessary to insure optimum performance by preventing corrosion, rust, and dust from damaging parts or causing arc-over or low-resistance leakage between high-voltage points and ground. Remove loose dust and dirt with a brush or blower. Remove dirt and grease which adheres to the chassis and parts with a brush or cloth and solvent (SD). Press a clean rag on each commutator while turning the armature by hand and remove all excess grease and dirt.

b. Inspecting. After the generator has been cleaned thoroughly and carefully, make a visual

inspection of parts and wiring for rust, corrosion, loose connections, frayed and burned insulation, loose screws, and burned and charred resistors and coils. Carefully inspect the voltage regulator socket for broken contacts. Carefully inspect and tighten all loose contacts and resistor adjusting bands.

42. Reassembling Generator

a. Replace all brushes in their correct brush holders. Tighten the brush-holder caps sufficiently to lock the spring contacts. If new brushes are to be used, observe the procedure noted in paragraph 48.

b. Replace the voltage regulator, the voltage regulator stop, and the thumbscrew.

c. Unless additional trouble shooting is to be performed, replace the top cover; tighten each of the four main cover screws a little at a time to insure an even watertight fit of the main cover.

Section II. TROUBLE SHOOTING AT FIELD MAINTENANCE LEVEL

Warning: When servicing the generator, be extremely careful because of the high voltages exposed. Potentials as great as 430 volts are present in the generator. Keep one hand in pocket when measuring voltages with a probe. Before touching any part after the voltage is shut off, short the part to ground.

43. Equipment Required for Trouble Shooting

The following equipment is required for trouble shooting Generator G–8/GRC.

a. Multimeter TS–352/U.

b. Six dummy load resistors with the following values:

(1) 5,333 ohms, 50 watts.
(2) 15,625 ohms, 10 watts.
(3) 3,816 ohms, 10 watts.
(4) 1,185 ohms, 10 watts.
(5) 2.74 ohms, 25 watts.
(6) 15,000 ohms, 1 watt.

44. Input Resistance Measurements

These measurements prevent further damage to the generator from possible short circuits. Since this test gives an indication of the condition of the filter circuits, its function is more than preventive. With the power cable disconnected from power output connector, J–1, measure the resistances as indicated in the following table. Use Multimeter TS–352/U or an equivalent meter. Do not have cranks connected to generator during this test. Replace any component found to be defective. See figure 11 for circuit details.

Point of measurement on connector J–1	Approximate normal reading (ohms)	Probable trouble
P to H	0	Open jumper.
E to K	0	Open jumper.
L to A	0	Open jumper.
L to N	0	Open jumper.
H to F	9, 375	Defective R–1.
H to C	6, 711	Defective R–2.
H to R	150	Defective L–1, C–1, E–2, E–3.
R to E	*0–300	Defective R–3.
E to B	32	Defective L–2, C–2, E–4, E–5.
E to L	3. 1	Defective L–3, E–6, E–7, C–3.

*Depends on setting of R–3.

45. Trouble Shooting by Means of an Operational Test

a. For the operational test described below, connect the dummy load resistors (par. 43) as indicated on figure 8. All load resistors must be connected to obtain the normal readings indicated in *b* below. If sufficient meters are not available to make all the meter connections shown in figure 8 simultaneously, make sure that each dummy resistor is connected either directly or through an ammeter to its appropriate terminal connection on receptacle J–1. This will insure that all circuits are drawing their proper load. Proper voltage and current readings then will be obtained.

Caution: The generator is not designed for operation without a load.

b. The following chart indicates the voltage and current readings which should be obtained when

the generator is cranked at normal speed with an appropriate load connected. Symptoms which indicate abnormal operation are also listed, along with possible causes of trouble. Once a particular circuit has been found defective, additional voltage and/or resistance measurements should

Meter No.	Meter range	Normal reading	Symptom	Probable trouble
M–11	0–5 amperes dc.	2.3 amperes	No reading	Defective C–3, L–3, E–7, E–6, or low-voltage armature winding.
M–12	0–.1 volt ac	.063 volts max	High reading	Defective C–3, L–3, E–6, or E–7.
M–13	0–10 volts dc	6.3 volts	Low reading	Defective C–3, E–6, E–7, VR–1, or X–1; defective or incorrectly adjusted R–4 or R–5.
			High reading	Defective VR–1 or X–1; defective or incorrectly adjusted R–4 or R–5.
M–8	0–100 ma dc	76 ma	No reading	Defective C–2, L–2, E–4, E–5, or medium-voltage armature winding.
M–9	0–1 volt ac	.9 volt max	High reading	Defective C–2, E–4, or E–5.
M–10	0–150 volts dc	90 volts	Low reading	Defective C–2, E–4, or E–5.
M–1	0–100 ma dc	75 ma	No reading	Defective C–1, L–1, E–2, E–3, or high-voltage armature winding.
M–2	0–5 volts ac	4 volts max	High reading	Defective C–1, E–2, or E–3.
M–3	0–500 volts dc	400 volts	Low reading	Defective E–2, E–3, or C–1.
M–4	0–30 ma dc	16 ma	No reading	Defective R–1.
M–5	0–300 volts dc	250 volts	Low reading	Defective R–1, wiring, or connections.
M–6	0–50 ma dc	38 ma	No reading	Defective R–2.
M–7	0–200 volts dc	145 volts	Low reading	Defective R–2, wiring, or connections.
M–14	0–5 ma dc	2 ma	No reading	Defective R–3.
M–15	0–50 volts dc	–30 volts	Low or high reading.	Defective or incorrectly adjusted R–3.

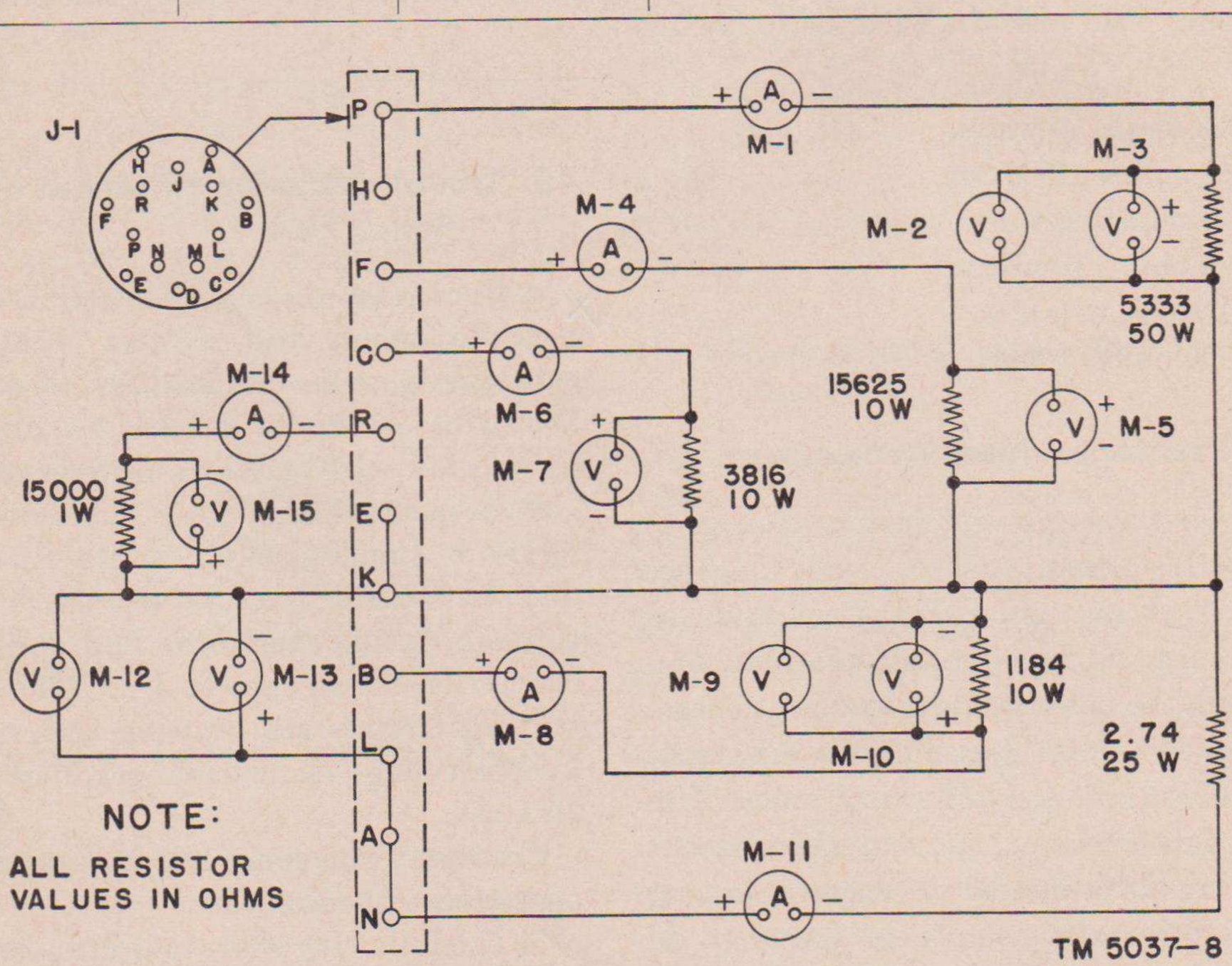


Figure 8. Generator G–8/GRC, operational test set-up.

isolate the defective part. To use the chart effectively, the measurements should be taken in the sequence listed. In column 1 of the chart, the meter number indicates the location of the meter in the circuit on figure 8. Multimeter TS–352/U is adequate for all readings except the a-c readings. For a-c readings use Electronic Multimeter ME–6/U or an equivalent vacuum-tube voltmeter.

Section III. REPAIRS

46. General Precautions

Careless replacement of parts often makes new faults inevitable. Note the following points:

a. Before a part is unsoldered, note the position of the leads. If the part, such as the choke coil, has a number of connections, tag each of the leads to it.

b. Be careful not to damage other leads by pulling or pushing them out of the way.

c. Do not allow drops of solder to fall into the generator, since they may cause short circuits.

d. A carelessly soldered connection may create a new fault. It is very important to make well-soldered joints, since a poorly soldered joint is one of the most difficult faults to find.

e. Be careful not to disturb the adjustment of the adjusting resistors, R–4, and R–5, unless absolutely necessary.

47. Disassembly for Lubrication and Replacement of Parts

Disassembly of the generator for lubrication and replacement of parts (*a* through *j* below) should be performed only by qualified field maintenance personnel. To reassemble the generator, the procedure should be followed in reverse order.

a. Unscrew the four screws at the corners of the generator housing. Remove the top cover. Without further disassembly, access may be had to the brushes, the voltage regulator, and the adjustable resistors.

b. With a spanner wrench, loosen the nut holding the connector receptacle (J–1) to the housing. Remove the nut and push the receptacle inside the case (fig. 6).

c. Remove the eight screws at each end of the housing.

d. Rock the generator unit back and forth in the housing to loosen the gaskets, and pull the generator unit out of the housing (fig. 6).

e. Remove all brushes (fig. 5).

f. Remove the screw which secures the bracket between resistor R–5 and the gear case (fig. 7). This screw also secures a ground lead for resistor R–3. Tag or identify the lead in some manner so as to be—NJPU
so as to insure its correct reconnection.

g. Remove the screws which secure the leads to the high-voltage commutator (figs. 5 and 7).

h. Loosen the long clamping bolt which holds resistors R–1, R–2, and R–3 to the gear case (fig. 6). Do not remove this screw; merely loosen it sufficiently to detach it from the gear case.

i. Remove the seven screws which hold the gear case to the magnet frame (fig. 7). The screw furthest to the left (fig. 7) also secures two ground leads. Identify these leads to insure proper reconnection. Pry off the gear case cover, taking care not to damage the gasket.

j. Separate the gear case, armature, and crankshaft as a unit (fig. 7) from the magnet frame and end bracket.

48. Replacement of Brushes

To gain access to the brushes, remove the top cover of the generator (par. 47*a*). To replace brushes, remove the proper brush-holder cap (fig. 5) and insert one of the spare brushes from the set of running spares. Operate the generator for a short period of time and remove the new brush for examination. The surface of the brush contacting the commutator should be smooth and shiny for about 75 percent of the contact surface. This indicates that there is a proper fit between the brush and commutator.

49. Lubrication

Parts which require lubrication semiannually (or when parts are replaced) are listed in paragraph 27. Disassemble the generator as outlined in paragraph 47. Clean all grease from the gear case, gears, sprockets, gaskets, and chain. Relubricate as directed in paragraphs 26 and 27. Reassemble the unit by reversing the procedure of paragraph 47.

937113°—50——3

50. Replacement of Field Windings

a. Disassemble the generator as outlined in paragraph 47.

b. Loosen the four screws which secure the windings to the magnet frame and remove the winding. (Two of the screws are visible in figure 6; the other two screws are directly opposite.)

c. Insert new windings (E–8) into the frame and secure them with the four screws.

