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TM 5-6115-304-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

**OPERATOR, ORGANIZATIONAL, FIELD
AND DEPOT MAINTENANCE MANUAL**

**GENERATOR SET, GASOLINE ENGINE:
1.5 KW, AC, 120 V, SINGLE PHASE
60 CYCLE, AIR COOLED; OPEN;
TUBULAR FRAME; SHOCK MOUNTED
(KOHLER MODEL KK 1.5M25) (LESS ENGINE)
FSN 6115-591-6867**



HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1963

DUE OUT

SAFETY PRECAUTIONS

BEFORE OPERATION

Do not operate the generator set in an enclosed area unless the exhaust fumes are piped to the outside. Inhalation of exhaust fumes will result in serious illness or death.

Do not operate the generator set until the ground terminal stud has been connected to a suitable ground. Electrical faults in the generator set load lines, or equipment can cause death by electrocution from contact with an ungrounded system.

When filling the fuel tank, do not smoke or use an open flame in the immediate vicinity. Always provide metal-to-metal contact between the container and the fuel tank. This will prevent a spark from being generated as fuel flows over metallic surfaces. Failure to observe this warning may result in death to personnel.

DURING OPERATION

Do not perform any electrical maintenance or change load connections while the generator set is operating or connected to an energized line. Failure to observe this safety precaution may result in death by electrocution.

Exercise extreme caution when making the voltage regulator relay adjustment. The voltage of this generator set can cause death by electrocution.

AFTER OPERATION

When filling the fuel tank, always maintain metal-to-metal contact between the filling apparatus and fuel tank to prevent a spark from being caused by static electricity.

Before servicing any part of the generator set, make certain that the engine is stopped. Failure to observe this safety precaution may result in severe electrical shock or death by electrocution.

OPERATOR, ORGANIZATIONAL, FIELD, AND DEPOT MAINTENANCE MANUAL
GENERATOR SET, GASOLINE ENGINE: 1.5 KW, AC, 120 V, SINGLE PHASE,
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MODEL KK 1.5M25) (LESS ENGINE) FSN 6115-591-6867

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions are published for the use of the personnel to whom the Kohler Model KK 1.5M25 Generator Set is issued. Chapters 1 through 5 provide information on the operation, daily preventive maintenance services, and organizational maintenance of the equipment, accessories, components, and attachments. Chapter 6 provides information for field and depot maintenance (3d, 4th, and 5th echelons). This manual also provides descriptions of the main units and their functions in relationship to other components.

b. Appendix I contains a list of publications applicable to this manual. Appendix II contains the list of basic issue items authorized the operator of this equipment. The organizational, field, and depot maintenance repair parts and special tool lists are in TM 5-6115-304-25P.

c. Numbers in parentheses on illustrations indicate quantity. Numbers preceding nomenclature callouts on illustrations indicate the preferred maintenance sequence.

d. The direct reporting by the individual user, of errors, omissions, and recommendations for improving this manual is authorized

and encouraged. DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9) will be used for reporting these improvements. This form will be completed in triplicate using pencil, pen, or typewriter. The original and one copy will be forwarded direct to the Commanding Officer, U. S. Army Mobility Support Center, ATTN: SMOMS-MM, P. O. Box 119, Columbus, Ohio 43216. One information copy will be forwarded to the individual's immediate supervisor (e.g., officer, noncommissioned officer, supervisor, etc.).

e. Report all equipment improvement recommendations as prescribed by TM 38-750.

2. Record and Report Forms

a. DA Form 2258 (Depreservation Guide of Engineer Equipment).

b. For other record and report forms applicable to operator, crew, or organizational maintenance, refer to TM 38-750.

Note: Applicable forms, excluding Standard Form 46 (United States Government Motor Vehicle Operator's Identification Card), which is carried by the operator, will be kept in a canvas bag mounted on the equipment.

Section II. DESCRIPTION AND DATA

3. Description

a. *General.* The Kohler Model KK 1.5M25 Generator Set (figs. 1 and 2) is a self-contained, skid-mounted, portable unit. It is powered by a 2-cylinder, 4-cycle, air cooled, military standard engine (fig. 2) that is directly coupled to a 1.5 kilowatt, alternating current generator (fig. 1).

b. *Engine.* Refer to TM 5-2805-206-14 for a description of the engine.

c. *Generator.* The generator (fig. 1) is a 2-pole revolving armature, 120-volt, 60-cycle unit with a voltage regulation system. It is rated at 1.5 kilowatt and is directly coupled to the engine (fig. 2).

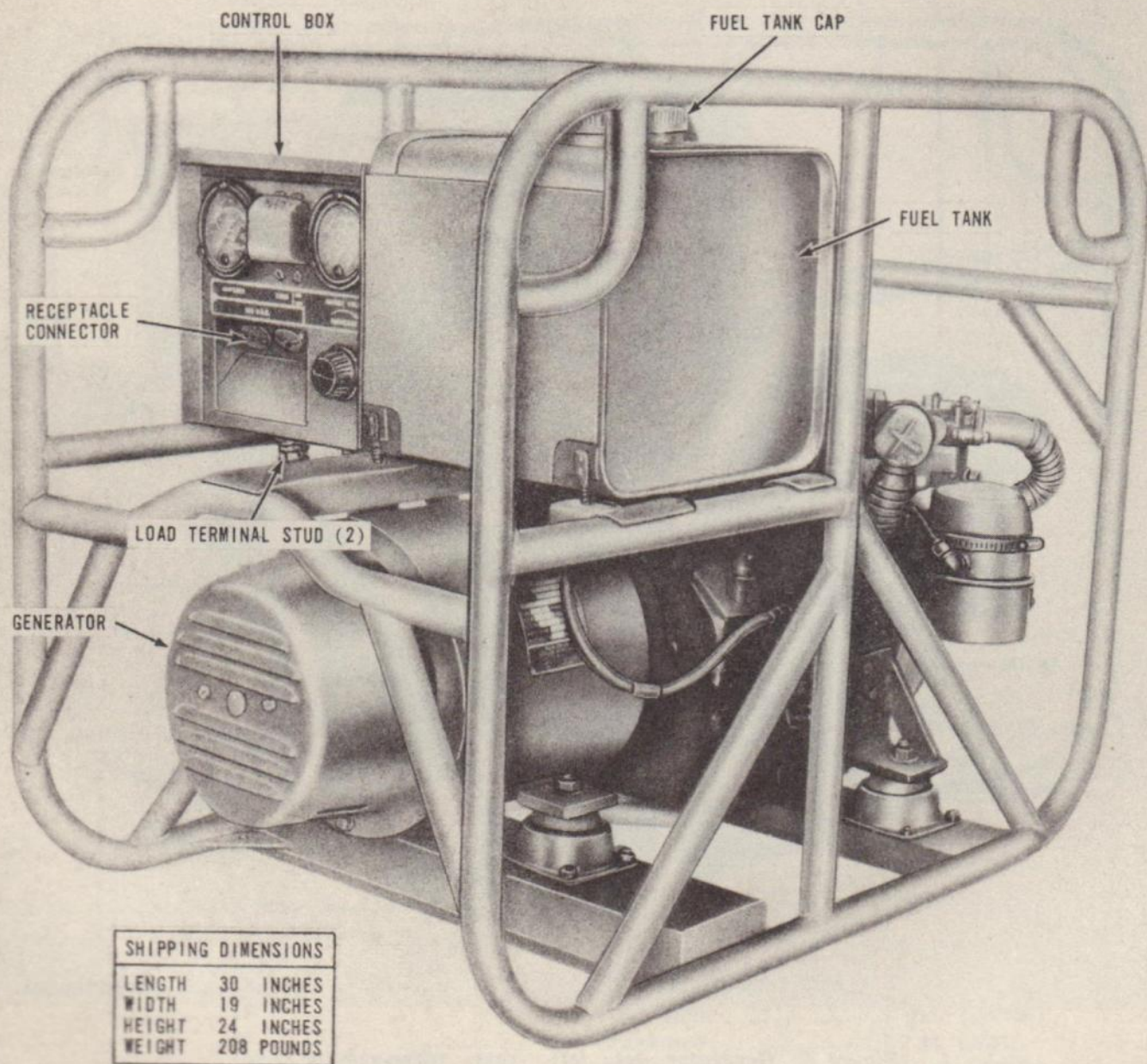
d. *Control Box.* The control box (fig. 1) con-

tains the controls, instruments, and electrical components necessary for the operation of the generator set.

4. Identification and Tabulated Data

a. *Identification.* The generator set has five identification and instruction plates.

- (1) *Corps of Engineers plate A.* The Corps of Engineers plate A is located on the rear of the fuel tank mounting bracket at the right side of the unit. It specifies the nomenclature, stock number, serial number, manufacturer, model, contract number, date manufactured, length, width, height, capacity or pay load, gvwt, shipping weight, cube, engine manufacturer, engine



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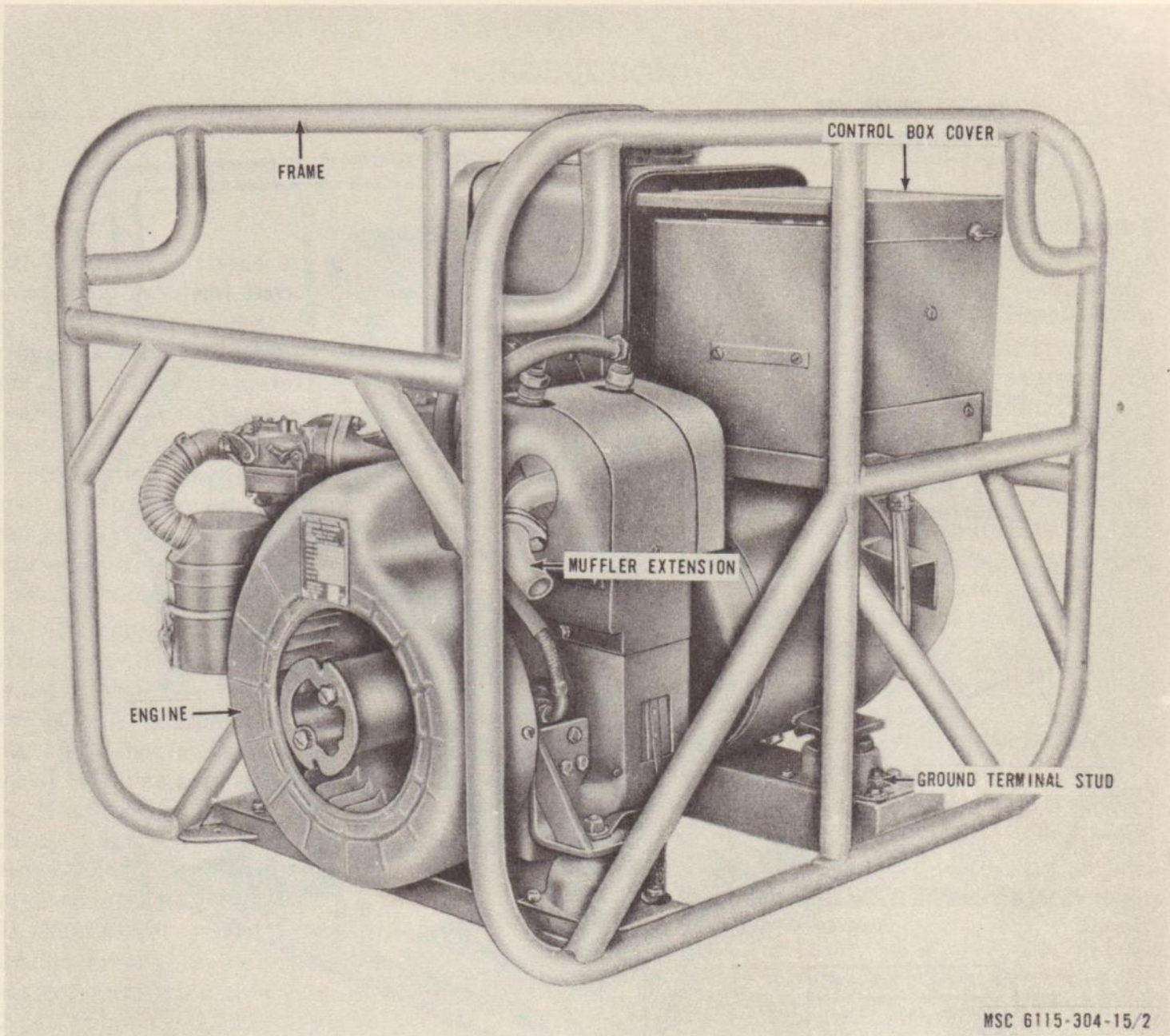
Figure 1. Generator set, right rear, three-quarter view, with shipping dimensions.

model number, engine serial number, and date inspected. This information is listed in the tabulated data.

- (2) *Corps of Engineers plate C.* The Corps of Engineers plate C is located below the plate A on the rear of the fuel tank mounting bracket at the right side of the unit. It specifies the nomenclature, make, model, serial number, volts, kilowatts, cycles, dates manufactured, TM number, kilovolt-amperes, revolutions per minute,

phase, number of wires, amperes, and power factor. This information is listed in the tabulated data.

- (3) *Generator plate.* The generator data plate is located on the right side of the generator housing, beneath the fuel tank. It specifies the manufacturer, model, serial specification number, kilowatts, kilovolt-amperes, volts, amperes per terminal, battery voltage, phase, cycles, revolutions per minute, power factor and horsepower. This



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Figure 2. Generator set, left front, three-quarter view.

information is listed on the tabulated data.

- (4) *Engine plate.* The engine data is located on the flywheel fan cover at the front of the engine. Refer to TM 5-2805-206-14.
- (5) *Operating instructions plate.* The operating instructions plate is located on the outer side of the hinged cover of the control box.

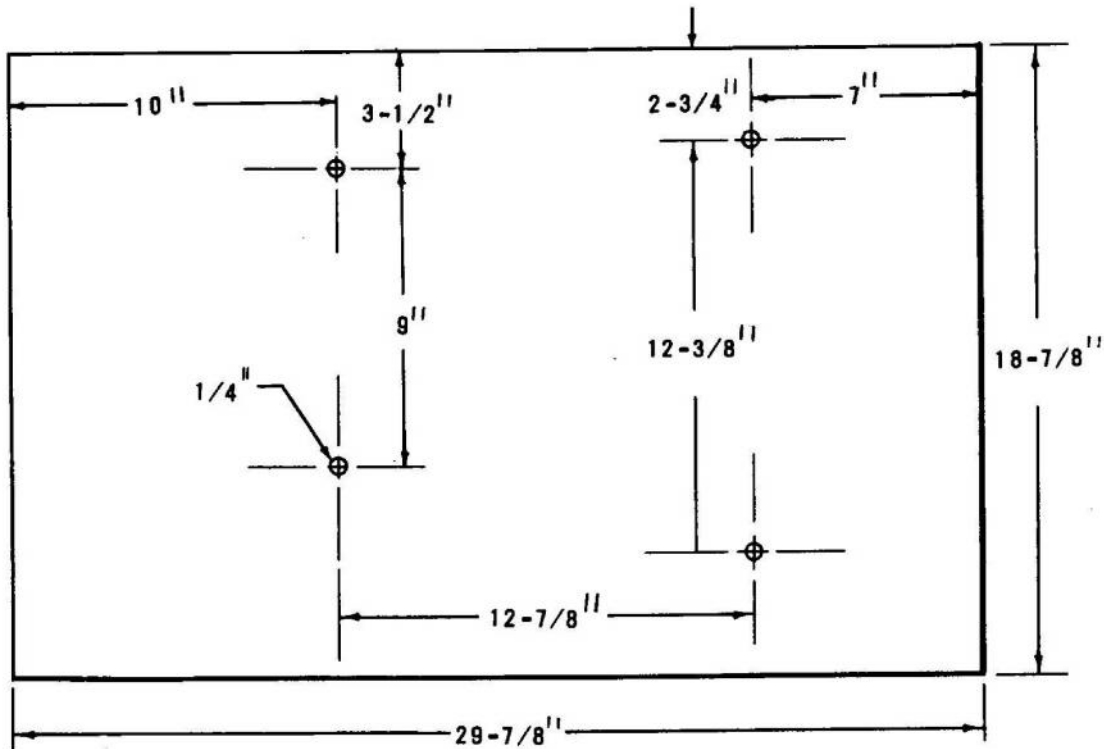
b. Tabulated Data.

(1) *General*

Manufacturer ----- Kohler Co.
Model ----- KK 1.5M25

- (2) *Corps of Engineers U.S. Army plate A.*

Nomenclature -----	Generator Set, Electric GED
Stock No. -----	FSN 6115-591-6867
Ser. No.	
Mfg. -----	Kohler Co.
Model -----	KK 1.5M25
Cont. No. -----	88-AF-47249-07
Date Mfgd.	
Length -----	30 inches
Width -----	19 inches
Height -----	24 inches
Cap or Pay Load -----	1.5 KW
GVW.	
Ship Wt. -----	208 lb (pounds)
Cube -----	7.9
Eng. Mfgr. -----	Continental Motors Corp.
Model -----	2 AO16-2
Eng. Ser. No.	
Date Insp.	



MSC 6115-304-15/3

Figure 3. Base plan.

(3) Corps of Engineers U.S. Army plate C

Nom.	
Make	Kohler Co.
Mod.	A-236000
Ser.	
Volts	120
KW	1.5
Cycles	60
MFD.	
TM 5.	
KVA	1.5
RPM	3600
PH	1
No. of Wires	2
Amps	12.5
P.F. %	100

(4) Engine. For tabulated data on the military standard engine, refer to TM 5-2805-206-14.

(5) Generator plate.

Manufacturer	Kohler Co.
Model	A-236000
Serial.	
Spec. No.	
KW	1.5
KVA.	1.5
Volts	120
Amp/Term	12.5
Batt. Volts.	

Phase	1
Cycles	60
RPM	3600
P.F.	1
HP.	

(6) Capacities.

Fuel Tank	1 gal. (gallon)
Crankcase	1.0 pt (pint)
Air Cleaner	1/8 qt (quart)

(7) Dimensions and weight.

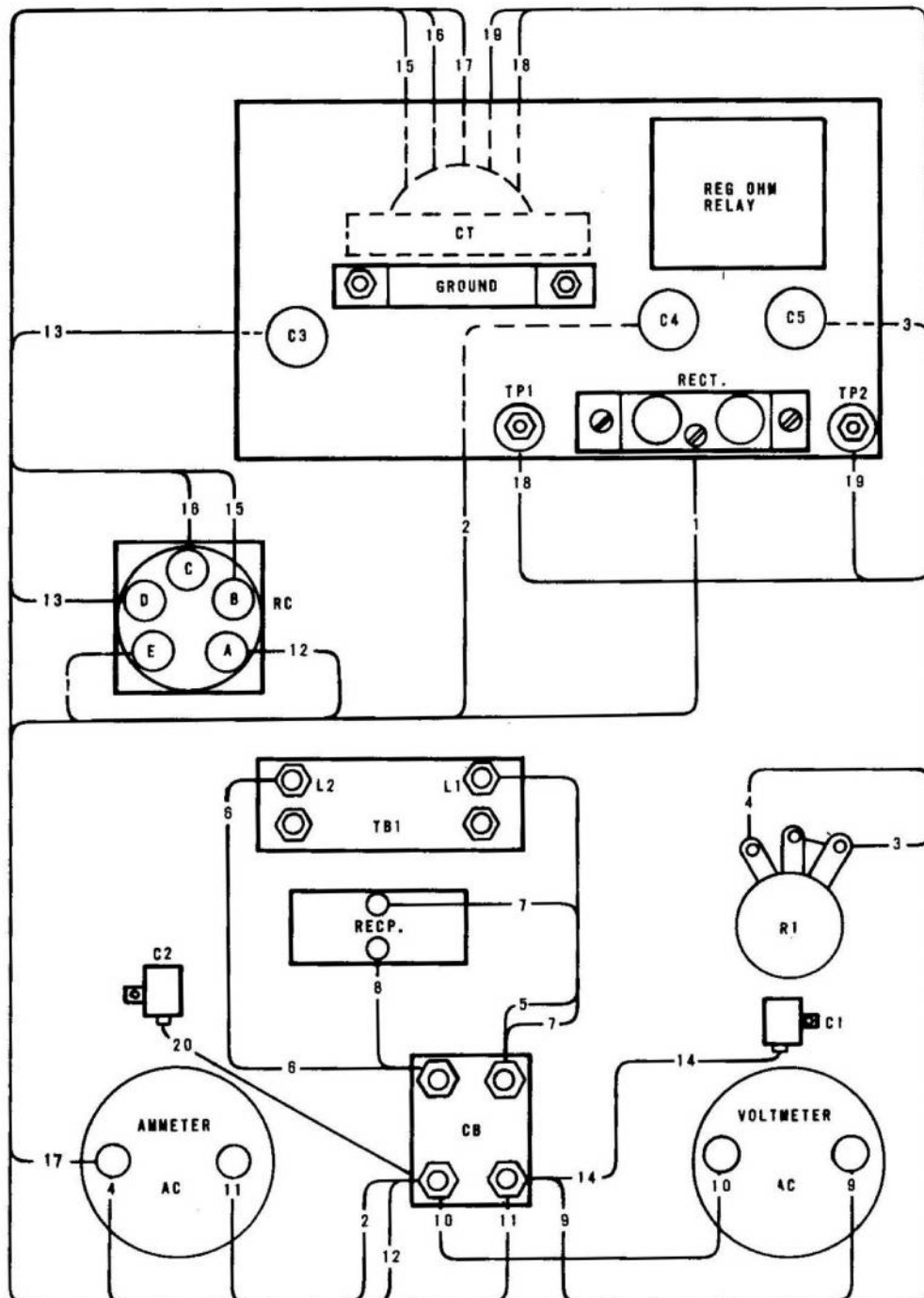
Length	30 in. (inches)
Width	19 in.
Height	24 in.
Weight	208 lb (pounds)
Cube	7.9

(8) Performance data.

Voltage	120
Kilowatts	1.5
Kilovolt-ampere	1.5
Revolutions per minute	3600
Amperes full load	12.5
Cycles	60
Phase	1

(9) Base plan. Refer to figure 3 for the base plan.

(10) Wiring diagram. Refer to figure 4 for the wiring diagram.



DEVICE LEGEND	
C1-C2	BYPASS CAPACITORS, 0.10 UF, 500 V/AC/DC
C3-C4-C5	FEED THRU CAPACITORS, 0.1 UF, 600V/DC, 20 AMPERE
CB	CIRCUIT BREAKER SWITCH
CT	CURRENT TRANSFORMER
L1-L2	LOAD TERMINALS
R1	VOLTAGE ADJUSTING RHEOSTAT, 200-OHM, 10 WATT
RC	RECEPTACLE CONNECTOR (CONTROL BOX TO GENERATOR)
RECP	RECEPTACLE CONNECTOR (AC OUTPUT)
RECT	SILICON DIODE RECTIFIER
TB1	TERMINAL BOARD
TP1-TP2	TERMINAL POSTS (VOLTAGE REGULATOR)

Figure 4. Wiring diagram.

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5. Differences in Models

This manual covers only the Kohler Model KK 1.5M25 Generator Set. No known differ-

ences exist for the model covered by this manual.

CHAPTER 2

INSTALLATION AND OPERATION INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

6. Unloading Equipment

The total weight of the packed generator is approximately 230 pounds. A handtruck, fork-lift, or manpower may be used to unload the unit. Keep the set in the UP position while unloading.

7. Unpacking Equipment

a. General. For domestic shipment, the generator set normally is packed in a wood container.

b. Unpacking.

- (1) Remove the container from the generator set.

Caution: Exercise care while unpacking to avoid damaging the generator set.

- (2) Check the equipment against the packing list. Correct or report discrepancies to field maintenance.

c. Depreservation. Prepare the generator set for inspection and operation as outlined on DA Form 2258 (Depreservation Guide of Engineer Equipment), attached on or near the operational controls.

8. Inspecting and Servicing Equipment

Note: Make sure equipment is completely deprocessed before servicing. Make sure preservatives have been removed from all components.

a. Inspection.

- (1) Perform the daily preventive maintenance services prescribed in paragraph 30 and the quarterly preventive maintenance services as outlined in paragraph 31.
- (2) Make a thorough visual inspection of the generator set for loose or missing mounting hardware, damage, or missing parts. Inspect the fuel lines for cracks or leaks. Correct or report deficiencies to field maintenance.
- (3) For inspection of the engine, refer to TM 5-2805-206-14.

b. Servicing.

- (1) *Lubrication.* The generator is equipped with sealed bearings and requires no lubrication. For lubrication of the engine, refer to TM 5-2805-206-14.

- (2) *Fuel system.*

- (a) Service the fuel strainer (TM 5-2805-206-14).

- (b) Remove the fuel tank cap (fig. 1), refer to the maintenance and operating supplies, and fill the fuel tank with the proper grade of fuel.

Warning: When filling the fuel tank, always maintain metal-to-metal contact between the filling apparatus and fuel tank to prevent a spark from being caused by static electricity.

Warning: Do not fill the fuel tank while the engine is in operation. Gasoline spilled on a hot engine may explode.

9. Installation or Setting-up Instructions

a. General. The generator set should be installed on a level site, clear of obstacles, and with ample ventilation.

b. Installation. When preparing for a permanent installation, construct the base outlined by figure 3. Select a site where there will be sufficient space on all sides for servicing and operation of the unit. For temporary installation, move the generator set as close to the worksite as practical. Avoid, if possible, dusty or sandy locations. Use boards or other material for a base in areas where ground is soft.

c. Indoor Installation. Keep the area well ventilated at all times so that the generator set will receive a maximum supply of air. Install a gastight exhaust line to pipe the exhaust gases to the outside. Use as few bends in the line as possible. Provide metal shields for the exhaust lines where they pass through flammable walls. Wrap the exhaust lines with asbestos if there is any danger of anyone touching them.

Warning: Do not operate the generator set in an enclosed area unless the exhaust gases are piped to the outside. Inhalation of exhaust fumes will result in serious illness or death.

d. Grounding. The generator set must be grounded prior to operation. The ground can be, in order of preference, an underground metallic water piping system, a driven metal rod, or a buried metal plate. A ground rod must have a minimum diameter of $\frac{5}{8}$ inch if solid or $\frac{3}{4}$ inch if pipe, and must be driven to a minimum depth of 8 feet. A ground plate must have a minimum area of 9 square feet and be buried at a minimum depth of 4 feet. The ground lead must be No. 6 AWG (American Wire Gage) copper wire and be bolted or clamped to the rod, plate, or piping system. Connect the other end of the ground lead to the generator set ground terminal stud (fig. 2).

Warning: Do not operate the generator set until the ground terminal stud has been con-

nected to a suitable ground. Electrical faults in the generator set, lead lines, or equipment can cause death by electrocution from contact with an ungrounded system.

e. Leveling. Set up the unit as level as possible. Keep the unit as level as possible during operation.

f. Load Connections.

- (1) Loosen the nuts on the load terminal studs (fig. 1).
- (2) Insert the stripped end of the load line into the terminal stud and tighten the nut.

Warning: Do not install or change the load cables while the generator set is operating. The voltage generated by this equipment can cause death by electrocution.

Note: The receptacles (fig. 1) may be used in lieu of the load terminal studs.

Section II. MOVEMENT TO A NEW WORKSITE

10. Dismantling for Movement

a. Preparation for Movement.

- (1) Stop the generator set (par. 16).
- (2) Disconnect the load lines and ground lead (par. 9).
- (3) Remove the exhaust pipe extension (par. 9), if used.
- (4) Open the drain valve located under the fuel tank and drain the fuel into a suitable container.
- (5) Refer to the basic issue items list and make sure that all items listed are on or with the equipment.

(6) Remove all anchoring devices.

b. Handling the Generator Set.

- (1) *Movement within the immediate area.* If the generator set is to be moved only a short distance, it may be carried or towed to the new worksite.
- (2) *Movement from the immediate area or over rough terrain.* Use a hand-truck or forklift and move the generator to the new worksite.

11. Reinstallation After Movement

Refer to paragraph 9 for reinstallation instructions after movement to a new worksite.

