TM 5-6115-222-20

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE

GENERATOR SET

GASOLINE ENGINE
2 KW, DC. 12V
SKID MOUNTED

(HOLLINGSWORTH MODEL
JHGV2A AND JHGV2B)
W/ENGINE, BRIGGS AND STRATTON
MODELS 23FBP, TYPE 803520
AND 23AFB, TYPE 703575
FSN 6115–561–6220
AND 6115–557–3612

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1959

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SAFETY PRECAUTIONS

Always disconnect the ignition cable from the spark plug before working on the engine or generator. This precaution will guard against accidental starting and possible injury to personnel.

Do not fill the gasoline tank while the engine is in operation. Gasoline spilled on a hot engine may explode and cause serious injury.

When filling the fuel tank, always provide a metal-to-metal contact between the container and tank. This will prevent a spark from being generated as gasoline flows over the metallic surface.

Do not operate the generator set with the blower housing or cylinder head cover removed. Such operation will prevent proper air-cooling and will result in serious overheating and damage to the engine.

Never operate the generator set in an inclosed area unless the exhaust gases are piped to the outside. Exhaust gases contain carbon monoxide which is a poisonous, odorless, and colorless gas.

TECHNICAL MANUAL
No. 5–6115–222–20

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *2 February 1959*

GENERATOR SET, GASOLINE ENGINE: 2 KW, DC, 12V, SKID MOUNTED (HOLLINGSWORTH MODEL JHGV2A AND JHGV2B) W/ENGINE, BRIGGS AND STRATTON, MODELS 23FBP, TYPE 803520 AND 23AFB, TYPE 703575 FSN 6115–561–6220 AND 6115–557–3612

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual is published for the information and guidance of the personnel to whom the generator set is issued. It contains information on the organizational maintenance of the equipment and its accessories and attachments. It also provides instructions on shipment and limited storage.

b. Supply manuals, technical manuals, and other publications, applicable to the generator set, are listed in appendix I. Appendix II contains the Maintenance Allocation Chart. The Repair Parts List is contained in TM 5–6115–222–20P.

c. Recommendations for changes, additions, deletions, and other corrections for the improvement of this manual should be forwarded by letter or on DA Form 2028, to The Commanding General, U. S. Army Engineer Maintenance Center, Corps of Engineers, P. O. Box 119, Columbus 16, Ohio, ATTN: EMCJM.

2. Record and Report Forms

The following forms are to be used by second echelon personnel for recording and reporting maintenance operations.

a. DA Form 5–22 (Unserviceable Part Identification Tag).

b. DA Form 5–53 (Equipment Record).

c. DA Form 9–79 (Parts Requisition).

d. DA Form 285 (Accident (report of individual accident)).

e. DA Form 464 (Work Sheet for Preventive Maintenance and Technical Inspection of Engineer Equipment).

f. DA Form 468 (Unsatisfactory Equipment Report).

g. DA Form 478 (Organizational Equipment File).

h. DA Form 811 (Work Request and Job Order).

i. DA Form 1115 (Property Turn-In Tag).

j. DA Form 1545 (Change Card).

k. DA Form 1546 (Request for Issue or Turn-In Slip).

l. DD Form 6 (Report of Damaged or Improper Shipment).

m. DD Form 362 (Statement of Charges for Government Property Lost, Damaged, or Destroyed).

Section II. DESCRIPTION AND DATA

3. Description

A general description and illustrations of the generator set will be found in TM 5–6115–222–10. A more specific and detailed description of the components is provided in the applicable maintenance sections.

4. Identification

There are no identification and instruction plates on the generator set other than those described in TM 5–6115–222–10.

5. Differences in Models

This manual applies only to the Hollingsworth generator set, model JHGV2A, serial numbers 1000 through 2485 and model JHGV2B, serial numbers 2600 through 5080. A description of the differences in models is contained in TM 5–6115–222–10.

6. Tabulated Data

a. Engine.

Make ..... Briggs and Stratton

Model	23AFB and 23FBP
Type	L-head
Cycle	4
Number of cylinders	1
Cooling	Air-cooled
Bore	3 in. (inch)
Stroke	3¾ in.
Piston displacement	22.9 cubic in.
Brake horsepower	5.35 at 2400 rpm (revolutions per minute).
Maximum torque	15.5 ft-lb (foot-pounds)
Governed rpm	2400 on model JHGV2B 2100 on model JHGV2A
Compression	100 lb (pound)
Compression ratio	5.4 to 1
Lubrication	Splash

b. Generator.

Make	Kurz and Root
Model	E1478M947
Volts	12
Amperes (full load)	167
Power output	2000 w (watts)
Brush spring tension	32–44 ounces
Type of current	Direct
Rated speed	2400 rpm
Duty classification	Continuous

c. Carburetor.

Make	Briggs and Stratton

d. Adjustment data.

Spark plug gap	.025 in.
Valve clearance, intake cold	.008 in.
Valve clearance, exhaust, cold.	.018 in.
Breaker point gap	.020 in.

e. Nut and Bolt Torque Data.

Spark plug	20–25 ft-lb
Cylinder head bolts	15–17 ft-lb

f. Base Plan. The generator set is fastened to the bottom of the base of the carrying case which serves as a base during operation. The necessary dimensions for a base other than the base of the carrying case are shown in figure 1.