51. Special Replacement Techniques

The replacement of ball bearings and gears (pars. 52 and 53) requires the use of an arbor press. The following procedures should be followed:

a. When a ball bearing is associated with a defective part, it should be discarded with the part and a new bearing should be used.

b. An arbor press should be used (as described in the specific disassembly procedure) for separating gears, bearings, and sprockets from shafts.

c. For reassembling gears, bearings, shafts, etc., place the parts, suitably supported, in an arbor press; keep the parts carefully alined while a moderate pressure is applied. If a heavy pressure is required, stop immediately and recheck the alinement of parts.

52. Replacement of Armature E–1

(fig. 7)

a. Disassemble the generator as outlined in paragraph 47.

b. Remove the nut which holds the sprocket on the armature shaft.

c. Remove the chain.

d. Remove the armature. A key (O–13) which secures the sprocket to the armature will adhere to the shaft as the armature is removed.

e. Install a new armature complete with new ball bearings O–4 and O–5. Do not use the old ball bearings. Secure the new bearings to the shaft with a light press fit (par. 51). Replace the key if necessary.

f. With the shaft and sprocket in place, replace the nut which secures the armature sprocket, and replace the chain.

g. Reassemble the generator by reversing the procedure of paragraph 47.

53. Replacement of Gears

(fig. 7)

a. Disassemble the generator as outlined in paragraph 47.

b. Remove the chain.

c. Carefully pry upward on the exposed driving sprocket and gear case assembly. This will release the two idler pinion assemblies (the sprocket on one shaft, the intermediate gear on another shaft) so that they can be removed. The crankshaft can also be removed at this time, if it is necessary to replace the main drive gear.

d. The driving sprocket is keyed and press-fitted to its idler pinion shaft. Separate the assembly by supporting the driving sprocket in an arbor press and carefully pressing the pinion shaft out of the sprocket. This will also remove the ball bearing (O–3) on the pinion shaft. Replace the pinion (O–23) and/or the sprocket (O–18). Use a light press fit (par. 51) to reassemble the gear, sprocket, key, and ball bearing. Do not use the old ball bearing. The original key may be used.

e. Separate the intermediate gear and its pinion shaft by supporting the intermediate gear in an arbor press and carefully pressing the pinion shaft out of the gear. The ball bearing (O–2) will be removed at the same time. Replace the pinion (O–21) and/or the intermediate gear (O–22). Use a light press fit (par. 51) to reassemble the gears, ball bearing, and key. The original key may be used.

f. Separate the drive gear from the crankshaft by supporting the gear in an arbor press and carefully pressing the crankshaft out of the gear. The associated ball bearing and a spacer also will come off; the key (O–14) will remain with the shaft. Replace the gear (O–20), and reassemble the shaft, key, gear, spacer, and ball bearing with a light press fit (par. 51).

g. Replace the crankshaft and two idler pinion assemblies in the gear case housing, replace the chain, and reassemble the generator by reversing the procedure of paragraph 47.

54. Refinishing

To refinish badly marred generator cases, follow instructions given in TM 9–2851.

Section IV. ADJUSTMENTS

55. Bias Adjustment

a. Resistor R–3 is initially adjusted to obtain a negative 30-volt potential at terminal R of connector J–1 with the generator properly loaded and cranked at normal speed. The adjustment should not be changed unless the proper voltage is not obtained when an operational or final test (par. 45 or 58, respectively) is made.

b. To adjust R–3, remove the generator cover and loosen the screw which secures the sliding tap (fig. 6); move the slider slightly, tighten the screw, and again make an operational check for the correct potential. Make repeated slight readjustments of the slider until the correct potential is obtained.

Caution: Always short-circuit filter capacitors before touching components within the generator.

56. Voltage Regulator Adjustment

a. Resistors R–4 and R–5 are initially adjusted to obtain a 6.3-volt potential at terminal A of connector J–1 with the generator properly loaded and cranked at normal speed. The adjustments should not be changed unless the proper voltage is not obtained when an operational or final test (par. 45 or 58, respectively) is made.

b. To gain access to R–4 and R–5, remove the generator cover. For a coarse adjustment, loosen the screw which secures the slider on resistor R–5 (fig. 5); move the slider slightly, tighten the screw, and again make an operational check for the correct potential. Make repeated adjustments of the slider on R–5 until further adjustments cause increased deviations from the 6.3-volt potential. Tighten the slider when the closest possible adjustment has been made. To make an exact adjustment, loosen the screw which secures the slider on resistor R–4 and make repeated adjustments of the slider on R–4 until a potential of exactly 6.3 volts is obtained.

Section V. FINAL TESTING

57. General

This section is intended as a guide to be used in determining the quality of a repaired Generator G–84/GRC. The minimum test requirements outlined below may be performed by maintenance personnel with adequate test equipment and the necessary skill. Repaired equipment meeting these requirements will furnish uniformly satisfactory operation.

58. Test Procedure

Crank the generator at a speed of 50 to 70 rpm while it is connected to a dummy load as shown in figure 8. Connect a voltmeter (Multimeter TS–352/U or equal) successively to each of the terminals indicated in the following table. If the voltages are within the limits indicated, the generator is satisfactory.

Metered terminal on P–1	Nominal voltage	High limit	Low limit
H	400	420	365
F	250	265	235
C	145	155	125
B	90	93	84
A	6. 3	6	6. 1
R	−30	−25	−32

CHAPTER 6

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

59. Disassembly

The following instructions are recommended as a guide for preparing the generator for transportation and storage.

a. Remove the geneator cranks and dismount the generator from its legs.

b. Stow the cranks and legs in their carrying case.

60. Repacking for Shipment or Limited Storage

a. The exact procedure in repacking for shipment or limited storage depends on the material available and the conditions under which the equipment is to be shipped or stored. Refer to paragraph 6 and figure 4 for details of the original packaging. Duplicate the original packing if possible.

b. Whenever practicable, place a dehydrating agent such as silica gel inside cartons used for packaging. Protect the cartons with a waterproof paper barrier. Seal the seams of the paper barrier with waterproof sealing compound or tape. Pack the protected cartons in a padded wooden case, providing at least 3 inches of excelsior padding or some similar material between the paper barrier and the packing case.

61. Demolition of Matériel to Prevent Enemy Use

When ordered by your commander, demolish this equipment in order to prevent the enemy from using or salvaging it. However, act only upon orders from your commander. Proceed as follows:

a. Smash. Smash the brushes, controls, resistors, coils, switches, capacitors, and connectors, using sledges, axes, handaxes, pickaxes, hammers, crowbars, or heavy tools.

b. Cut. Cut cords, cables, and wiring, using axes, handaxes, or machetes.

c. Burn. Burn cords, resistors, capacitors, coils, wiring, technical manuals, and instruction books, using gasoline, kerosene, oil, flame throwers, or incendiary grenades.

d. Bend. Bend brackets, mountings, and housing.

e. Explosives. If explosives are necessary, use firearms, grenades, or TNT.

f. Bury. Bury or scatter the destroyed parts in slit trenches, fox holes, or other holes, or throw them into streams.

g. Destroy everything.

APPENDIX I

REFERENCES

Note. For availability of items listed, check SR 310– 20–3 and SR 310–20–4. Check Department of the Army Supply Catalog SIG 1 for Signal Corps supply catalog pam phlets.

1. Army Regulations

AR 380–5_____. Safeguarding Military Information.

2. Supply Publications

SIG 1_____. Introduction and Index.
SIG 3_____. List of Items for Troop Issue.
SB 11–47_____. Preparation and Submission of Requisition for Signal Corps Supplies.
SB 11–76_____. Signal Corps Kit and Materials for Moisture- and Fungi-Resistant Treatment.

3. Publications on Auxiliary Equipment and Test Equipment

NAVSHIPS 91, 269_____. Instruction Book for Electronic Multimeter ME–6A/U.
SB 11–54_____. Conversion of Tool Equipments TE–45A and TE–48 to Tool Equipment TE–113.
TM 11–5527____. Multimeter TS–352/U.

4. Painting, Preserving, and Lubrication

TB SIG 13_____. Moistureproofing and Fungiproofing Signal Corps Equipment.
TB SIG 69_____. Lubrication of Ground Signal Equipment.
TM 9–2851_____. Painting Instructions for Field Use.

5. Demolition

FM 5–25_____. Explosives and Demolitions.

6. Other Publications

FM 24–18_____. Field Radio Techniques.
SR 310–20–3____. Index of Training Publications (Field Manuals, Training Circulars, Firing Tables and Charts, Army Training Programs, Mobilization Training Programs, Graphic Training Aids, Joint Army - Navy - Air Force Publications, and Combined Communications Board Publications).
SR 310–20–4____. Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, Modification Work Orders, Tables of Organization and Equipment, Reduction Tables, Tables of Allowances, Tables of Organization, Tables of Equipment.
SR 700–45–5____. General Unsatisfactory Equipment Report (Reports Control Symbol CSGLD–247).
SR 745–45–5____. Report of Damaged or Improper Shipment (Reports Control Symbols CSGLD–66 (Army), SandA–70–6 (Navy), and AF–MC–U2 (Air Force).
TB SIG 25_____. Preventive Maintenance of Power Cords.
TB SIG 66_____. Winter Maintenance of Signal Equipment.

TB SIG 72	Tropical Maintenance of Ground Signal Equipment.
TB SIG 75	Desert Maintenance of Ground Signal Equipment.
TB SIG 123	Preventive Maintenance Practices for Ground Signal Equipment.
TB SIG 178	Preventive Maintenance Guide for Radio Communication Equipment.
TB SIG 223	Field Expedients for Wire and Radio.
TM 11–453	Shop Work.
TM 38–650	Basic Maintenance Manual.

7. Abbreviations

a, amp	ampere
ac	alternating current
C	centigrade
dc	direct current
F	Fahrenheit
ma	milliampere
mh	millihenry
r-f	radio-frequency
rpm	revolutions per minute
μf	microfarad
μh	microhenry

APPENDIX II

IDENTIFICATION TABLE OF PARTS

1. Requisitioning Parts

The fact that a part is listed in this table is not sufficient basis for requisitioning the item. Requisitions must cite an authorized basis, such as T/O&E, T/A, T/BA, SIG 7–8–10, SIG 10, list of allowances of expendable material, or other authorized supply basis. The Department of the Army Supply Catalog applicable to the equipment covered in this manual is SIG 7 & 8–G–8/GRC. For an index of available supply catalogs in the Signal portion of the Department of the Army Supply Catalog, see the latest issue of SIG 1, Introduction and Index.

2. Identification Table of Parts for Generator G–8/GRC

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
	GENERATOR G–8/GRC: 80 w; 430 v at .115 amp, 7% regulation, 90 v at 70 ma, 7% regulation, 6.3 v at 2.3 amp, 8% regulation; open frame, 2 pole; 8⅞″ lg x 6½″ wd x 10″ h; hand cranked w/2 Sig Crank CGC–7; RF and AF filter, dropping resistors, plug-in type v regulator; tripod type mtg using 2 Sig C Legs LG–3–B and 1 LG–2–B; rubber vibration mts; ball bearings, acoustically quiet.	Portable power source	3H2320–8
	TECHNICAL MANUAL (TM 11–5037)		(Order through AGO channels.)
E–1	ARMATURE, generator: for hand crank driven DC gen.	Generates voltage	3H135–37
O–4	BEARING, ball: single row radial; double seal; .3150″ bore, .8661″ OD x .2756″ wd.	Supports armature	3H320–98
O–3	BEARING, ball: single row radial; plain; 8 mm bore, 22 mm OD x 7 mm thk.	Supports second idler pinion shaft.	3H2337/3
O–2	BEARING, ball: single row radial; plain; 9 mm bore, 26 mm OD x 8 mm wd.	Supports first idler pinion shaft	3H320–9
O–5	BEARING, ball: single row radial; single seal; .3150″ bore, .8661″ OD x .2756″ wd.	Supports armature	3H320–99
O–1	BEARING, ball: single row radial; single seal; .6693″ bore, 1.5748″ OD x .4724″ wd.	Supports crankshaft	3H305–170
E–2 through E–5.	BRUSH SET, electrical contact: c/o 1 ea HV-med v pos commutator brush, 1 ea HV-med v neg commutator brush; set.	Conduct high-voltage current	3H535B
E–6, E–7	BRUSH SET, electrical contact: c/o 1 pos and 1 neg LV commutator brush; set.	Conduct low-voltage current	3H525B–8
A–1	BUMPER: cemented to housing	Directs generator	6Z1650–7
O–7	CAP: connector	Protects power connector	2Z1619–67
O–6	CAP: covers brush holder	Holds brushes	2Z1607–83
C–3	CAPACITOR, fixed: paper; 500,000 $\mu\mu$f $\pm$10%; 200 vdcw; JAN type CP29A1EC504K.	Filters 6.3-volt circuit	3DA500–650