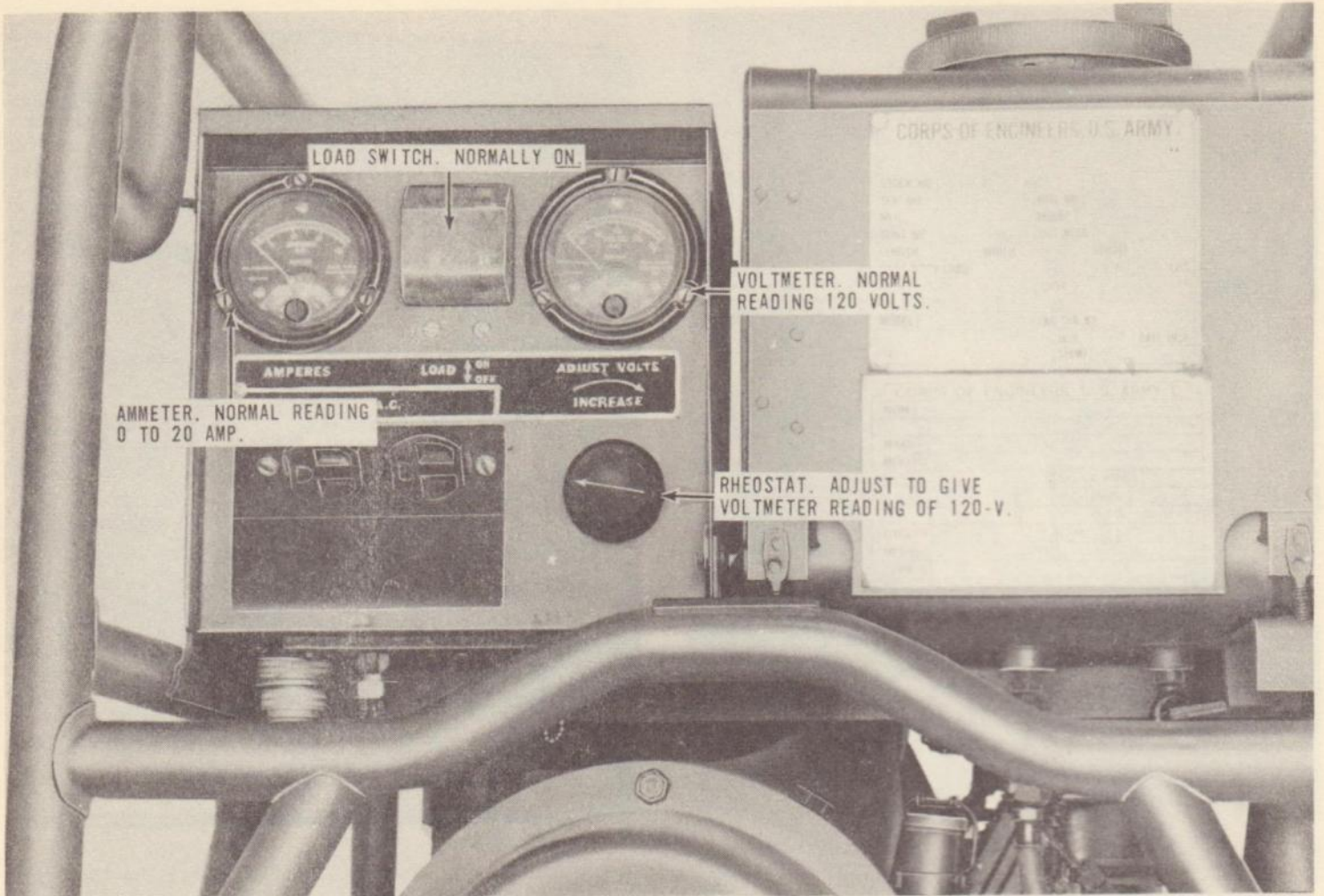
Section III. CONTROLS AND INSTRUMENTS

12. General

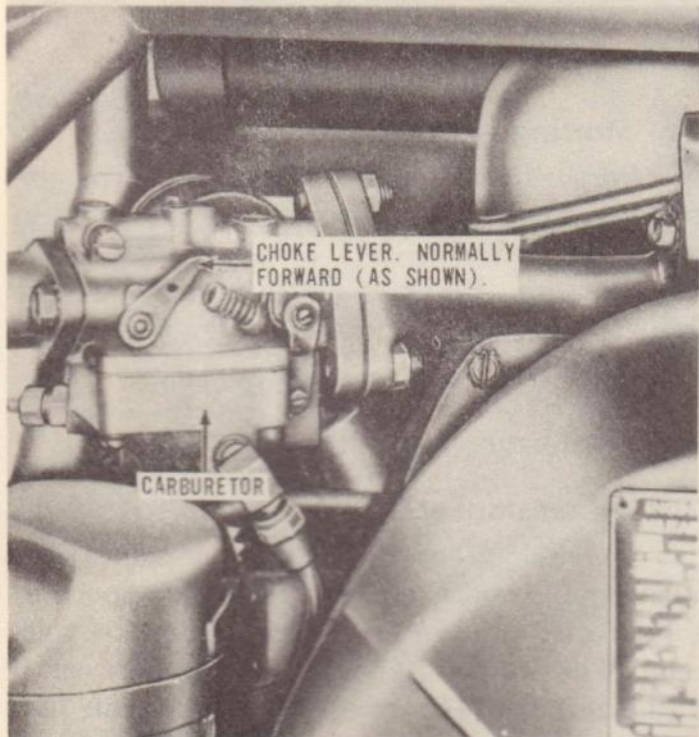
This section describes, locates, illustrates, and furnishes the operator, crew, or organizational maintenance personnel sufficient information about the various controls and instruments for proper operation of the generator set.

13. Controls and Instruments

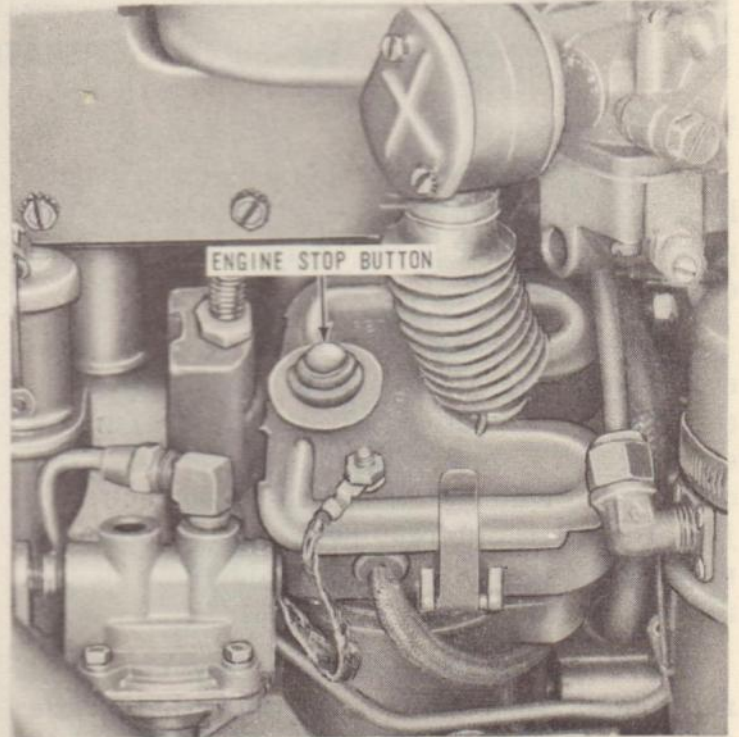
Refer to figure 5 for the purpose, normal readings, and location of all controls and instruments.



A. AMMETER, LOAD SWITCH, VOLTMETER, AND RHEOSTAT.



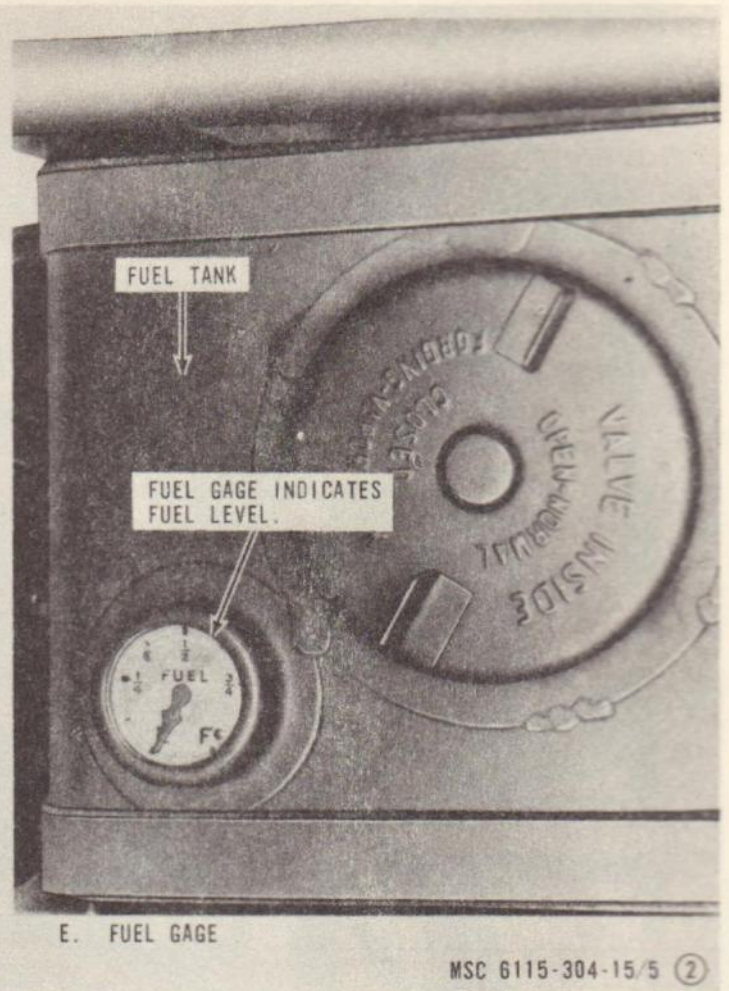
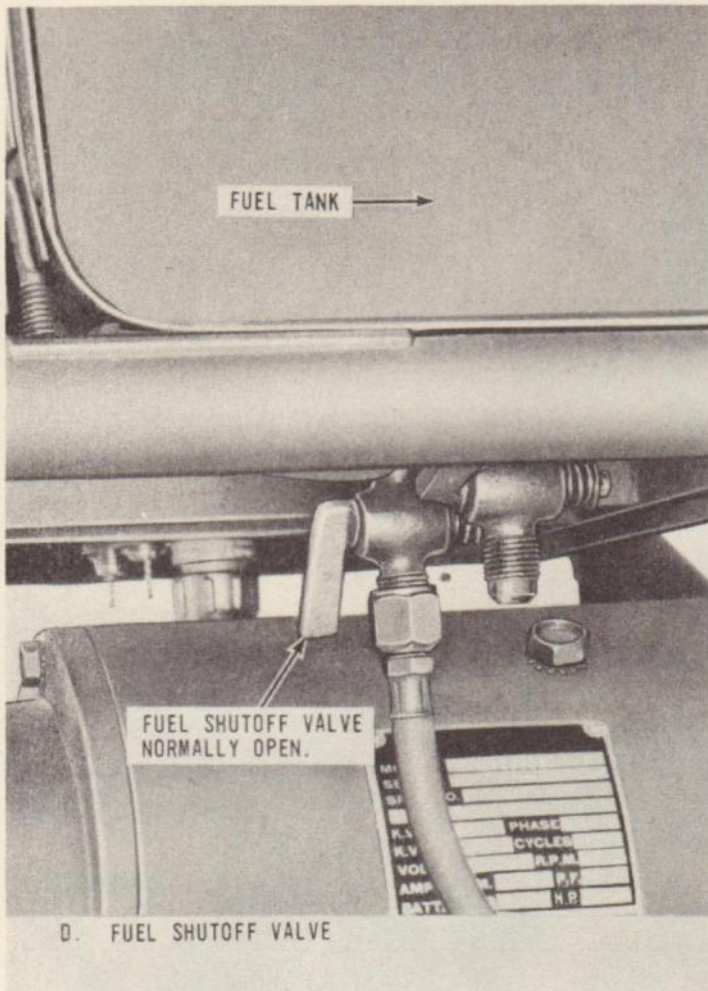
B. CHOKE LEVER.



C. ENGINE STOP SUTTON.

MSC 6115-304-15/5 ①

Figure 5. Controls and instruments.



MSC 6115-304-15/5 (2)

Figure 5—Continued.

Section IV. OPERATION OF EQUIPMENT

14. General

a. The instructions in this section are published for the information and guidance of the personnel responsible for operation of the generator set.

b. The operator must know how to perform every operation of which the generator set is capable. This section gives instructions on starting and stopping the engine, and operating details of the generator set. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

Warning: Do not perform any electrical maintenance or change load connections while the generator set is operating or connected to an energized line. Failure to observe this safety precaution may result in severe electrical shock or death by electrocution.

15. Starting

a. *Preparation for Starting.* Perform the preventive maintenance services as outlined in paragraph 30.

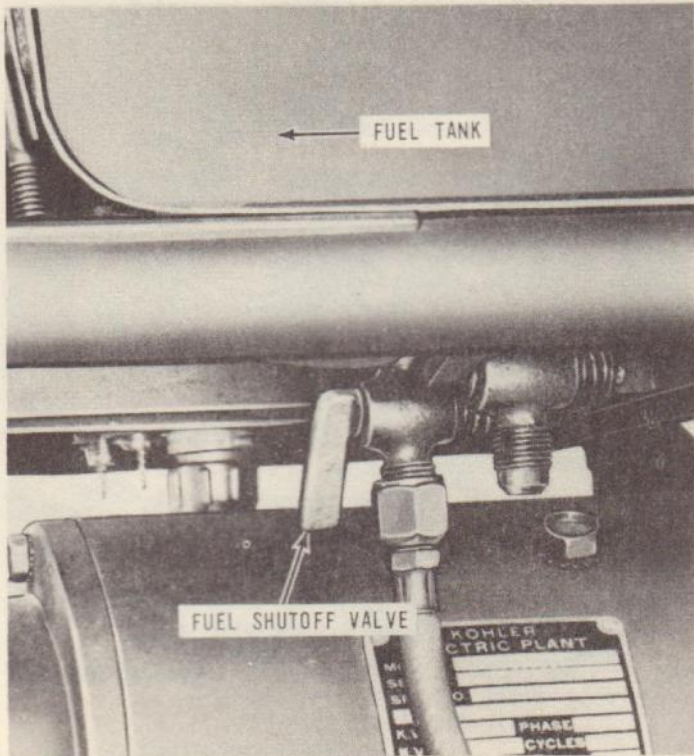
b. *Starting.* Refer to figure 6 and start the engine.

16. Stopping

Refer to figure 7 and stop the engine.

17. Generator Set Operation

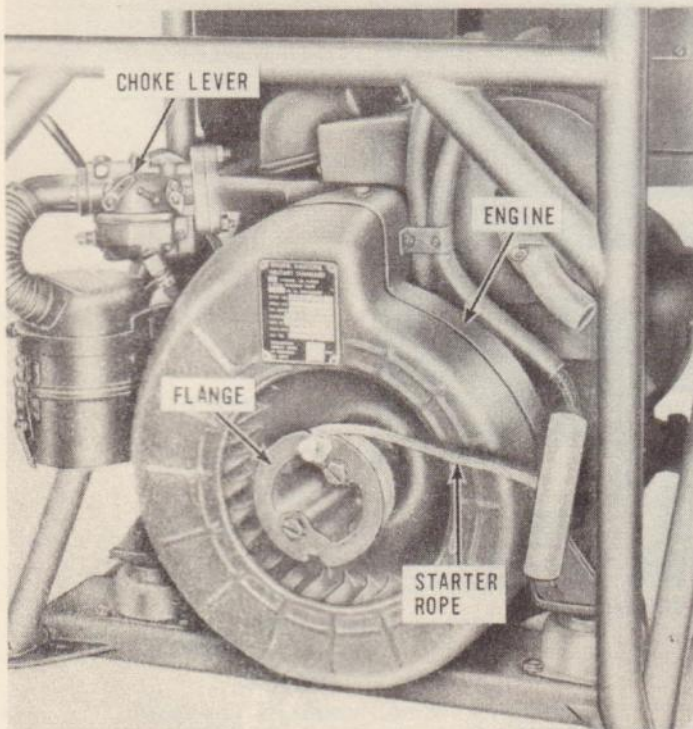
a. *General.* When the load is connected and the engine is operating, the generator operates at its rated voltage as indicated on the voltmeter. The ammeter should indicate between 0 to 12.5 amperes. If a reading of more than 12.5 amperes is indicated, reduce the load or report the condition to organizational maintenance. The generator set does not have a throttle control and the engine is designed to operate con-



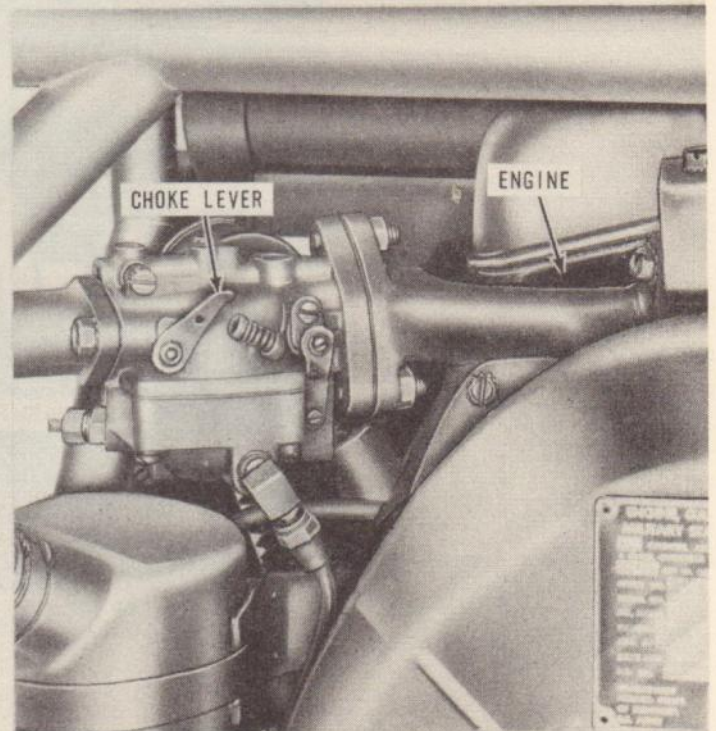
STEP 1. OPEN FUEL SHUTOFF VALVE.



STEP 2. TURN RHEOSTAT KNOB FULLY COUNTERCLOCKWISE AND POSITION LOAD SWITCH TO OFF.



STEP 3. CLOSE CHOKE. WRAP STARTER ROPE ON FLANGE AND PULL WITH QUICK STEADY MOTION.



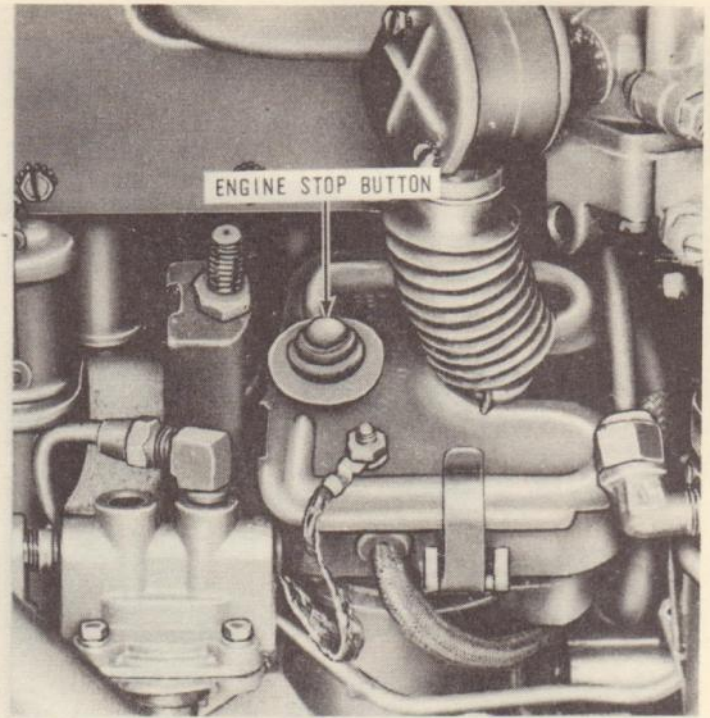
STEP 4. GRADUALLY OPEN CHOKE AS ENGINE ATTAINS OPERATING TEMPERATURE.

MSC 6115-304-15/6

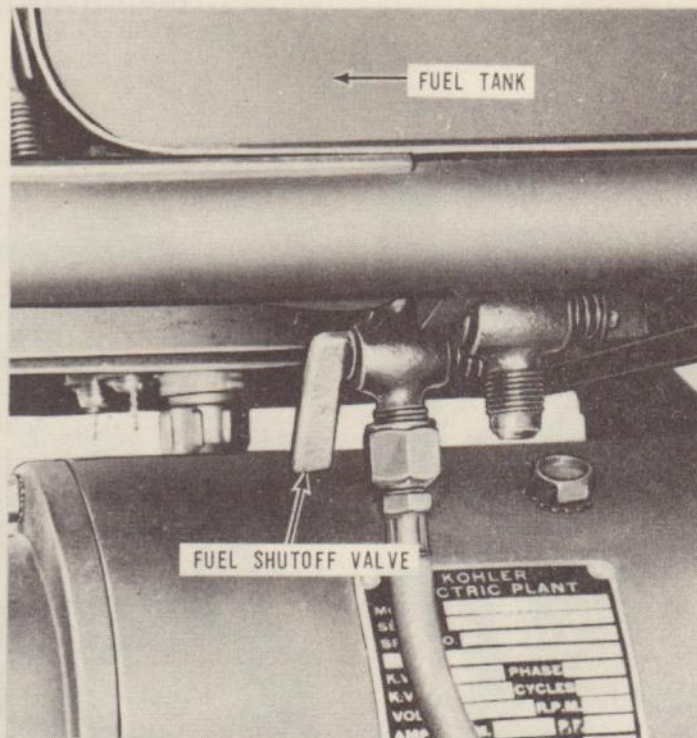
Figure 6. Engine starting instructions.



- STEP 1. TURN RHEOSTAT KNOB FULLY COUNTERCLOCKWISE.
 STEP 2. POSITION LOAD SWITCH TO OFF.



- STEP 3. PRESS ENGINE STOP BUTTON UNTIL ENGINE STOPS.



- STEP 4. CLOSE THE FUEL SHUTOFF VALVE.

MSC 6115-304-15/7

Figure 7. Engine stopping instructions.

tinuously at 3,600 revolutions per minute (full load) in accordance with the governor setting. The operator must observe the generator set, paying particular attention to unusual sounds which indicate malfunction. In such an event,

stop the engine (par. 16). Refer to paragraph 42 or report the condition to organizational maintenance.

b. Operation. Refer to figure 8 and operate the generator set.

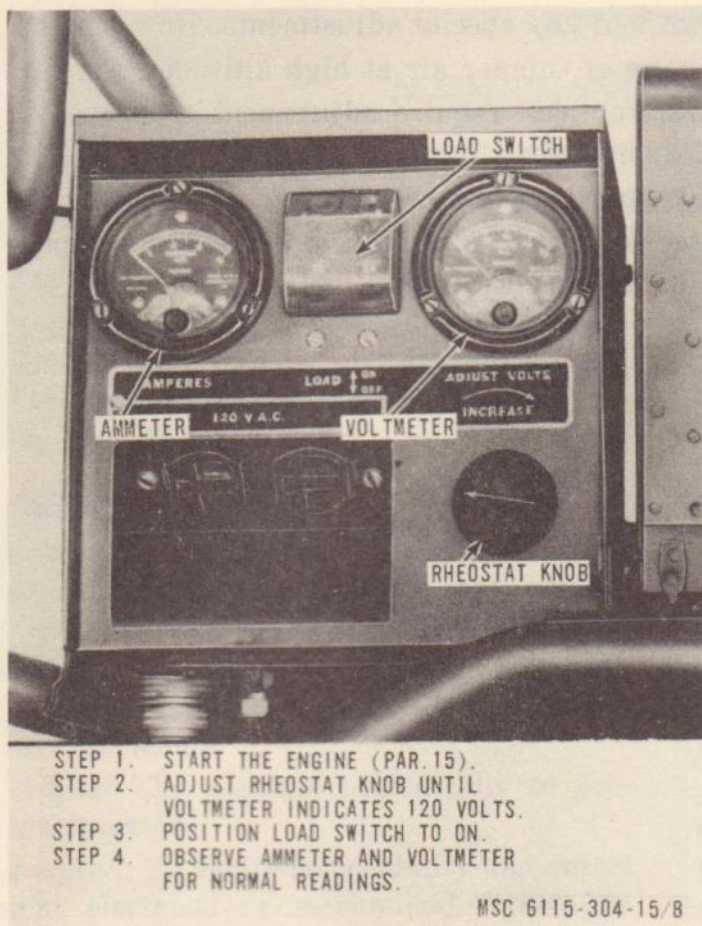


Figure 8. Generator set operating instructions.

18. Operation in Extreme Cold (Below 0°F)

a. General. The generator set will function satisfactorily at temperatures down to -65°F, (Fahrenheit). Care should be taken to keep the engine in good operating condition, to assure quick starting in very cold weather.

b. Fuel System. Keep the fuel tank as full as possible to prevent condensation. Drain and service the fuel filter more frequently than under normal conditions (TM 5-2805-206-14).

c. Electrical System.

- (1) Before attempting to start the engine, remove any accumulation of ice or snow from the spark plug or wiring.

Caution: Do not bend or kink wiring during cold weather. Electrical wiring becomes brittle with extreme cold.

- (2) Allow at least a 5-minute stabilization period after starting the engine before applying the load to the generator.

d. Lubrication. Lubricate the engine as prescribed in TM 5-2805-206-14.

19. Operation in Extreme Heat

a. Indoor Ventilation. If the generator set is operated indoors, allow sufficient space around the equipment for air circulation.

b. Cooling. Inspect the cooling fins on cylinder frequently to make sure they are clean.

c. Generator. Inspect the instruments frequently to make sure generator is not overloaded. Excessive overloading will cause arcing at the brushes.

d. Lubrication. Lubricate the engine as prescribed in TM 5-2805-206-14.

20. Operation in Dusty or Sandy Areas

a. Protection. Shield generator set from dust. Take advantage of natural barriers which offer protection from dust and sand.

b. Air Cleaner. Service the air cleaner daily to keep the carburetor free of dirt and sand (TM 5-2805-206-14).

c. Lubrication. Lubricate the engine as prescribed in TM 5-2805-206-14. Keep lubricants free of dust and sand.

21. Operation Under Rainy or Humid Conditions

a. General. If the unit is outside and is not operating, place a canvas cover or waterproof cover over the unit during storms. During dry periods, remove the cover.

b. Fuel. Keep the fuel tank as full as possible to prevent condensation. Drain and service the fuel filter more frequently than under normal conditions (TM 5-2805-206-14).

c. Electrical System. Humid conditions can cause corrosion and deterioration of electrical components. Keep electrical components and wiring clean and dry.

22. Operation in Salt Water Areas

a. General. Wipe the generator set with a clean cloth dampened with clean, fresh water at frequent intervals. Use care not to contaminate the fuel supply or damage the electrical system with water.

b. Lubrication. Use care to keep salt water from entering engine when adding or changing oil. Lubricate more frequently than under normal conditions. Lubricate the engine as prescribed in TM 5-2805-206-14.

c. Preservation. Paint all exposed nonpolished surfaces. Coat exposed parts of polished steel

or other ferrous material with standard issue, rustproofing material, if available or cover parts with a light coat of grease. Refer to TB ENG 60.

23. Operation at High Altitudes

The generator set is rated 1.5 kw (kilowatt) at altitudes up to 5,000 feet above sea level

without any special adjustments. However, because of thinner air at high altitudes, the carburetor may require adjustment to provide a leaner fuel-air mixture. (TM 5-2805-206-14). To guard against overheating of the generator set at higher altitudes, provide ample space and ventilation around the set.

CHAPTER 3

OPERATOR AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. OPERATOR AND ORGANIZATIONAL MAINTENANCE TOOLS AND EQUIPMENT

24. Special Tools and Equipment

No special tools or equipment are required by the operator or organizational maintenance personnel for the maintenance of the generator set (less engine).

25. Basic Issue Tools and Equipment

Tools and repair parts issued with or author-

ized for the generator set are listed in the basic issue items list, appendix III.

26. Organizational Maintenance Repair Parts

Organizational maintenance repair parts are listed and illustrated in TM 5-6115-304-25P.

Section II. LUBRICATION

27. General Lubrication Maintenance

a. Generator. Lubrication is not required for the generator.

b. Engine. For general lubrication instructions on the engine, refer to TM 5-2805-206-14.

28. Detailed Lubrication Information

a. Refer to TM 5-2805-206-14 for detailed lubrication instructions on the engine.

b. The generator is equipped with a sealed bearing and requires no lubrication.

Section III. PREVENTIVE MAINTENANCE SERVICES

29. General

To insure that the equipment is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraphs 30 and 31. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the unit will be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded, together with the corrective action taken, on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

30. Daily Preventive Maintenance Services

This paragraph contains an illustrated tabu-

lated listing of preventive maintenance services which must be performed by the operator. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 9 for the daily preventive maintenance services.

31. Quarterly Preventive Maintenance Services

a. This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by organizational maintenance personnel at quarterly intervals. A quarterly interval is equal to 3 calendar months, or 250 hours of operation, whichever occurs first.

b. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 10 for the quarterly preventive maintenance services.

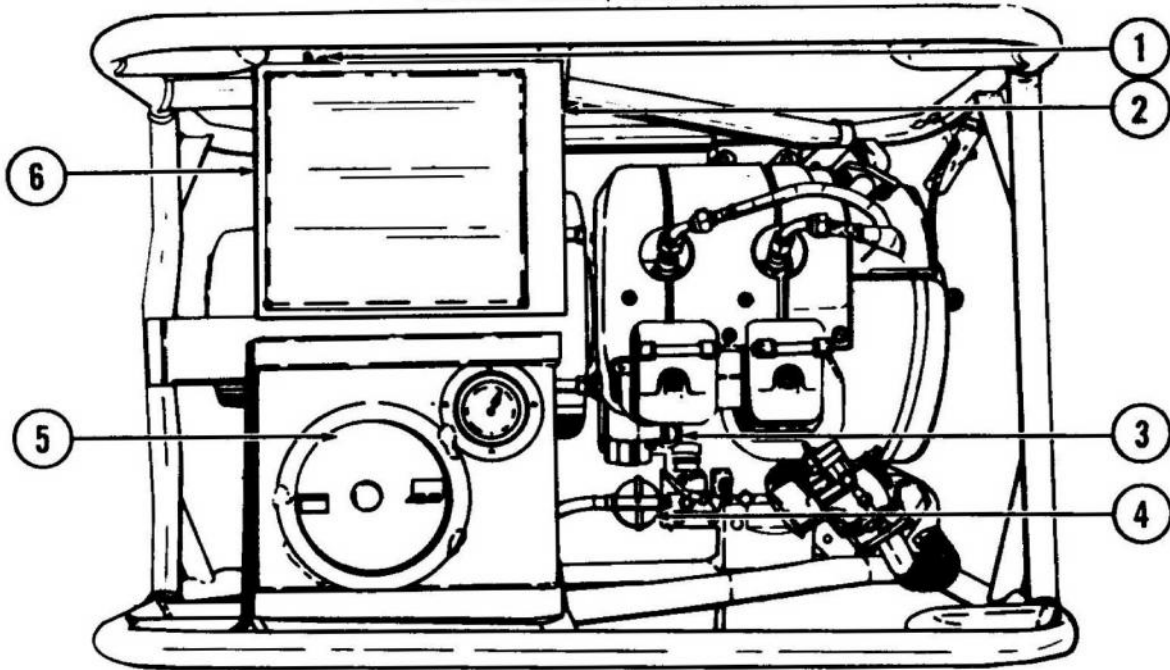
PREVENTIVE MAINTENANCE SERVICES

DAILY

TM5-6115-304-15

KOHLER MODEL KK1.5M25

GENERATOR SET



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION CHART

ITEM		PAR REF
1	ELECTRICAL CONNECTOR. Check for corrosion, loose connections, and damage.	68
2	GROUND TERMINAL. Check for proper ground. A proper ground will consist of a 3/4-inch-dia. hollow rod or 5/8-inch-dia. solid rod, 9 feet long. The cable will be No. 6 AWG copper wire, bolted or clamped to the rod and attached to the ground terminal of the generator set.	9
3	OIL LEVEL GAGE. Add oil as indicated by level gage. Reference current L05-2805-206-14.	8
4	FUEL FILTER. Tighten thumbnut if gasket is leaking. (Clean weekly.) Reference TM5-2805-206-14, par. 55.	32
5	FUEL TANK. Add fuel as required.	8
6	CONTROLS AND INSTRUMENTS. Inspect for damage and loose mounting. With unit operating, check for proper operation. Normal operating readings for instruments are as follows: Voltmeter 120 volts Ammeter Indicates applied load not to exceed 12.5 amperes maximum	13

MSC 6115-304 15/9 (1)

Figure 9. Daily preventive maintenance services.