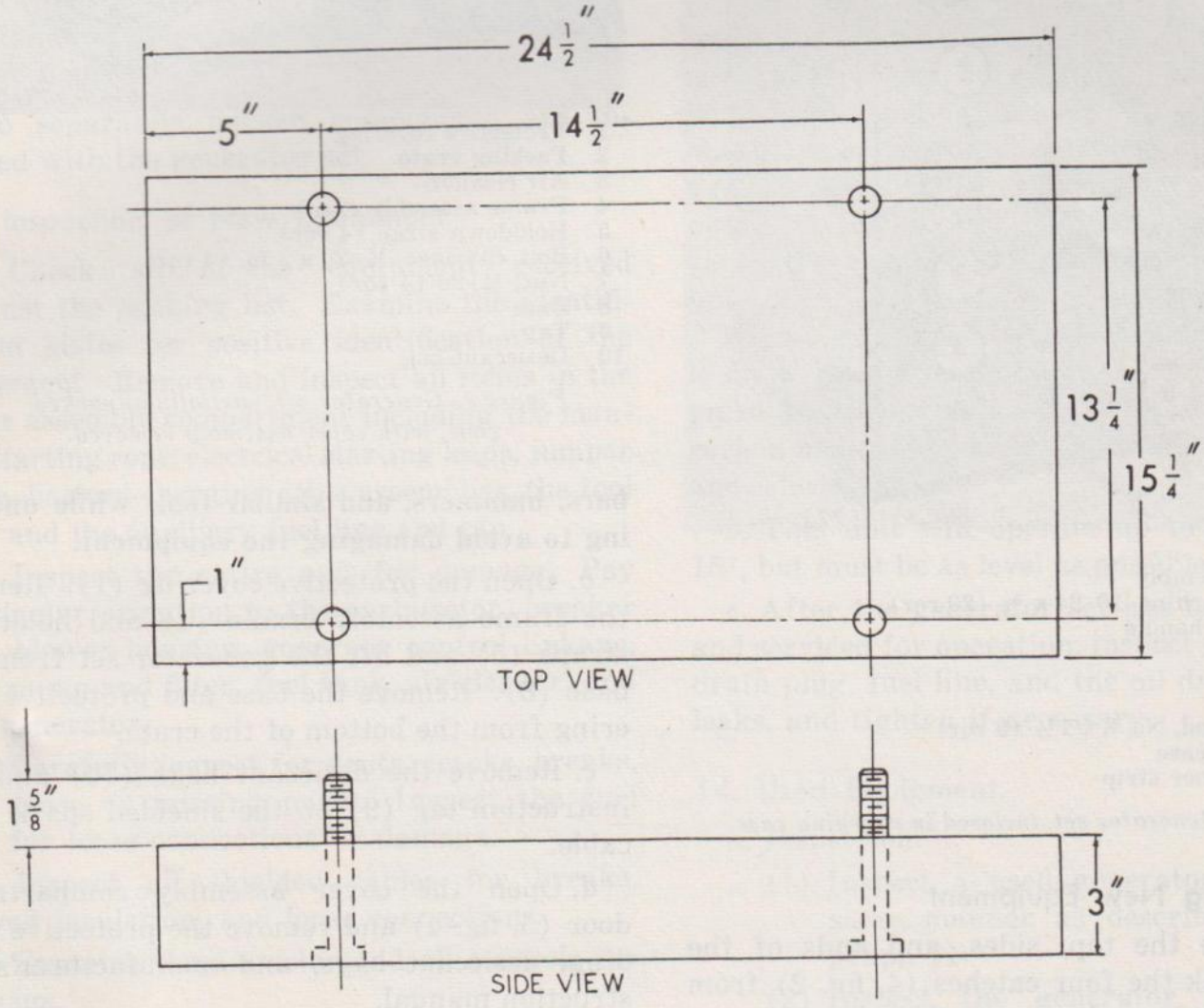
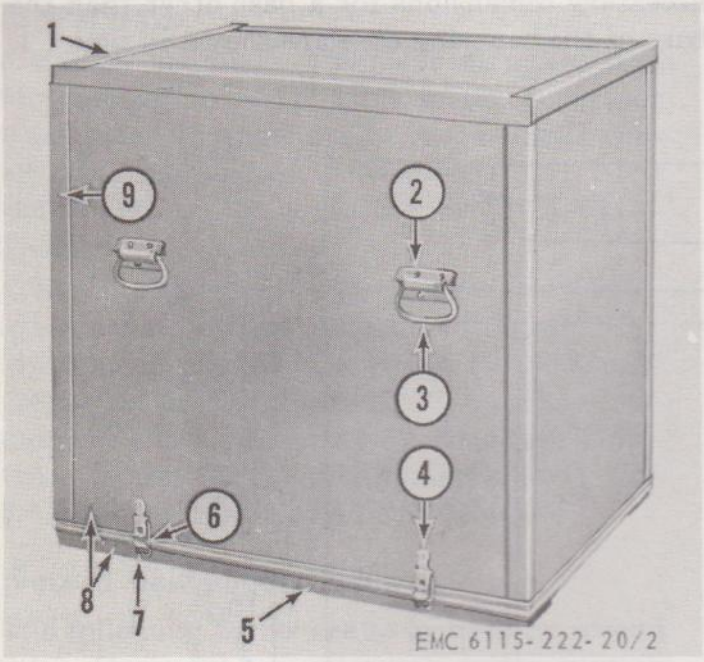


Figure 1. Base plan.

CHAPTER 2
OPERATING INSTRUCTIONS

7. Unloading New Equipment

The total weight of the crated generator set is 340 pounds. A hand truck, fork lift, or manpower may be used to unloaded the crated unit. If the unit is inclosed only in the carrying case, as shown in figure 2, the carrying handles (3) may be used to move the unit. The generator set must be kept right side up while handling.