2. Identification Table of Parts for Generator G–8/GRC—Continued

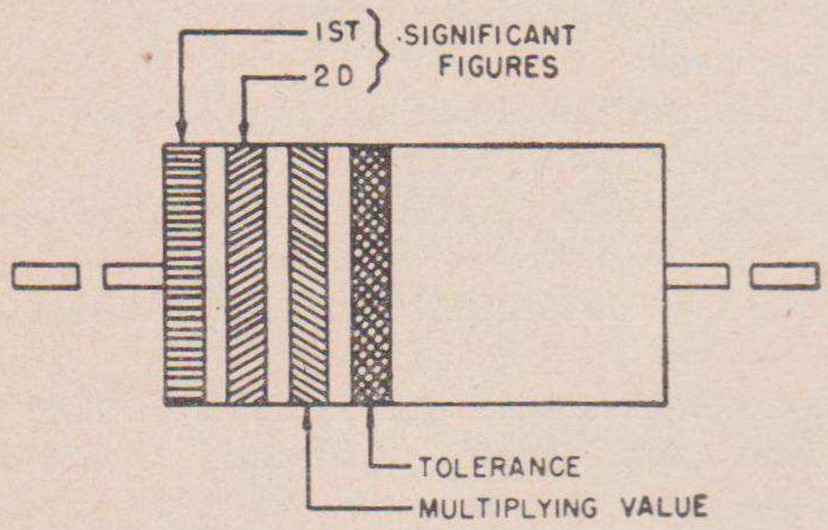
Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
C–1	CAPACITOR, fixed: paper; 2 μf ±10%; 600 vdcw; JAN type CP55B1EF205K.	Filters 430-volt circuit	3DB2–239
C–2	CAPACITOR, fixed: electrolytic; 20 mf; 150 vdcw; JAN type CE61C200J.	Filters 90-volt circuit	3DB20–143
H–1	CHAIN: silent drive type, inverted tooth, 11/32″ wd; 3/16″ pitch, 58 pitches lg.	Connects driving sprocket	6Z1805–6
L–2	COIL, RF: choke; cylindrical zinc shield can	Filters 90-volt circuit	3C575K–1
L–1	COIL, RF: choke; unshielded	Filters 430-volt circuit	3C323–34Y
J–1	CONNECTOR, receptacle: 14 round, female cont, pol; straight type; cylindrical brass body, electro tin pl finish, locking.	Provides power connection	2Z3075–26
X–1	CONNECTOR, receptacle: 14 round female cont, pol; straight type; rect bakelite body.	Holds voltage regulator	2Z8684–35
O–8	CRANK GC–7: hand gen crank	Provides manual operation	3H1407
O–9	GASKET: connector; neoprene; single hole; doughnut shape, 1.632″ mx ID, 1¾″ nom OD x .062″ nom thk.	Connector fixed joint	2Z4868.788
O–10	GASKET: gear housing; vellumoid; 8 holes; irregular shape, approx 7 29/32″ lg x 4 3/16″ wd x 1/32″ thk.	Gear case housing fixed joint	2Z4867.606
O–11	GASKET: main housing cover; syn rubber; single hole; doughnut shape, 6.975″ nom ID, 7⅜″ nom OD x .210″ nom thk.	Main cover fixed joint	2Z4868.789
O–12	GASKET: vibration mount; syn rubber; single hole; doughnut shape, 2.225″ nom ID, 2⅝″ nom OD x .210″ nom thk.	Vibration mount fixed joint	2Z4868.790
O–21	GEAR: spur; 1st driven pinion; 12 teeth; .552″ OD x .605″ wd.	Provides first speed expansion stage.	3H2230.1–26
O–20	GEAR: spur; 1st driving pinion; 62 teeth; max dimen, .6725″ bore, 2.655″ OD x .437″ thk.	First pinion driver	3H2230.1–29
O–23	GEAR: spur; 2d driven pinion; 14 teeth; .508″ max OD x .574″ wd.	Provides second speed expansion stage.	3H2230.1–28
O–22	GEAR: spur; 2d driving pinion; 60 teeth; .4377″ nom bore, 2.058″ max OD x .375″ thk o/a.	Second pinion driver	3H2230.1–27
H–3	HOLDER, brush: holds HV brush and spring	Supports 430-volt and 90-volt brushes.	2Z5042–62
H–2	HOLDER, brush: holds LV brush and spring	Supports 6.3-volt brush	2Z5042–61
O–13	KEY, machine: sq; 5/16″ lg x .094″ wd x .125″ thk o/a.	Locks driving sprocket	6L996–5–1
O–14	KEY, machine: sq; 7/16″ lg x .094″ wd x .125″ thk o/a.	Locks crankshaft gear	6L996–7–3
A–2	LEG LG–2–B: gen	Supports generator	2Z6102B
A–3	LEG LG–3–B: gen	Supports generator	2Z6103B
A–4	MOUNT, vibration: round mtg; 2 13/16″ OD x .932″ nom thk.	Isolates vibration of generating unit.	2Z8405–87
L–3	REACTOR: 3.11 mh, 3 amp DC; .12 ohm DC resistance at 68° F.; open frame.	Filters 6.3-volt circuit	3C575K
VR–1	REGULATOR, voltage: 87 w, 6.3 v, 90 v, and 430 v, DC; 2 wire; 50 to 70 rpm.	Maintains constant output voltage	3H4490–6.7
R–4	RESISTOR, adjustable: WW; 1 ohm ±10%; 10 w; single adj slide.	Provides fine adjustment for voltage regulator nominal voltage.	3Z5991–119
R–5	RESISTOR, adjustable: WW; 10 ohms ±10%; 10 w; 1 slide.	Provides coarse adjustment for voltage regulator nominal voltage.	3Z6001–120

2. Identification Table of Parts for Generator G–8/GRC—Continued

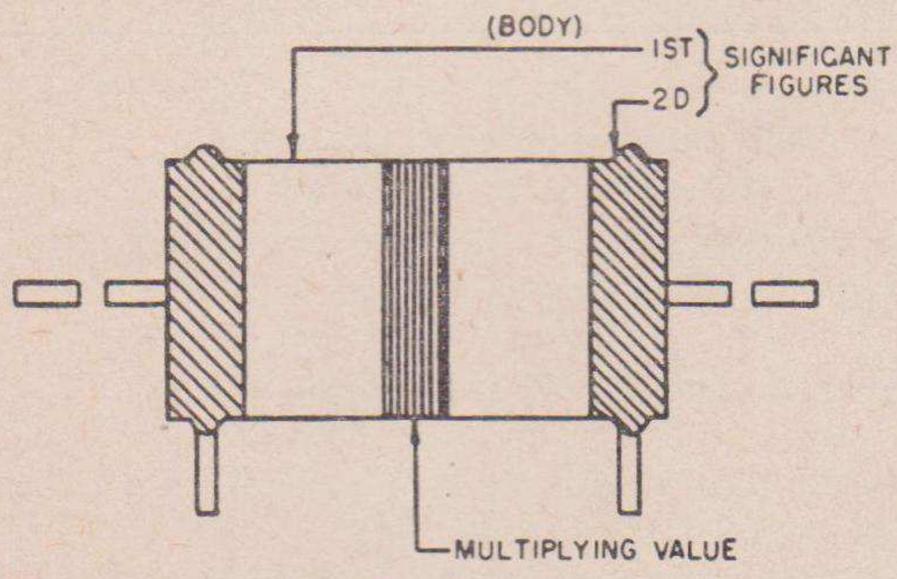
Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
R–3	RESISTOR, adjustable: WW; 300 ohms ±10%; 10 w; 1 adj lug scdr type.	Provides voltage drop for 30-volt circuit.	3Z6030–121
R–1	RESISTOR, adjustable: WW; 10,000 ohms ±10%; 10 w; single adjustable slide.	Drops voltage for 250-volt circuit	3Z6610–136
R–2	RESISTOR, fixed: WW; 6711 ohms ±1%; 25 w.	Drops voltage for 145-volt circuit	3Z6567A1
O–15	SEAL, grease: flat washer shape	Seals passage of crankshaft through gear case.	6Z8085–6
O–16	SEAL, water: doughnut shape	Provides waterproof seal at external crankshaft opening.	6Z8093–16
H–4	SCREW, captive: slotted drive; Fil H; SS; # 12–24 NC; 1¼″ lg.	Fastens main top cover	6L4772–20.3S
O–17	SPRING: flat type; to hold gen legs; 1⅝″ lg x 1⅝″ wd o/a.	Retains legs	7A1678–23
O–18	SPROCKET, chain: 3/16″ cir pitch, 50 teeth	Drives chain	3H5286
O–19	SPROCKET, chain: 3/16″ pitch, 15 teeth	Provides third speed expansion stage.	2Z8880–3
E–8	WINDING, generator field: c/o 2 coils	Creates magnetic field flux	3H8400A–7

RESISTOR COLOR CODES

RMA COLOR CODE FOR FIXED COMPOSITION RESISTORS*



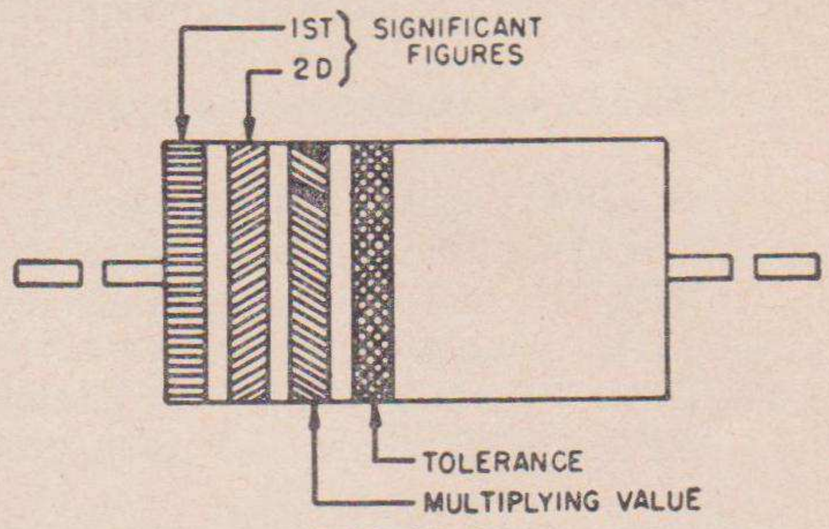
METHOD A



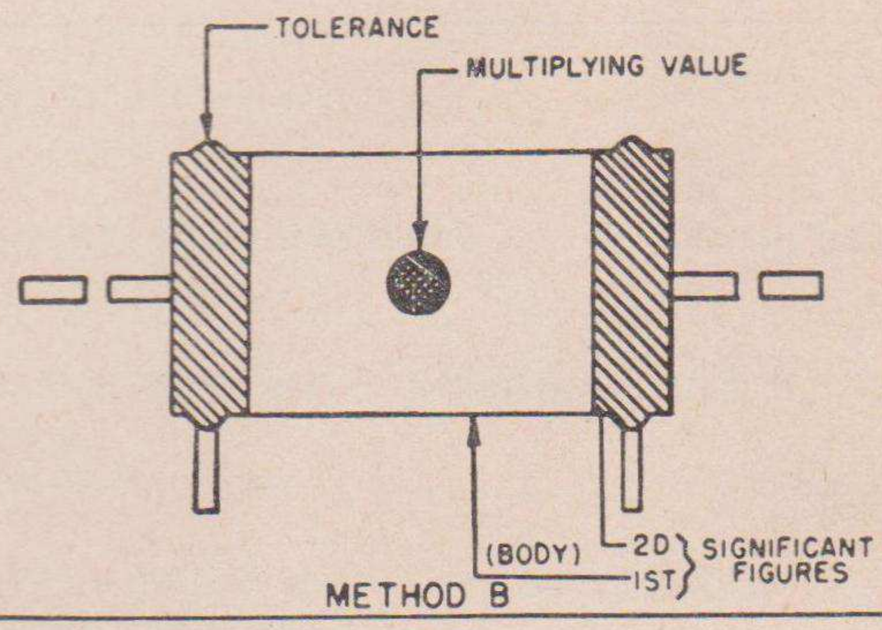
METHOD B

A

JAN COLOR CODE FOR FIXED COMPOSITION RESISTORS†



METHOD A



METHOD B

B

COLOR	SIGNIFICANT FIGURE	MULTIPLYING VALUE	TOLERANCE (%)
BLACK	0	1	± –
BROWN	1	10	± 1
RED	2	100	± 2
ORANGE	3	1,000	± 3
YELLOW	4	10,000	± 4
GREEN	5	100,000	± 5
BLUE	6	1,000,000	± 6
VIOLET	7	10,000,000	± 7
GRAY	8	100,000,000	± 8
WHITE	9	1,000,000,000	± 9
GOLD	–	0.1	± 5
SILVER	–	001	± 10
NO COLOR	–	–	± 20

NOTES

* INSULATED FIXED COMPOSITION RESISTORS WITH AXIAL LEADS ARE DESIGNATED BY A NATURAL TAN BACKGROUND COLOR. NON-INSULATED FIXED COMPOSITION RESISTORS WITH AXIAL LEADS ARE DESIGNATED BY A BLACK BACKGROUND.

† RESISTORS WITH AXIAL LEADS ARE INSULATED. RESISTORS WITH RADIAL LEADS ARE NON-INSULATED.