ITEM	PAR REF
<p><u>NOTE 1. OPERATION.</u> During operation observe for any unusual noise or vibration.</p>	17

MSC 6115-304-15/9

2

Figure 9—Continued.

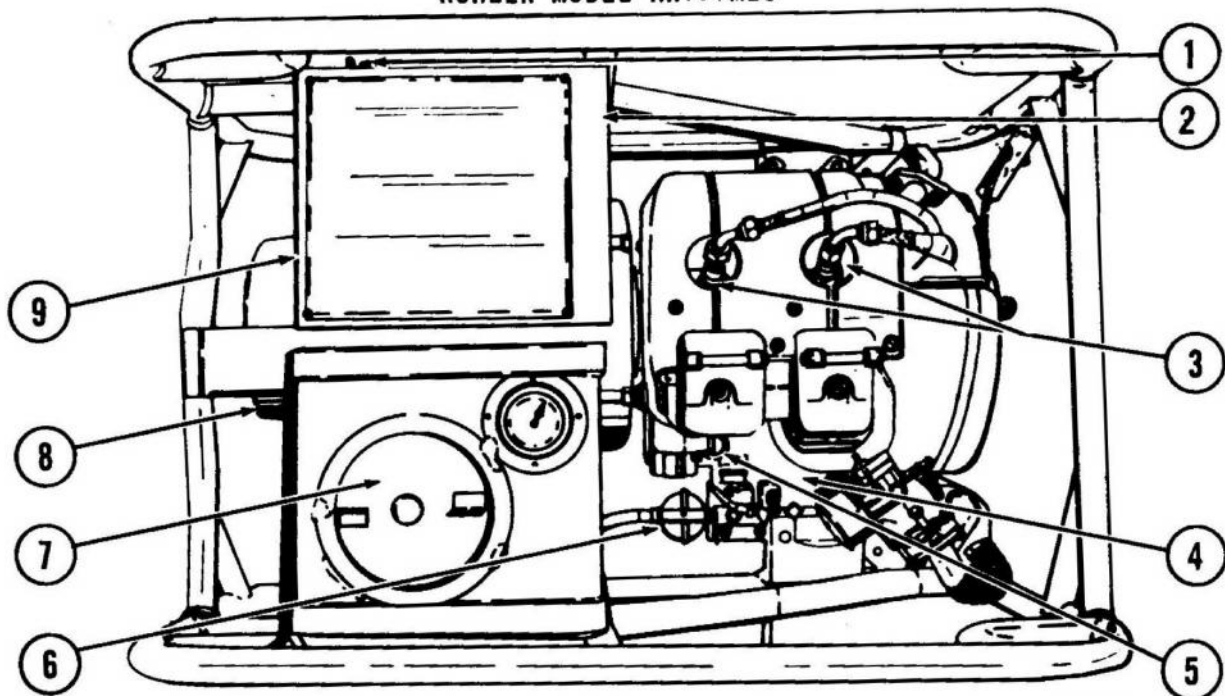
PREVENTIVE MAINTENANCE SERVICES

QUARTERLY

TM5-6115-304-15

KOHLER MODEL KK1.5M25

GENERATOR SET



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM		PAR REF
1	ELECTRICAL CONNECTOR. Clean corroded connector and tighten loose connections. Replace damaged connector.	68
2	GROUND TERMINAL. Check for proper ground. A proper ground will consist of a 3/4-inch-dia. hollow rod or 5/8-inch-dia. solid rod, 9 feet long. The cable will be No. 6 AWG copper wire, bolted or clamped to the rod and attached to the ground terminal of the generator set.	9
3	SPARK PLUGS. Replace spark plugs that have cracked insulators and burned electrodes. Clean and set spark plug gaps for 0.024-0.026 inch. Torque spark plugs to 25 to 27 foot-pounds. Replace leads which are frayed or broken. Clean and tighten lead connections. Reference TM5-2805-206-14, par.61.	
4	CONTACT POINTS. Replace pitted or burned points. Proper gap adjustment is 0.018 inch. (Check adjustment every 500 hours.) Reference TM5-2805-206-14, par.58.	
5	OIL LEVEL GAGE. Add oil as indicated by level gage. Reference current L.O. L05-2805-206-14.	
6	FUEL FILTER. Tighten thumb nut if gasket is leaking. Clean a dirty filter element. Reference TM5-2805-206-14, par.55.	32

MSC 6115-304-15/10 (1)

Figure 10. Quarterly preventive maintenance services.

ITEM	PAR REF				
7	53				
<p><u>FUEL TANK.</u> Add fuel as required. Tighten loose mounting. Replace leaking fuel tank. Replace defective cap gasket. Clean cap vent.</p>					
8	58				
<p><u>GENERATOR BRUSHES AND CONTACT RINGS.</u> Check generator for worn or frayed wiring. Smooth or clean, rough or dirty contact rings. Replace brushes if worn to bottom of 'V' mark on brushes.</p>					
9	13				
<p><u>CONTROLS AND INSTRUMENTS.</u> Replace damaged instruments. Tighten loose mounting. With the unit operating, check for proper operation. Normal operating readings for instruments are as follows:</p> <table data-bbox="135 515 1300 627"> <tr> <td>Voltmeter</td> <td>120 volts</td> </tr> <tr> <td>Ammeter</td> <td>Indicates applied load not to exceed 12.5 amperes maximum.</td> </tr> </table>	Voltmeter	120 volts	Ammeter	Indicates applied load not to exceed 12.5 amperes maximum.	
Voltmeter	120 volts				
Ammeter	Indicates applied load not to exceed 12.5 amperes maximum.				
<p><u>NOTE 1. OPERATIONAL TEST.</u> During operation observe for any unusual noise or vibration.</p>					
<p><u>NOTE 2. ADJUSTMENTS.</u> Make all necessary adjustments during operational test.</p>					

MSC 6115-304-15/10 (2)

Figure 10—Continued.

Section IV. OPERATOR'S MAINTENANCE

32. Fuel Filter and Air Cleaner

Service the fuel filter and air cleaner as shown by TM 5-2805-206-14.

Warning: Before servicing any part of the generator set, make certain that the engine is stopped. Failure to observe this safety precaution may result in severe electrical shock or death by electrocution.

33. Fuel Tank Cap and Strainer

a. *Removal.* Refer to figure 11 and remove the fuel tank cap and strainer.

b. *Cleaning and Inspection*

- (1) Clean the fuel tank cap and strainer with an approved cleaning solvent and dry thoroughly.
- (2) Inspect the fuel tank cap for breaks or other damage. Inspect the gasket for breaks or signs of deterioration. Make sure the vent in the cap and gasket are open.
- (3) Inspect the strainer for cracks, breaks, or a plugged screen.
- (4) Replace a defective fuel tank cap or strainer.

c. *Installation.* Refer to figure 11 and install the fuel tank cap and strainer.

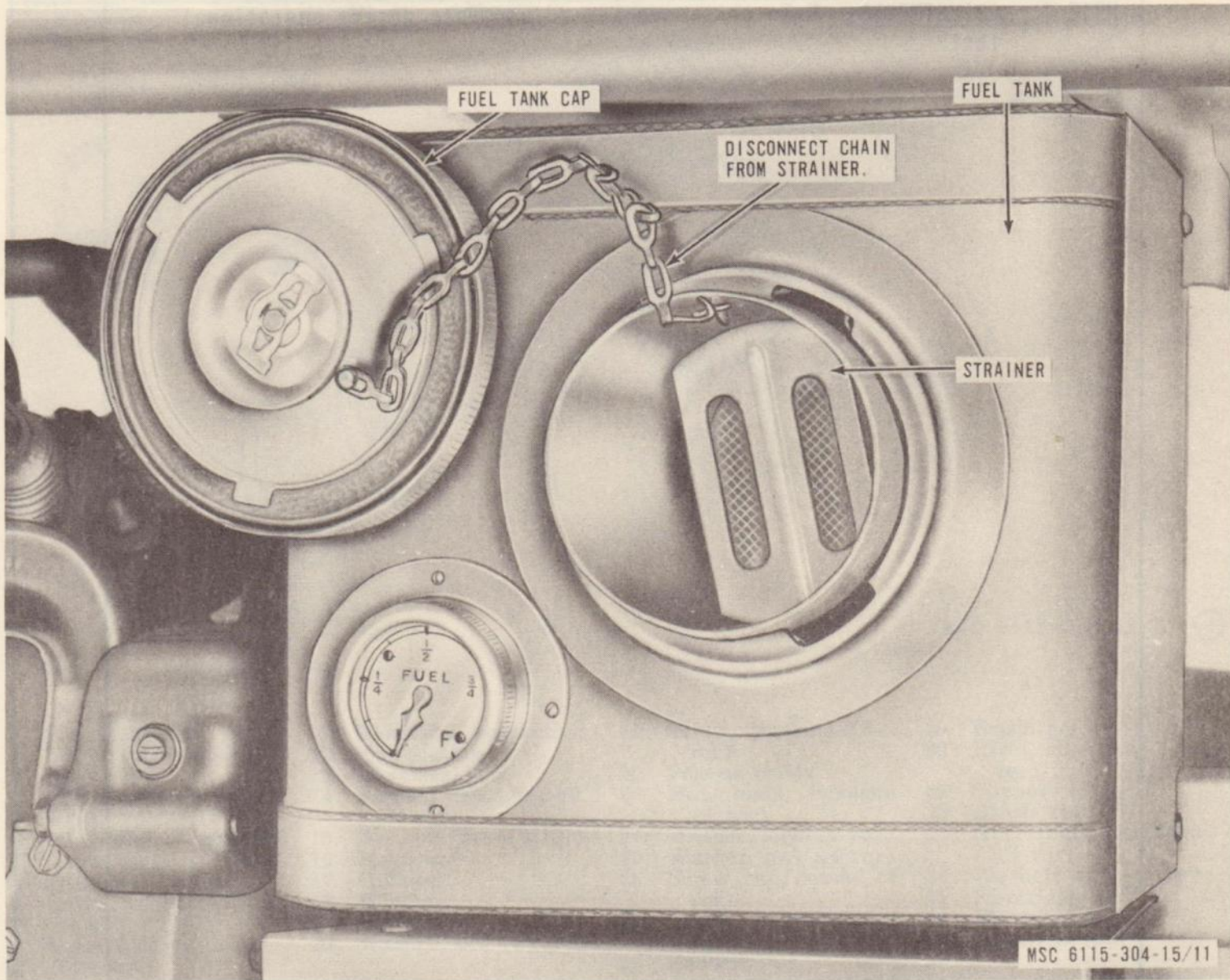


Figure 11. Fuel tank cap and strainer, removal and installation.

Section V. TROUBLESHOOTING

34. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the generator set and its components. Each trouble symptom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any trouble beyond the scope of organizational maintenance shall be reported to field maintenance, 3d echelon. Refer to TM 5-2805-206-14 for engine troubleshooting.

35. Generator Fails to Build up Rated Voltage

<i>Probable cause</i>	<i>Possible remedy</i>
Rheostat incorrectly adjusted -----	Adjust the rheostat (par. 17).
Brush contact poor -----	Inspect and replace defective brushes or tension spring (par. 58).
Engine speed too low -----	Refer to TM 5-2805-206-14 for engine maintenance.

36. Generator Overheats

<i>Probable cause</i>	<i>Possible remedy</i>
Generator overloaded -----	Reduce the load.
Brush pressure excessive -----	Inspect and replace defective brushes or tension spring (par. 58).

<i>Probable cause</i>	<i>Possible remedy</i>
Vent holes restricted -----	Remove the restriction.
Generator dirty -----	Blow dirt and dust from generator.

37. Generator Fails to Supply Load

<i>Probable cause</i>	<i>Possible remedy</i>
Terminal studs or receptacle defective -----	Replace studs or receptacle (pars. 64 and 68).
Ammeter defective -----	Replace ammeter (par. 63).
Load switch defective -----	Replace switch (par. 65).

38. Generator Voltage Fluctuates

<i>Probable cause</i>	<i>Possible remedy</i>
Generator overloaded -----	Reduce the load.
Engine speed fluctuates -----	Refer to TM 5-2805-206-14 for engine maintenance.
Brush contact poor -----	Inspect and replace defective brushes or tension springs (par. 58).

39. Generator Brushes Spark Excessively

<i>Probable cause</i>	<i>Possible remedy</i>
Brush contact poor -----	Inspect and replace defective brushes or tension springs (par. 58).
Generator overloaded -----	Reduce the load.

40. Generator Noisy

<i>Probable cause</i>	<i>Possible remedy</i>
Brush contact poor -----	Inspect and replace defective brushes or tension springs (par. 58).
Mounting bolts loose -----	Tighten mounting bolts.

Section VI. FIELD EXPEDIENT REPAIRS

41. Field Expedient Repairs

Operator and organizational maintenance troubles may occur while the generator set is operating in the field where supplies and repair parts are not available and normal corrective action cannot be performed. When this condition exists, the following expedient repairs may be used in emergencies, upon the decision of the unit commander. Equipment so repaired must be removed from operation as soon as possible and properly repaired before being placed in operation again.

42. Voltmeter Does Not Register

<i>Trouble</i>	<i>Expedient remedy</i>
Voltmeter shorted or grounded.	Disconnect and tape the voltmeter leads separately.

43. Loss of Fuel

<i>Trouble</i>	<i>Expedient remedy</i>
Fuel hose cracked -----	Tape cracked hose until defective hose can be replaced. (par. 50).

44. Ammeter Does Not Register

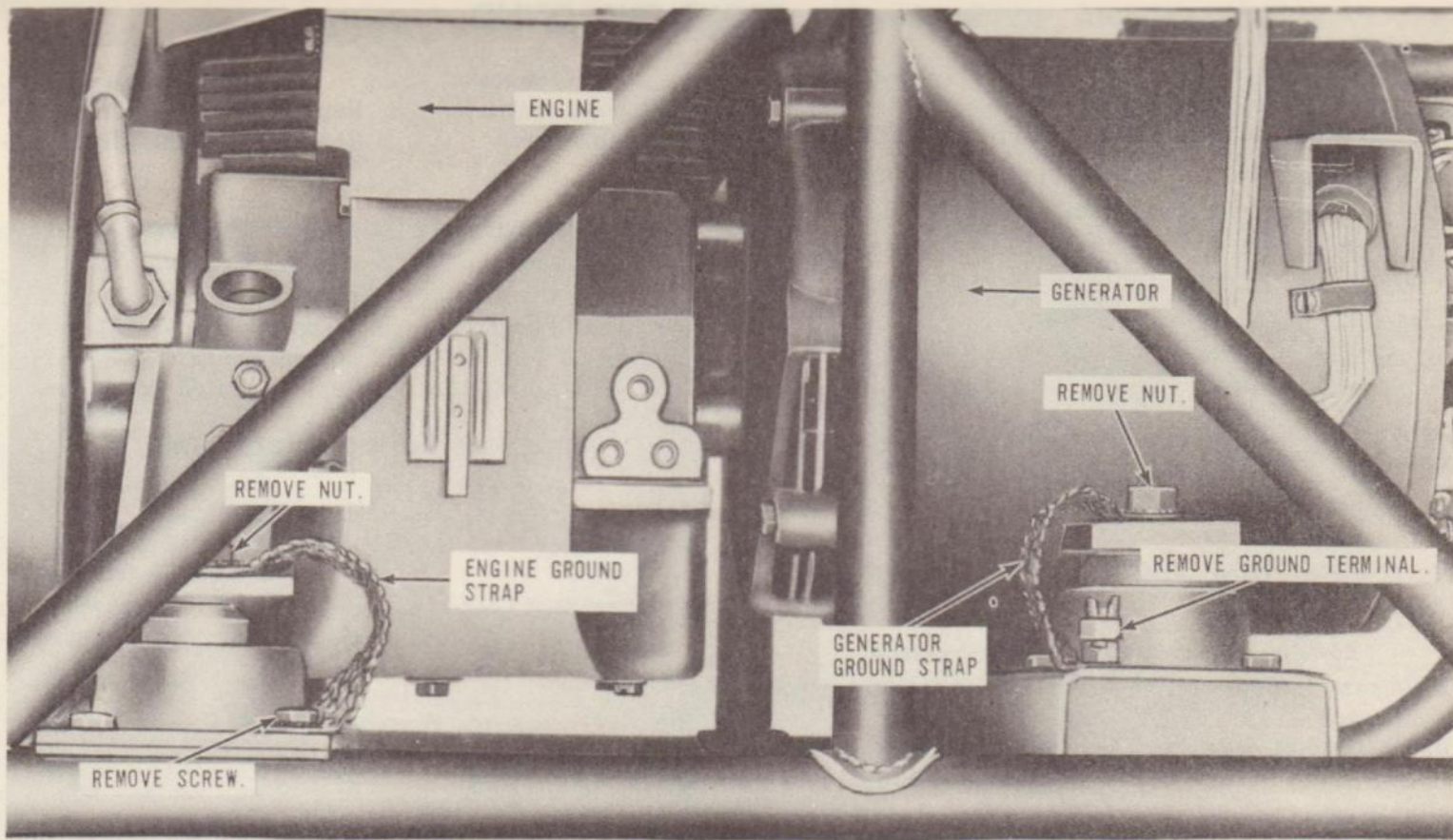
<i>Trouble</i>	<i>Expedient remedy</i>
Ammeter shorted or grounded	Disconnect and tape the ammeter leads together (par. 63).

Section VII. RADIO INTERFERENCE SUPPRESSION

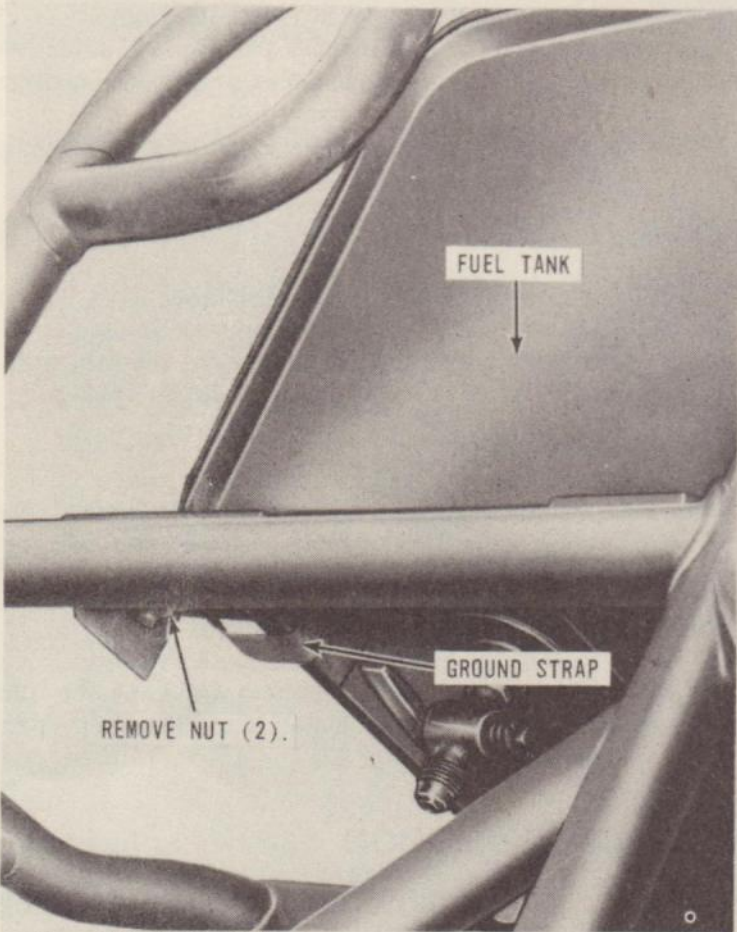
45. General Methods Used to Attain Proper Suppression

Essentially, suppression is attained by providing a low-resistance path to ground for stray

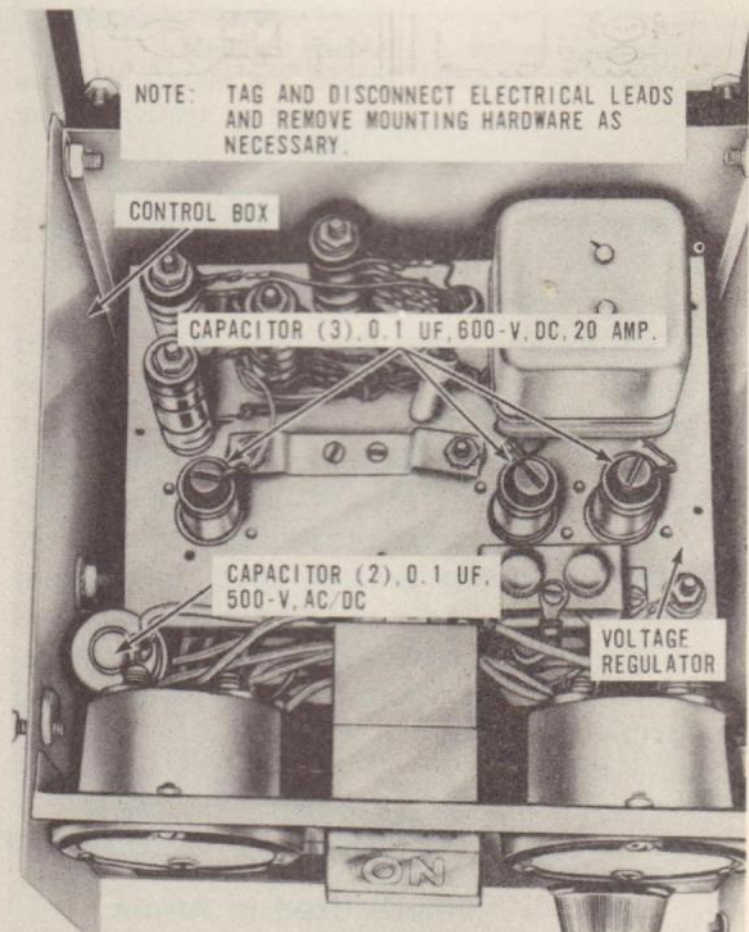
currents. The methods used include shielding the ignition and high-frequency wires, grounding the frame with bonding straps, and using capacitors and resistors. For general informa-



A. ENGINE AND GENERATOR GROUND STRAPS.



B. FUEL TANK STRAP.



C. CAPACITORS

MSC 6115-304-15/12

Figure 12. Radio interference suppression components, location, removal, and installation.

tion on radio interference suppression, see TM 11-483.

46. Interference Suppression Components

Figure 12 locates and illustrates the interference suppression components.

47. Replacement of Suppression Components

a. Remove a voltage regulator cover (par. 67).

b. Refer to figure 12 and remove and install the radio interference suppression components.

48. Testing of Radio Interference Suppression Components

Test the capacitors for leaks and shorts on a capacitor tester; replace defective capacitors. If test equipment is not available and interference is indicated, isolate the cause of interference by the trial-and-error method of replacing each capacitor in turn until the cause of interference is located and eliminated.

Section VIII. ENGINE ACCESSORIES

49. General

This section includes maintenance instructions for the fuel hose, drain valve, fuel shutoff valve, fuel filter, fuel gage, fuel tank, muffler ex-

tension and engine vibration dampeners. Refer to TM 5-2805-206-14 for maintenance of engine components.

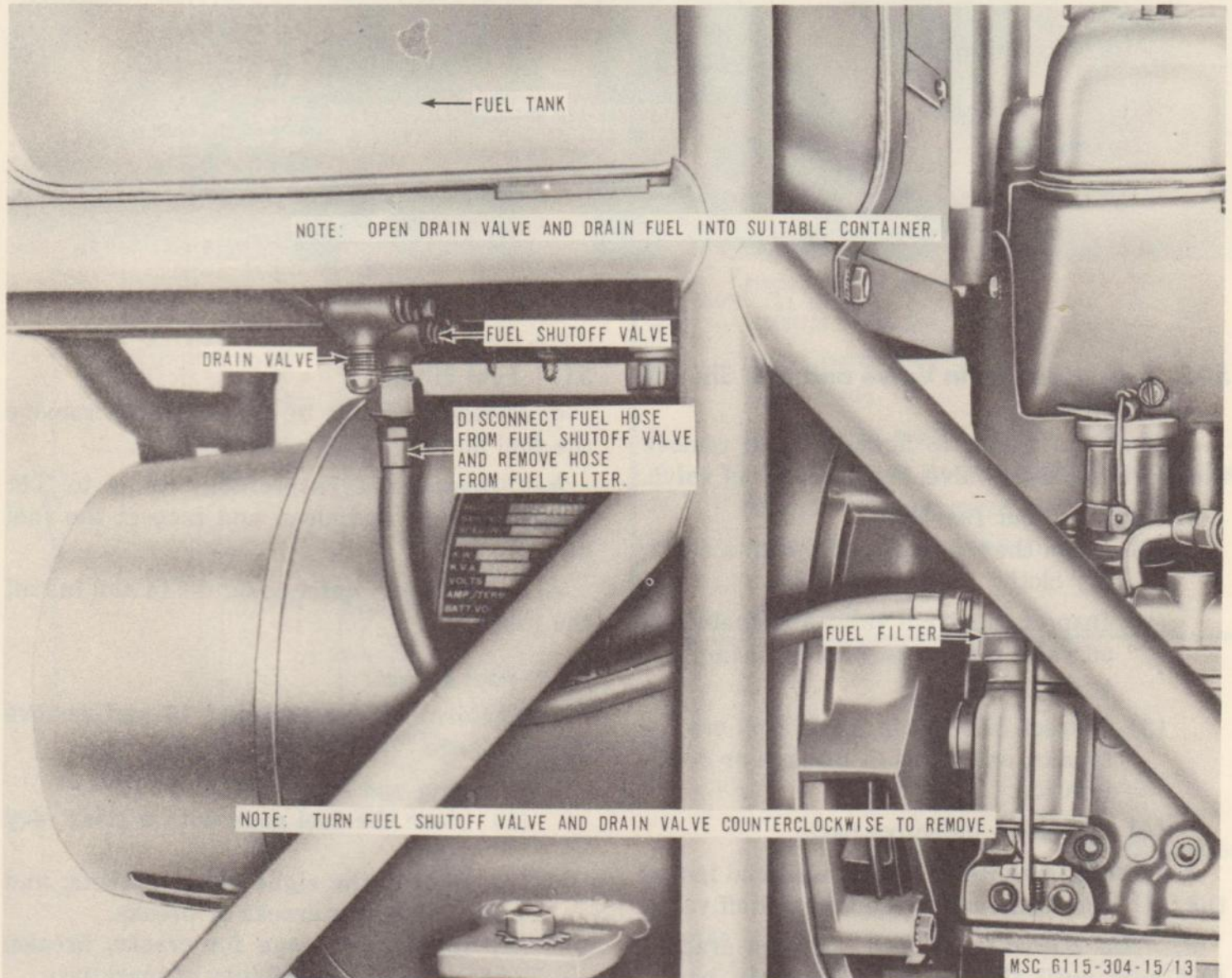


Figure 13. Fuel hose, drain valve, and fuel shutoff valve, removal and installation.

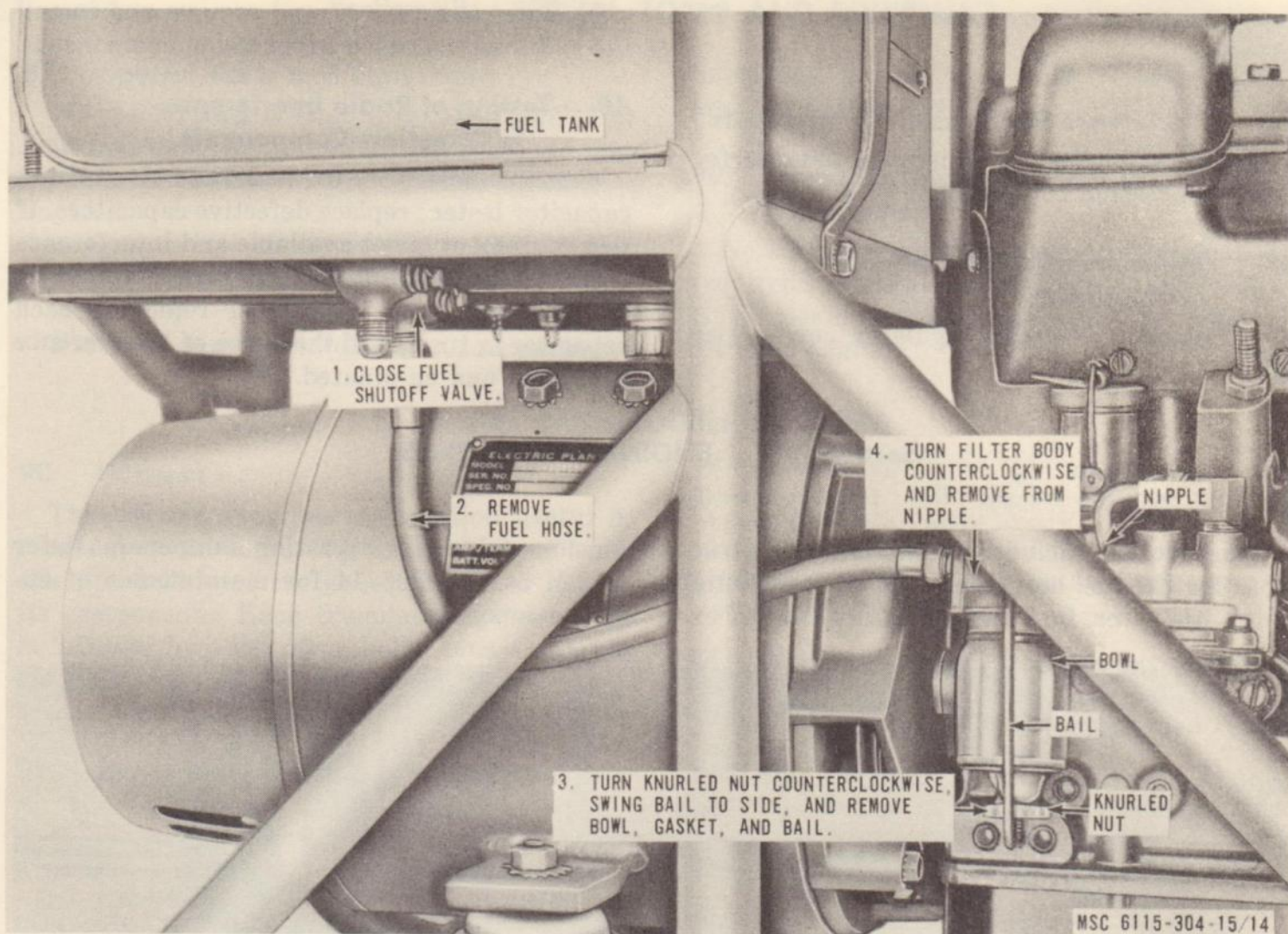


Figure 14. Fuel filter, removal and installation

50. Fuel Hose, Drain Valve and Fuel Shutoff Valve

a. *Removal.* Refer to figure 13 and remove the fuel hose, drain valve, and fuel shutoff valve.

b. *Cleaning and Inspection.*

- (1) Clean the removed parts with a clean, dry cloth.
- (2) Inspect the drain valve and fuel shutoff valve for cracks, breaks, or improper operation.
- (3) Inspect the drain hose for cracks, breaks, and signs of leakage or deterioration.
- (4) Replace a defective part.

c. *Installation.* Refer to figure 13 and install the fuel hose, drain valve, and fuel shutoff valve.

d. *Field Expedient Repair.* Tape a cracked fuel hose until the defective hose can be replaced.