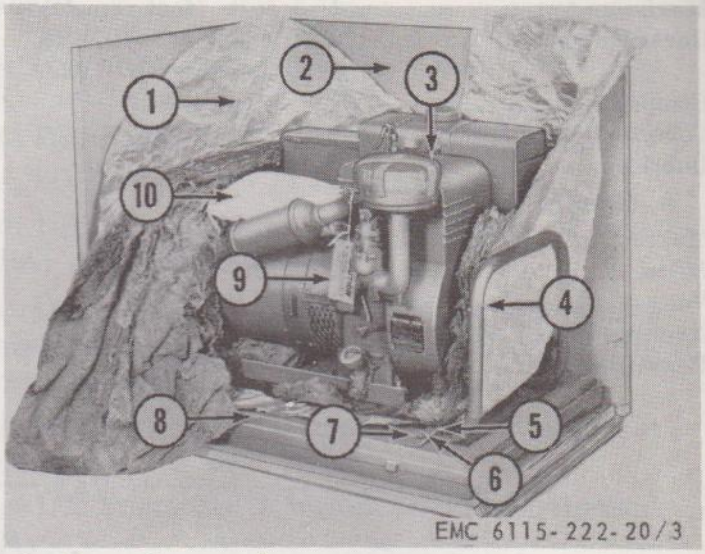
1 Cover assembly
2 Screw, machine, 10–24 x ⅝ (20 rqr)
3 Carrying handle
4 Catch
5 Base
6 Strike
7 Screw, wood, No. 8 x 1½ (8 rqr)
8 Carrying case
9 Metal corner strip

Figure 2. Generator set, inclosed in carrying case.

8. Unpacking New Equipment

a. Remove the top, sides, and ends of the crate, unhook the four catches (4, fig. 2) from the strikes (6) and remove the carrying case cover assembly (1) from the carrying case base (8, fig. 3).

Caution: **Exercise great care in the use of bars, hammers, and similar tools while uncrating to avoid damaging the equipment.**



1 Protective covering
2 Packing crate
3 Air cleaner
4 Frame assembly cradle
5 Holddown strap (4 rqr)
6 Bolt, carriage, ¼–20 x 3 in. (4 rqr)
7 Nut, ¼–20 (4 rqr)
8 Base
9 Tag
10 Desiccant bag

Figure 3. Generator set, partially unpacked view, with cover assembly removed.

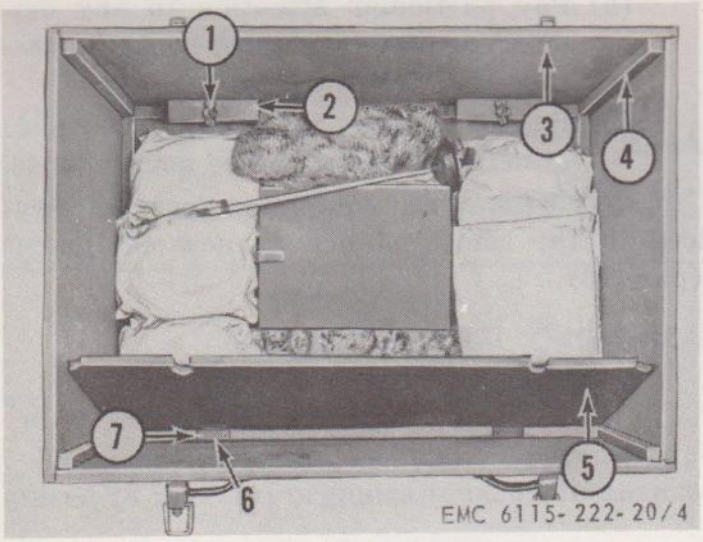
b. Open the protective covering (1). Remove the frame assembly cradle (4) and holddown straps (5) and lift the generator set from the base (8). Remove the base and protective covering from the bottom of the crate.

c. Remove the desiccant bags (10) and the instruction tag (9) on the shielded spark plug cable.

d. Open the cover assembly compartment door (5, fig. 4) and remove the protective padding, desiccant bags, and manufacturer's instruction manual.

9. Removal of Protective Material and Devices

Remove all protective tape on the air cleaner, muffler, and the crankcase breather.



1 Door button (2 rqr)
2 Support (2 rqr)
3 Nut, 10–24 (12 rqr)
4 Corner strip (4 rqr)
5 Door
6 Hinge (2 rqr)
7 Screw, wooden (4 rqr)

Figure 4. Carrying case cover assembly, inside view, with contents exposed.

10. Installation of Separately Packed Components

No separately packed components are included with the generator set.

11. Inspection of New Equipment

a. Check all of the equipment received against the packing list. Examine the identification plates for positive identification of the equipment. Remove and inspect all items in the cover assembly compartment including the manual starting rope, electrical starting leads, jumper leads, battery-charging cable assemblies, the tool box, and the auxiliary fuel line and cap.

b. Inspect the entire unit for damage. Pay particular attention to the carburetor, breaker box, blower housing, governor control linkage, fuel pump and filter, fuel tank, air cleaner, and the generator.

c. Carefully inspect for dents, cracks, breaks, and loose or missing parts. Inspect the fuel line for loose connections or damage.

d. Inspect all shielded cables for breaks, frayed insulation, and loose connections.

e. Examine the ammeter and all controls for damage.

f. Crank the engine slowly several times with the starter rope (TM 5–6115–222–10). If the engine does not turn freely, do not attempt to start it until the trouble has been corrected or reported to field maintenance.

g. If any deficiencies are noted, or if the equipment does not correspond with the packing list, correct the deficiencies or report to field maintenance.

12. Servicing New Equipment

a. Perform the before-operation services as described in TM 5–6115–222–10.

b. Lubricate the unit in accordance with the current lubrication order.

c. Perform the preventive maintenance services as described in paragraph 18.

d. Fill the fuel tank with the proper grade of gasoline.

13. Installation or Setting-Up Instructions

a. The generator set is shipped assembled for operation. When preparing for a permanent indoor or outdoor installation, be sure the base is solid and strong enough to support the weight of the unit. Refer to figure 1 for dimensions of the base. Select a site where there will be sufficient space on all sides for servicing and operation of the unit. Be sure there is ample ventilation in the area in which the unit will operate. Install an air-tight exhaust line to carry the exhaust gases to the outside of the building.

Warning: **Never operate the generator set in an inclosed area unless the exhaust gases are piped to the outside. Exhaust gases contain carbon monoxide which is a poisonous, odorless, and colorless gas.**

b. This unit will operate up to an angle of 15°, but must be as level as possible at all times.

c. After the generator set has been installed and serviced for operation, inspect the fuel tank drain plug, fuel line, and the oil drain plug for leaks, and tighten if necessary.

14. Used Equipment

a. Inspection.