RMA: RADIO MANUFACTURERS ASSOCIATION

JAN. JOINT ARMY-NAVY

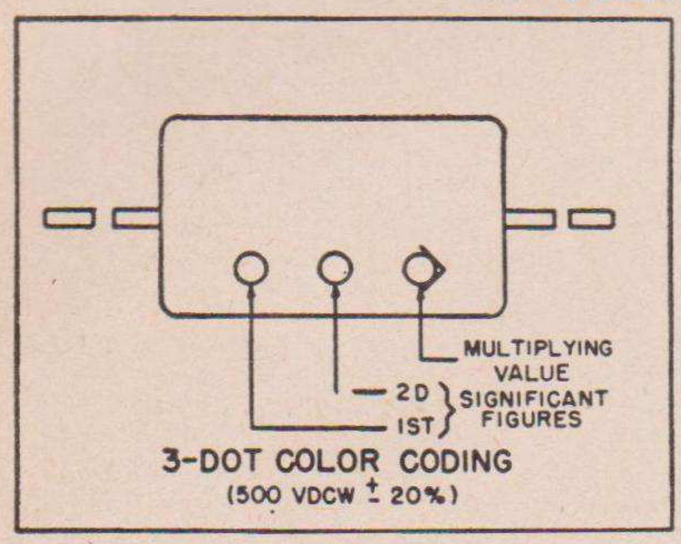
THESE COLOR CODES GIVE ALL RESISTANCE VALUES IN OHMS.

TL 32454S

Figure 9. Resistor color codes.

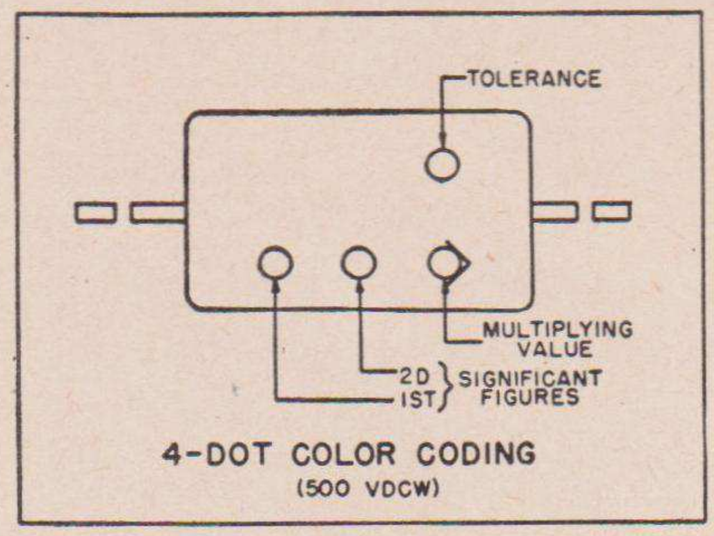
CAPACITOR COLOR CODES

RMA 3-,4-,5-,& 6-DOT COLOR CODES FOR MICA-DIELECTRIC CAPACITORS



3-DOT COLOR CODING
(500 VDCW ± 20%)

A

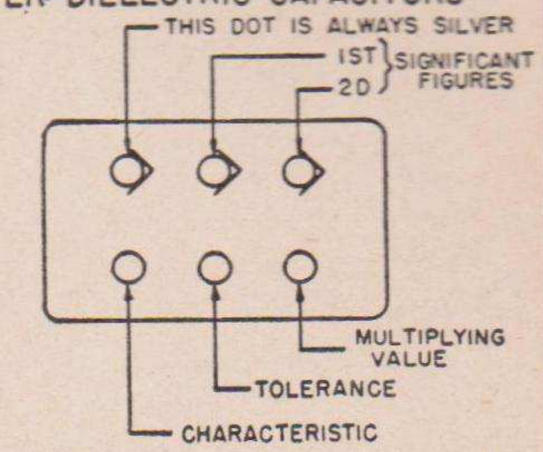


4-DOT COLOR CODING
(500 VDCW)

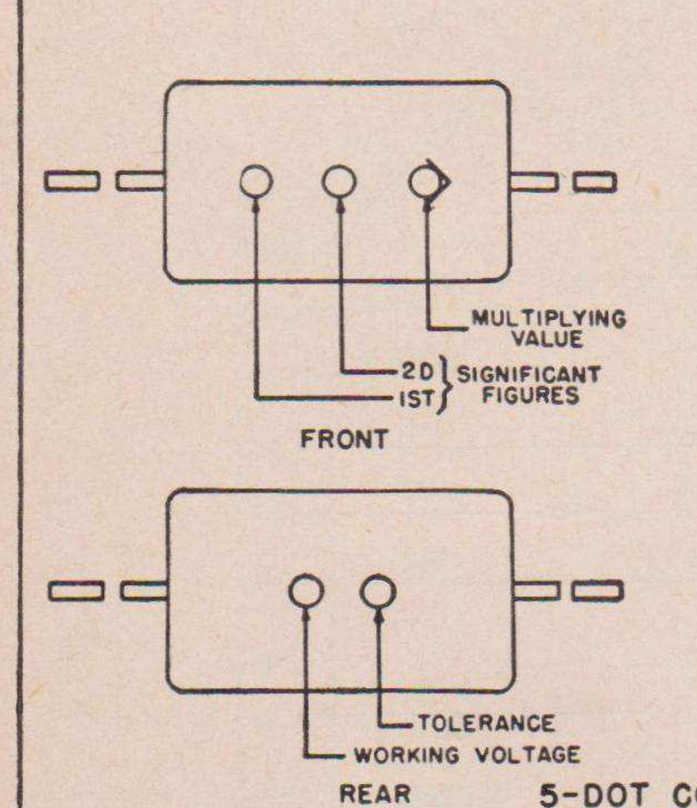
B

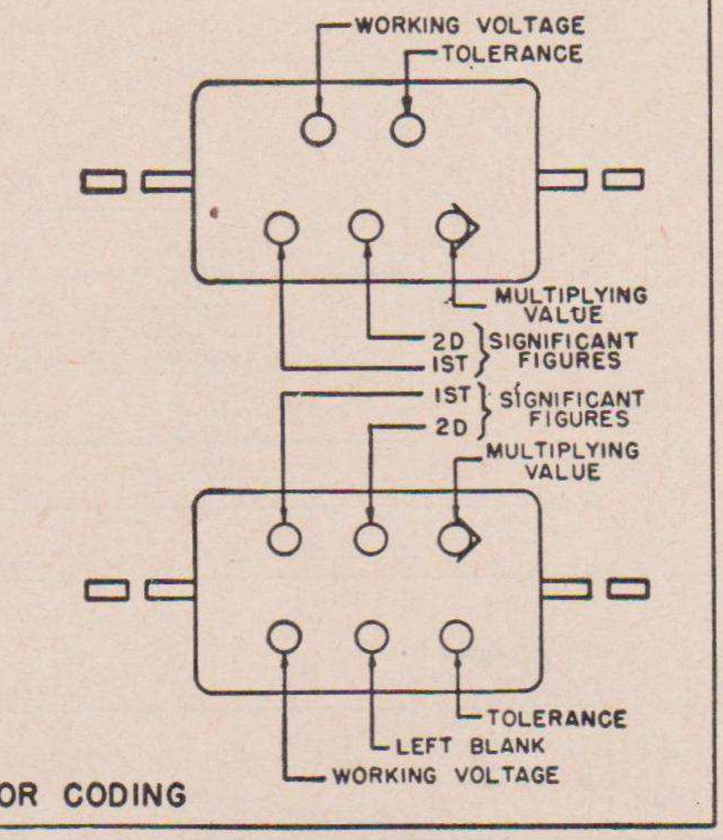
JAN 6-DOT COLOR CODES FOR:

PAPER-DIELECTRIC CAPACITORS *



F

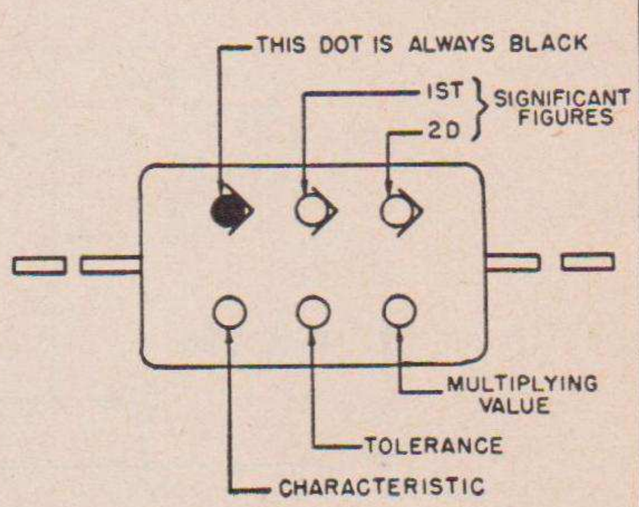




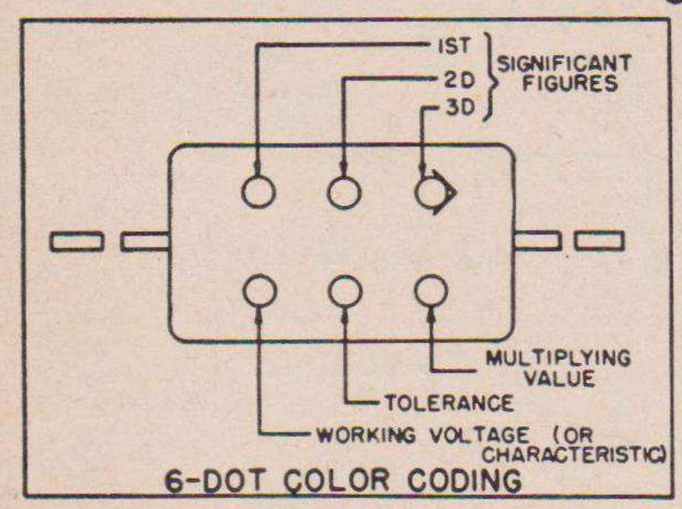
5-DOT COLOR CODING

C

MICA-DIELECTRIC CAPACITORS ✓



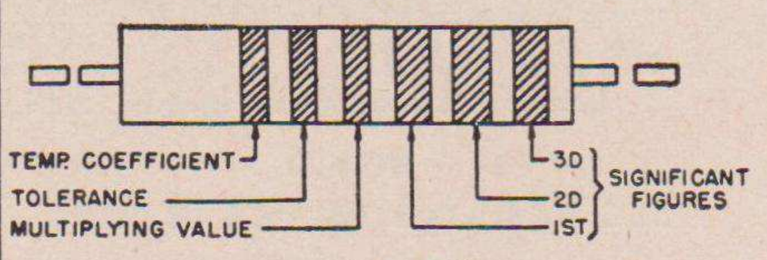
G



6-DOT COLOR CODING

D

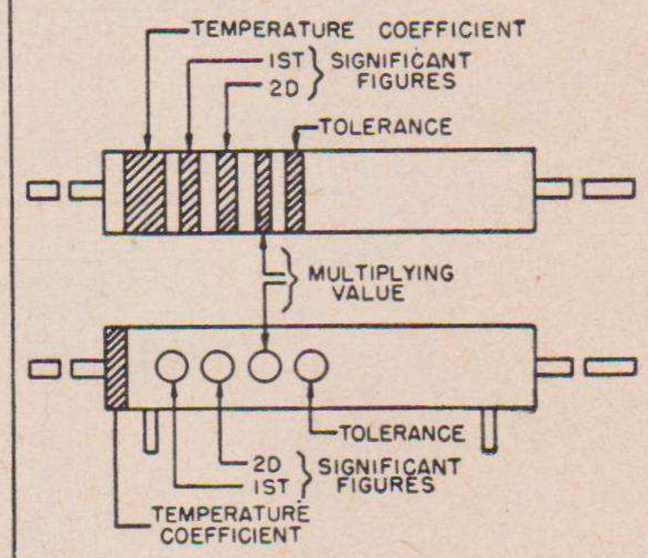
RMA COLOR CODE FOR TUBULAR CERAMIC-DIELECTRIC CAPACITORS



(500 VDCW)

E

CERAMIC-DIELECTRIC CAPACITORS **



H

COLOR	SIGNIFICANT FIGURE	MULTIPLYING VALUE			RMA VOLTAGE RATING
		RMA MICA-AND CERAMIC-DIELECTRIC	JAN MICA-AND PAPER-DIELECTRIC	JAN CERAMIC-DIELECTRIC	
BLACK	0	1	1	1	-
BROWN	1	10	10	10	100
RED	2	100	100	100	200
ORANGE	3	1,000	1,000	1,000	300
YELLOW	4	10,000	10,000		400
GREEN	5	100,000			500
BLUE	6	1,000,000			600
VIOLET	7	10,000,000			700
GRAY	8	100,000,000		0.01	800
WHITE	9	1,000,000,000		0.1	900
GOLD	-	0.1	0.1		1,000
SILVER	-	0.01	0.01		2,000
NO COLOR	-				500

NOTES

* THE SILVER DOT IDENTIFIES THIS MARKING FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

✓ THE BLACK DOT IDENTIFIES THIS MARKING. FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

** CAPACITORS MARKED WITH THIS CODE HAVE A VOLTAGE RATING OF 500 VDCW. EITHER THE BAND OR DOT CODE MAY BE USED FOR BOTH INSULATED (AXIAL-LEAD) OR UNINSULATED (RADIAL-LEAD) CAPACITORS.