51. Fuel Filter

a. *Removal.* Refer to figure 14 and remove the fuel filter.

b. *Cleaning and Inspection.* Refer to TM 5-2805-206-14 and clean and inspect the fuel filter.

c. *Installation.* Refer to figure 14 and install the fuel filter.

52. Fuel Gage

a. *Removal.* Refer to figure 15 and remove the fuel gage.

b. *Cleaning and Inspection.*

- (1) Clean the fuel gage with a clean, dry cloth.
- (2) Inspect the sight glass, gaskets, and retainer for cracks or breaks.
- (3) Inspect the gage for cracks, breaks, bends, and illegibility of markings.
- (4) Replace a defective part.

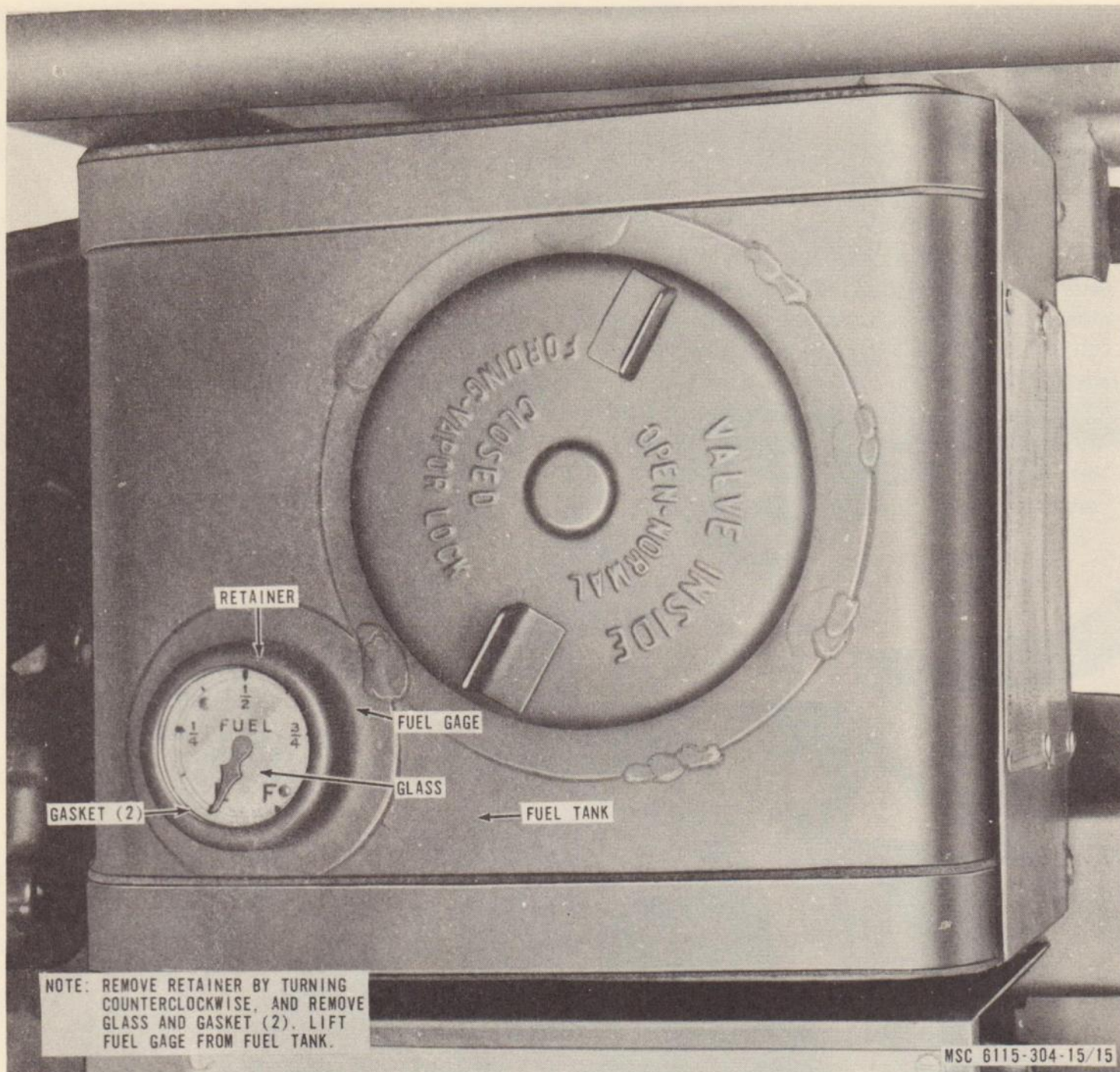


Figure 15. Fuel gage, removal and installation.

c. *Installation.* Refer to figure 15 and install the fuel gage.

53. Fuel Tank

a. Removal

- (1) Refer to figure 16 and remove the fuel tank.
- (2) Remove the fuel tank cap and strainer (par. 33).
- (3) Remove the drain valve and fuel shut-off valve (par. 50).
- (4) Remove the fuel gage (par. 52).

b. Cleaning and Inspection.

- (1) Clean the fuel tank with an approved cleaning solvent and dry thoroughly.
- (2) Inspect the fuel tank for cracks, breaks, dents, and other damage.
- (3) Replace a defective fuel tank.

c. Installation.

- (1) Install the fuel gage (par. 52).
- (2) Install the drain valve and fuel shut-off valve (par. 50).
- (3) Install the fuel tank cap and strainer (par. 33).

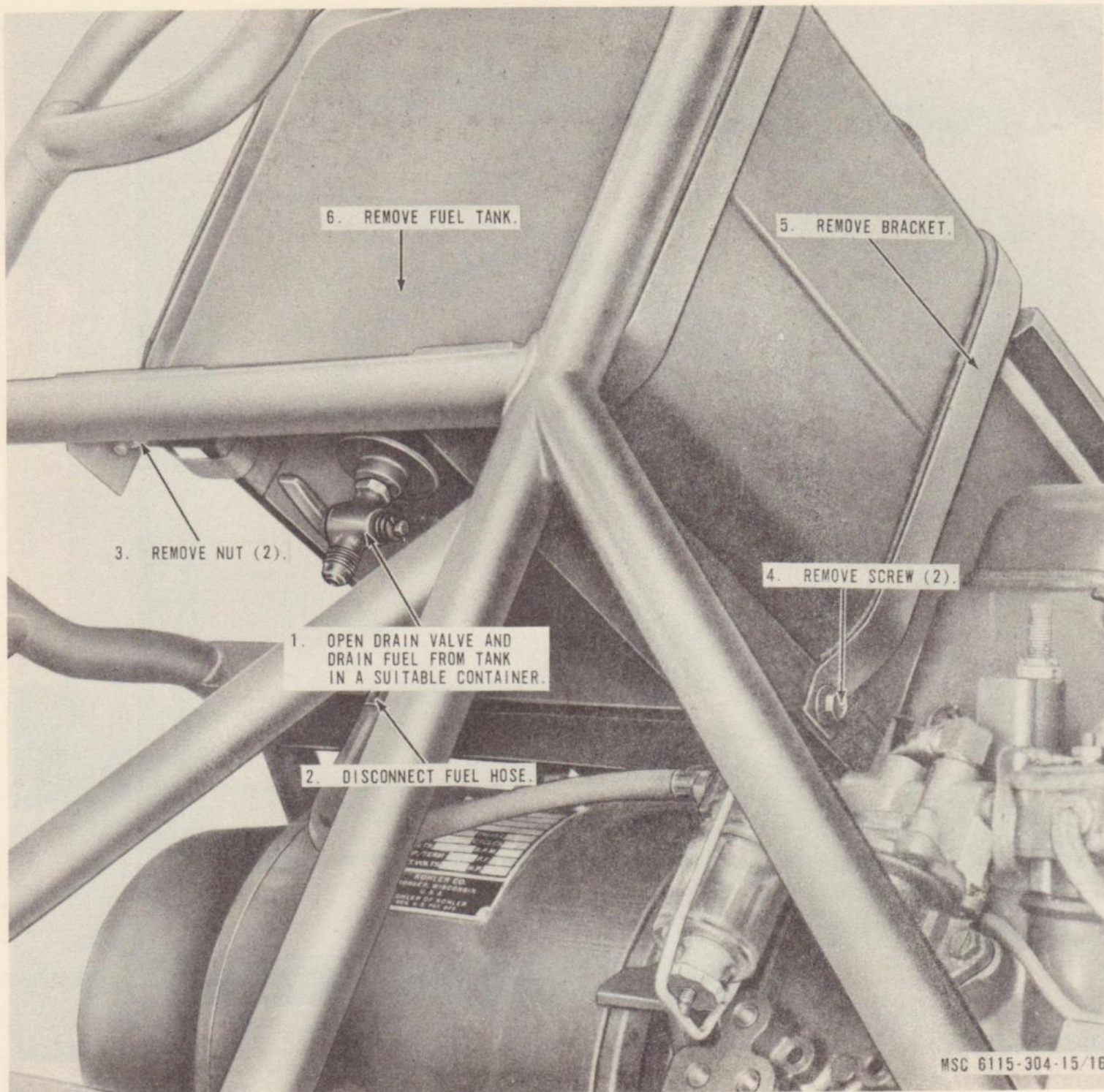


Figure 16. Fuel tank, removal and installation.

- (4) Refer to figure 16 and install the fuel tank.

54. Muffler Extension

- a. Inspection.* Inspect the muffler extension for cracks, breaks, holes, and rusted areas.
- b. Removal.* Refer to figure 17 and remove the muffler extension.
- c. Installation.* Refer to figure 17 and install the muffler extension.

55. Engine Vibration Dampeners

- a. Removal.* Refer to figure 18 and remove the engine vibration dampeners.
- b. Cleaning and Inspection.*
- (1) Clean the vibration dampeners with a clean, dry cloth.
 - (2) Inspect the vibration dampeners for cracks, breaks, and signs of deterioration.

(3) Replace a defective vibration dampener.

c. *Installation.* Refer to figure 18 and install the engine vibration dampeners.

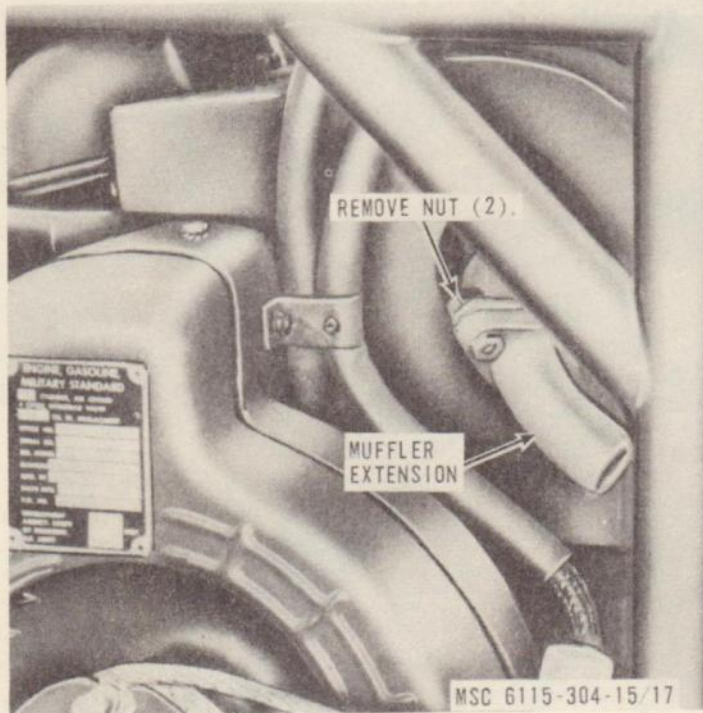


Figure 17. Muffler extension, removal and installation.

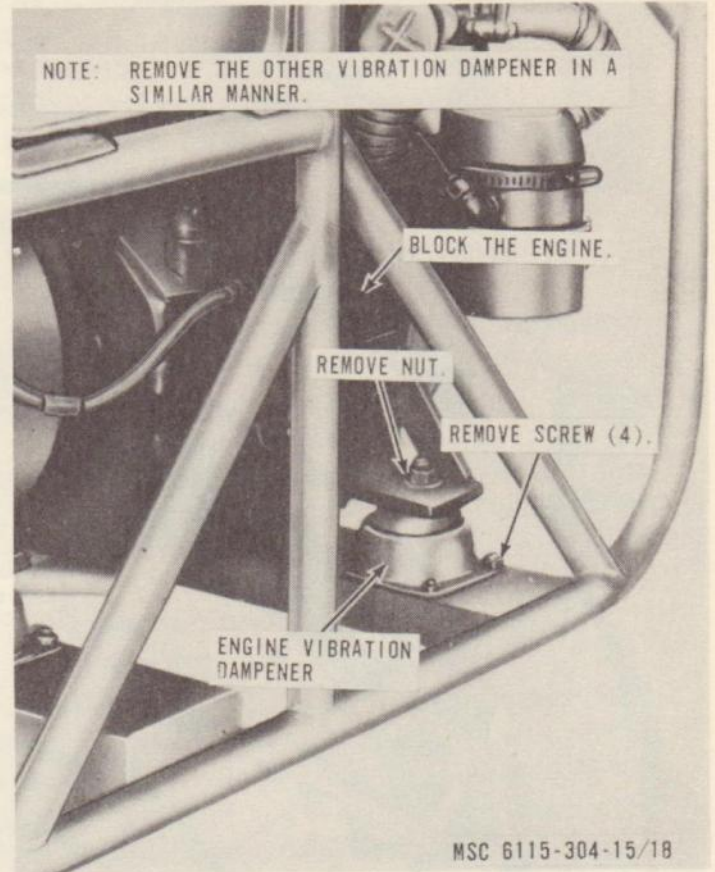


Figure 18. Engine vibration dampeners, removal and installation.

Section IX. GENERATOR

56. General

The generator is a two-pole, revolving armature, alternating shock-mounted on one end and directly coupled to the engine on the other end. The elongated holes and louvers in the endbell cover provide ventilation for the generator. The endbell cover must be removed to gain access to the electrical contact brushes. The voltmeter, ammeter, receptacle, load switch, and the voltage adjusting rheostat are located on the control box panel. The load terminals are located on the under side of the control box.

57. Endbell Cover

a. *Removal.* Refer to figure 19 and remove the endbell cover.

b. *Cleaning, Inspection, and Repair.*

- (1) Clean the endbell cover with an approved cleaning solvent and dry thoroughly.
- (2) Inspect the cover for cracks, dents, and burs.

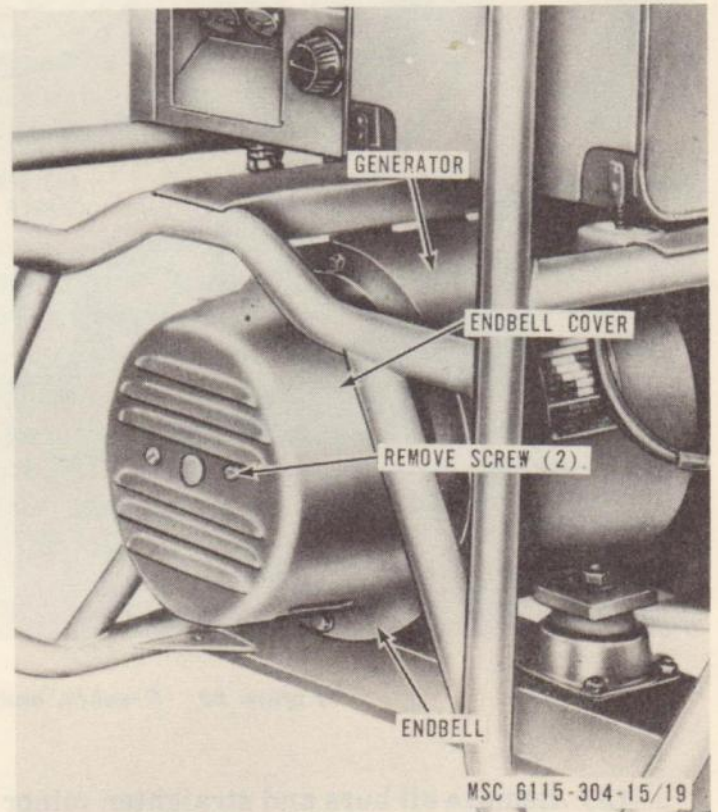
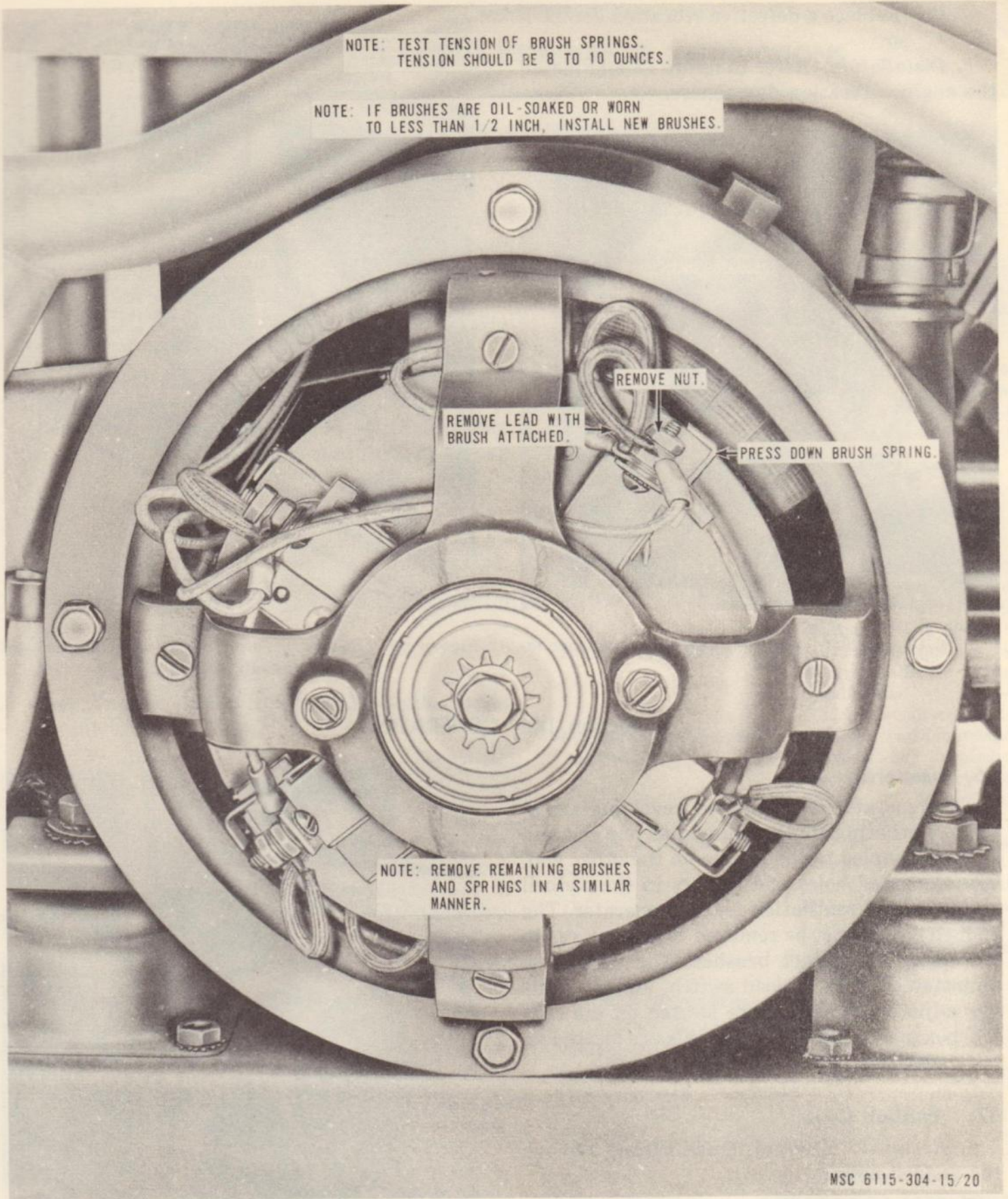


Figure 19. Endbell cover, removal and installation.

NOTE: TEST TENSION OF BRUSH SPRINGS.
TENSION SHOULD BE 8 TO 10 OUNCES.

NOTE: IF BRUSHES ARE OIL-SOAKED OR WORN
TO LESS THAN 1/2 INCH, INSTALL NEW BRUSHES.

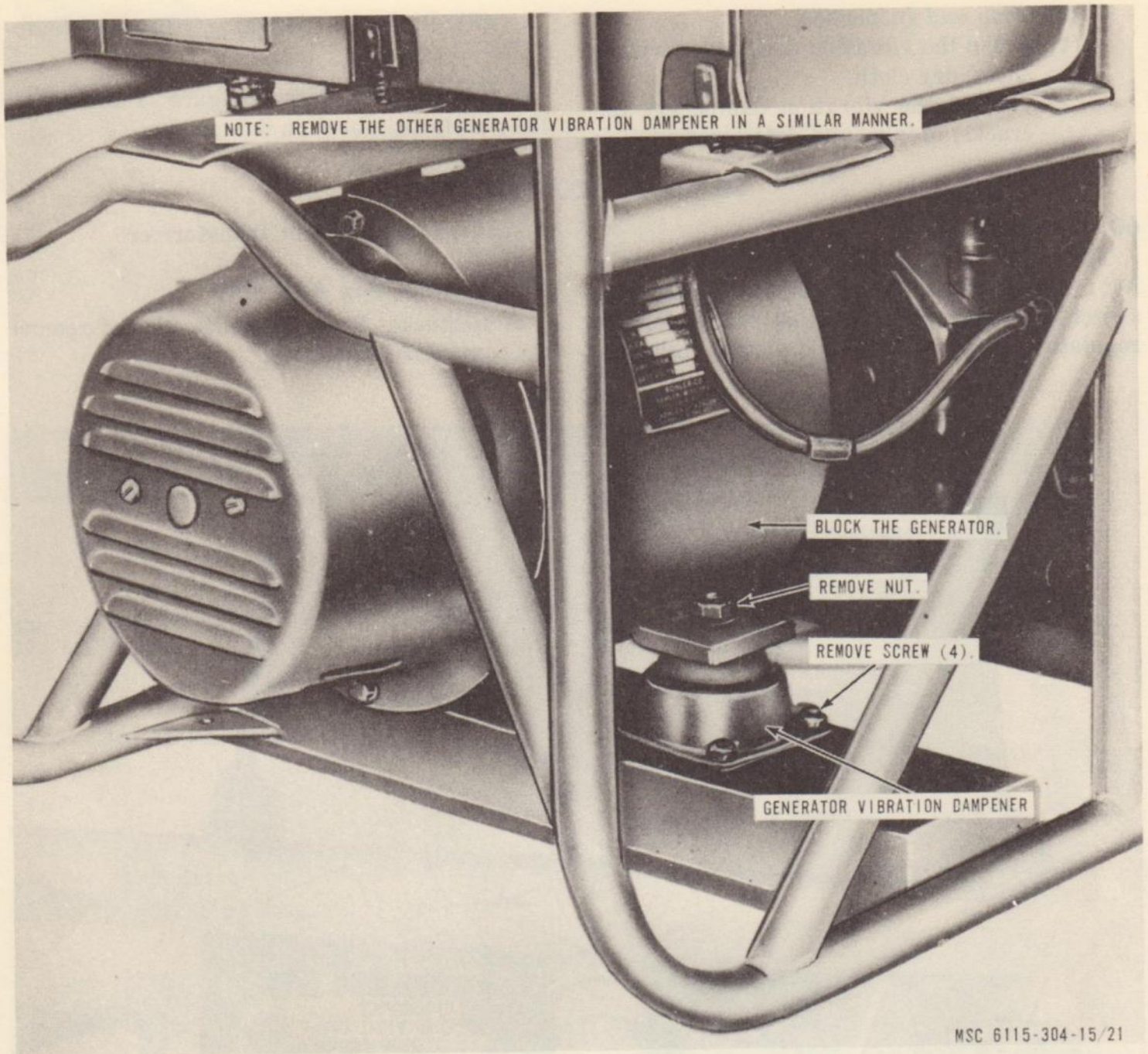


MSC 6115-304-15/20

Figure 20. Brushes, and springs, removal and installation.

(3) Remove all burrs and straighten minor dents. Replace a defective cover.

c. Installation. Refer to figure 19 and install the endbell cover.



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Figure 21. Generator vibration dampeners, removal and installation.

58. Brushes and Springs

a. Removal.

- (1) Remove the endbell cover (par. 57).
- (2) Refer to figure 20 and remove the brushes and springs.

b. Cleaning and Inspection.

- (2) Clean brushes with a dry, clean cloth.
- (2) Clean the springs with an approved cleaning solvent and dry thoroughly.
- (3) Clean the contact rings with No. 00 sandpaper and a piece of clean canvas.
- (4) Inspect the brushes for breaks, cracks, chips and frayed leads. Replace a de-

fective brush or one that is worn to less than $\frac{1}{2}$ inch in length.

- (5) Inspect the springs for breaks, cracks, and fatigue.
- (6) Replace a defective spring.

c. Installation.

- (1) Refer to figure 20 and install the brushes and springs.
- (2) Seat the brushes (TM 5-764).
- (3) Install the endbell cover (par. 57).

59. Generator Vibration Dampeners

a. *Removal.* Refer to figure 21 and remove the generator vibration dampeners.

b. Cleaning and Inspection.

- (1) Clean the vibration dampeners with a clean, dry cloth.
- (2) Inspect the vibration dampeners for cracks, breaks, and deterioration.

- (3) Replace a defective vibration dampener.

c. Installation. Refer to figure 21 and install the generator vibration dampeners.

Section X. CONTROL BOX

60. General

The control box protects and provides mounting for the voltmeter, ammeter, receptacle, load switch, rheostat, load terminal studs, voltage regulator relay, heat sink and diodes, resistors,

capacitors, and current transformer.

61. Control Box Assembly

a. Removal. Refer to figure 22 and remove the control box assembly.