(1) Inspect a used generator set in the same manner as described in paragraph 11.

(2) Inspect the generator brushes for wear. Check the spring tension (par. 69). Replace worn brushes. Inspect the commutator. If the surfaces are rough or pitted, sand and polish (par. 70).

(3) Inspect the blower housing and flywheel for any accumulation of dust or dirt (pars. 51 and 52).

(4) Inspect the fuel system for leaks. Tighten any loose connections. Inspect the fuel filter for evidence of sediment and dirt. Clean and service the fuel filter (TM 5–6115–222–10).

(5) Pay particular attention to any evidence of excessive wear, broken. missing, or bent part.

(6) Repair, replace, or report deficiencies or defective parts to field maintenance.

b. Servicing. Used equipment must be serviced in the same manner as new equipment (par. 12).

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. SPECIAL ORGANIZATIONAL TOOLS AND EQUIPMENT

15. Special Tools and Equipment

There are no special tools and equipment required to perform organizational maintenance.

16. Organizational Repair Parts

Organizational repair parts are contained in TM 5–6115–222–20P.

Section II. PREVENTIVE MAINTENANCE SERVICES

17. General

Preventive maintenance is performed by organizational maintenance personnel at biweekly and bimonthly intervals. The biweekly interval will be equivalent to a maximum of 50 hours of use. The bimonthly interval will be equivalent to 8 weeks or a maximum of 250 hours of use, whichever occurs first. The preventive maintenance services to be performed at these regular intervals are listed and described in paragraph 18. The numbers appearing at the columns opposite each service, refer to a corresponding number appearing on the DA Form 464 and indicate that a report of the services should be made at that particular number of the form. These numbers appear either in the second, the third, or both columns as an indication of the interval at which the service is to be performed. The Inspection Column is provided for the information of the person performing the inspection. A number in this column indicates that an inspection should be made of the listed items in accordance with the instructions given in the text opposite. The indicated items and instructions constitute the minimum inspection requirements for the equipment.

18. Biweekly and Bimonthly Preventive Maintenance Service

Inspection	Service		GENERAL
	Bimonthly	Biweekly	
1	1	1	*Before-operation services.* Inspect and perform services listed in the daily before-operation services (TM 5–6115–222–10).
2	2	2	*Lubrication.* Inspect all external moving parts for need of lubrication. Inspect the oil drain plug for damage, and replace if damaged.
	2	2	Lubrication as specified in the current lubrication order.
3	3	3	*Tools and equipment.* Inspect all tools and equipment assigned to the generator set. Inspect the condition of the carrying case.
	3	3	See that all tools and equipment assigned to the generator set are clean, serviceable, and properly stowed. See that the carrying case is in good condition, and that it closes and fastens securely.
4	4	4	*Fire extinguisher.* Check for full charge by shaking the extinguisher. See that the unit is free from corrosion and operates freely.
	4	4	Correct any deficiencies noted or replace a defective fire extinguisher.
5	5	5	*Publications.* See that a copy of TM 5–6115–222–10, the current lubrication order, and DA Form 285 are with the generator set and in serviceable condition.

Inspection	Service		
	Bimonthly	Biweekly	
6	6	6	*Appearance.* Inspect the general appearance of the generator set, paying particular attention to cleanness, legibility of all identification and instruction plates, and condition of the paint.
	6	6	Correct any deficiencies noted or report them to field maintenance.
7	7	7	*Modification.* See that all available modification work orders applying to this generator set have been completed and recorded on DA Form 478.
			ENGINE AND ACCESSORIES
11	11	11	*Cylinder head, manifold, and gaskets.* Inspect the cylinder head and carburetor intake elbow for leaks, loose bolts, or defective gaskets. Inspect the exhaust muffler and fittings for damage or evidence of exhaust leakage.
	11	11	Tighten any loose bolts. Replace any defective part (par. 53). During the first biweekly servicing of new or reconditioned engines, inspect all of the head bolts for tightness, after the engine has warmed to operating temperature. Tighten any loose bolts to 15 to 17 ft-lb. Replace a defective muffler (par. 53).
12	12	12	*Valve mechanism.* Inspect the valve cover and gasket for oil leaks. Listen for excessive tappet noise.
	12	12	Report excessive valve tappet noise to field maintenance.
	13	--------	*Compression test.* Remove the spark plug and insert a compression gage into the spark plug hole. Crank the engine electrically until the gage reading stabilizes. Correct reading is 100 psi. Record the reading on DA Form 464.
	13	--------	If the compression is low, inspect the cylinder head bolts for looseness. Tighten any loose bolts and retest compression. If low compression persists, the trouble lies with the cylinder head gasket, valves, or piston rings. Replace a faulty cylinder head gasket (par. 63). Report defective valves or worn piston rings to field maintenance.
14	14	14	*Engine base and crankcase breather.* Inspect for leaks, paying particular attention to the oil filler cap gasket. Service the crankcase breather as directed in paragraph 64.
	14	14	Correct or report any leaks to field maintenance. Service or replace the breather (par. 64).
20	20	20	*Governor and linkage.* Inspect the governor and linkage for excessive wear or damage. Inspect the governor control lever and governor crank for proper operation.
	20	20	Adjust the governor, if necessary (par. 49).
17	17	17	*Cooling system.* Inspect the blower housing, flywheel vanes, cylinder, cylinder head fins, and the cylinder head cover for any accumulation of dust or dirt. Inspect the cylinder head cover and the blower housing for dents that might restrict the normal flow of air.
	17	17	Remove the blower housing, if necessary, and clean all dust and dirt from inside the housing and flywheel (pars. 51 and 52). See that the blower housing is in good condition and is properly installed (par. 51).
			FUEL SYSTEM
39	39	39	*Carburetor and linkage.* Inspect the carburetor for loose or missing mounting and assembly bolts and screws. Inspect all connections for leaks. Inspect for excessive wear or play in linkage connections.
	39	39	Tighten or replace loose or missing bolts and screws. Correct any defects noted. Replace worn linkage. Adjust or replace a defective carburetor (par. 47).
40	40	40	*Fuel pump and filter.* Inspect the fuel strainer sediment bowl for any accumulation of water and dirt. Inspect the strainer for cracked or damaged parts. Inspect the fuel pump for evidence of leaks.
	40	40	Clean the sediment bowl if it contains water or dirt. Inspect and clean the strainer screen. Tighten loose connections and replace worn or defective part (par. 43).
41	41	41	*Air cleaner.* Inspect the air cleaner for insecure mounting and for loose connections between the air cleaner and carburetor. Inspect the oil condition and level in the bowl.
	41	41	Tighten any loose connections or mounting screws. Clean the air cleaner, if the oil or filter element is dirty (par. 46). Be sure the bowl is filled with oil to the correct level. Refer to the current lubrication order.