RMA: RADIO MANUFACTURERS ASSOCIATION

JAN: JOINT ARMY-NAVY

THESE COLOR CODES GIVE CAPACITANCES IN MICROMICROFARADS.

TL 324535

Figure 10. Capacitor color code.

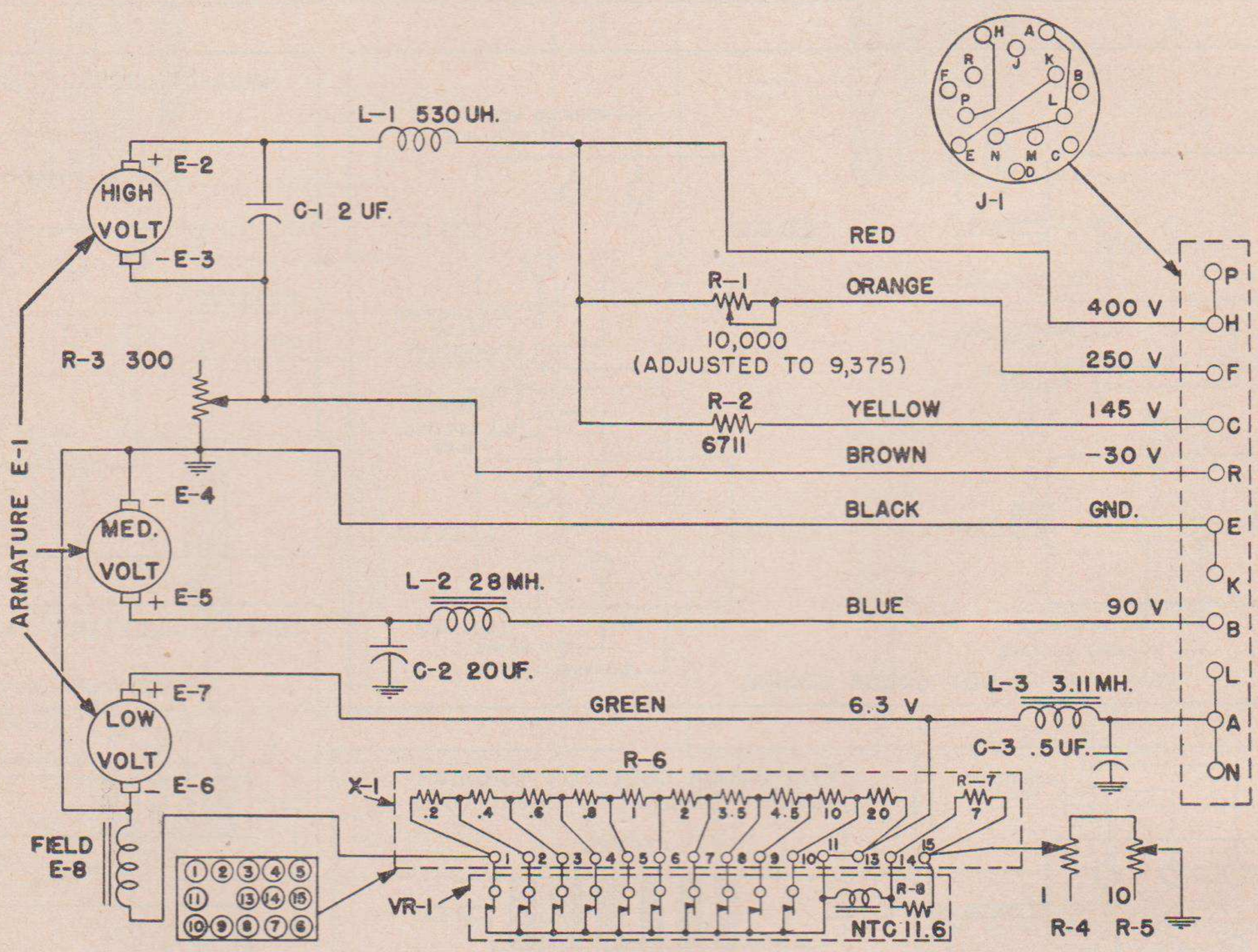


Figure 11. Generator G–8/GRC, schematic diagram.

TECHNICAL MANUAL

GENERATOR G–8/GRC

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *1 November 1951*

CHANGES
No. 1

TM 11–5037, 20 March 1951, is changed as follows:

35. Voltage Outputs
(fig. 11)

a. HIGH-VOLTAGE WINDING. The voltage induced * * * E–2 and E–3. Filter capacitor C1 is connected **from the positive side of the winding** to remove a-c (alternating-current) ripple. **Capacitors C4 and C5 are r-f bypass capacitors.** The positive side * * * 145 volts, respectively.

b. MEDIUM-VOLTAGE WINDING. The voltage induced * * * of connector J1. **C2 is a low-frequency filter capacitor.** Terminal B of * * * respect to ground. **Capacitor C6 is connected across the brushes to filter radio frequencies.**

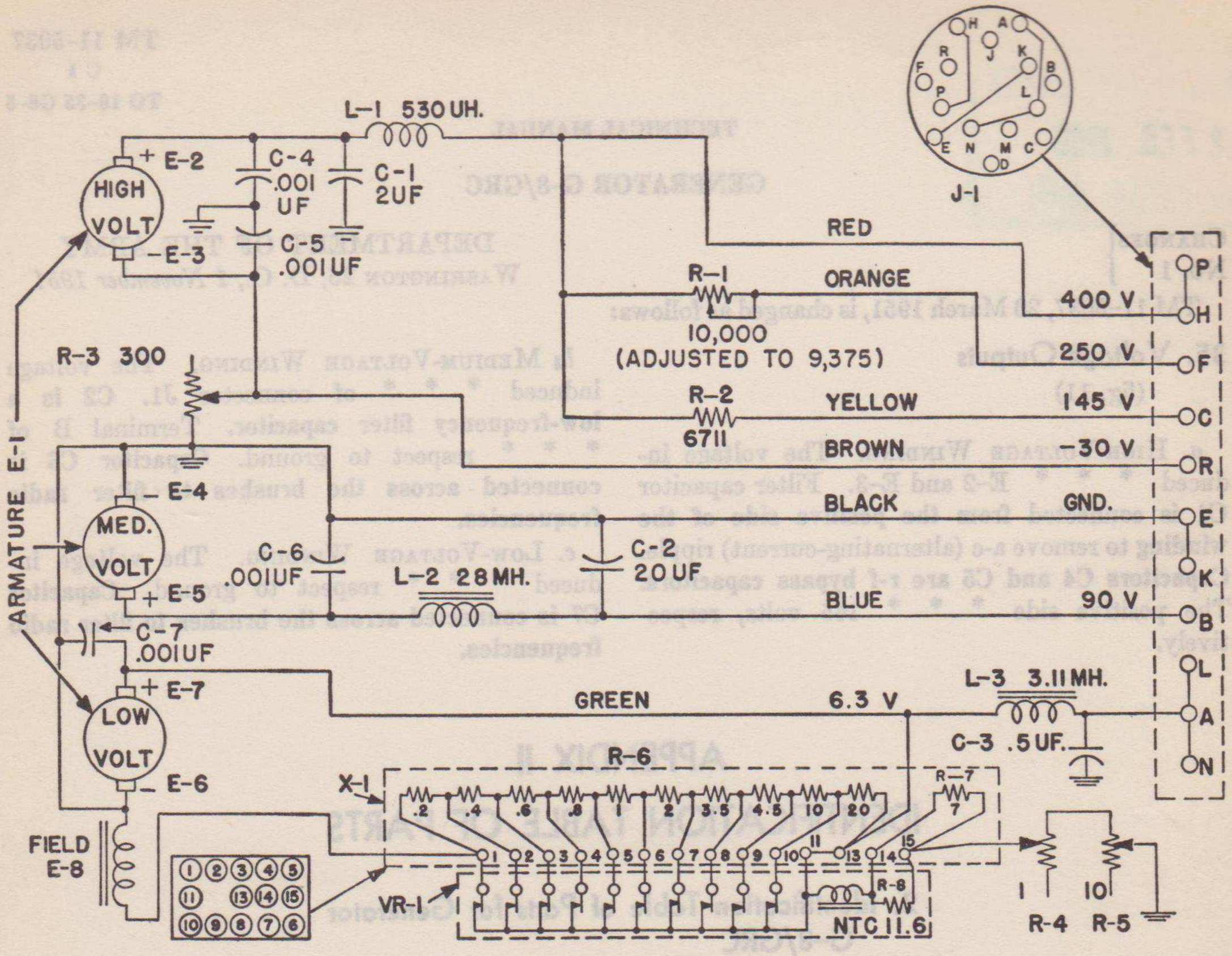
c. LOW-VOLTAGE WINDING. The voltage induced * * * respect to ground. **Capacitor C7 is connected across the brushes to filter radio frequencies.**

APPENDIX II

IDENTIFICATION TABLE OF PARTS

2. Identification Table of Parts for Generator G–8/GRC

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
*	* * *	* *	*
C1	Capacitor, fixed * * * JAN type CP55B1-EF205K.	Filters 430-volt circuit.	3DB2–239
C4 thru C7.	Capacitor, fixed: mica; .001 μf ± 10%; 500 vdcw; JAN type CM30B102K.	R-f bypass capacitors.	3K3010221
*	* * *	* *	*



NOTE:

ALL RESISTOR VALUES IN OHMS

TM 5037-13

Figure 11 (Superseded). *Generator G–8/GRC, schematic diagram.*

[AG 413.44 (1 Oct 51)]

BY ORDER OF THE SECRETARY OF THE ARMY:

J. LAWTON COLLINS
Chief of Staff, United States Army

OFFICIAL:
WM. E. BERGIN
Major General, USA
The Adjutant General

DISTRIBUTION:

Tech Svc (1); Arm & Svc Bd (1); AFF Bd (ea Svc Test Sec) (1); AFF (5); AA Comd (2); OS Maj Comd (5); Base Comd (5); MDW (5); Log Comd (2); A (20); CHQ (2); FC (2); Sch (2) except 11 (25); Gen Dep (2); Dep 11 (20) except Sig Sec, Gen Dep (10); Tng Div (2); PE (10), OSD (2); Lab 11 (5); 4th & 5th Ech Maint Shops 11 (3); Two (2) copies to each of the following T/O & E's: 5–225; 5–226; 6–200; 6–225; 6–226; 6–227; 6–229; 6–235; 6–236; 6–237; 6–416; 6–419; 6–447; 7–11N; 7–31; 7–32; 7–34; 7–35; 7–36; 11–107; 11–127; 11–500 CA, CB, CC, CD; 11–557; 11–587; 11–592; 11–597; 17–32; 17–35N; 17–36N; 17–37N; 17–77; 17–115; 17–116; 17–117; 17–125; 19–97; 44–275; 44–276; 44–277; SPECIAL DISTRIBUTION.

For explanation of distribution formula, see SR 310–90–1.

U. S. GOVERNMENT PRINTING OFFICE: 1951

GENERATORS G–8/GRC AND G–8A/GRC

TM 11–5037
TO 31R2–2GRC–111
CHANGES No. 2

DEPARTMENTS OF THE ARMY AND
THE AIR FORCE
WASHINGTON 25, D. C., *3 October 1955*

TM 11–5037/TO 31R2–2GRC–111, 20 March 1951, is changed as follows:

The title of the manual is changed to Generators G–8/GRC **and G–8A/GRC.**

In the following places in the manual, change Generator G–8/GRC to **Generator G–8(*)/GRC.**

Page x. Figure 1. Caption.
Page 1. Paragraph 3. Line 1.
Page 1. Paragraph 4. Line 2.
Page 2. Figure 2. Title at upper left-hand corner of illustration and caption.
Page 2. Paragraph 6. Line 2 and first item under "contents" in chart.
Page 2. Paragraph 7. Line 1 and item under "component" in chart.
Page 2. Paragraph 8. Paragraph heading and line 1.
Page 3. Figure 3. Captain and reference at upper left-hand corner of illustration.
Page 3. Paragraph 10. Line 4.
Page 4. Section I. Heading.
Page 4. Paragraph 13. Heading.
Page 4. Figure 4. Caption.
Page 5. Paragraph 18. Line 1.
Page 7. Paragraph 22. Line 2.
Page 8. Paragraph 27. Line 1.
Page 9. Paragraph 28. Line 1.
Page 10. Paragraph 29*b*. Line 6.
Page 11. Chapter 4. Heading.
Page 11. Paragraph 33. Line 1.
Page 15. Paragraph 43. Line 2.
Page 19. Paragraph 57. Line 3.

Page 1. Delete paragraph 1 and substitute the following:

1. Scope

This manual contains instructions for the installation, operation, maintenance, and repair of Generator G–8(*)/GRC (fig. 1). Official nomenclature followed by (*) is used to indicate all models of the equipment covered in this manual. Thus Generator G–8(*)/GRC indicates Generator G–8/GRC and Generator G–8A/GRC.