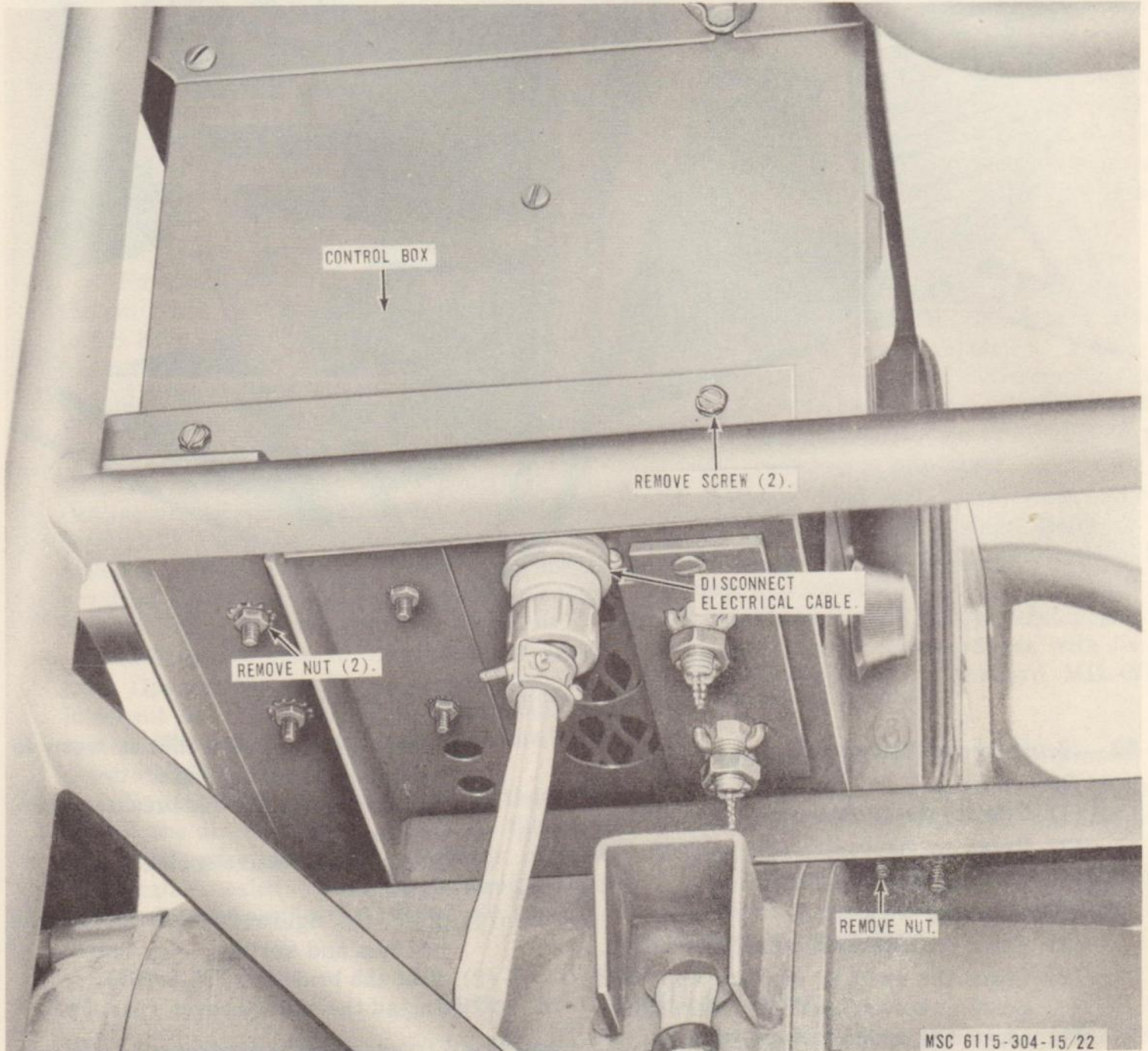
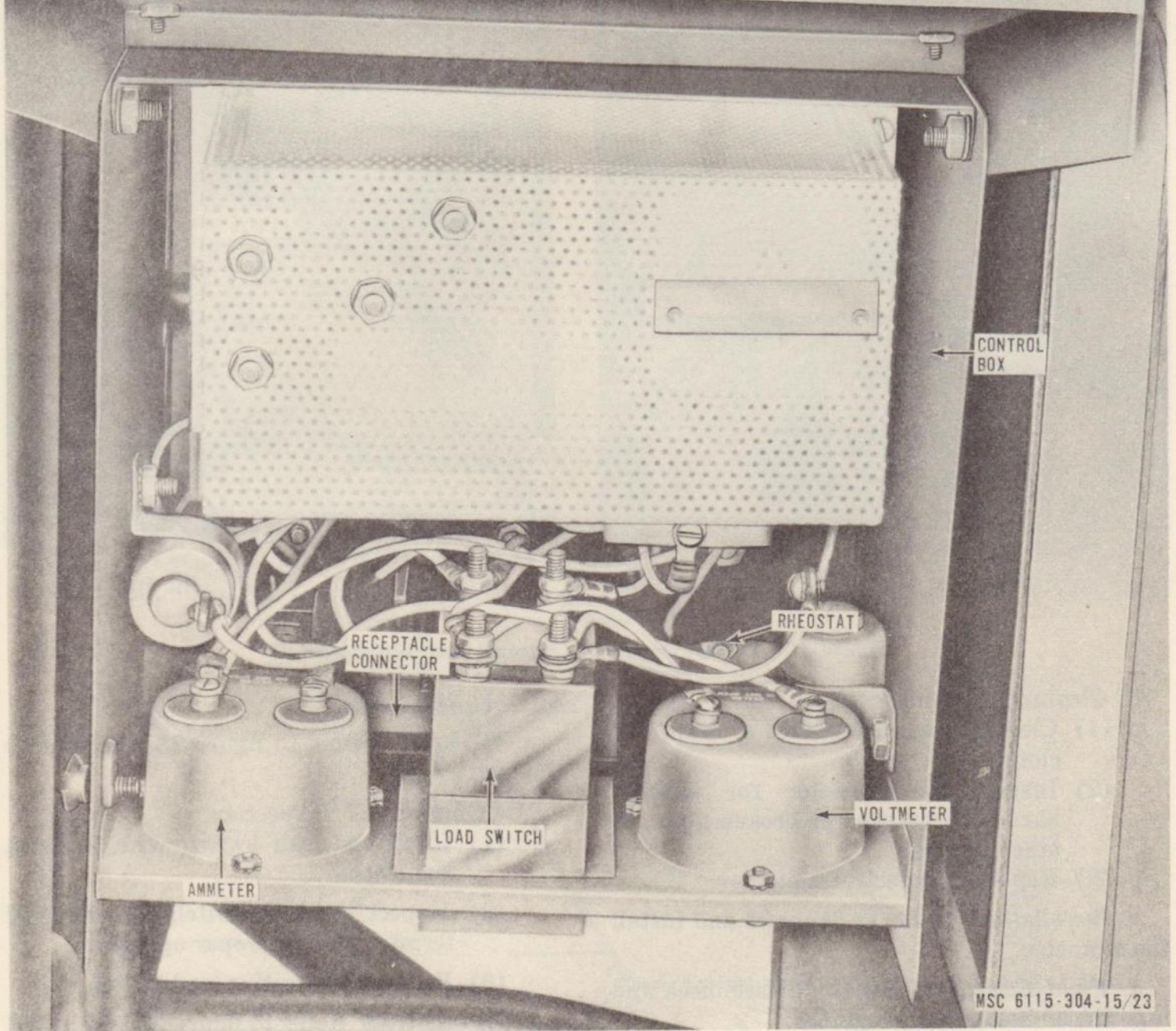


Figure 22. Control box assembly, removal and installation.

NOTE: TAG AND DISCONNECT ELECTRICAL LEADS AND REMOVE ATTACHING HARDWARE AS NECESSARY.



MSC 6115-304-15/23

Figure 23. Voltmeter, ammeter, receptacle connector, load switch, and rheostat, removal and installation.

b. *Installation.* Refer to figure 22 and install the control box assembly.

62. Voltmeter

a. *Removal.* Refer to figure 23 and remove the voltmeter.

b. *Cleaning and Inspection.*

- (1) Clean the voltmeter with a clean, dry cloth.
- (2) Inspect the voltmeter for missing hardware, cracked or broken glass, or

other damage.

- (3) Replace a defective voltmeter.

c. *Installation.* Refer to figure 23 and install the voltmeter.

d. *Field Expedient Repair.* Disconnect and tape the voltmeter leads separately.

63. Ammeter

a. *Removal.* Refer to figure 23 and remove the ammeter.

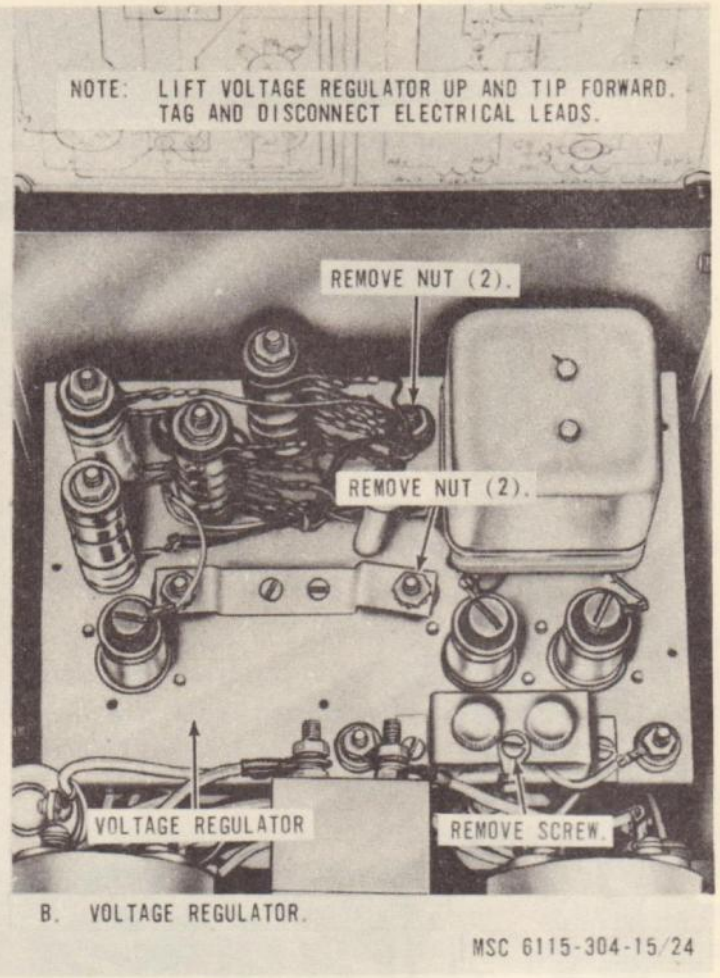
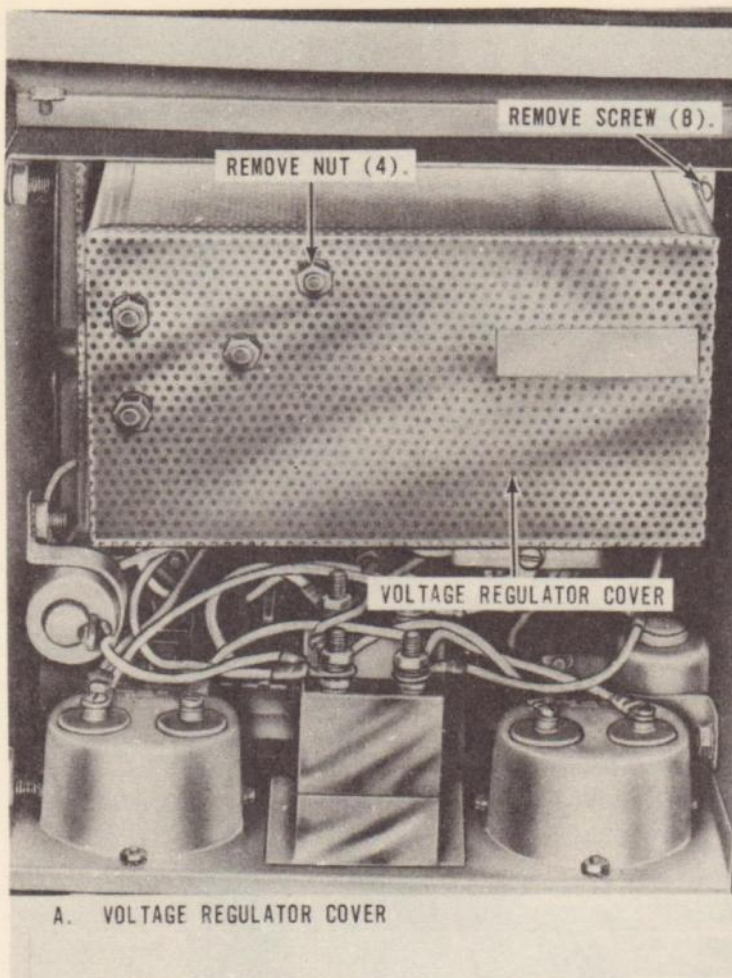


Figure 24. Voltage regulator, removal and installation.

b. Cleaning and Inspection.

- (1) Clean the ammeter with a clean, dry cloth.
- (2) Inspect the ammeter for missing hardware, cracked or broken glass, or other damage.
- (3) Replace a defective ammeter.

c. Installation. Refer to figure 23 and install the ammeter.

d. Field Expedient Repair. Disconnect and tape the ammeter leads together.

64. Receptacle Connector

a. Removal. Refer to figure 23 and remove the receptacle connector.

b. Cleaning and Inspection.

- (1) Clean the receptacle connector with a clean, dry cloth.
- (2) Inspect the receptacle connector for cracks, breaks, or other damage.
- (3) Replace a defective receptacle connector.

c. Installation. Refer to figure 23 and install the receptacle connector.

65. Load Switch

a. Removal. Refer to figure 23 and remove the load switch.

b. Cleaning and Inspection.

- (1) Clean the load switch with a clean, dry cloth.
- (2) Inspect the load switch for damaged terminals or improper operation.
- (3) Replace a defective load switch.

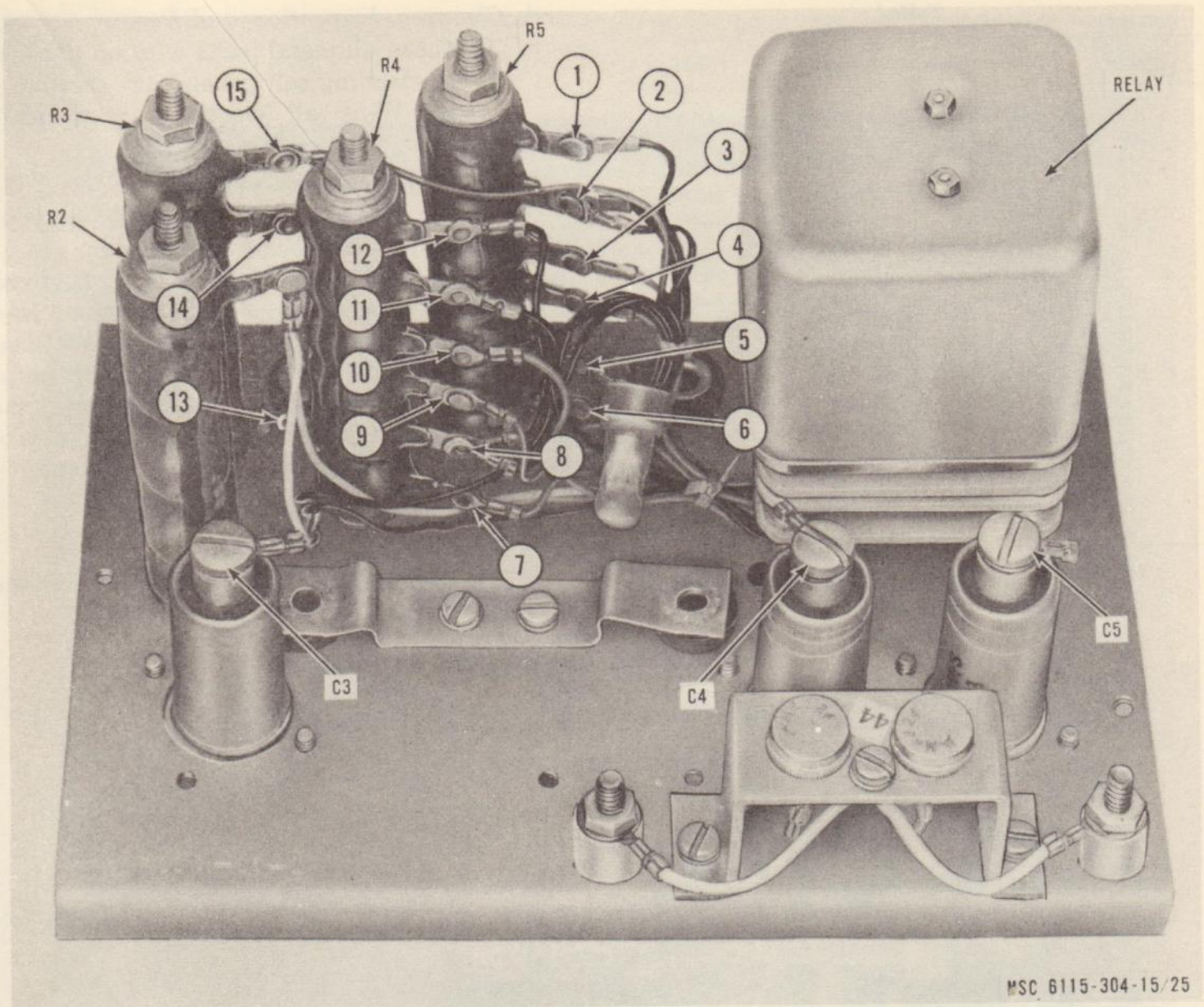
c. Installation. Refer to figure 23 and install the load switch.

66. Rheostat

a. Removal. Refer to figure 23 and remove the rheostat.

b. Cleaning and Inspection.

- (1) Clean the rheostat with a clean, dry cloth.
- (2) Inspect the rheostat for cracks, breaks, or worn areas, or other damage.
- (3) Replace a defective rheostat.



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Figure 25. Resistor test points.

c. Testing.

- (1) Using a multimeter, set on RXI scale, measure the resistance between the outside terminals of the rheostat.
- (2) Test rheostat throughout its entire range. The resistance should vary between zero ohms (knob turned fully clockwise) and $200 \pm 10\%$ ohms (knob turned fully counter-clockwise), and should vary smoothly as the knob is rotated.

67. Voltage Regulator

a. Removal. Refer to figure 24 and remove the voltage regulator.

b. Resistor Testing.

- (1) *Series Resistance of resistor R3 and relay coil.* Using a multimeter, set dial to appropriate scale, refer to figure 25, and test between points C4 and C5. A resistance of $450 \pm 10\%$ ohms should be indicated.
- (2) Remove the voltage regulator relay (par. 67).
- (3) Test resistors R2, R3, R4, and R5 as shown by figure 25 and table I.

c. Disassembly.

- (1) Remove the heat sink and diode assembly (par. 70).

Table I

Resistor	Between points	Resistance	Tolerances
R2	C3 and C4	43-ohms	±10%
R3	13 and 14	428-ohms	±10%
	14 and 15	162-ohms	±10%
	13 and 15	590-ohms	±10%
R4	7 and 8	131-ohms	±10%
	8 and 9	105.5-ohms	±10%
	10 and 11	81.3-ohms	±10%
	11 and 12	72-ohms	±10%
	7 and 12	205-ohms	±10%
R5	9 and 10	192-ohms	±10%
	1 and 2	55-ohms	±10%
	2 and 3	33-ohms	±10%
	4 and 5	16.5-ohms	±10%
	5 and 6	5.5-ohms	±10%
	1 and 6	60.5-ohms	±10%
	4 and 5	51-ohms	±10%

(2) Refer to figure 26 and disassemble the voltage regulator.

d. *Cleaning, Inspection, and Repair.*

(1) Clean all metal parts with an approved cleaning solvent and dry thoroughly. Wipe all electrical components clean with a dry cloth.

(2) Inspect the chassis and ground strap for breaks, dents, and other damage. Inspect the socket assembly for cracked or broken housing and damaged pin sockets. Inspect the electrical lead for breaks and frayed or worn insulation. Inspect the feedthrough terminals for cracks and breaks. Inspect the fixed resistors for cracks, breaks, broken terminals, and other damage.

(3) Replace any defective part.

e. *Reassembly.*

(1) Refer to figure 26 and reassemble the voltage regulator.

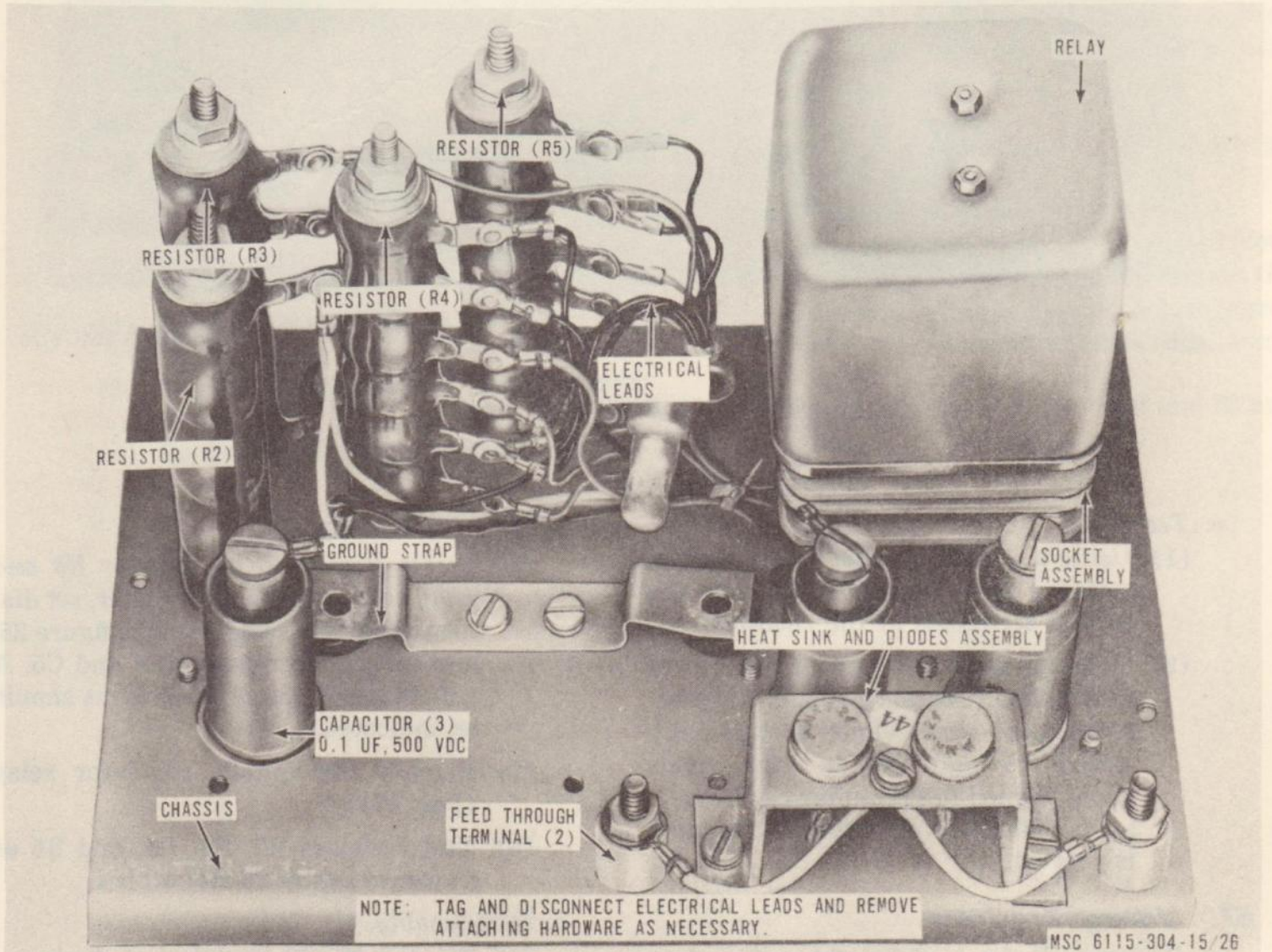


Figure 26. Voltage regulator, disassembly and reassembly.

- (2) Install the heat sink and diode assembly (par. 70).
- (3) Install the voltage regulator relay (par. 67).

f. *Installation.* Refer to figure 24 and install the voltage regulator.

68. Load Terminal Studs, Terminal Board, and Electrical Connector

a. Removal.

- (1) Remove the control box (par. 61).
- (2) Remove the voltage regulator (par. 67).
- (3) Refer to figure 27 and remove the load terminal studs, terminal board, and electrical connector.

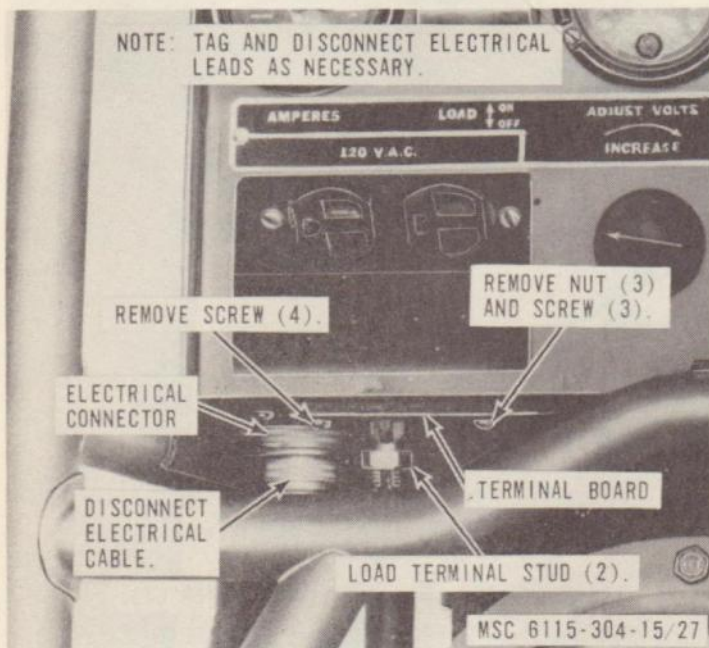


Figure 27. Load terminal studs, terminal board, and electrical connector, removal and installation.

b. Cleaning, Inspection and Repair.

- (1) Clean the load terminal studs, terminal board, and electrical connector with a clean, dry cloth.
- (2) Inspect the load terminal studs and electrical connector for defective threads and other damage.
- (3) Inspect the terminal board for breaks, cracks, and other damage.
- (4) Replace a defective part.

c. Installation.

- (1) Refer to figure 27 and install the load terminal studs, terminal board, and electrical connector.
- (2) Install the voltage regulator (par. 67).
- (3) Install the control box (par. 61).

69. Voltage Regulator Relay

a. On-equipment testing.

- (1) Disconnect the generator electrical lead connector from the control box (par. 61).
- (2) Remove the voltage regulator cover (par. 67).
- (3) Refer to wiring diagram (fig 33) and using a multimeter set on R10 scale check the combined resistance of resistor R3 and the voltage regulator relay coil, by measuring the resistance between capacitor C4 and C5 terminals. The resistance should be $459 \pm 10\%$ ohms. The resistance of R3 is approximately 450 ohms and the voltage regulator relay coil approximately 29 ohms.
- (4) With the voltage regulator relay installed and the sensing circuit not energized the C3 and C4 resistance should be zero. With the voltage regulator relay removed the C3 and C4 resistance should be $43 \pm 10\%$ ohms.

b. Removal.

- (1) Remove the voltage regulator cover (par. 67).
- (2) Refer to figure 28 and remove the voltage regulator relay.

c. Cleaning and Inspection.

- (1) Clean the voltage regulator relay with a clean dry cloth.
- (2) Inspect the voltage regulator relay for a cracked housing and bent or broken contact pins.
- (3) Replace a defective voltage regulator relay.

d. Installation.

- (1) Refer to figure 28 and install the voltage regulator relay.
- (2) Install the voltage regulator cover (par. 67).

e. Adjustment.

Note: The voltage regulator relay normally does not require any further adjusting after the initial adjustment upon installation of a new relay.

Caution: Do not attempt to make any adjustments to the voltage regulator relay other than the dashpot adjustment.

- (1) Remove the voltage regulator cover (par. 67).

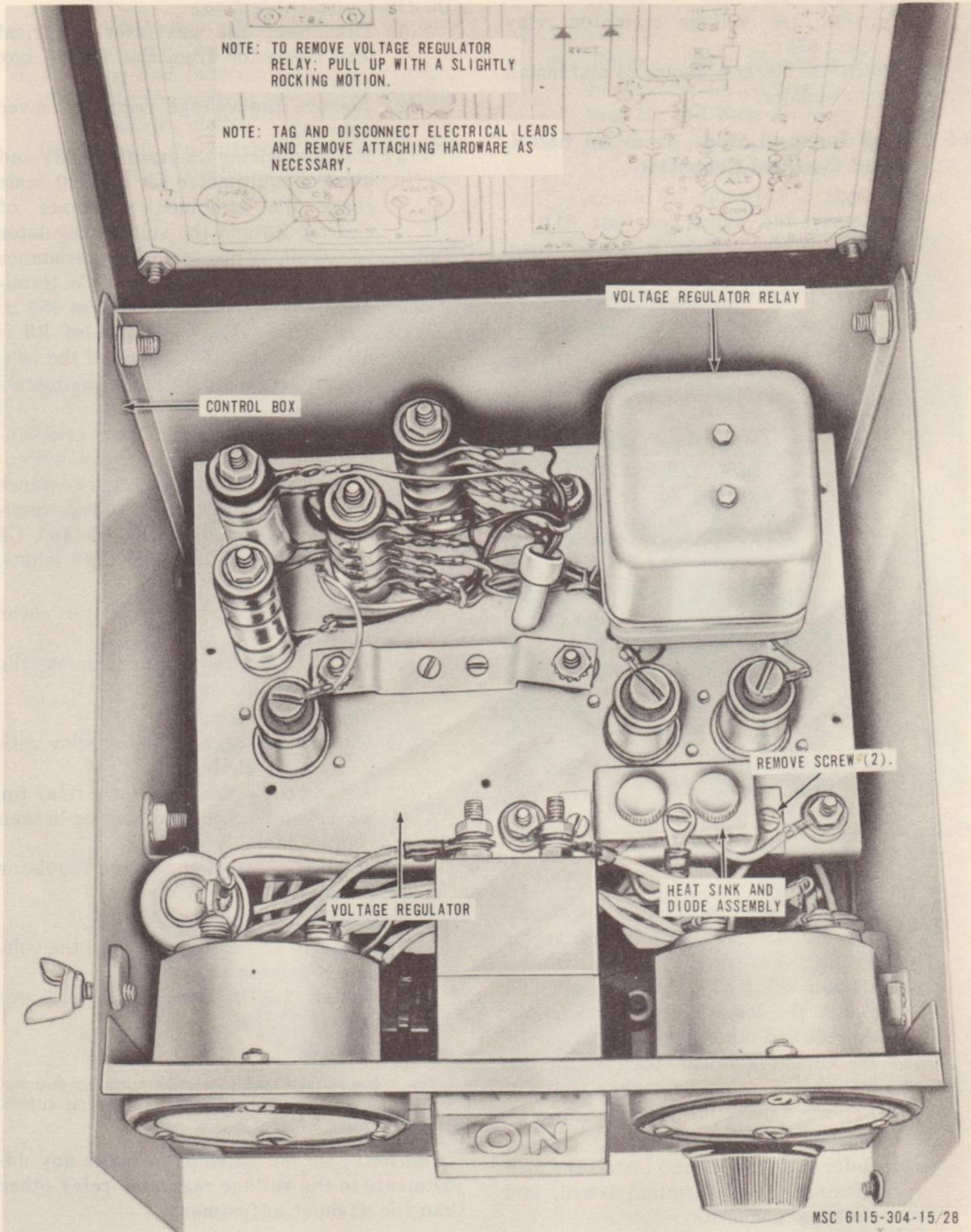
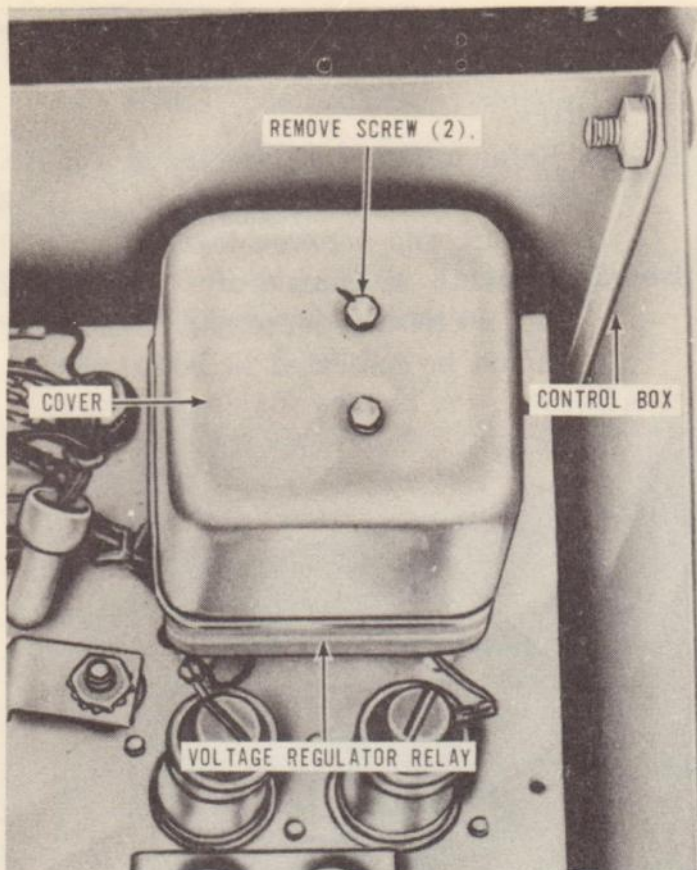
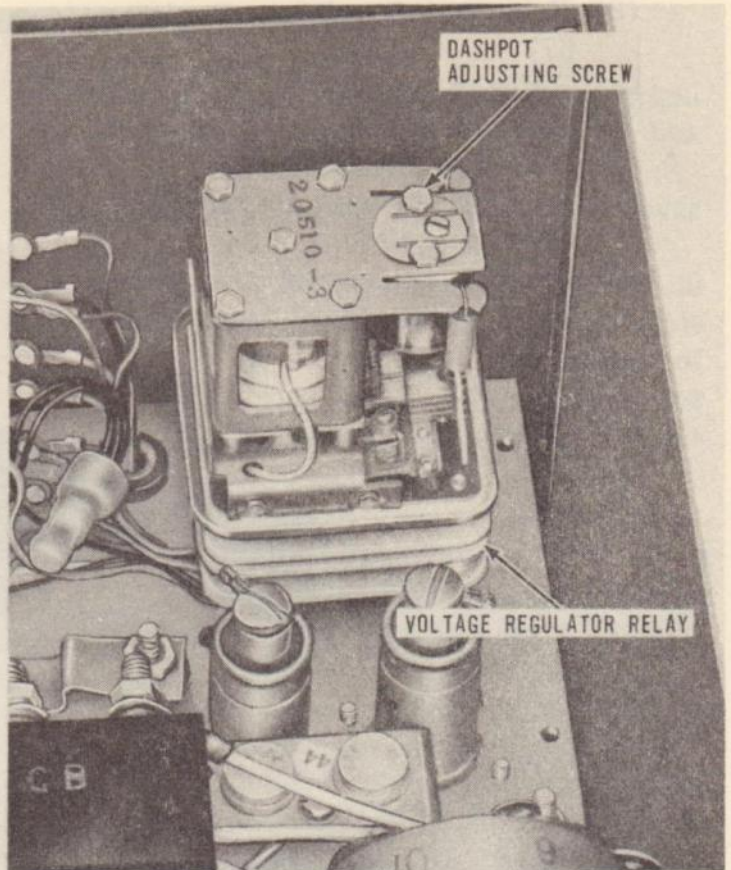


Figure 28. Voltage regulator relay and heat sink and diodes assembly, removal and installation.