Inspection	Service		
	Bimonthly	Biweekly	
43	43	43	*Fuel tank, cap, and gasket.* Inspect the drain plug in the fuel tank for looseness. Remove the fuel tank cap and strainer (par. 45). Inspect the strainer for cleanness and freedom from breaks. Inspect the cap and gasket. Be certain the cap fits securely. Inspect the fuel tank for leaks, cleanness, and secure mounting.
	43	43	Tighten the drain plug if loose. Clean the fuel strainer or replace if damaged. Replace a defective fuel tank cap or cap gasket (par. 45). Tighten all loose mounting bolts and nuts.
44	44	44	*Fuel line.* Inspect fuel lines for leaks, loose connections, and damage.
	44	44	Tighten loose or leaking fuel line connections. Replace a defective fuel line or connections (par. 42).
			ELECTRICAL SYSTEM
46	46	46	*Spark plug.* Inspect the spark plug for a dirty or cracked insulator and burned electrodes.
	46	46	Remove and clean the spark plug. Adjust the electrode gap to 0.025 inch (par. 59). See that the spark plug and gasket are in good condition before reassembling. Replace a defective spark plug and gasket (par. 59).
49	49	49	*Magneto contacts.* Inspect the condition and adjustment of the magneto contacts (par. 56). The correct contact gap is 0.020 inch.
	49	49	Clean and adjust the magneto contacts (par. 56). Replace defective contacts (par. 56).
50	50	50	*Wiring, start and stop switches, and electrical relay switch.* Inspect all external wiring for oil-soaked or frayed insulation, broken wires, and loose connections. Inspect all switches for proper operation.
	50	50	Replace oil-soaked, frayed or broken external wires (pars. 60 and 88). See that connections are clean and tight. Replace a defective switch (pars. 78 and 79).
			FRAME AND MOUNTING HARDWARE
80	80	80	*Frame assembly.* Inspect the frame assembly and base mounting hardware for breaks, cracks, and loose or missing bolts, nuts, or holddown straps.
	80	80	Tighten or replace loose or missing bolts, nuts, and holddown straps. Repair, replace, or report any unserviceable parts to field maintenance.
			GENERATOR
172	172	172	*Commutator, brushes, and brush holders.* Inspect armature, commutator, and brush holders for dust, dirt, and oil deposits. Inspect brushes for wear, weak springs, and loose wire connections. Brushes must be renewed before they are worn to one-half of their original length. Inspect brushes for freedom in holders and contact with commutator. Inspect the commutator for wear, roughness, pitting, and high mica between the commutator segments.
	172	172	Clean dust, dirt, or oil from inside of generator. Replace loose or damaged brushes (par. 69). Tighten loose connections. If commutator is rough or pitted, sand and polish (par. 70). If mica is high, report the condition to field maintenance.
174	174	174	*Ventilating fan.* Inspect the generator stator cover, fan, and adapter cover screen for dirt, dust, cracks, or other mechanical damage. Inspect for loose or missing mounting bolts and nuts.
	174	174	Clean the generator stator cover screen, fan, and adapter screen with an approved cleaning solvent. Repair or replace damaged parts. Tighten or replace loose or missing bolts and nuts.
175	175	175	*Control panel—meters.* Inspect for loose connections, cracked or frayed wire insulation, corroded terminals, and loose or missing bolts or nuts. Inspect the ammeter for cracked or broken glass, loose mounting screws, or defective operation. Inspect the electrical relay switch for free operating condition.
	175	175	Replace a damaged or inoperative ammeter (par. 81). Tighten loose mounting bolts or electrical connections.

Section III. TROUBLESHOOTING

19. 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 the trouble. The possible remedy recommended is described opposite of the probable cause.

20. Engine Fails to Start

Probable cause	*Possible remedy*
Dirt or gum in fuel lines	Clean fuel lines (par. 42).
Carburetor out of adjustment	Adjust carburetor (par. 47).
Spark plug dirty or damaged	Remove, clean, inspect, adjust, or replace spark plug (par. 59).
Magneto contacts pitted or improperly adjusted	Clean, adjust, or replace contacts (par. 56).
Capacitor open or shorted	Replace capacitor (par. 57).

21. Engine Misses or Operates Erratically

Probable cause	*Possible remedy*
Spark plug dirty or damaged	Remove, clean, inspect, adjust, or replace spark plug (par. 59).
Spark gap incorrect	Adjust spark gap to .025 inch (par. 59).
Magneto contacts pitted or improperly adjusted	Clean contacts and adjust to .020 inch gap or replace (par. 56).
Sediment or water in fuel lines	Clean fuel lines (par. 42).

22. Engine Overheats

Probable cause	*Possible remedy*
Fuel mixture too lean	Adjust carburetor (par. 47).
Muffler clogged	Clean muffler (par. 53).
Ventilation poor	Remove and clean blower housing (par. 51).