Page 1. Paragraph 2*b*. Line 1. Change "DA AGO Form" to read: **DA Form.**

Page 1. Paragraph 2*c*. Line 1, Change "DA AGO Form" to read: **DA Form.**

Page 1. Paragraph 5. In Line 2, add the following after "Power output": (Generator G–8/GRC).

Insert the following between lines 7 and 8:

Power output (Generator G–8A/GRC):
0.07 ampere at 400 volts.
.015 ampere at 250 volts.
.038 ampere at 145 volts.
.071 ampere at 85 volts.
2.5 amperes at 6.3 volts.
.002 ampere at —27 volts.

10.1. Differences in Models
(Added)

The assembly of the electrical components of Generator G–8A/GRC has been changed to permit easier part replacement, and the speed-change mechanism has been changed for greater ease of servicing. Consequently, several of the components, mechanical and electrical, have been changed. The significant changes follow:

a. The series arrangement of R4 and R5 is replaced by a single 15-ohm, slide-wire resistor, R4.

b. The value of L2 is changed from 28 millihenrys to .25 millihenry. L2 is not potted and is an open-frame type.

c. Capacitor C1 has been changed from 2 microfarads (μf) plus or minus 10 percent, to 2 μf, plus or minus 20 percent. Its case has been changed from a bottom terminal to a side-terminal type and its negative terminal connects to ground instead of the negative side of the high-voltage winding. Its positive terminal connects to the output instead of the input side of L1.

d. Capacitor C2 has been changed from a grounded negative type case to a two-terminal type case, and its positive terminal connects from the output instead of the input side of L2.

e. Capacitor C3 has been changed from a tubular to a bathtub type.

f. Capacitors C4 through C7 have been added to suppress radio-frequency noise.

g. The power output ratings have been changed (par. 5).

h. The main drive shaft grease seal has been changed to a standard commercial instead of a special type for better operation and greater ease of replacement.

i. A grease seal has been incorporated to prevent seepage of grease past the outer race of the ball bearing on the driven end of the armature shaft.

j. The ball bearings for the main drive shaft have been changed to smaller, fully sealed types.

k. The ball bearings for the first and second stage pinion shafts have been changed to a smaller size and are identical.

l. The bearing housing is secured in place with a headless setscrew instead of a pin.

m. The sprocket that drives the generating unit armature is secured to the armature shaft through flats on the shaft and in the sprocket bore and a flat washer, lockwasher, and screw threaded into the end of the shaft, instead of by a threaded shaft, key, and nut.

n. As a result of the changes in *h* through *l* above, minor changes have been made on the machining of all shafts, gear and sprocket bores, machine keys, end bells, gearcase cover, and the vibration mounts. Because of these slight changes the components of the G–8/GRC and the G–8 A/GRC are not interchangeable with components used on Generator G–8/GRC.

o. Four bumpers are cemented into the housing cover rather than three. This allows the cover to be installed in any position.

Page 6. Paragraph 19*c*. Delete the second sentence and substitute the following:

This is normal and, **in Generator G–8/GRC,** is due to the thickness of the grease in the gearcase. **In Generator G–8A/GRC, the gearcase is not filled with grease, but the grease on the grease-sealed ball bearings may thicken.**

Page 8. Paragraph 26*e*. Delete subparagraph *e* and substitute the following:

e. For the location of parts refer to figures 5, 6, and 7 for Generator G–8/GRC and figures 5.1, 6.1, 6.2, and 7.1 for Generator G–8A/GRC. Refer to paragraph 47 for disassembly instructions.

Page 11. Paragraph 34. Make the following changes in paragraph 34:

Line 2. Change "figure 7" to read: **figures 7 and 7.1.**

Line 3. Change "figure 11" to read: **figures 11 and 12.**

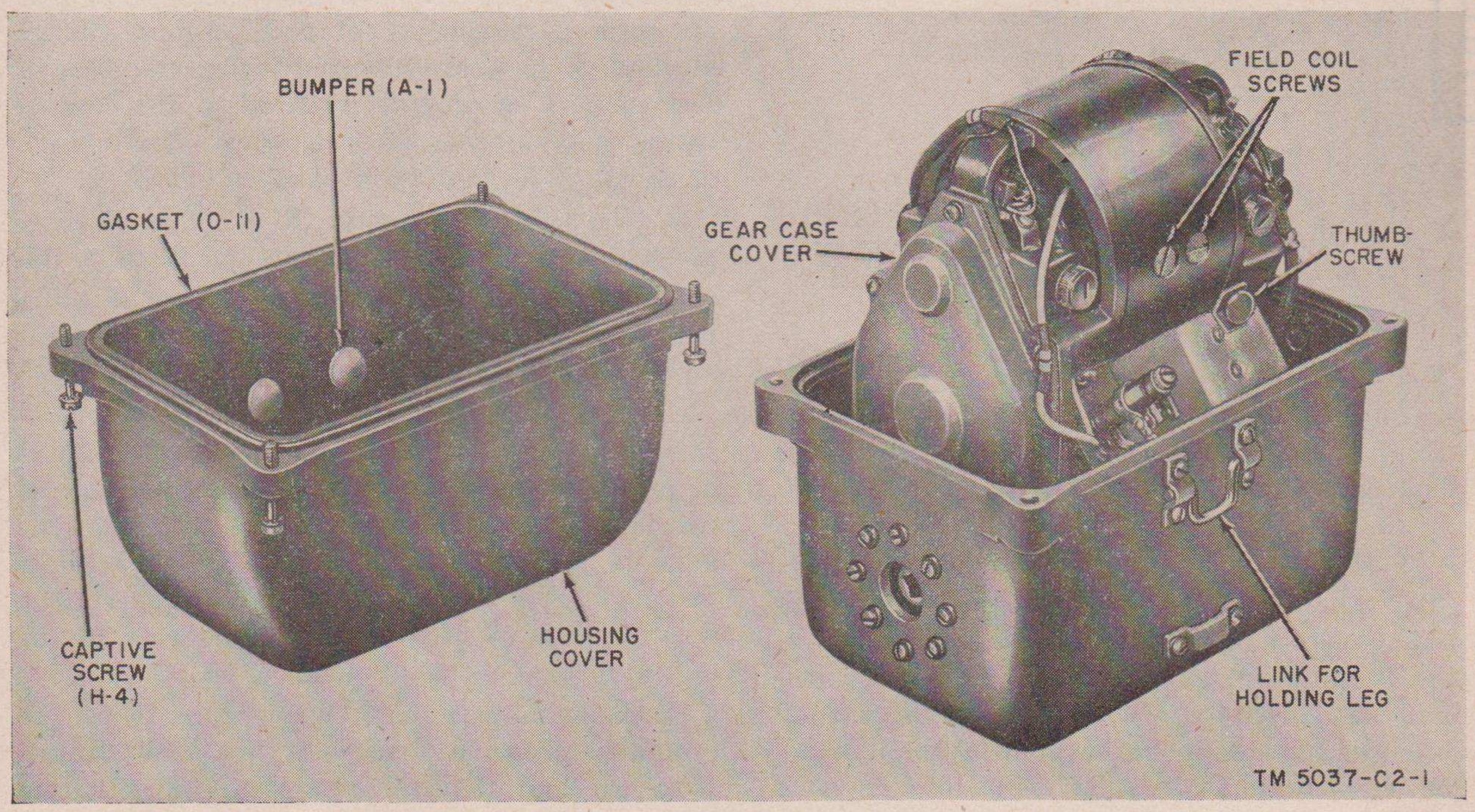


Figure 5.1 (Added). Generator G–8A/GRC, top cover removed.

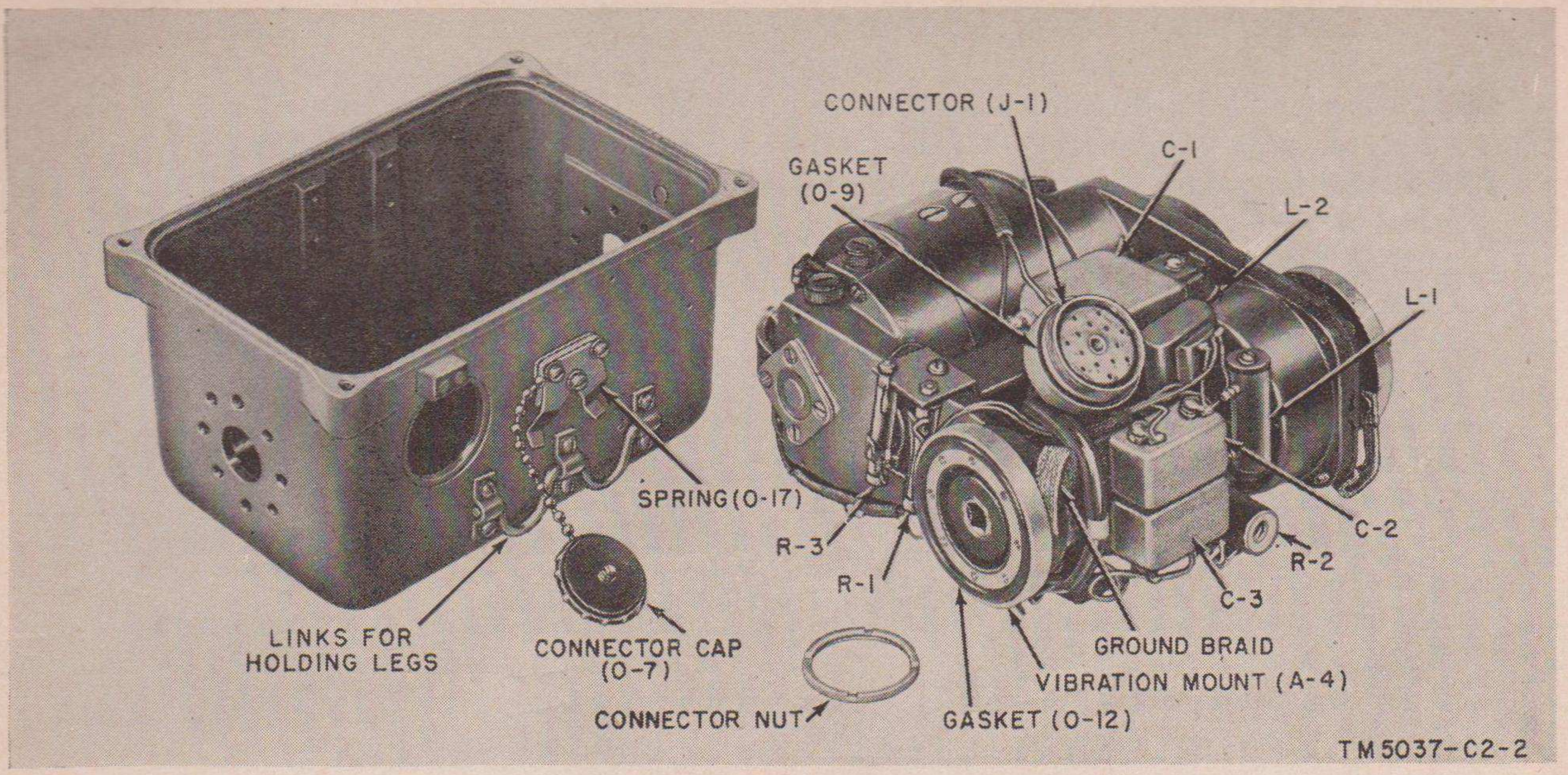


Figure 6.1 (Added). Generator G–8A/GRC, case removed.