STEP 1. REMOVE VOLTAGE REGULATOR RELAY COVER.



- STEP 2. START THE ENGINE (PAR. 15).
 STEP 3. TURN ADJUSTING SCREW TO FULL COUNTERCLOCKWISE POSITION.
 STEP 4. TURN ADJUSTING SCREW CLOCKWISE UNTIL VOLTMETER INDICATOR NEEDLE STOPS SEEKING.
 STEP 5. STOP THE ENGINE (PAR. 16).
 STEP 6. INSTALL THE VOLTAGE RELAY COVER.

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Figure 29. Voltage regulator relay adjustment.

- (2) Refer to figure 29 and adjust the voltage regulator relay.
- (3) Install voltage regulator cover (par. 67).

70. Heat Sink and Diodes Assembly

a. *Removal.* Refer to figure 27 and remove the heat sink and diodes assembly.

b. *Cleaning and Inspection.*

- (1) Clean the heat sink and diodes assembly with a clean, dry cloth.
- (2) Inspect the heat sink and diodes assembly for a cracked or broken heat sink and defective diode leads.
- (3) Replace a defective heat sink and diodes assembly.

c. *Testing Diodes.*

- (1) Using a multimeter, position the dial at R x 1, connect the positive lead to the base of the diode and the negative

lead to the lead of the diode. The ohmmeter leads or lead clips must be positioned so as to isolate the diode being tested from the other diode. The ohmmeter should indicate 10 to 20 ohms resistance.

- (2) Reverse the multimeter leads. With the multimeter dial set at R x 10,000, a resistance of 10 to 20 megohms should be indicated.
- (3) Replace a heat sink and diode assembly that indicates a shorted or open circuit.

d. *Installation.* Refer to figure 27 and install the heat sink and diode assembly.

71. Current Transformer

a. *Removal.*

- (1) Remove the control box (par. 61).

(2) Remove the voltage regulator (par. 67).

(3) Refer to figure 30 and remove the current transformer.

b. Cleaning and Inspection.

(1) Clean the current transformer with a clean, dry cloth.

(2) Inspect the current transformer for defective electrical leads and insulation.

(3) Replace a defective current transformer.

c. Testing.

(1) Refer to figure 33, and using a multimeter, test for continuity of leads 18 and 19, and between leads 16 and 17 (lead 16 is connected to pm C of the electrical connector). Continuity should be indicated in both tests.

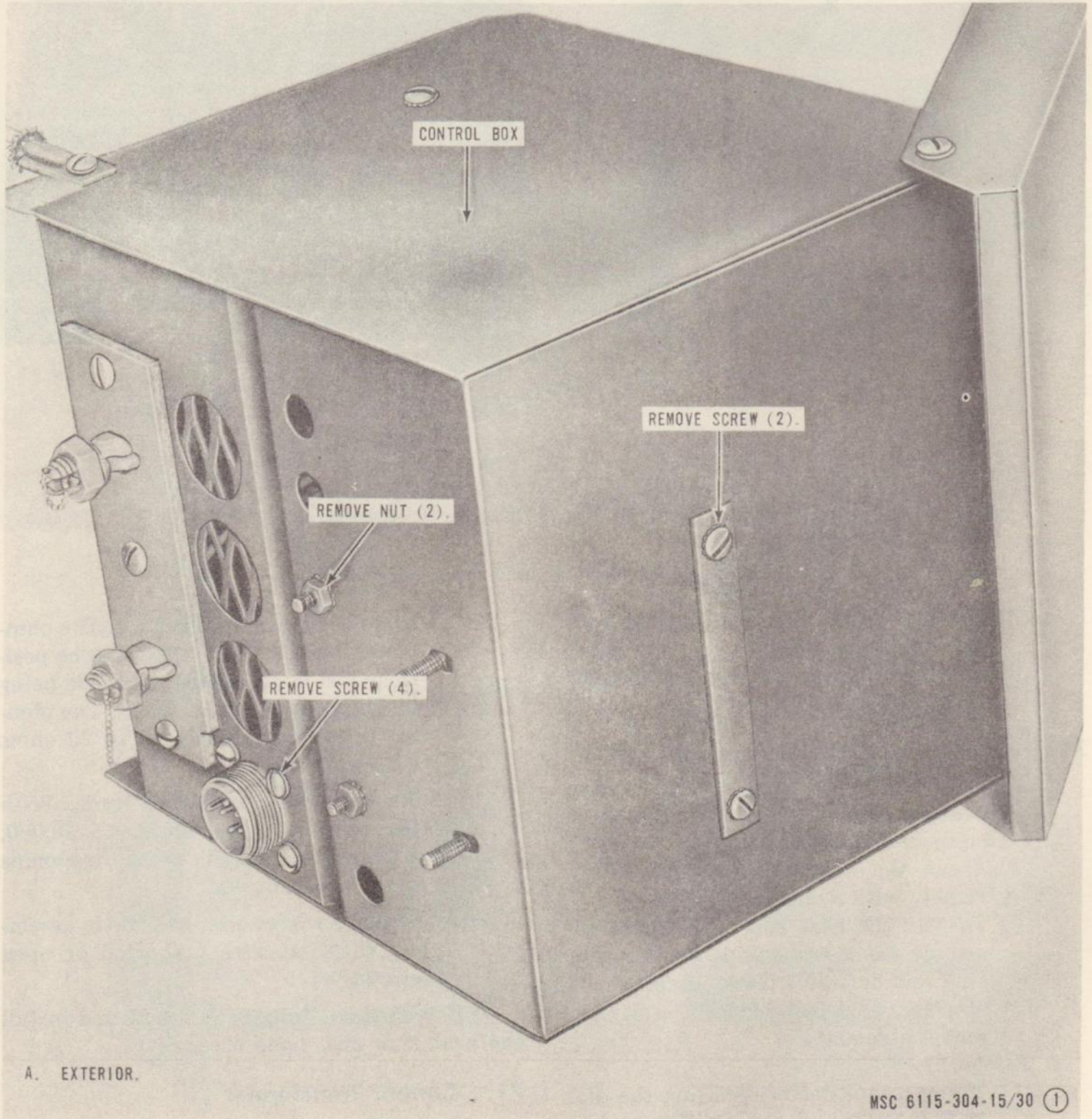


Figure 30. Current transformer removal and installation.

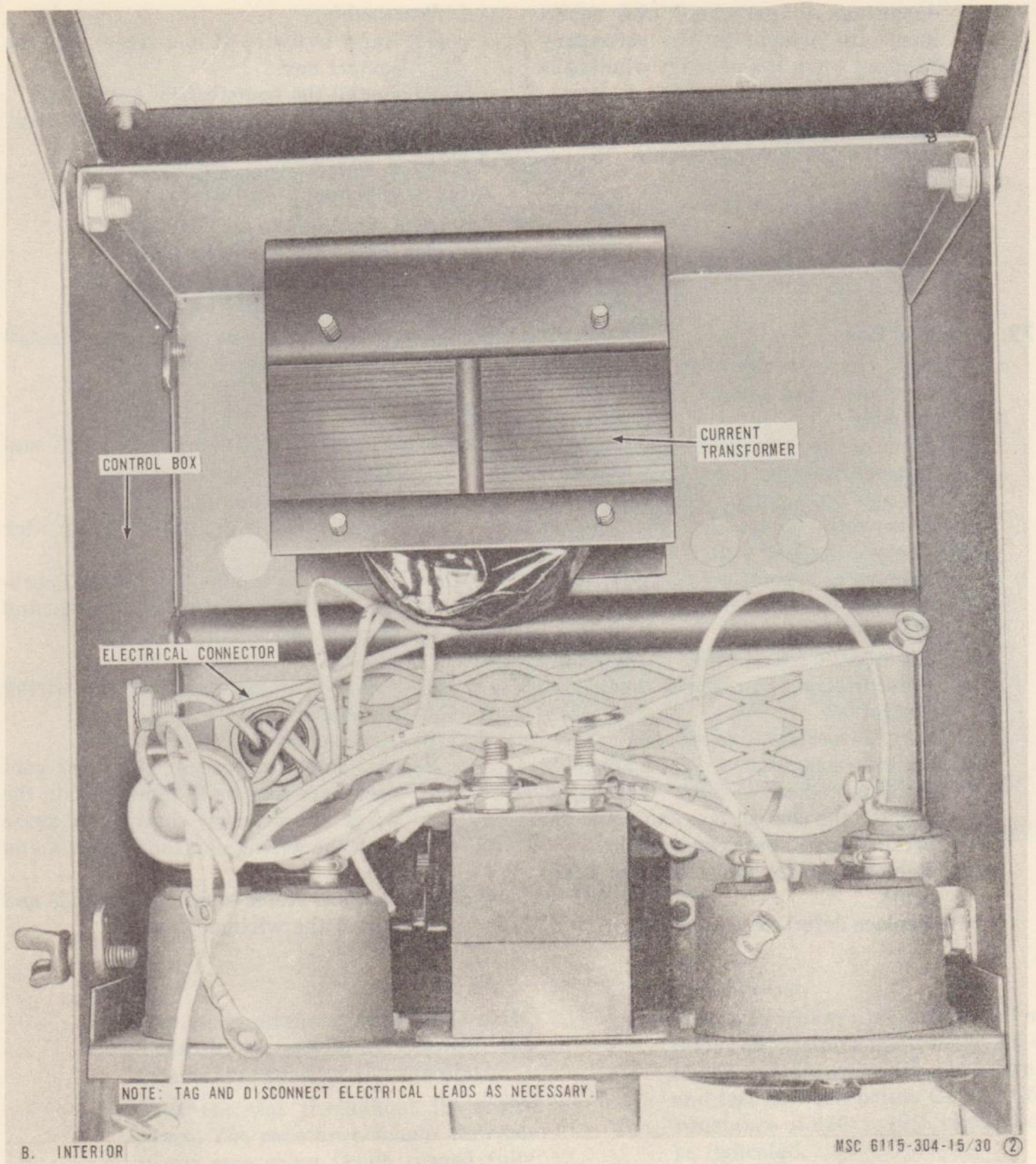


Figure 30—Continued.

(2) Using a megohmmeter, measure the insulation resistance. Be sure to ground the leads of the secondary winding when measuring the insulation resistance of the primary winding. Ground the primary leads when measuring the

insulation resistance of the secondary winding. A reading of less than 0.2 megohm indicates defective insulation.

Warning: When working with a current transformer, the secondary leads must be grounded. Voltages

dangerous to personnel and equipment are present at the secondary winding when the primary winding is energized.

- (3) Replace a transformer that does not meet the above requirements.

d. Installation.

- (1) Refer to figure 30 and install the current transformer.
- (2) Install the voltage regulator (par. 67).
- (3) Install the control box (par. 61).

72. Control Box

- a. Removal.** Refer to figure 22 and remove the control box assembly.

b. Disassembly.

- (1) Remove the capacitors (par. 47).
- (2) Remove the voltmeter (par. 62).
- (3) Remove the ammeter (par. 63).
- (4) Remove the receptacle (par. 64).
- (5) Remove the load switch (par. 65).
- (6) Remove the rheostat (par. 66).
- (7) Remove the voltage regulator (par. 67).
- (8) Remove the transformer (par. 71).
- (9) Refer to figure 31 and disassemble the control box.

c. Cleaning, Inspection, and Repair.

- (1) Clean the control box with an approved cleaning solvent and dry thoroughly.
- (2) Inspect the control box and cover for breaks, dents, burs, and cracks.
- (3) Remove all burs and straighten minor dents.
- (4) Replace defective control box.

d. Reassembly.

- (1) Refer to figure 31 and reassemble the control box.
- (2) Install the transformer (par. 71).
- (3) Install the voltage regulator (par. 67).
- (4) Install the rheostat (par. 66).
- (5) Install the load switch (par. 65).
- (6) Install the receptacle (par. 64).
- (7) Install the ammeter (par. 63).
- (8) Install the voltmeter (par. 62).
- (9) Install the capacitors (par. 47).

- e. Installation.** Refer to figure 22 and install the control box assembly.

73. Wiring

- a. Removal.** Refer to figures 4 and 33 and remove the wiring.

b. Cleaning and Inspection.

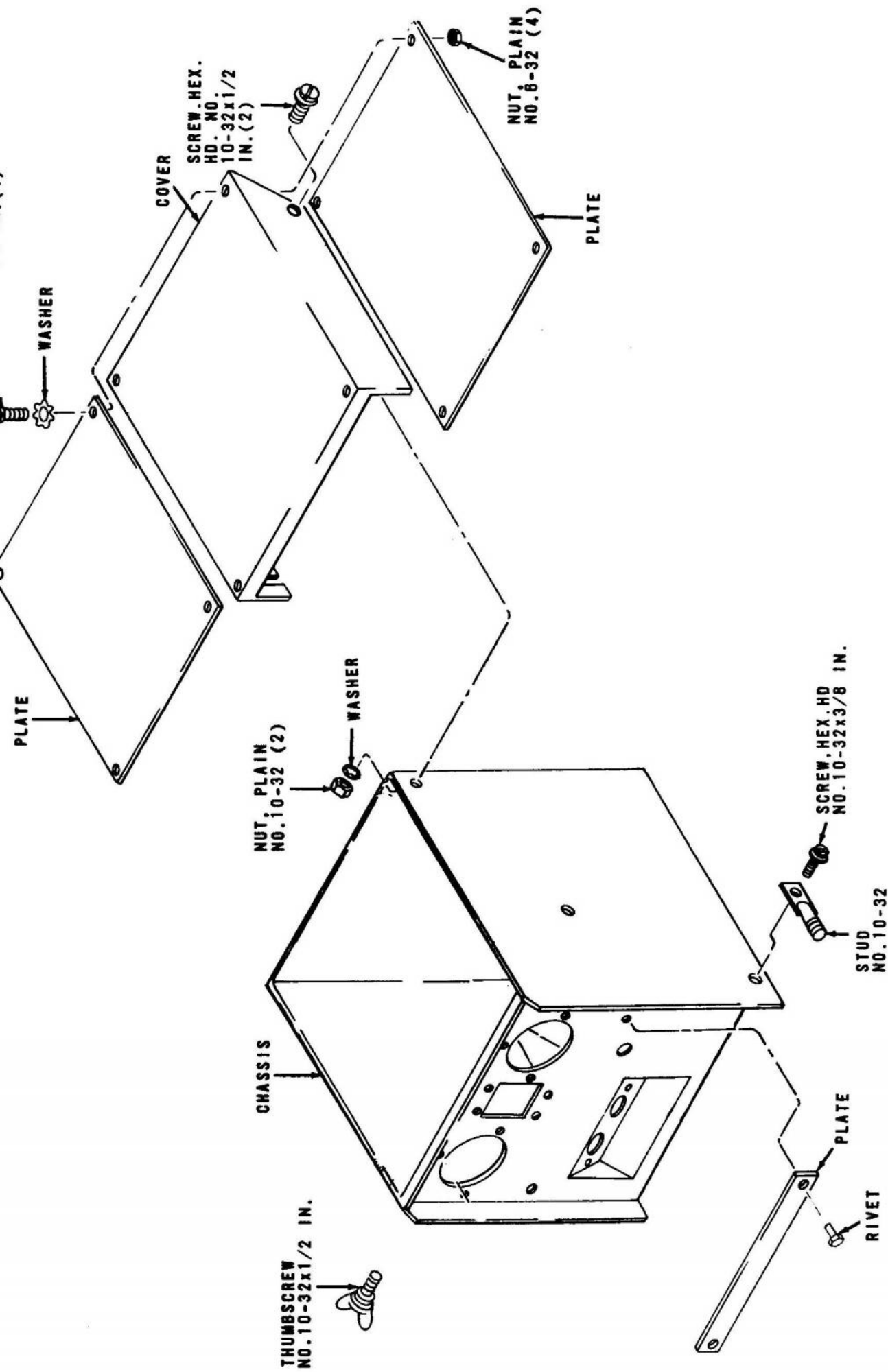
- (1) Clean the wiring with a clean, dry cloth.
- (2) Inspect the wiring for cracked, broken, or deteriorated insulation, and damaged terminals.

c. Testing.

- (1) Using a multimeter, test the wiring for continuity.
- (2) Replace any defective wires.

- d. Repair.** Replace loose or damaged connectors or terminals. Make certain the wires are properly marked to agree with the wiring diagrams (figs. 4 and 33).

- e. Installation.** Refer to figures 4 and 33 and install the wiring.



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Figure 31. Control box, disassembly and reassembly.

CHAPTER 4

DEMOLITION OF GENERATOR SET TO PREVENT ENEMY USE

74. General

When capture or abandonment of the generator set to an enemy is imminent, the responsible unit commander must make the decision either to destroy the equipment or to render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the same vital parts of all generator sets and all corresponding repair parts.

75. Demolition to Render Generator Set Inoperative

a. Mechanical Means. Using sledge hammers, crowbars, picks, axes, or any other heavy tool available, punch holes in the fuel tank inflict damage to such items as the generator, control panel, carburetor assembly, exhaust manifold, and engine.

b. Misuse. Add sand to the oil in the engine base through the oil filler tube and throw sand or metal filings into the generator. Run the engine until its generator set fails.

76. Demolition by Explosives or Weapons Fire

a. Explosives. Place the charges as shown by figure 32 and detonate them simultaneously with detonating cord and a suitable detonator.

- (1) One ½-pound charge on the front of the control box.
- (2) One ½-pound charge on the generator.
- (3) One ½-pound charge on the right side of the engine.

Note: These are the minimum requirements for this method.

77. Other Demolition Methods

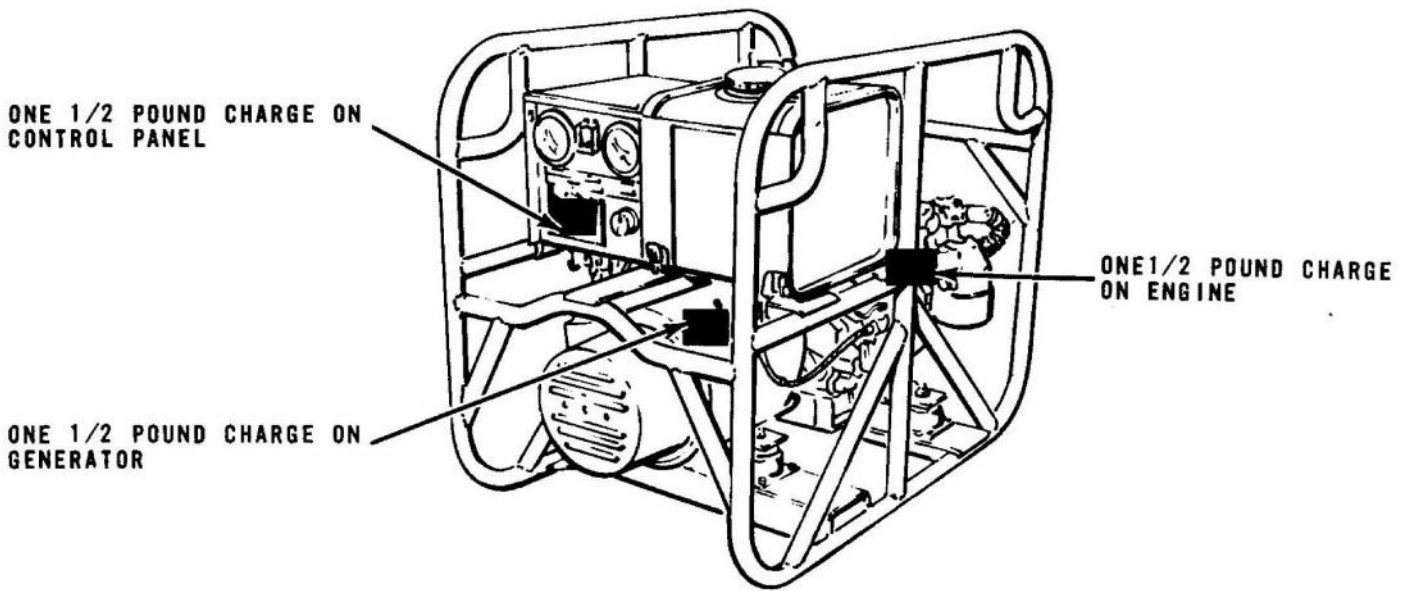
a. Scattering and Concealment. Remove all easily accessible parts, such as the air cleaner, carburetor, and generator brushes, and scatter them in dense foliage, bury them in dirt or sand, or throw them into a lake, river, stream, or other body of water.

b. Burning. Pack rags, clothing, or canvas under or around the engine and generator. Saturate this packing with gasoline, oil, or diesel fuel and ignite.

c. Submersion. Knock the spark plug base from the engine with any convenient tool and completely submerge the generator set in a body of water to provide water damage and concealment. Salt water will do greater damage to metal than fresh water.

78. Training

All operators should receive thorough training in the destruction of the generator set. Refer to FM 5-25, simulated destruction, using all the methods listed above, should be included in the operator training program. It must be emphasized in training that demolition operations are usually necessitated by critical situations when time available for carrying out destruction is limited. For this reason, it is necessary that operators be thoroughly familiar with all methods of destruction of equipment and be able to carry out demolition instructions without reference to this or any other manual.



LEGEND 1/2 POUND CHARGE

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Figure 32. Placement of charges.

CHAPTER 5

SHIPMENT AND LIMITED STORAGE

Section I. SHIPMENT WITHIN ZONE OF INTERIOR

79. Preparation of Equipment for Shipment

a. General. Detailed instructions for the preparation for domestic shipment are outlined within this paragraph. Preservation will be accomplished in sequence that will not require the operation of previously preserved components.

b. Inspection. Equipment will be inspected for any unusual condition such as damage, rusting, accumulation of water, or pilferage.

c. Cleaning and Drying. Thorough cleaning and drying by an approved technique is the first essential procedure in any effective preservation process. Approved methods of cleaning, drying, types of preservatives, and methods of application are described in TM 38-230.

d. Painting. Paint all surfaces from which the paint has been removed or damaged. Refer to TB ENG 60 for detailed cleaning and painting instructions.

e. Depreservation Guide. DA Form 2258 (Depreservation guide of Engineer Equipment). Annotate DA Form 2258 concurrently with the preservation of each generator set. Outline all peculiar requirements in blocks 27 through 33. Place the completed Depreservation Guide in a waterproof envelop marked "Depreservation Guide" and secure in a conspicuous location on or near the operator's controls.

f. Lubrication System. Check level of lubricant. Operate the engine at a fast idle until lubricant has been circulated throughout the system. The crankcase will then be drained and the drain plugs reinstalled.

g. Sealing of Openings. Openings that will permit the direct entry of water into the interior of the gasoline engine, generator, or controls shall be sealed with pressure-sensitive tape conforming to Specification PPP-T-60, type III, class 1.

h. Fuel Tank. Drain fuel tank after engine preservation and fog interior with preservative oil, type P-10, grade 2, conforming to Specification MIL-L-21260.

i. Air Cleaner. Drain the air cleaner and seal all openings that permit the direct entry of water. Use type III, class 1, waterproof pressure sensitive adhesive tape conforming to PPP-T-60.

j. Exterior Surfaces. Coat exposed machined ferrous metal surfaces with preservative (P-6) conforming with Specification MIL-C-11796, class 3. If preservative is not available, general purpose grease, identified as G.A.A. may be used.

k. Disassembly, Disassembled Parts, and Basic Issue Items.

(1) Disassembly will be limited to the removal of electrical cables, ground wire, exhaust extension, etc.

(2) Basic issue and disassembled items will be packed in a suitable container and secured to the equipment to prevent loss or pilferage.

l. Packing. Pack the generator set and components in a suitable container. Refer to TM 38-230 for guidance in container selection, fabrication, and packing.

m. Marking. Mark the generator set and shipping container in accordance with the requirements of Military Standard MIL-STD-129.

80. Loading Equipment for Shipment

a. Lifting. When loading the crated generator set, a forklift or other suitable lifting device may be used.

b. Manpower. When a forklift or other suitable device is not available, generator set may be loaded by manpower.

Section II. LIMITED STORAGE

81. Preparation of Equipment for Storage

a. General. Detailed instructions for preserving and maintaining equipment in limited

storage are outlined in this paragraph. Limited storage is defined as storage not to exceed 6 months. Refer to AR 743-505.

b. Inspection. Equipment will be inspected for any unusual condition such as damage, rusting, accumulation of water, or pilferage. Perform quarterly preventive maintenance services outlined in paragraph 31. Record all deficiencies and shortcomings on DA Form 2404, together with corrective action taken.

c. Cleaning and Drying. Thorough cleaning and drying by an approved technique is the first essential procedure in any effective preservation process. Approved methods of cleaning, drying, types of preservatives, and methods of application are described in TM 38-230.

d. Painting. Paint all surfaces from which the paint has been removed or damaged. Refer to TB ENG 60 for detailed cleaning and painting instructions.

e. Depreservation Guide. Annotate DA Form 2258 concurrently with the preservation of each generator set. Outline all peculiar requirements in blocks 27 through 33. Place the completed Depreservation Guide in a waterproof envelope marked "Depreservation Guide" and secure in a conspicuous location on or near the operators controls.

f. Lubrication System. Check level of lubricant. Operate the engine at a fast idle until lubricant has been circulated throughout the system. Leave lubricating oil in crankcase.

g. Sealing of Openings. Openings that will permit the direct entry of water into the interior of the gasoline engine, generator, or controls, shall be sealed with pressure-sensitive tape conforming to Specification PPP-T-60, type III, class 1.

h. Fuel Tank. Drain fuel tank after engine preservation and fog interior with preservative oil, type P-10, grade 2, conforming to Specification MIL-L-21260.

i. Disassembly, Disassembled Parts and Basic Issue Items. Disassembly will be limited to the removal of parts and projecting components that tend to interfere with storage of

the equipment and that which is subject to pilferage.

j. Packing. Pack the basic issue items and disassembled components in a suitable container and secure to the generator set to prevent loss or damage.

k. Weatherproofing.

- (1) Store the generator set under cover if space is available.
- (2) When outdoor storage is necessary
 - (a) Store the generator set on the most suitable hardstand or natural ground surface available.
 - (b) Cover the generator set with a paulin or other suitable waterproof covering and tie down securely.

82. Inspection and Maintenance of Equipment in Storage

a. Inspection. When equipment has been placed in storage, all scheduled preventive maintenance services, including inspection, will be suspended and preventive maintenance inspection will be performed as specified herein. Refer to AR 743-505.

b. Worksheet and Preventive Maintenance. Perform the quarterly preventive maintenance services outlined in paragraph 31 when the generator set is initially placed in storage and every 90 days thereafter. Record all deficiencies and shortcomings, together with corrective action, on DA Form 2404. Perform required maintenance promptly to make sure equipment is mechanically sound and ready for immediate use.

c. Operation. Operate equipment in limited storage long enough to bring it up to operating temperature and insure complete lubrication of all bearings, gears, and the like, at time quarterly preventive maintenance services are performed. Equipment must be serviced and in satisfactory operating condition before it is operated. After each operating period preserve the generator set as outlined in paragraph 81.

CHAPTER 6

FIELD AND DEPOT MAINTENANCE INSTRUCTIONS

Section I. GENERAL

83. Scope

a. The following instructions are for field and depot maintenance personnel. They contain information on equipment maintenance that is beyond the scope of tools, equipment, personnel, or supplies normally available to organizational maintenance.

b. Appendix I includes the publications applicable to field and depot maintenance. Appendix II contains the maintenance allocation chart. The field and depot Maintenance repair

parts and special tool lists are listed in TM 5-6115-304-25P.