23. Engine Lacks Power

Probable cause	*Possible remedy*
Fuel mixture too lean	Adjust carburetor (par. 47).
Governor out of adjustment	Adjust governor (par. 49).
Spark plug dirty or damaged	Remove, clean, inspect, adjust, or replace spark plug (par. 59).
Magneto contacts pitted or improperly adjusted	Clean, adjust, or replace contacts (par. 56).
Carbon excessive	Remove cylinder head and scrape carbon from head and piston (par. 63).
Muffler clogged	Clean muffler (par. 53).
Cooling air stream obstructed or restricted	Remove and clean the blower housing (par. 51).

24. Engine Stops Suddenly

Probable cause	*Possible remedy*
Fuel mixture too lean	Adjust carburetor (par. 47).
Dirt or gum in fuel lines	Clean fuel lines (par. 42).
Muffler clogged	Clean muffler (par. 53).
Spark plug dirty or damaged	Remove, clean, inspect, adjust, or replace spark plug (par. 59).
Magneto contacts pitted or improperly adjusted	Clean, adjust, or replace contacts (par. 56).

25. Engine Backfires

Probable cause	*Possible remedy*
Fuel mixture too lean	Adjust carburetor (par. 47).

Probable cause	Possible remedy
Intake valve sticking	Remove spark plug and pour one-half to one ounce of penetrating oil into the engine block. Let the engine stand for five minutes, then rotate the crankshaft slowly by hand. If the above procedure does not free the valve, notify field maintenance.

26. Exhaust Smoke Excessive

Probable cause	Possible remedy
Carburetor needle valve open too far	Adjust carburetor (par. 47).

27. Engine Knocks

Probable cause	Possible remedy
Fuel mixture too lean	Adjust carburetor (par. 47).
Carbon in cylinder head	Remove cylinder head and scrape carbon from head and piston (par. 63).

28. Generator Fails to Crank Engine

Probable cause	Possible remedy
Brush contact poor	Adjust brush spring tension (par. 69). Replace worn brushes (par. 69).

29. Generator Fails to Build Up Rated Voltage

Probable cause	Possible remedy
Loss of residual magnetism	Crank engine electrically until residual magnetism is restored.
Variable resistor defective	Replace variable resistor (par. 82).
Brush contact poor	Adjust brush spring tension (par. 69). Clean, reseat, or replace brushes (par. 69).
Short circuit on load line	Locate short and correct deficiency.
Commutator dirty	Clean and sand commutator (par. 70).
High resistance connections	Make better electrical and mechanical joints and connections.

30. Generator Fails to Supply Power to Load

Probable cause	Possible remedy
Electrical relay switch defective	Replace switch (par. 80).
Shunt defective	Replace a defective shunt (par. 84).
Generator cutout relay defective	Replace a defective cutout relay (par. 85).
Receptacle connectors defective	Replace defective connectors (par. 75).

31. Generator Overheats

Probable cause	Possible remedy
Ventilating cover clogged	Clean ventilating cover and air passages (par. 72).
Brush pressure excessive	Adjust brush spring tension (par. 69). Replace worn brushes (par. 69).

32. Sparking at Generator Brushes Excessive

Probable cause	Possible remedy
Brushes dirty or improperly seated	Clean or replace and reseat brushes (par. 69).
Brush pressure weak	Adjust brush spring tension (par. 69).
Brushes sticking in brush holders	Clean brushes and brush holders and adjust brushes (par. 69).

33. Generator Noisy

Probable cause	Possible remedy
Brushes worn or broken	Replace worn or broken brushes (par. 69).

Section IV. RADIO INTERFERENCE SUPPRESSION

34. Definitions

a. Interference. The term "interference" as used herein applies to electrical disturbances in the radio frequency range, which are generated by the generator set and which may interfere with the proper operation of radio receivers or other electronic equipment.

b. Interference Suppression. The term "interference suppression" as used herein applies to the methods used to eliminate or effectively reduce radio interference generated by the generator set.

35. Purpose of Interference Suppression

The tactical importance of effective interference suppression cannot be stressed too greatly. Since the electrical disturbances generated by the generator set are composed partly of electrical waves in the radio frequency range, they must be suppressed for two important reasons. First, they will interfere with the proper operation of the friendly radio net, and second, they will enable the enemy to locate the equipment and its associated units.

36. General Sources of Interference

Generally, radio interference is generated anywhere a spark occurs or where a high-frequency current is present. A spark is a small amount of current jumping an air gap in response to the force of a relatively high voltage. The gasoline engine ignition system is a common source. Magneto contacts, generator commutators, relay contacts, and static charges collecting on the frame are other common sources which in some way must be suppressed.

37. General Methods Used to Attain Proper Suppression

Essentially, suppression is attained by providing a low resistance path to ground for the stray currents. The method used to attain suppression include shielding the ignition and high-frequency wires, grounding the frame with bonding straps, and using capacitor, filter, and resistance circuits where necessary.

38. Interference Suppression Components

a. Capacitors, Generator Assembly (Two). Two fixed paper dielectric capacitors (1, fig. 5A), having a capacity of 0.1 microfarad each, are mounted at the top and the bottom of the generator stator (8). The lead from the top capacitor is connected to the upper rear brush holder terminal. The lead from the bottom capacitor is connected to the lower front brush holder terminal. Each capacitor is grounded to the generator stator cover through its mounting bracket, and with two IET lockwashers to insure a firm electrical contact.

b. Capacitor, Control Panel Box. A fixed paper dielectric capacitor (5, fig. 5B), having a capacity of 0.1 microfarad, is mounted directly below the electrical starting terminals on the inside of the control panel box (4). The lead from this capacitor is connected to the positive electrical starting terminal. The capacitor is grounded to the control panel box through the capacitor mounting bracket. The mounting hardware for the capacitor includes two No. 8, IET lockwashers to insure a resistance free metal-to-metal contact.

c. Electrical Lead (Engine base-to-frame assembly). An electrical lead (8, fig. 5C) grounds the engine base (4) to the frame assembly (7). The electrical lead is secured with two No. 10, IET lockwashers at the frame assembly, and with two IT lockwashers at the engine base.

d. Spark Plug. The spark plug (1, fig. 5D) is located on top of the cylinder head. It is integrally shielded and radio interference suppressed.