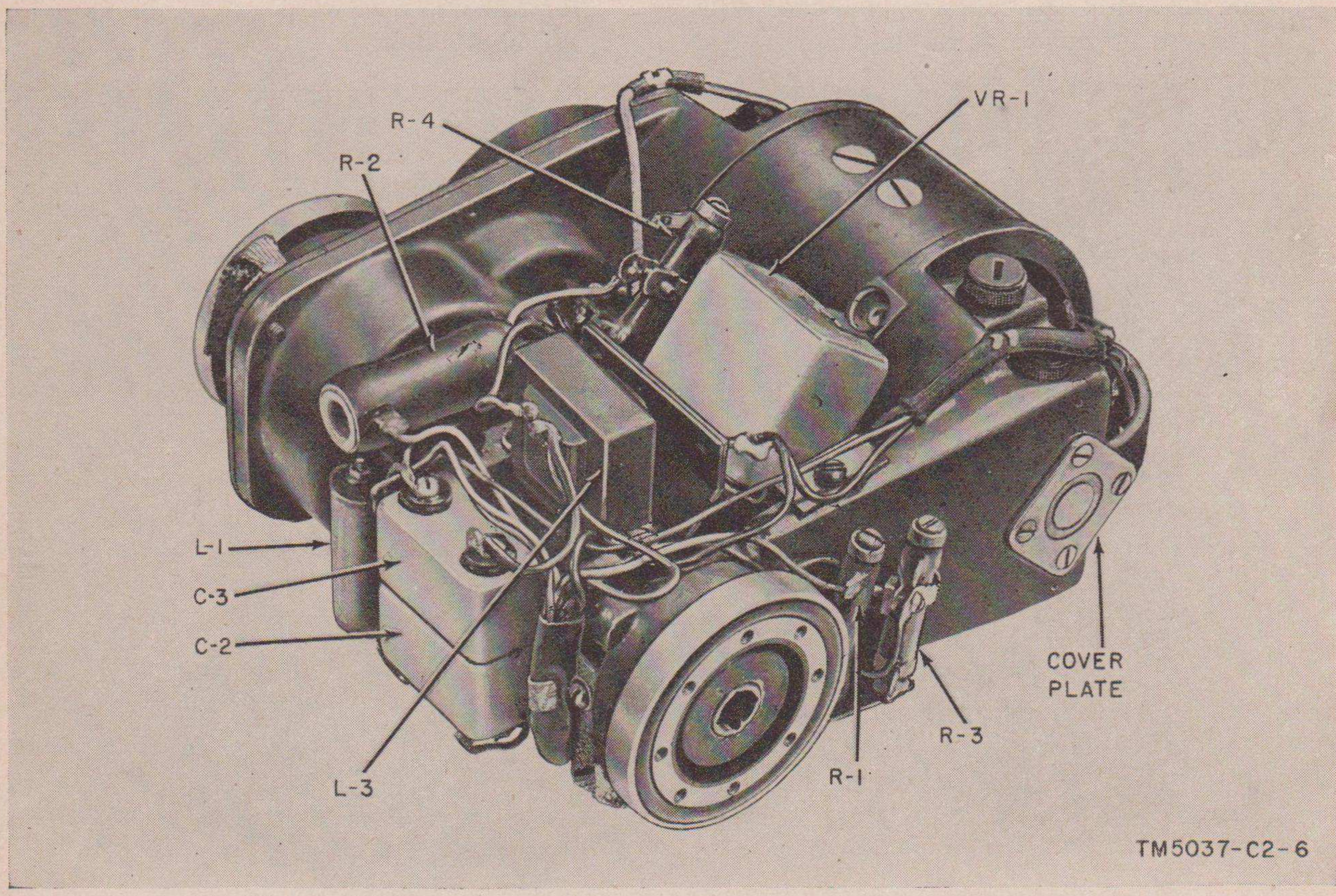


Figure 6.2 (Added). Generator G–8A/GRC, underside view with case removed.

Line 5. Change "shown in figs. 7 and 11" to read: **figs.** 7, **7.1**, 11, **and 12.**

Page 11. Paragraph 35. In the heading, change (fig. 11) to read: (**figs.** 11 **and 12**).

Make the following changes in subparagraph *a*:

Line 3 in the second column on the page. Change "Filter capacitor C–1" to read: **In Generator G–8/GRC,** filter capacitor C1.

Line 5. Insert the following after the sentence ending in the word "ripple": In Generator G–8A/GRC, capacitor C1 is connected from the output side of coil L1 to ground.

Line 15. Insert the following after "negative": for Generator G–8/GRC or 27 volts negative for Generator G–8A/GRC.

Line 19. Delete the words "30-volt".

Make the following changes in subparagraph *b*:

Line 10. Change "Terminal B" to read: **In Generator G–8/GRC,** terminal B.

Line 12. Add the following sentence after the word "ground": In Generator G–8A/GRC, terminal B is approximately 85 volts positive with respect to ground.

Page 12. Paragraph 36. Heading. Change "(fig. 11)" to read: (**figs.** 11 **and 12**).

Subparagraph *b*. Line 16. Change "Two additional resistors" to read:

In Generator G–8/GRC, two additional resistors.

Add the following to subparagraph *b*: In Generator G–8A/GRC this function is accomplished through the use of one 15-ohm adjustable resistor, R4 (fig. 12).

Page 15. Paragraph 43*b*. Line 2. Add the following after "values": (for Generator G–8/GRC).

Add the following after subparagraph *b*:

c. Six dummy load resistors with the following values (for Generator G–8A/GRC):

(1) 5,700 ohms, 50 watts.
(2) 16,700 ohms, 10 watts.
(3) 3,800 ohms, 10 watts.
(4) 1,200 ohms, 10 watts.
(5) 2.52 ohms, 25 watts.
(6) 13,500 ohms, 1 watt.

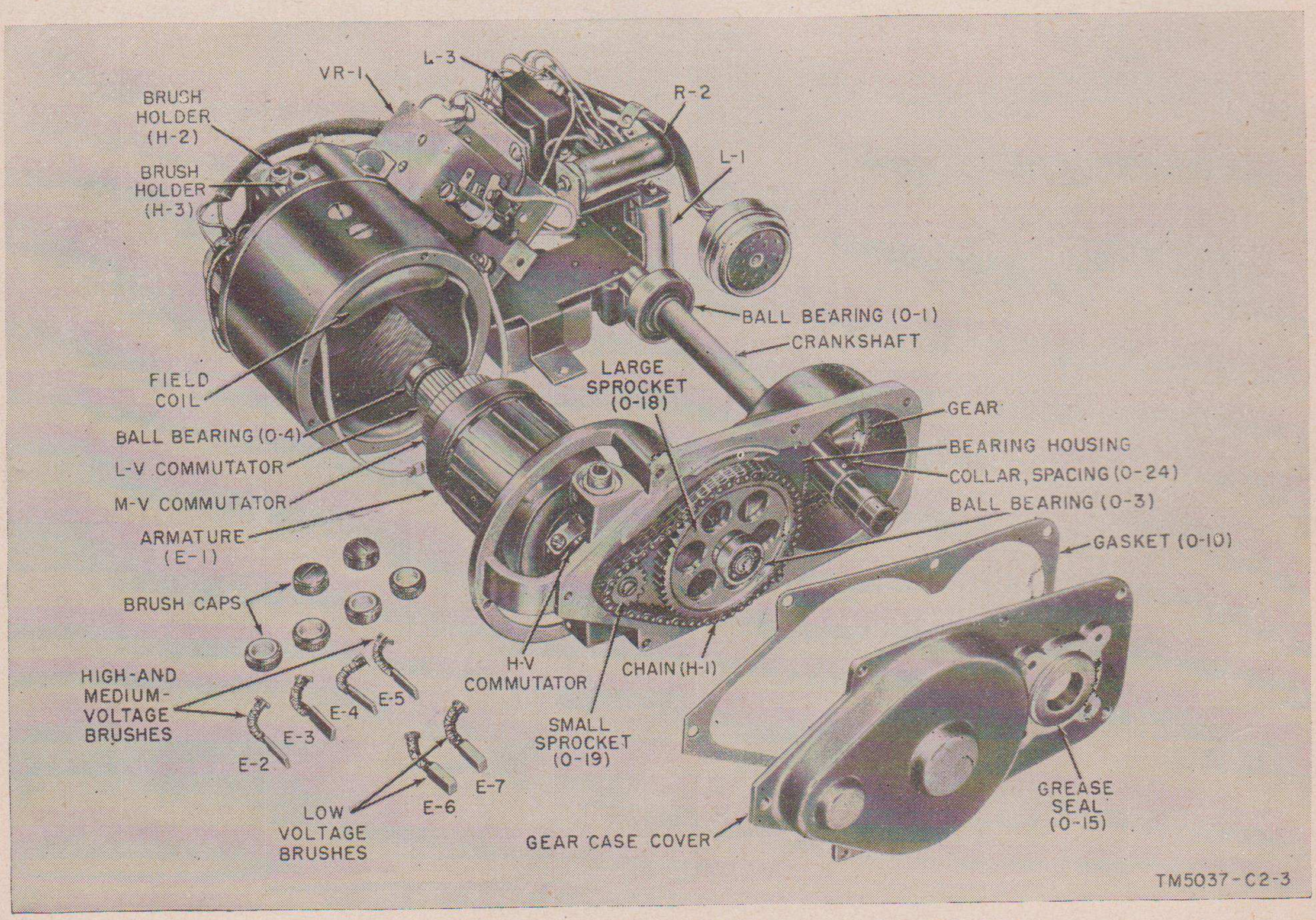


Figure 7.1 (Added). Generator G–8A/GRC, disassembled for lubrication.

Page 15. Paragraph 45*a*. Line 3. Change "on figure 8" to read: **in figure 8 for Generator G–8/GRC or in figure 8.1 for Generator G–8A/GRC.**

Page 16. Paragraph 45*b*. In the "Normal reading" column of the table, make the following changes:

In the first item, change "2.3 amperes" to read: 2.3 amperes **in Generator G–8/GRC; 2.5 amperes in Generator G–8A/GRC.**

In the fourth item, change "76 ma" to read: 76 ma in Generator G–8/GRC; 71 ma in Generator G–8A/GRC.

In the sixth item, change "90 volts" to read: 90 volts in Generator G–8/GRC; 85 volts in Generator G–8A/GRC.

In the seventh item, change "75 ma" to read: 75 ma **in Generator G–8/GRC; 70 ma in Generator G–8A/GRC.**

In the last item, change "—30 volts" to read: —30 volts **in Generator G–8/GRC; —27 volts in Generator G–8A/GRC.**

Page 17. Paragraph 46*e*. Line 2. Add the following after "R–5": (in Generator G–8A/GRC, R4 only).

Page 17. Paragraph 47. Make the following changes:

In subparagraph *f*, line 5, delete "so as to be—NJPU".

Delete subparagraph *h* and substitute the following:

h. On Generator G–8/GRC, loosen the long clamping bolt that holds resistors R1, R2, and R3 to the gearcase (fig. 6). Do not remove the bolt, merely loosen it enough to detach it from the gearcase. On Generator G–8A/GRC, remove the screws that hold the filter assembly and voltage regulator brackets to the gearcase.

47.1. Replacement of Armature Shaft Grease Seal in Generator G–8A/GRC

(Added)

If there is an excessive grease film on the high-voltage end of the armature assembly (fig. 7.1), replace grease seal O 25 as follows:

a. Disassemble the generator as outlined in paragraph 52*a* through *d*.

b. Grease seal O 25 is an O-ring. It is mounted in, and seals, the armature shaft passage that enters the gear case (on the opposite side of the frame from the small sprocket shown in figure 7.1). Pry the O-ring out of its slot with a narrow blade screwdriver.

c. Snap a new O-ring in place and reassemble the unit.

d. Whenever a new armature is installed, inspect

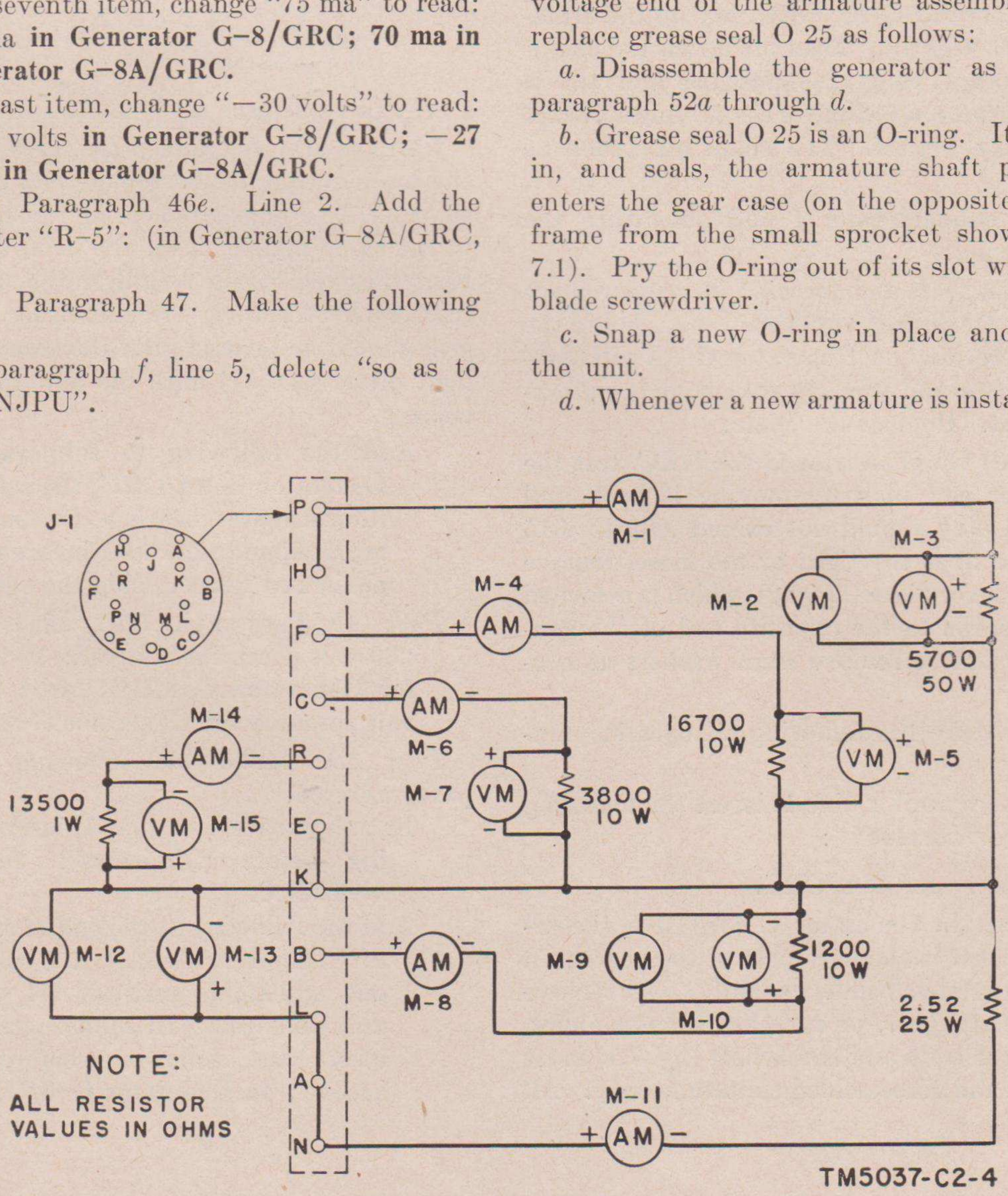


Figure 8.1 (Added). *Generator G–8A/GRC, operational test setup.*

the grease seal and replace it if signs of wear or damage are evident.