84. Record and Report Forms

For record and report forms applicable to field and depot maintenance, refer to TM 38-750.

Note: Applicable forms, excluding Standard Form 46 (United States Government Motor Vehicle Operator's Identification Card), which is carried by the operator, will be kept in a canvas bag mounted on the equipment.

Section II. DESCRIPTION AND DATA

85. Description

For a complete description of the generator set, refer to paragraph 3.

86. Tabulated Data

a. *Engine.* Refer to TM 5-2805-206-14 for engine tabulated data.

b. *Generator Repair and Replacement Standards.*

(1) Field windings.

Number of coils ----- 2
 Turns per coil ----- 250 auxiliary; 675 shunt
 Wire size ----- No. 17 (auxiliary) and 20 (shunt) AWG (American Wire Gage)
 Type of wire ----- Heavy synthetic resin coated
 List of insulation material including dimensions, materials and number required. ----- per Military Specification MIL-W-583A

Four formed coil shields 27/8 in. wide, 47/8 in. long, 0.010 in. thick of polyester film with rag paper backing per MIL-1-19362.
 Two insulating strips 3/4 in. wide, 13 1/2 in. long, 0.010 in. thick of polyester film with rag paper backing per MIL-1-19362. Two insulating strips 1 3/8 in. wide, 19 1/2 in. long. 0.010 in. thick of varnishing cambric per MIL-1-3374. Ends

and sides of coils wrapped with 3/4 in. wide white cotton tape per Military Specification MIL-1-3042.

Dipping compounds ----- Clean baking varnish, type M. grade CB per Military Specification MIL-V-1137A, amendment 1.

Dipping and baking procedure. ----- Apply per varnish treating methods and procedures specified in Military Specification MIL-E-917C, amendment 2.

Fungus treatment ----- One coat of moisture-and fungus-resistant varnish per Military Specification MIL-V-173A, amendment 4, applied and air dried at 70°F. for 15 minutes minimum.

(2) Armature.

(a) Exciter winding.

Number of poles ----- 2
 Number of slots ----- 25
 Number of coils ----- 25
 Turns per coil ----- 3
 Coil pitch ----- 11 slots
 Coils per slot ----- 1
 Wire size ----- No. 14 AWG
 Type of wire ----- Single cotton heavy formvar
 Type of winding ----- Lap

(b) Armature winding.

Coils per armature ----- 8
 Turns per coil ----- 11
 Blank slots per coil ----- 4 and 5
 Coils per slot ----- 1

Wire size -----	No. 12 AWG
Type of wire -----	Heavy Formvar
List of insulation materials including dimensions, materials and number required.	25 slot insulators (1 per slot) 0.015 in. polyester film with rag paper backing, 2¾ in. wide, 3¼ in. long per Military Specification MIL-1-19632. 25 wedge insulated (1 per slot) 1/16 in. laminated plastic 3¼ in. long, 15/64 in wide, per Military Specification MIL-P-15037. 16 slot wedges 0.010 in. thick type GMG laminated plastic, 1/4 in. wide 4 in. long, per Military Specification MIL-P-15037.
Dipping and baking procedure.	Apply varnish treating methods and procedures specified Military Specification MIL-E-917C, amendment 2.

Fungus treatment ----- One coat of moisture-and-fungus resistant varnish per Military Specification MIL-V-173A, amendment 4, applied and air-dried at 70°F. for 15 minutes minimum.

c. Time Standards. Table II lists the number of man-hours required under normal conditions to perform the indicated maintenance and repair for the generator set. Components are listed under the appropriate functional index. The times listed are not intended to be rigid standards. Under adverse conditions, the operation will take longer; but under ideal conditions, with highly skilled mechanics, most of the operations can be accomplished in considerably less time.

Table II. Time Standards

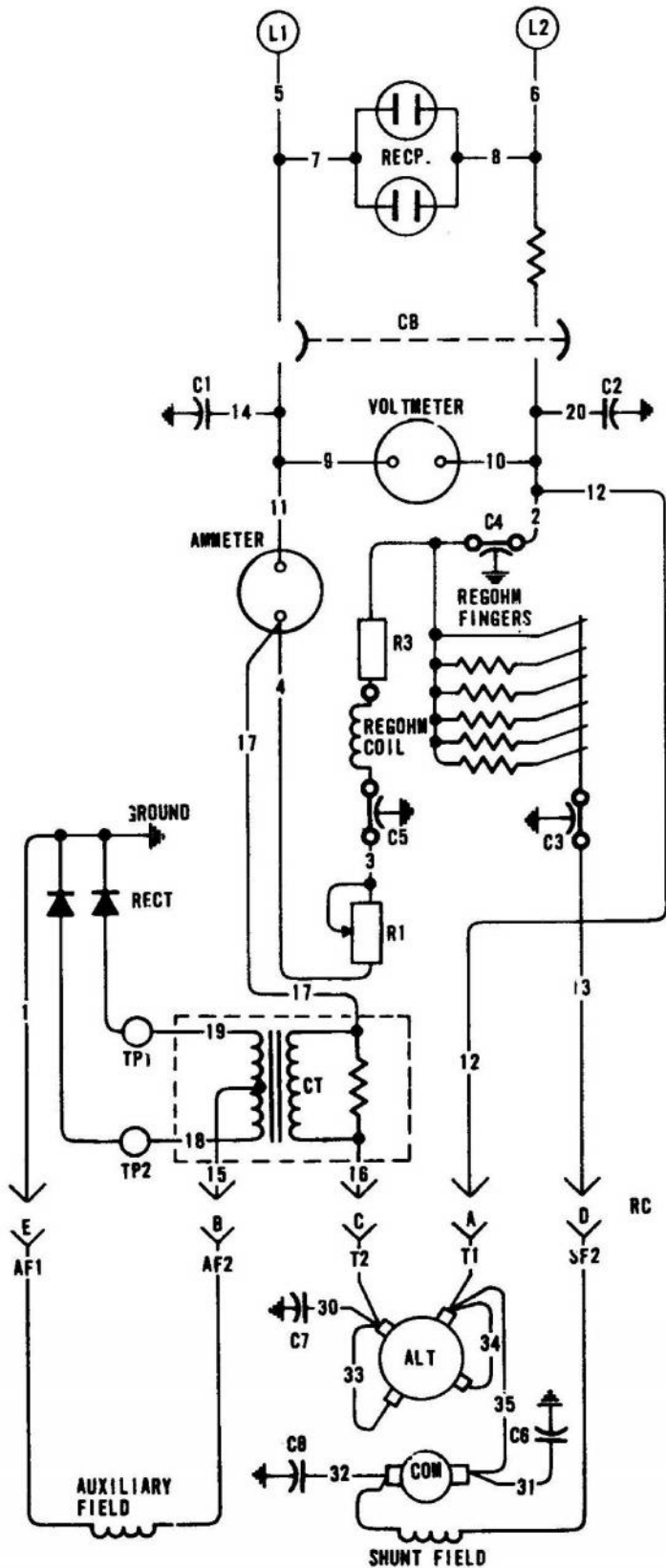
	Hours
<i>Lubrication and Service</i>	
03 FUEL SYSTEM.	
0306 Tanks, Lines, Fittings.	
Tank, fuel.....	0.1
(Fill fuel tank with fuel.)	
Strainer, tank.....	0.1
(Remove and clean screen.)	
<i>Remove and Replace</i>	
01 ENGINE.	
0100 ENGINE ASSEMBLY.	
Engine, gasoline.....	1.5
(Includes removal and installation of generator.)	
Mount, resilient (ea).....	0.3
03 FUEL SYSTEM.	
0306 Tanks, Lines, Fittings.	
Tank, fuel.....	0.5
Strainer, tank.....	0.1
Valve, shutoff.....	0.2
Hose assembly, fuel.....	0.2
Cap, fuel tank.....	0.2
04 EXHAUST SYSTEM.	
0410 Pipes.	
Pipe, exhaust.....	0.2
15 FRAME.	
1501 FRAME ASSEMBLY.	
Frame assembly.....	2.0
(Includes removal and installation of engine, generator, fuel tank, and control panel assembly.)	
22 MISCELLANEOUS BODY, CHASSIS, OR HULL AND ACCESSORY ITEMS.	
2201 Canvas Items.	
Paulin.....	0.1
2210 Data Plates.	
Plate, instruction.....	0.3
Plate, identification (C.O.E.).....	0.6
(Includes stamping.)	

Table II. Time Standards—Continued

	Hours
40 GENERATOR.	
4000 Generator.	
Generator assembly.....	1.3
(Includes removal of drive end bracket from engine.)	
Mount, resilient.....	0.3
4001 Rotor Assemblies.	
Armature assembly.....	0.5
(Includes removal and installation of endbell cover, stator and endbell assembly, bearing, and fan.)	
4002 Stator Assemblies.	
Stator, generator.....	0.5
(Includes removal and installation of endbell.)	
4003 Brush Holder.	
Ring, brush holder.....	0.6
(Endbell removed.)	
Brush, electrical contact.....	0.5
(Includes removal and installation of endbell cover.)	
4004 Ventilating System.	
Fan.....	0.2
(Stator and housing removed.)	
4005 Frame Supports and Housings.	
Endbell.....	0.6
Bearing.....	0.3
(Endbell removed.)	
Bracket, drive end.....	0.3
(Generator removed.)	
4009 Control Panels.	
Ammeter.....	0.3
Voltmeter.....	0.3
Connector, receptacle.....	0.3
4010 Master or Auxiliary Control Assembly.	
Controller.....	0.5
4011 Circuit Breakers.	
Circuit breaker.....	0.3
4013 Regulator.	
Voltage regulator.....	0.5
4014 Resistors.	
Resistors, fixed (ea).....	0.3
Rheostat.....	0.3
4015 Relay or Assembly.	
Relay, voltage regulator.....	0.5
4017 Transformers.	
Transformer.....	0.5
(Voltage regulator removed.)	
Heatsink and diode assembly.....	0.3
4018 Terminal Blocks.	
Board, terminal.....	0.4
(Voltage regulator removed.)	
Loas terminals.....	0.2
(Terminal board removed.)	
4019 Radio Interference Suppression.	
Capacitors (all).....	0.3
(Endbell removed.)	
Strap, ground.....	0.3
47 GAGES.	
4702 Gages.	
Gage, fuel level.....	0.2

d. Schematic Wiring Diagram. The schematic wiring diagram for the generator set is shown by figure 33 and should be referred to

when troubleshooting or analyzing the electrical circuits.



DEVICE LEGEND	
ALT	ALTERNATOR
C1-C2	BY PASS CAPACITORS, 0.10 UF, 500 V/AC/DC
C6-C7-C8	
C3-C4-C5	FEED THRU CAPACITORS, 0.1 UF, 600 V/DC 20 AMPERE
CB	CIRCUIT BREAKER SWITCH
COM	GENERATOR DC ARMATURE
CT	CURRENT TRANSFORMER
L1-L2	LOAD TERMINALS
R1	VOLTAGE CONTROL RHEOSTAT, 200-OHM, 10 WATT
R3	FIXED TAP RESISTOR 590-OHM, 25 WATT, W/TAP AT 162-OHM
RC	RECEPTACLE CONNECTOR (CONTROL BOX TO GENERATOR)
RECP	RECEPTACLE CONNECTOR (AC OUTLET)
RECT	SILICON DIODE RECTIFIERS
TP1-TP2	TERMINAL POSTS

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Figure 33. Schematic wiring diagram.

Section III. SPECIAL TOOLS AND EQUIPMENT

87. Special Tools and Equipment

No special tools or equipment are required by field and depot maintenance personnel to perform maintenance on the generator set (less engine).

88. Field and Depot Maintenance Repair Parts

Field and depot maintenance repair parts are

listed and illustrated in TM 5-6115-304-25P and TM 5-2805-206-14P.

89. Specially Designed Tools and Equipment

No specially designed tools or equipment are required by field and depot maintenance personnel to perform maintenance on the generator set (less engine).

Section IV. TROUBLESHOOTING

90. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the generator set or any of its components. Each trouble symptom stated is followed by a list of probable causes of trouble. The possible remedy recommended is described opposite the probable cause.

91. Generator Fails to Build up Rated Voltage

<i>Probable cause</i>	<i>Possible remedy</i>
Armature open, grounded, or shorted.	Replace armature (par. 106).
Generator field coil open, shorted, or grounded.	Replace coil (par. 106).

92. Generator Amperage Drops Under Load

<i>Probable cause</i>	<i>Possible remedy</i>
Engine lacks power	Refer to TM 5-2805-206-14 for engine maintenance.

93. Generator Overheats

<i>Probable cause</i>	<i>Possible remedy</i>
Bearing defective	Replace bearing (par. 106).

<i>Probable cause</i>	<i>Possible remedy</i>
Generator field coil open, grounded, or shorted.	Replace coil (par. 106).
Armature open, grounded, or shorted.	Replace armature (par. 106).

94. Generator Brushes Spark Excessively

<i>Probable cause</i>	<i>Possible remedy</i>
Brush holder loose or defective.	Tighten or replace holder (par. 106).
Brush ring defective	Replace ring (par. 106).
Sliprings defective	Replace armature (par. 106).

95. Generator Noisy

<i>Probable cause</i>	<i>Possible remedy</i>
Bearing defective	Replace bearing (par. 106).
Armature shaft defective.	Replace armature (par. 106).

96. Generator Voltage Fluctuates

<i>Probable cause</i>	<i>Possible remedy</i>
Armature defective	Replace armature (par. 106).
Generator field coil has intermittent open, short, or ground.	Replace field coil (par. 106).

97. Generator Voltage Drops Under Load

<i>Probable cause</i>	<i>Possible remedy</i>
Armature defective	Replace armature (par. 106).

Section V. RADIO INTERFERENCE SUPPRESSION

98. General Methods Used to Attain Proper Suppression

For general information relative to attaining radio interference suppression, refer to paragraph 46.

99. Testing of Radio Interference Suppression Components

Test the capacitor for leaks and shorts on a capacitor tester. Replace a defective capacitor.

If test equipment is not available and interference is indicated, isolate the cause of interference by trial-and-error method of replacing each capacitor in turn until the cause of interference is located and eliminated.

100. Interference Suppression Components

Refer to figure 34 for location and illustration of interference suppression components.

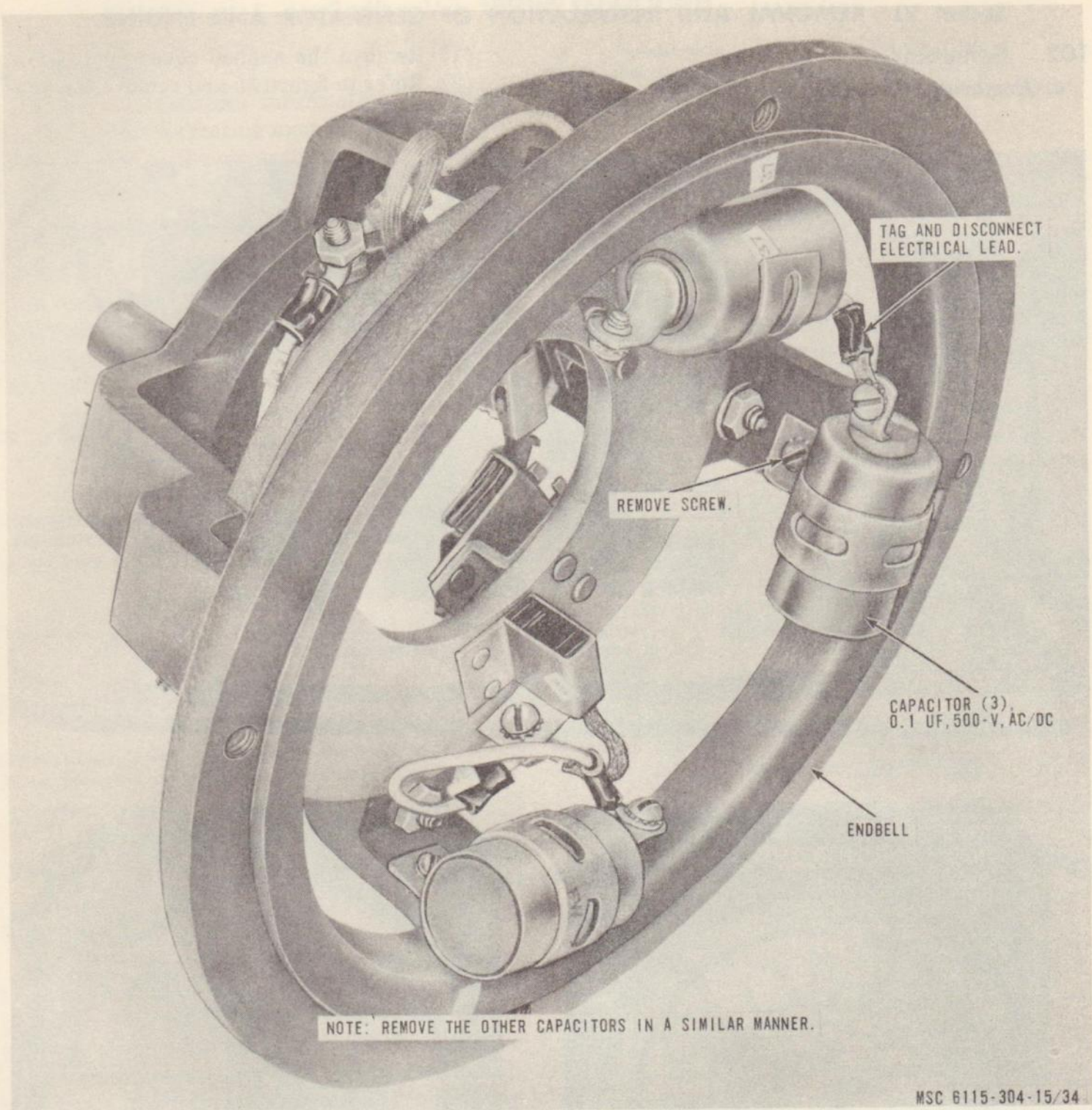


Figure 34. Radio interference suppression components,, location, removal and installation.

101. Replacement of Suppression Components

a. Removal.

- (1) Remove the endbell cover (par. 57).
- (2) Remove the endbell (par. 106).
- (3) Refer to figure 34 and remove the capacitors.

b. Cleaning and Inspection.

- (1) Clean the capacitors with a clean, dry cloth.

- (2) Inspect the capacitors for defective terminals and mounting plate.

- (3) Replace a defective capacitor.

c. Testing. Test the capacitors (par. 99).

d. Installation.

- (1) Refer to figure 34 and install the capacitors.

- (2) Install the endbell (par. 106).

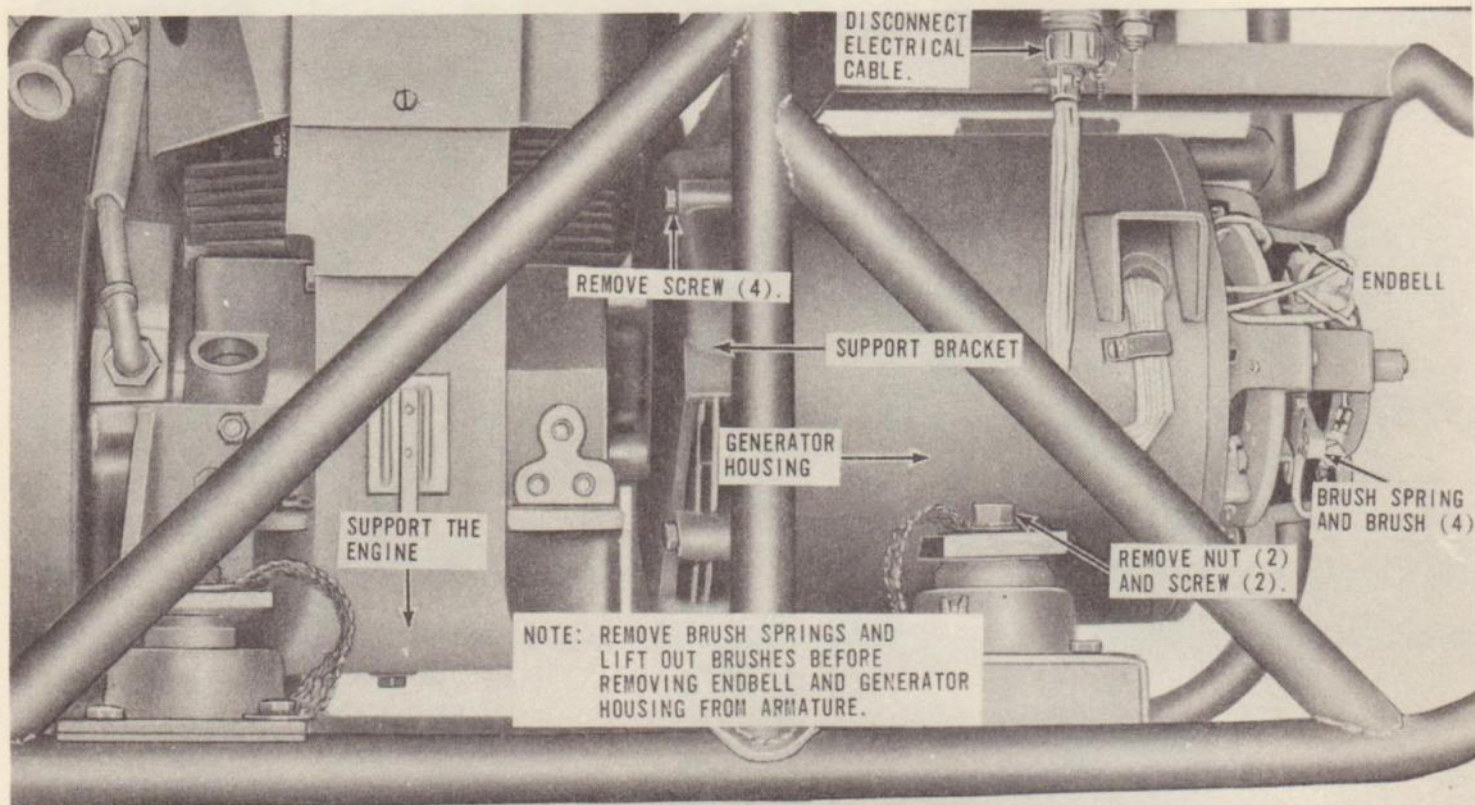
- (3) Install the endbell cover (par. 57).

Section VI REMOVAL AND INSTALLATION OF GENERATOR AND ENGINE

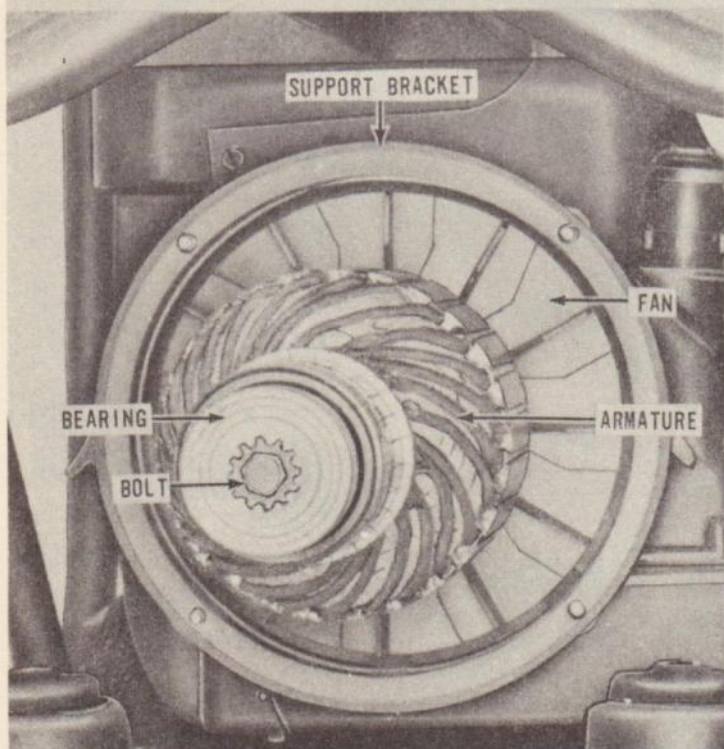
102. Generator

a. Removal.

- (1) Remove the endbell cover (par. 57).
- (2) Refer to figure 35 and remove the generator.

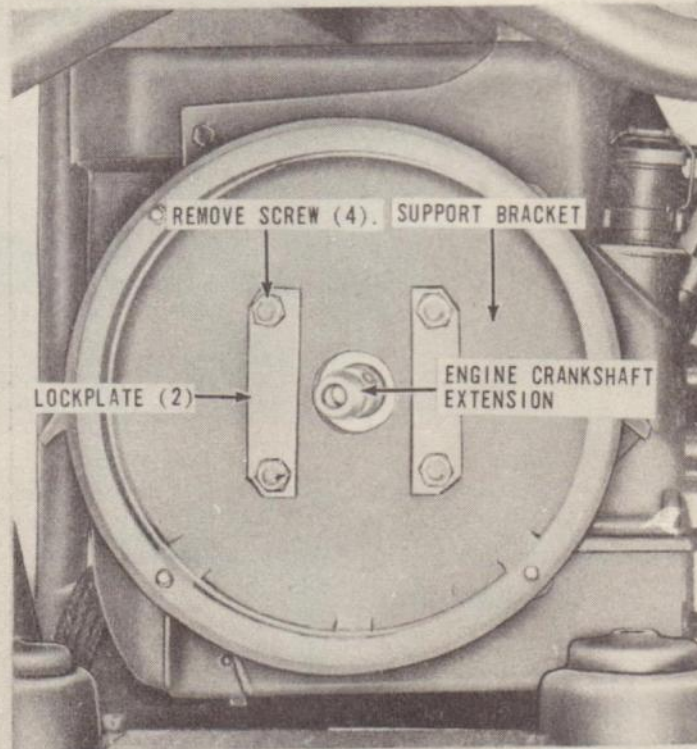


STEP 1. REMOVE ENDBELL AND GENERATOR HOUSING.



STEP 2. LOOSEN BOLT AND TAP LIGHTLY TO LOOSEN ARMATURE ON CRANKSHAFT EXTENSION.

STEP 3. REMOVE BOLT. REMOVE BEARING, ARMATURE, AND FAN AS A UNIT.



STEP 4. REMOVE GENERATOR SUPPORT BRACKET.

MSC 6115-304-15/35

Figure 35. Generator, removal and installation.

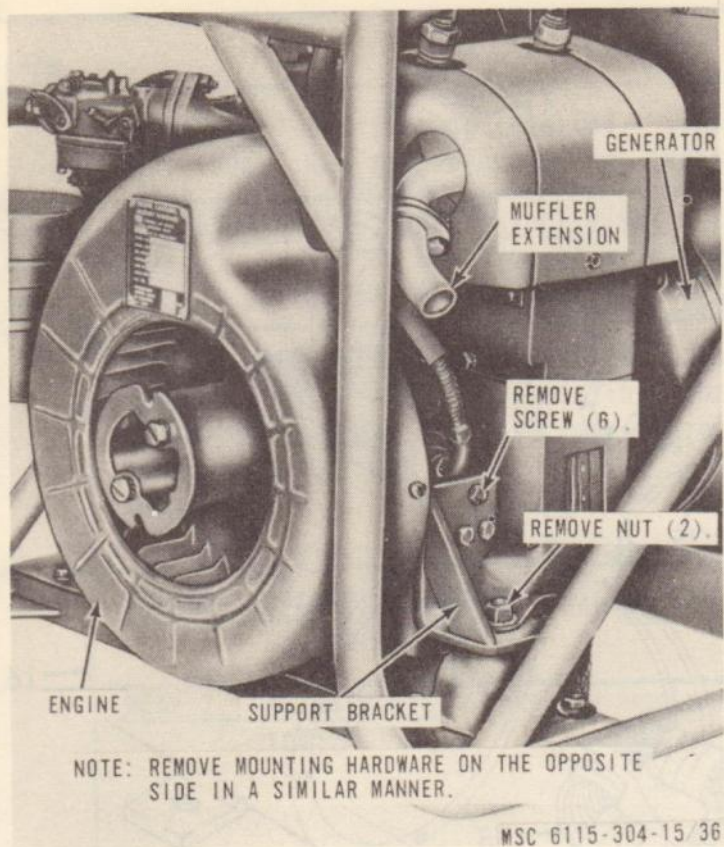


Figure 36. Engine, removal and installation.

104. General

The generator is a two-pole, revolving armature alternator. The drive end of the armature shaft is taper bored to mount on the end of the engine crankshaft extension. A through bolt passes through the armature shaft and threads into the crankshaft extension, securing the armature.

105. On-Equipment Testing

a. Armature. Test the armature for continuity and insulation resistance as instructed in TM 5-764.

b. Field Windings. Test the field coils for series resistance and insulation resistance as instructed in TM 5-764. The shunt field winding resistance should be $17 \pm 10\%$ ohms. The auxiliary field winding resistance should be $1.07 \pm 10\%$ ohms.

Note: In all cases where a megohmmeter is used for testing, make certain the unit is thoroughly dry. Wet condensation tolerances should be considered. The resistance measurements, together with this tolerance contained herein, should be used only as a general guide, taking into consideration the accuracy of the instrument used, test lead resistance, and ambient tempera-

b. Installation.

- (1) Refer to figure 35 and install the generator.
- (2) Install the endbell cover (par. 57).

103. Engine

a. Removal.

- (1) Remove the generator (par. 102).
- (2) Remove the fuel filter (par. 51).
- (3) Refer to figure 36 and remove the engine.

b. Installation.

- (1) Refer to figure 36 and install the engine.
- (2) Install the fuel filter (par. 51).
- (3) Install the generator (par. 102).

ture at time of test. If more precise measurements are required, an instrument such as a Kelvin or Wheatstone bridge should be used, or comparative measurements between the suspected component and a like item known to be good should be utilized.

106. Removal, Disassembly and Testing

a. Removal. Remove the generator (par. 102).

Note: The following test must be made before removing the brush holders from the endbell.