e. Ingnition Cable Assembly. The ignition cable assembly (2, fig. 5D), which leads from the magneto to the spark plug (1), is enclosed in copper braided shielding. This shielding is grounded to the magneto backplate with one No. 8, IET lockwasher.

f. Primary Lead. The primary lead, which extends from the magneto to the breaker box, is enclosed in copper braid shielding. This shielding is grounded to the magneto backplate and to the ground terminal inside the breaker box. A No. 8, IET lockwasher is employed at each ground connection.

g. Stop Switch Lead. The stop switch lead, which extends from the breaker box to the stop switch in the control panel box, is also inclosed

in copper braided shielding. This shielding is grounded at both the ground terminal inside the breaker box and at the interior of the control panel box. A No. 8, IET lockwasher is employed at each ground connection.

h. Lockwashers. The generator set contains numerous bonds and electrical connections using IT, ET, or IET lockwashers other than those specifically covered under radio interference suppression. As all such lockwashers have potential value for interference suppression, it is extremely important that they be noted carefully during disassembly, and reinstalled at their original locations.

39. Testing of Radio Suppression Components

Test the capacitors 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 determined and eliminated.

40. Replacement of Radio Interference Suppression Components

a. General. When replacing suppression components, always replace with the identical parts to provide proper interference suppression. Take special care to obtain a firm metal-to-metal contact between all shields, lockwashers, leads, capacitor mounting brackets, and electrical leads. Be sure all connections are clean and tight.

b. Capacitors, Generator Assembly (two).

(1) *Removal.*

(*a*) Remove the generator stator cover (par. 68).

(*b*) Remove the capacitor terminal screw (5, fig. 5A) with ET lockwasher (6) on each of the two capacitors (1) and disconnect the capacitor leads (7).

(*c*) Unscrew the nuts (3) from the screws (4) and remove two IET lockwashers (2) and the capacitors. Remove the screw (4) and the other IET lockwashers (2) from the generator stator (8).

Note. Remove the lug of the electrical lead and second IET lockwasher with the upper capacitor on model JHGV2B.

(2) *Installation.*

(*a*) Install the screws (4) with the IET lockwashers (2) through the generator stator (8). Place each capacitor (1) in mounting position and secure with nuts (3) and the other IET lockwashers (2). Install a second IET lockwasher and the lug of the electrical lead with the upper capacitor (1) on model JHGV2B.

(*b*) Install the capacitor terminal screw (5) with the lead (7) and IET lockwasher (6) at each capacitor terminal.

(*c*) Install the generator stator cover (par. 68).

c. Capacitor (Control Panel Box).

(1) *Removal.*

(*a*) Remove the receptacle connector panel (par. 74).

(*b*) Remove the capacitor terminal screw (1, fig. 5B) and IET lockwasher (2), and remove the lead (3).

(*c*) Remove the capacitor mounting screw (7) with IET lockwasher (8), mounting nut (6), and the other IET lockwasher (8). Remove the capacitor (5) from the control panel box (4).

(2) *Installation.*

(*a*) Place the capacitor (5) in mounting position inside the control panel box (4). Install the capacitor mounting screw (7) with IET lockwasher (8) and secure with nut (6) and the other IET lockwasher (8).

(*b*) Place the lead (3) on the capacitor terminal and secure with screw (1) and IET lockwasher (2).

(*c*) Install the receptacle connector panel (par. 74).

d. Electrical Lead (Base-to-Frame Assembly).

(1) *Removal.*

(*a*) Remove the hex nut (6, fig. 5C) and one IT lockwasher (5) from the cap screw (3) at the engine base (4). Remove the lug of the electrical lead (8), and the other IT lockwasher (5) underneath the lug.