Page 18. Make the following changes in paragraph 52:

Delete subparagraph *b* and substitute the following:

b. On Generator G–8/GRC, remove the nut that holds the small sprocket on the armature shaft. On Generator G–8A/GRC, remove the screw, flat washer, and lockwasher that hold the sprocket on the armature shaft.

Delete subparagraph *c* and substitute the following:

c. Remove the chain and pry off the armature sprocket (the small sprocket). To remove the chain on Generator G–8A/GRC, pry up the armature sprocket slightly. Then lift up on the chain-driving sprocket as far as possible and tilt it toward the armature. Rotate the driving sprocket approximately ½ turn. The chain may then be removed.

Delete subparagraph *f* and substitute the following:

f. With the shaft and sprocket in place, replace the nut, on Generator G–8/GRC, that holds the armature sprocket; on Generator G–8A/GRC replace the screw and washers that hold the armature sprocket. Replace the chain.

f.1 (Added) On Generator G–8A/GRC, test the armature for end play by moving it back and forth. End play should not exceed .005 to .015 inch. If the fit is too tight or too loose, remove the bearing cover plate (fig. 6.2), which is attached with four screws to the opposite end of the generator, and add or remove shim washers as necessary.

Page 18. Make the following changes in paragraph 53:

In subparagraph *c*, line 1, insert the following before "Carefully":

In Generator G–8/GRC.

c.1 (Added) In Generator G–8A/GRC, the armature sprocket is the only part of the gear train that can be removed independently. To remove the other shaft, gear, or sprocket subassemblies, the entire gear train and crankshaft (fig. 7.1) must be removed and reassembled simultaneously. All ball bearings are a creep fit in their housings and will come out easily. To remove the gears, first remove the setscrew that holds the intermediate-drive bearing housing to the gearcase. Tap the right end of the crankshaft lightly and carefully; this will enable all parts of the gear train to be removed from the gearcase.

Delete the first subparagraph *d*.

Add the following to subparagraph *d*: When reassembling this shaft in the gearcase of the A model generator, the ball bearing must be seated in the intermediate bearing housing. The bearing housing can be moved and lined up with the setscrew hole when the complete gear assembly is in place.

In subparagraph *f*, line 1, insert the following before "Separate":

In Generator G–8/GRC.

f.1 (Added) In Generator G–8A/GRC, slip the brass spacing collar off the end of the crankshaft. The crankshaft bearing can be pressed off in the same manner after the drive-gear key has been removed. Ball bearings, key, and gear are reassembled in their original order. The drive gear should be pressed onto the crankshaft with a light press (par. 51) until the hub meets the ball bearing.

Add the following to subparagraph *d*: In Generator G–8A/GRC, the setscrew in the intermediate bearing housing must be replaced and tightened before replacing the chain and reassembling the equipment.

Page 19. Paragraph 55*a*. Line 2. Change "30-volt potential" to read: 30-volt potential **for Generator G–8/GRC or a negative 27-volt potential for Generator G–8A/GRC.**

Page 19. Make the following changes in paragraph 56:

In subparagraph *a* line 1, insert the following before "Resistors": **In Generator G–8/GRC.**

Add the following at the end of subparagraph *a*: Generator G–8A/GRC contains only one adjustable resistor, R4, for the 6.3-volt potential. In subparagraph *b*, line 1, insert the following before "To gain access": **In Generator G–8/GRC.**

b. 1 (Added) In Generator G–8A/GRC, to gain access to R4, remove the generator cover. To make adjustments, loosen the screw that secures the slider on R4. Move the slider slightly, tighten the screw and make an operational test for the correct potential. Make repeated adjustments of the slider on R4 until a 6.3-volt potential is obtained. Tighten the slider securely when the closest possible adjustment has been made.

58. Test Procedure

(Superseded)

Crank the generator at a speed of 50 to 70 rpm while it is connected to a dummy load as shown in figure 8 or 8.1. For Generator G–8/GRC connect a voltmeter (such as Multimeter TS–352/U or equal) successively to each of the terminals indicated in the chart in *a* below. For Generator G–8A/GRC, follow the same procedure using the chart in subparagraph *b* below. If the voltages are within the limits indicated, the generator is satisfactory. All voltages are measured to terminal E of connector J1.

a. Output Voltages, Generator G–8/GRC (fig. 8).

Metered terminal on J1	Normal voltage	High limit	Low limit
H	400	420	365
F	250	265	235
C	145	155	125
B	90	93	84
A	6. 3	6	6. 1
R	−30	−25	−32

b. Output Voltages, Generator G–8A/GRC (fig. 8.1).

Metered termina' on J1	Normal voltage	High limit	Low limit	Normal current (amperes)
H	400	420	380	. 07
F	250	262. 5	237. 5	. 015
C	145	152	138	. 038
B	85	88	82	. 071
A	6. 3	6. 4	6. 2	2. 5
R	−27	−30	−24	. 002

Pages 23 through 25. Appendix II. Delete the entire Identification Table of Parts.

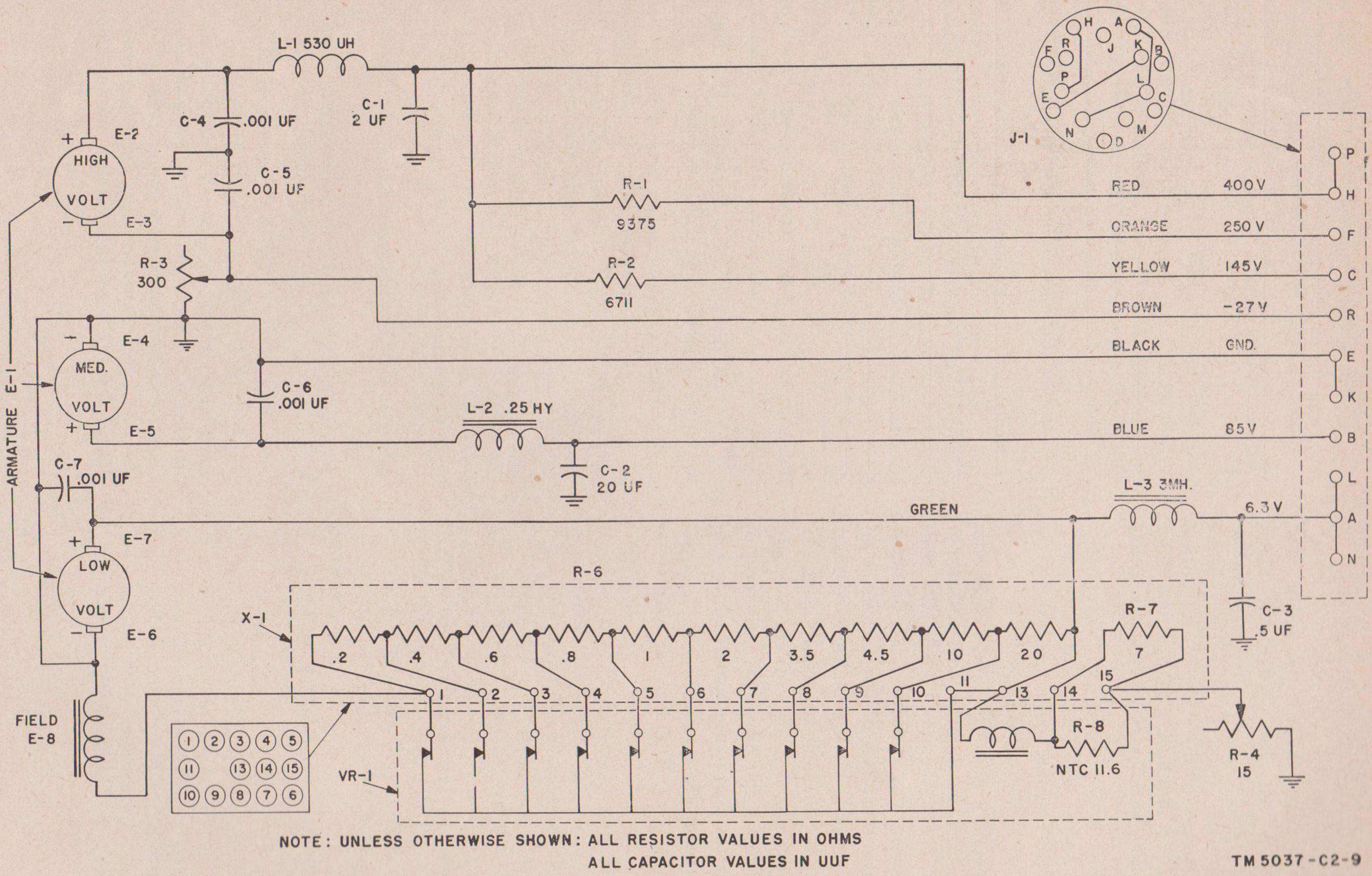


Figure 12. (Added) *Generator G–8A/GRC, schematic diagram.*

[AG 413.44 (29 Aug 55)]

By order of the Secretaries of the Army and the Air Force:

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:
JOHN A. KLEIN,
Major General, United States Army,
The Adjutant General.

N. F. TWINING,
Chief of Staff, United States Air Force.

Official:
E. E. TORO,
Colonel, United States Air Force,
Air Adjutant General.

Distribution:

Active Army:

CNGB (1)
Tec Svc, DA (1)
Tec Svc Bd (1)
Hq CONARC (5)
CONARC Bd (Incl ea Test Sec) (1)
Army AA Comd (2)
OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5)
Corps (2)
Tng Div (2)
Ft & Cp (2)
USMA (5)
Gen & Br Svc Sch (5) except SigC Sch (25)
Gen Depots (2) except Atlanta Gen Depot (None)
SigC Sec, Gen Depots (10)
SigC Depots (20)
POE (2)
OS Sup Agencies (2)
SigC Fld Maint Shops (3)
SigC Lab (5)
Mil Dist (1)

Units organized under following TOE'S:

5–215R (2)	6–617R (2)	11–127R (2)	17–57R (2)
5–217R (2)	7R (2)	11–128R (2)	17–62R (2)
5–218R (2)	7–1R (2)	11–500R (2)	17–115R (2)
6–100R (2)	7–2R (2)	11–537R (2)	17–116R (2)
6–125R (2)	7–11R (2)	11–557R (2)	17–117R (2)
6–126R (2)	7–12R (2)	11–587R (2)	17–125R (2)
6–200R (2)	7–14R (2)	11–592R (2)	17–126R (2)
6–225R (2)	7–15R (2)	11–597R (2)	17–127R (2)
6–226R (2)	7–16R (2)	17R (2)	19–97R (2)
6–227R (2)	7–25R (2)	17–1R (2)	44–35R (2)
6–229R (2)	7–26R (2)	17–2R (2)	44–36R (2)
6–235R (2)	7–27R (2)	17–17R (2)	44–37R (2)
6–236R (2)	7–31R (2)	17–22R (2)	44–75R (2)
6–237R (2)	7–32R (2)	17–25R (2)	44–76R (2)
6–300R (2)	7–34R (2)	17–26R (2)	44–77R (2)
6–315R (2)	7–35R (2)	17–27R (2)	44–275R (2)
6–316R (2)	7–36R (2)	17–32R (2)	44–276R (2)
6–415R (2)	7–45R (2)	17–35R (2)	44–277
6–416R (2)	7–46R (2)	17–36R (2)	51–2R (2)
6–419R (2)	7–95R (2)	17–37R (2)	52–2R (2)
6–447R (2)	7–96R (2)	17–45R (2)	55–57R (2)
6–535R (2)	9–65R (2)	17–46R (2)	57R (2)
6–537R (2)	9–66R (2)	17–51R (2)	57–2R (2)
6–538R (2)	9–67R (2)	17–52R (2)	57–57R (2)
6–558R (2)	11–7R (2)	17–53R (2)	
6–615R (2)	11–16R (2)	17–55R (2)	
6–616R (2)	11–57R (2)	17–56R (2)	

NG: State AG (6); units—same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see SR 320–50–1.

U. S. GOVERNMENT PRINTING OFFICE: 1955