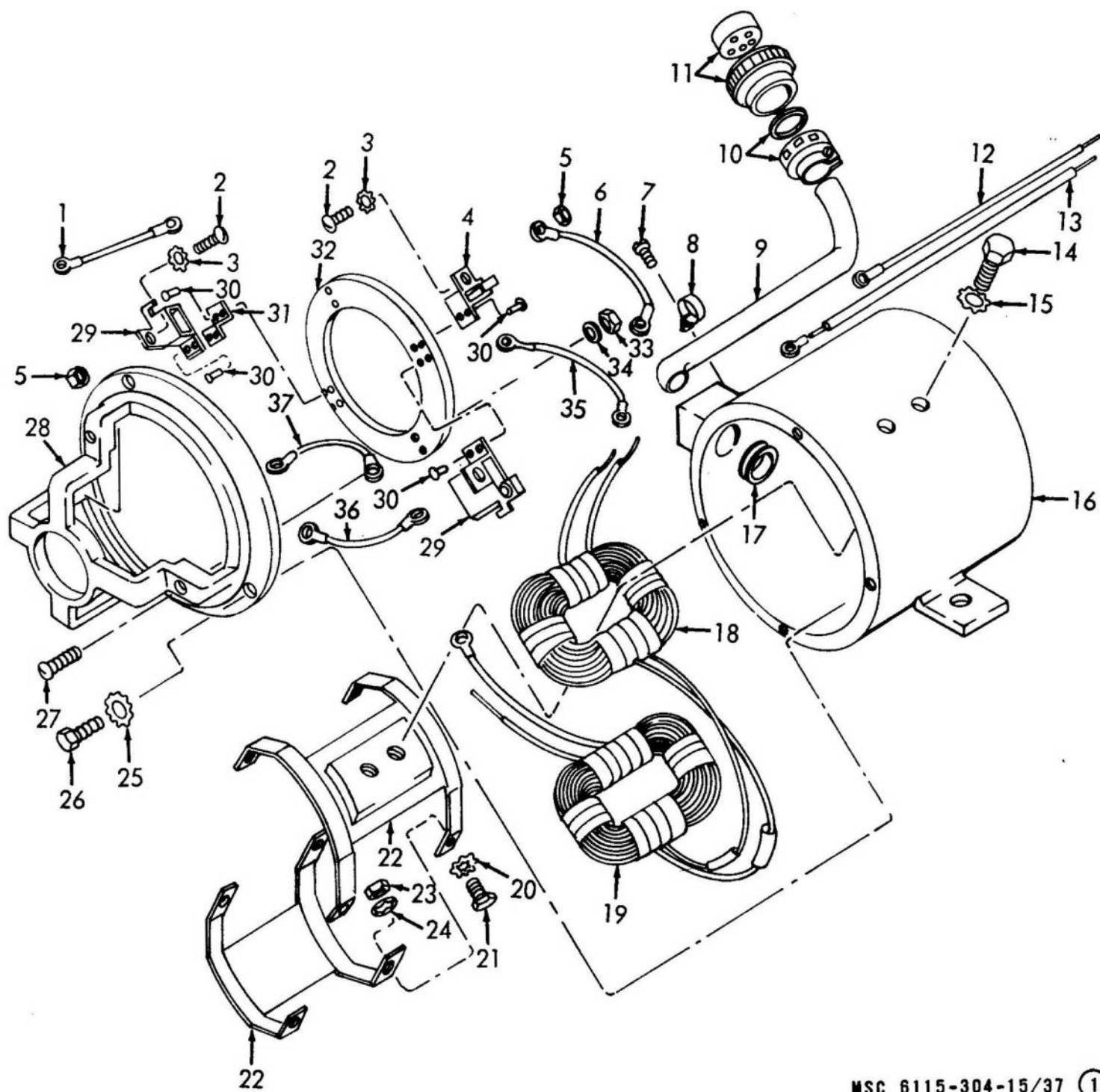
b. Brush Holders Testing. Test the brush holders for insulation resistance as instructed in TM 5-764.

c. Disassembly. Refer to figure 37 and disassemble the generator.

d. Testing after Disassembly.

- (1) Test the armature for shorts as instructed in TM 5-764.
- (2) Test each field coil for resistance of the winding and for insulation resistance as instructed in TM 5-764.

Note: Disconnect and test each field coil insulation resistance before removing it from the field frame. The generator should be inoperative for 8 hours before taking resistance readings.

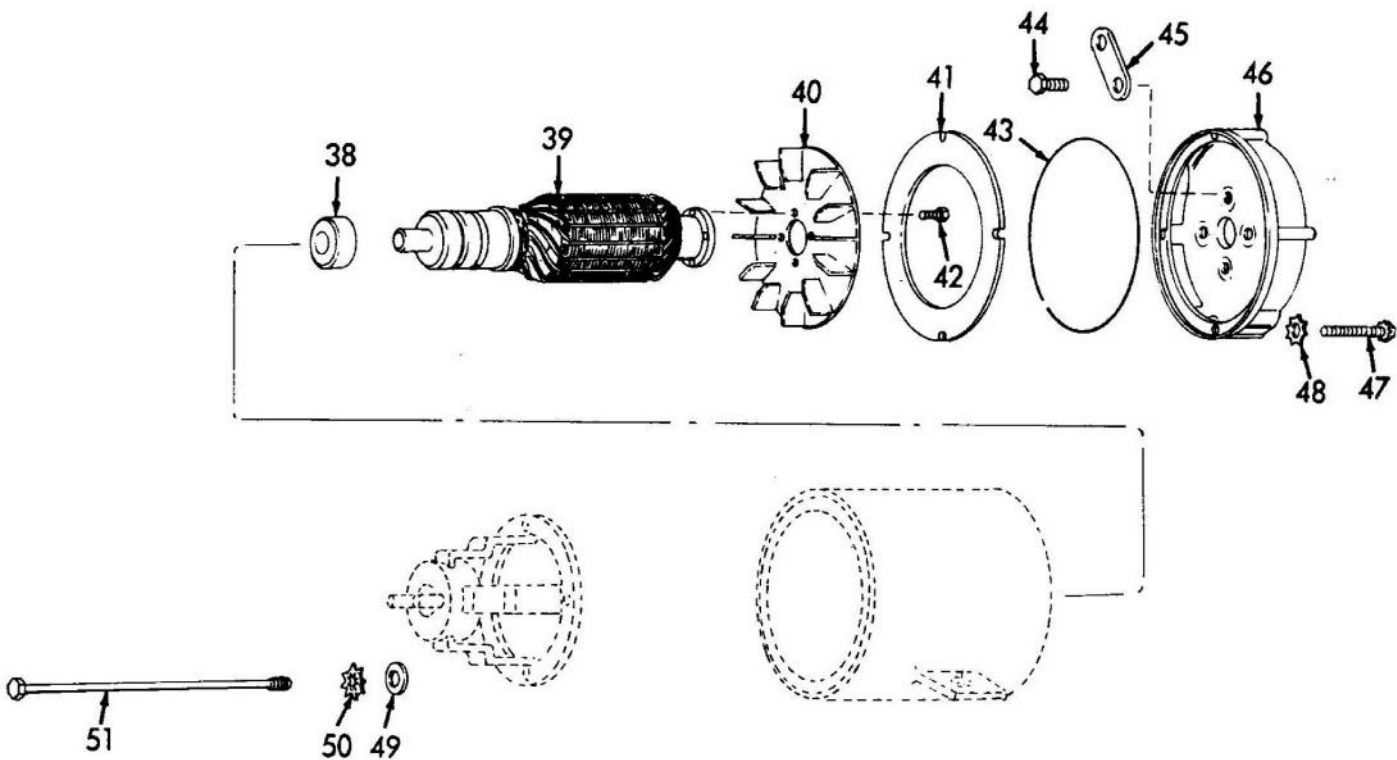


MSC 6115-304-15/37 ①

- | | | | |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1 Electrical lead | 11 Electrical connector | 21 Screw, machine (4 rqr) | 29 Brush holder (4 rqr) |
| 2 Screw, machine (6 rqr) | 12 Electrical lead | 22 Pole assembly | 30 Rivet, flat head (12 rqr) |
| 3 Washer, lock (12 rqr) | 13 Electrical lead | 23 Nut, plain, hexagon (4 rqr) | 31 Support (2 rqr) |
| 4 Brush holder (2 rqr) | 14 Screw, cap, hex-hd, (4 rqr) | 24 Washer, lock (4 rqr) | 32 Brush ring |
| 5 Nut, plain, hexagon (12 rqr) | 15 Washer, lock (4 rqr) | 25 Washer, lock (4 rqr) | 33 Nut, plain, hexagon (4 rqr) |
| 6 Electrical lead | 16 Housing | 26 Screw, cap, hex-hd (4 rqr) | 34 Washer, flat (4 rqr) |
| 7 Screw, machine | 17 Grommet | 27 Screw, machine (4 rqr) | 35 Electrical lead |
| 8 Clamp | 18 Winding | 28 Endbell | 36 Electrical lead |
| 9 Insulation | 19 Winding | | 37 Electrical lead |
| 10 Adapter | 20 Washer, lock (4 rqr) | | |

Stator and Endbell

Figure 37. Generator, disassembly and reassembly.



MSC 6115-304-15/37 (2)

38 Bearing	42 Screw, assembled washer (4 rqr)	45 Lock plate	48 Washer, lock, (4 rqr)
39 Armature	43 Guard	46 Support bracket	49 Washer, flat
40 Fan	44 Bolt, machine (4 rqr)	47 Screw, cap, hex-hd (4 rqr)	50 Washer, lock
41 Baffle			51 Bolt, machine (spec)

Armature, Fan, and Support Bracket

Figure 37—Continued.

107. Cleaning, Inspection, and Repair

a. Blow dust and loose dirt from the armature and field frame with low-pressure, compressed air.

b. Use a cloth dampened with an approved cleaning solvent to remove accumulations of grease and oil from the field coils.

c. Inspect the armature for a bent shaft, worn or out-of-round slipsprings, and evidence of physical damage to the core or windings.

d. Inspect the field frame for cracks, breaks, defective threads, and evidence of physical damage to the field coils.

e. If the slipsprings show more than a total runout of 0.001 inch as shown by a dial indicator, turn the rings down on a lathe (TM 5-764). After turning, polish them with a piece of canvas.

f. Replace defective parts.

108. Reassembly and Installation

a. *Reassembly.* Refer to figure 37 and reassemble the generator.

b. *Installation.* Install the generator (par. 102).

Section VIII. ENGINE SUPPORT AND FRAME

109. General

The engine support attaches the engine to the engine shock mounts. The frame is welded tubular part that provides carrying handles and skids for movement, support, and protection for the generator set.

110. Engine Support

a. *Removal.* Refer to figure 38 and remove the engine support.

b. *Cleaning, Inspection, and Repair.*

(1) Clean the support with an approved cleaning solvent and dry thoroughly.

- (2) Inspect the support for cracks, breaks, or other damage.
- (3) Replace a defective engine support.

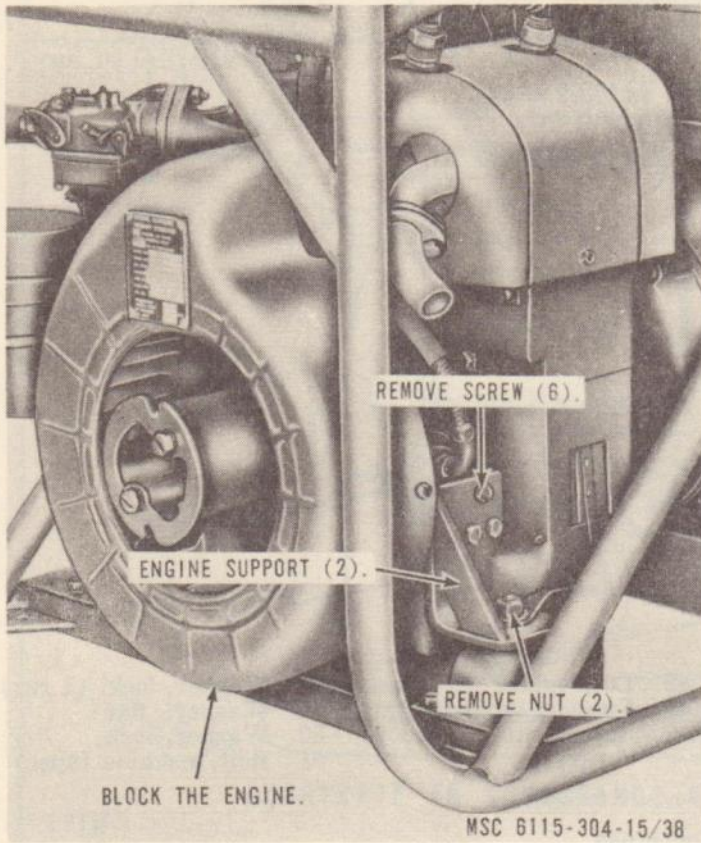


Figure 38. Engine support, removal and installation.

c. *Installation.* Refer to figure 38 and install the engine support.

111. Frame

a. Removal.

- (1) Remove the fuel tank (par. 53).
- (2) Remove the control box (par. 61).
- (3) Remove the ground straps (par. 47).
- (4) Remove the engine and generator vibration dampeners (pars. 55 and 59).

Note: Remove engine and generator as a unit.

b. Cleaning and Inspection.

- (1) Clean the frame with an approved cleaning solvent and dry thoroughly.
- (2) Inspect the frame for cracks, breaks, bends, and broken welds.
- (3) Straighten minor bends, weld cracked welds or replace a defective frame which is damaged beyond repair.

c. Installation.

- (1) Install the engine and generator vibration dampeners (pars. 55 and 59).

Note: Install engine and generator as a unit.

- (2) Install the ground straps (par. 47).
- (3) Install the control box (par. 61).
- (4) Install the fuel tank (par. 53).

APPENDIX I

REFERENCES

- | | | |
|--|--|--|
| Dictionaries of Terms and Abbreviations | | 6. Painting and Preservation |
| R 320-5 | Dictionary of United States Army Terms. | TB ENG 60 Preservation and Painting of Serviceable Corps of Engineers Equipment. |
| R 320-50 | Authorized Abbreviations and brevity Codes. | |
| Field Maintenance | | 7. Preventive Maintenance |
| M 5-764 | Electric Motor and Generator Repair. | AR 700-38 Unsatisfactory Equipment Report. |
| | | AR 750-5 Maintenance Responsibilities and Shop Operations. |
| Fire Protection | | |
| M 5-687 | Repairs and Utilities: Fire Protection Equipment and Appliances; Inspections, Operations, and Preventive Maintenance. | TB ENG 347 Winterization Techniques for Engineer Equipment. |
| M 9-1799 | Ordnance Maintenance: Fire Extinguishers. | |
| Lubrication | | 8. Publication Indexes |
| D 5-2805-206-14 | Engine, Gasoline: Military Standard, 1½ hp, Models 1A08-1 and 1A08-2 Engine, Gasoline: Military Standard, 3 hp, Models 2A016-1 and 2A016-2. | DA Pam 108-1 Index of Army Motion Pictures, Film Strips, Slides, and Phonorecordings. |
| | | DA Pam 310-1 Index of Administrative Publications. |
| | | DA Pam 310-2 Index of Blank Forms. |
| | | DA Pam 310-3 Index of Doctrinal, and Organizational Publications. |
| | | DA Pam 310-4 Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders. |
| | | DA Pam 310-5 Index of Graphic Training Aids and Devices. |
| | | DA Pam 310-25 Index of Supply Manuals—Corps of Engineers. |
| Operator, Organizational, and Field Maintenance | | 9. Radio Interference Suppression |
| M 5-2805-206-14 | Operator, Organizational, and Field Maintenance Manual Engine, Gasoline, Military Standard Models (Model 1A08-1) 1½ Hp, FSN 2805-601-5181 (Model 1A08-2) 1½ Hp, FSN 2805-714-8552 (Model 2A016-1) 3 Hp, FSN 2805-601-5121 (Model 2A016-2) 3 Hp, FSN 2805-714-8553. | TM 11-483 Radio Interference Suppression. |
| | | 10. Shipment and Limited Storage |
| | | AR 743-505 Limited Storage of Engineer Mechanical Equipment. |

TM 38-230 Preservation, Packaging, and Packing of Military Supplies and Equipment.

11. Supply Publications

SM 10-1-C4-1 Petroleum, Petroleum-Base Products, and Related Material.

TM 5-2805-206-14P Operator, Organizational, and Field Maintenance Repair Parts and Special Tool Lists Engine, Gasoline, Military Standard Models (Model 1A08-1) 1½ Hp, FSN 2805-601-5181 (Model 1A08-2) 1½ Hp, FSN 2805-714-8552 (Model 2A016-1) 3 Hp, FSN 2805-601-5121 (Model 2A016-2) 3 Hp, FSN 2805-714-8553.

TM 5-6115-304-25P Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists Generator Set, Gasoline Engine: 1.5 KW, AC, 120V, Single Phase, 60 Cycle, Air Cooled, Open, Tubular Frame, Shock Mounted (Kohler Model KK1. 5M-25) (Less Engine) FSN 6115-591-6867.

12. Training Aids

FM 5-25 Explosives and Demolition.

FM 21-5 Military Training.

FM 21-6 Techniques of Military Instruction.

FM 21-30 Military Symbols.

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

This Appendix contains explanations of all maintenance and repair functions authorized the various echelons. Section II contains the maintenance allocation chart.

2. Maintenance

Maintenance is any action taken to keep materiel in a serviceable condition or to restore it to serviceability when it is unserviceable. Maintenance of materiel includes the following:

- a. *Service.* To clean, preserve, and replenish fuel and lubricants.
- b. *Adjust.* To regulate periodically to prevent malfunction.
- c. *Inspect.* To verify serviceability and detect incipient electrical or mechanical failure by scrutiny.
- d. *Test.* To verify serviceability and detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, and the like.
- e. *Replace.* To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.
- f. *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.
- g. *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.
- h. *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.
- i. *Overhaul.* To restore an item to completely

serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

3. Explanation of Columns

a. *Functional Group.* The functional group is a numerical group set up on a functional basis. The applicable functional grouping indexes (obtained from the Corps of Engineers Functional Grouping Indexes) are listed on the MAC in the appropriate numerical sequence. These indexes normally are set up in accordance with their function and proximity to each other.

b. *Components and Related Operation.* This column contains the functional grouping index heading, subgroup headings, and a brief description of the part starting with the noun name. It also designates the operations to be performed such as service, adjust, inspect, test, replace, repair, and overhaul.

c. *Echelons of Maintenance.* This column contains the various echelons of maintenance by number designation. An X placed in the appropriate echelon column in line with an indicated maintenance function authorizes that echelon to perform the function. The X indicates the lowest echelon responsible for performing the function, but does not necessarily indicate repair parts stockage at that level. Higher echelons are authorized to perform the indicated functions of lower echelons.

d. *Remarks.* This column lists specific maintenance functions, special tools, cross-references, instructions, and the like pertinent to the operation being performed.

Section II. MAINTENANCE ALLOCATION CHART

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
01 0100	ENGINE. Engine Assembly. Engine, gasoline.....						Refer to TM 5-2805-206-14. Compression. Refer to TM 5-2805-206-14.
	Inspect.....	X					
	Services.....	X					
	Test.....		X				
	Replace.....			X			
	Repair.....			X			
	Overhaul.....				X		
	Mount, resilient: Replace.....		X				
	Support, engine: Replace.....		X				
03 0306	FUEL SYSTEM. Tanks, Lines, Fittings. Tank, fuel: Service..... Replace.....						
	Strainer, tank: Service..... Replace.....	X					
	Cap, fuel tank: Replace.....		X				
	Hose assembly: Replace.....		X				
	Valve, shut-off and drain: Replace.....		X				
04 0401	EXHAUST SYSTEM. Pipes. Pipe, exhaust: Replace.....						
			X				
15 1501	FRAME. Frame Assembly. Frame mounting: Replace.....						
				X			
22 2201	MISCELLANEOUS BODY, CHASSIS, OR HULL AND ACCESSORY ITEMS. Canvas Items. Cover, electrical generator: Replace..... Repair.....						
		X					
				X			
22 2210	Data Plates. Plate, identification (C.O.E.): Replace..... Plate, instruction and identification: Replace.....						
				X			
			X				
40 4000	GENERATOR. Generator. Generator assembly: Inspect..... Test..... Replace..... Repair..... Overhaul..... Mount, resilient: Replace.....						
		X					
				X			
				X			
				X			
					X		
			X				

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
4001	Rotor Assemblies. Armature assembly:						
	Test			X			
	Replace			X			
	Repair			X			
	Overhaul					X	Rewind.
4002	Stator Assemblies. Stator, generator:						
	Test			X			
	Replace			X			
	Repair			X			
	Overhaul					X	Rewind.
4003	Brush Holders. Holder Assembly, Electrical Contact brush:						
	Replace			X			
	Repair			X			
	Brush, electrical contact:						
	Replace		X				
	Spring, electrical contact brush:						
	Replace		X				
4004	Ventilating System. Fan, electrical rotating equipment:						
	Replace			X			
	Guard, fan:						
	Replace			X			
	Baffle, air, generator:						
	Replace			X			
4005	Frame Supports and Housing. Endbell, electrical rotating equipment:						
	Replace			X			
	Lock plate:						
	Replace			X			
	Bearings:						
	Replace			X			
	Bracket, power generator:						
	Replace			X			
4009	Control Panels. Ammeter:						
	Replace		X				
	Voltmeter:						
	Replace		X				
	Connector, receptacle:						
	Replace		X				
	Leads, electrical:						
	Replace		X				Fabricate.
	Connector, Electrical:						
	Replace		X				
	Knob, Rheostat:						
	Replace		X				
4010	Master or Auxiliary Control Assembly. Modulator assembly:						
	Test		X				
	Adjust		X				
	Replace		X				
	Repair		X				
	Control cabinet:						
	Replace		X				
	Repair		X				

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
4011	Regulator, voltage: Replace		X				
	Circuit Breakers. Circuit breaker: Replace		X				
4014	Boot, circuit breaker: Replace		X				
	Resistors. Resistor, fixed: Test		X				
4017	Replace		X				
	Standard assembly: Replace		X				
4018	Transformers. Transformer, current: Test		X				
	Replace		X				
4019	Plate, heat sink and diode: Test		X				
	Replace		X				
47	Terminal Blocks. Terminal board: Replace		X				
	Radio Interference Suppression. Capacitors: Test		X				
4702	Replace		X				
	GAGES. Gages. Gage, fuel level: Replace		X				

APPENDIX III

BASIC ISSUE ITEMS AND MAINTENANCE AND OPERATING SUPPLIES

Section I. INTRODUCTION

1. General

Section II lists the accessories, tools, and publications required in first echelon maintenance and operation, initially issued with, or authorized for the generator set. Section III lists the maintenance and operating supplies required for initial operation.

2. Explanation of Columns Contained in Section II

a. *Source Codes.* The information provided in each column is as follows:

(1) *Materiel.* This column lists the basic materiel code number of the supply service assigned responsibility for the part. Blank spaces denote supply responsibility of the preparing agency. General Engineer supply parts are identified by the letters "GE" in parentheses, following the nomenclature in the description column. Other basic materiel code numbers are

10—Quartermaster Materiel

12—Adjutant General

(2) *Source.* The selection status and source of supply for each part are indicated by one of the following code symbols:

- (a) P—applied to high-mortality repair parts which are stocked in or supplied from the technical service depot system, and authorized for use at indicated maintenance echelons.
- (b) P1—applied to repair parts which are low-mortality parts, stocked in or supplied from technical service depots, and authorized for installation at indicated maintenance echelons.
- (c) M—applied to repair parts which are not procured or stocked but are to be manufactured at indicated maintenance echelons.
- (d) X2—applied to repair parts which are not stocked. The indicated main-

tenance echelon requiring such repair parts will attempt to obtain them through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with supporting justification through normal supply channels.

(3) *Maintenance.* The lowest maintenance echelon authorized to use, stock, install, or manufacture the part is indicated by the following code symbol:

O—Organizational Maintenance
(1st and 2d echelon)

(4) *Recoverability.* Repair parts and/or tool and equipment items that are recoverable are indicated by one of the following code symbols:

- (a) R—applied to repair parts and assemblies which are economically repairable at field maintenance facilities (3d and 4th echelons) and are normally furnished by supply on an exchange basis.
- (b) T—applied to high-dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance facilities.
- (c) U—applied to repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high-dollar value reusable casings, castings, and the like.

Note: When no code is shown in the recoverability column the part is considered expendable.

b. *Federal Stock Numbers.* When a federal stock number is available for a part, it will be shown in this column and, used for requisitioning purposes.

c. *Description.*

- (1) The item name and a brief description of the part are shown.

(2) A five-digit Federal supply code for manufacturers and/or other technical services is shown in parentheses followed by the manufacturer's part number. This number will be used for requisitioning purposes when no Federal stock number is indicated in the Federal stock column.

Example (08645) 86453

(3) The letters "GE", shown in parentheses immediately following the description, indicate general Engineer supply responsibility for the part.

d. Unit of Issue. If no abbreviation is shown in this column, the unit of issue is each.

e. Quantity Authorized. This column lists the quantities of repair parts, accessories, tools, or publications authorized for issue to the equipment operator or crew as required.

f. Quantity Issued with Equipment. This column lists the quantities of repair parts, accessories, tools, or publications that are initially issued with each item of equipment. Those indicated by an asterisk are to be requisitioned through normal supply channels as required.

g. Illustrations. This column is subdivided into two columns which provide the following information:

- (1) *Figure number.* Provides the identifying number of the illustration.
- (2) *Item number.* Provides the referenced number for the parts shown in the illustration.

3. Federal Supply Code for Manufacturers
34199 KOHLER COMPANY

4. Explanation of Columns Contained in Section III

a. Item. This column contains numerically sequenced numbers, assigned to each component application, to facilitate reference.

b. Component Application. This column identifies the component application of each maintenance or operating supply item.

c. Source of Supply. This column lists the basic number of the technical services assigned supply responsibility for the item. Blank spaces denote Corps of Engineers supply responsibility. The other technical service basic number is 10—Quartermaster Corps

d. Federal Stock Number. The Federal stock number will be shown in this column and will be used for requisitioning purposes.

e. Description. The item name and a brief description are shown.

f. Quantity Required for Initial Operation. This column lists the quantity of each maintenance or operating supply item required for initial operation of the equipment.

g. Quantity Required for 8 Hours Operation. Quantities listed represent the estimated requirements for an average 8 hours of operation.

h. Notes. This column contains informative notes keyed to data appearing in the preceding column.

Section II. BASIC ISSUE ITEMS LIST

Source codes				Federal stock No.	Description	Unit of issue	Expendability	Quantity authorized	Quantity issued with equipment	Illustration	
Technical service	Source	Maintenance	Recoverability							Fig.	Item
					GROUP 01—ENGINE						
					0114—ENGINE STARTING SYSTEM						
	M	O			ROPE ASSEMBLY, STARTING:						
10	P	O		4020-240-2146	MANUFACTURE FROM: Cord, nylon (4 ft required)	ft		4	*		
					GROUP 22—MISCELLANEOUS BODY, CHASSIS OR HULL, AND ACCESSORY ITEMS						

Technical service	Source codes			Federal stock No.	Description	Unit of issue	Expendability	Quantity authorized	Quantity issued with equipment	Illustration	
	Source	Maintenance	Recoverability							Fig.	Item
					2201—CANVAS ITEMS						
	P1	O		6115-888-9288	PAULIN, COVER GROUP 16—ACCESSORIES PUBLICATIONS, TEST EQUIPMENT AND TOOLS			1	*		
					2602—ACCESSORIES						
	P	O		7520-559-9618	CASE, MAINTENANCE AND OPERATIONAL MANUALS: cotton duck, water repellent, mildew resistant (GE)			1	*		
	P1	O		5975-642-8937	ROD, GROUND: 9 ft lg $\frac{5}{8}$ in. dia, cone point, 3 sections (GE)			1	*		
	P1	O		5975-243-5861	CLAMP, ELECTRICAL: ground rod, $\frac{1}{2}$ to lin. id.			1	*		
	M	O			WIRE, ELECTRICAL: ground- ing.						
	P	O		6145-189-6695	MANUFACTURE FROM: Wire, electrical: No. 6 AWG (10 ft. required).	ft		10	*		
					2603—COMMON TOOLS						
10	P	O		5120-223-7396	PLIERS, SLIP JOINT: w/cut- ter, 6 in. lg.			1	*		
10	P	O		5120-278-1283	SCREWDRIVER, FLAT TIP: plastic handle, flared tip, $\frac{5}{16}$ in. w, 6 in. lg blade.			1	*		
10	P	O		5120-240-5328	WRENCH, OPEN END, ADJUSTABLE: $\frac{15}{16}$ in. jaw opening, 8 in. lg.			1	*		
					2605—PUBLICATIONS						
12					Department of the Army Lubrica- tion Order, LO 5-2805-206-14.			2	2		
12					Department of the Army Opera- tor, Organizational, and Field Maintenance Manual, TM 5- 2805-206-14.			2	2		
12					Department of the Army Opera- tor, Organizational, and Field Maintenance Repair Parts and Special Tool Lists, TM 5-2805- 206-14P.			2	2		
12					Department of the Army Opera- tor, Organizational, Field and Depot Maintenance Manual TM 5-6115-304-15.			2	2		
12					Department of the Army Organi- zational, Field and Depot Main- tenance Repair Parts and Special Tool Lists, TM 5-6115- 304-25P.			2	2		

Section III. MAINTENANCE AND OPERATING SUPPLIES

Item	Component application	Source of supply	Federal stock No.	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
1.	0101—CRANKCASE.	-----	-----	OIL, LUBRICATING: 1 Qt cans as follows:			(1) Includes quantity of oil to fill engine oil system as follows: 1/5 Qt crankcase. (2) Reference current L.O. for grade application and replenishment intervals. (3) Use oil as prescribed in item 1 above. (4) Tank capacity. (5) Average fuel consumption is 0.64 gal per hour of continuous operation.
		10	9150-265-9433	OE-30-----	1/5 Qt	(2)	
		10	9150-265-9425	OE-10-----	1/5 Qt	(2)	
		10	9150-242-7602	OES-----	1/5 Qt	(2)	
2.	0104—AIR CLEANER.	-----	-----	OIL, LUBRICATING: (3).			
3.	0306—FUEL TANK	-----	-----	FUEL, GASOLINE: bulk as follows: Gasoline: 91A, automotive combat.	2 gal (4)	(5)	
		10	9130-160-1818				

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By Order of the Secretary of the Army:

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