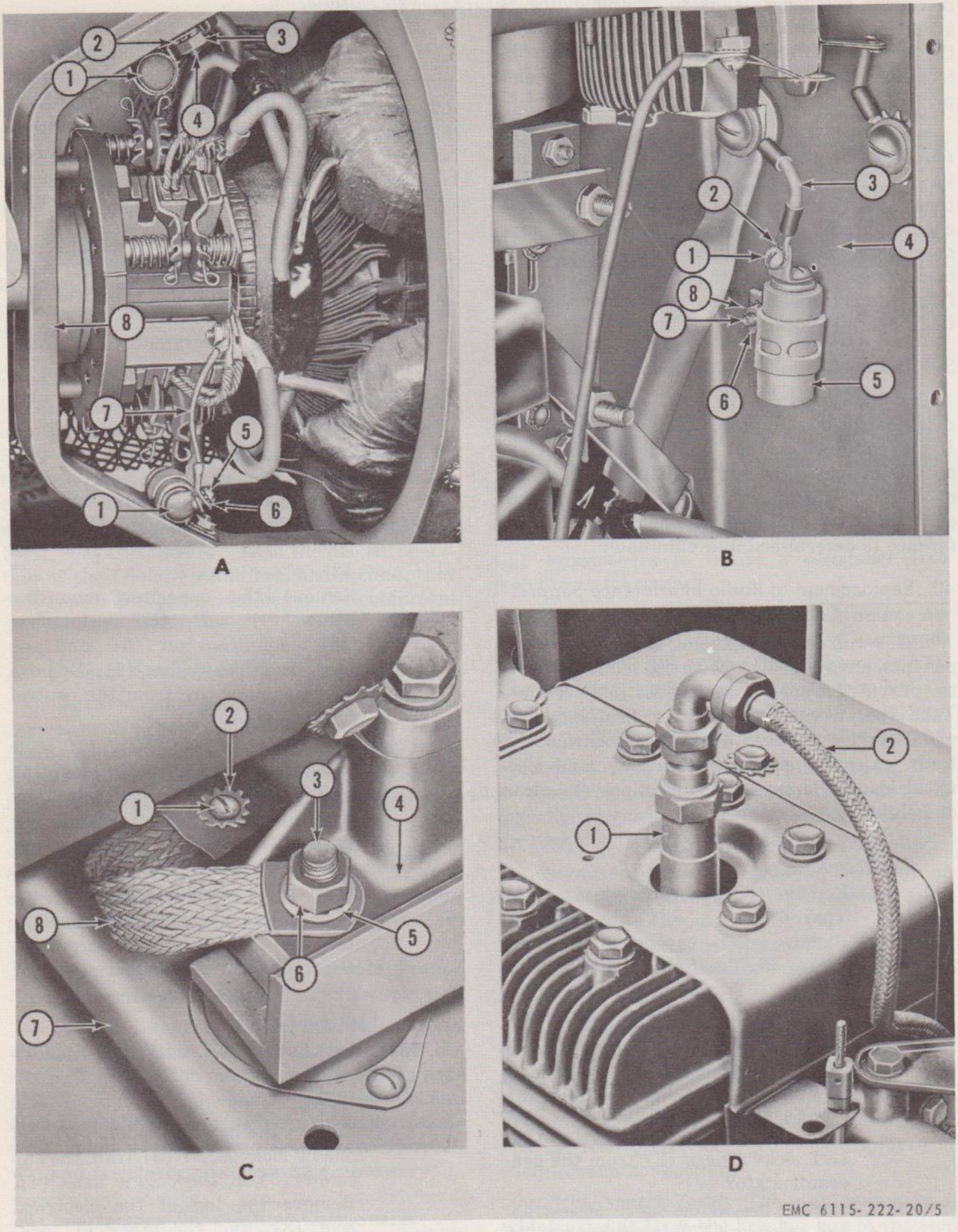


Figure 5. Radio interference suppression points.

1 Capacitor, fixed, paper dielectric, 0.1 mfd, 100 VDC (2 rqr)
2 Washer, lock, IET, ¼ in. (4 rqr)
3 Nut, plain, hex-hd, cadmium or zinc plated, ¼–20 (2 rqr)
4 Screw, machine, ¼–20 x ¾ in. (2 rqr)
5 Screw, capacitor terminal, 8–32 x ¼ in. (2 rqr)
6 Washer, lock, IET, capacitor terminal, No. 8 (2 rqr)
7 Lead, capacitor terminal
8 Generator stator

Capacitors, generator assembly.

A

1 Screw, capacitor terminal
2 Washer, lock, IET, capacitor terminal
3 Lead, capacitor terminal
4 Control panel box
5 Capacitor, fixed, paper dielectric, 0.1 mfd
6 Nut, plain, hex, cadmium or zinc plated, 8–32
7 Screw, machine, cadmium or zinc plated, 8–32 x ⅜ in.
8 Washer, lock, cadmium plated, IET, No. 8 (2 rqr)

Capacitor, control panel box.

B

1 Screw, machine, 10–24 x ½ in.
2 Washer, lock, IET, No. 10, (2 rqr)
3 Screw, cap, hex-hd, ⅜–16 x 2¾ in.
4 Engine base
5 Washer, lock, IT, ⅜ in., (2 rqr)
6 Nut, hex, ⅜–16
7 Frame assembly
8 Electrical lead

Electrical lead, engine base-to-frame assembly.

C

1 Spark plug
2 Ignition cable assembly

Spark plug.

D

Figure 5—Continued.

(*b*) Remove the cap screw (3) with one bottom lockwasher and flat washer from underneath the frame assembly (7).

(*c*) Remove the screw (1), nut, and two IET lockwashers (2) that secure the electrical lead to the frame assembly, and remove the electrical lead.

(2) *Installation.*

(*a*) Install the screw (1), with the lug of the electrical lead (8) and one IET lockwasher (2) to the frame assembly (7), and secure from underneath the frame assembly with the nut and one IET lockwasher.

(*b*) Insert the cap screw (3) with lockwasher and flat washer, through the frame assembly and the engine base (4).

(*c*) Place the IT lockwasher on the cap screw and install the remaining lug of the electrical lead with second IT lockwasher (5). Secure the cap screw and the electrical lead with nut (6).

e. Spark Plug. Refer to paragraph 59 for replacement of the spark plug.

f. Ignition Cable. Refer to paragraph 60 for replacement of the ignition cable.

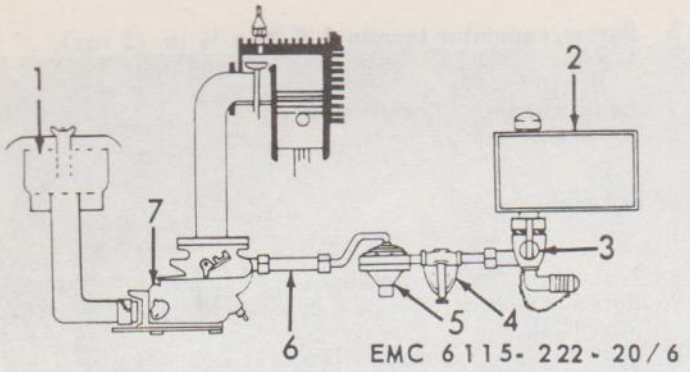
g. Primary Lead. Refer to paragraph 60 for replacement of the primary lead.

h. Stop Switch Lead. Refer to paragraph 79 for replacement of the stop switch lead.

Section V. FUEL SYSTEM

41. General

The fuel system consists of the fuel tank (2, fig. 6), fuel shutoff plug cock (3), fuel pump (5) and filter (4), fuel line (6), carburetor (7), and air cleaner (1). The suction created by the piston on the intake stroke draws the air in through the oil bath air cleaner. The air passes through the carburetor where it picks up vaporized gasoline regulated by the jets of the carburetor. The air and gasoline mixture then passes into the combustion chamber of the engine.



1 Air cleaner
2 Fuel tank
3 Fuel shutoff plug cock
4 Fuel filter
5 Fuel pump
6 Fuel line
7 Carburetor

Figure 6. Fuel system, schematic drawing.

42. Fuel Lines

a. Removal.

(1) Close the fuel shutoff plug cock (3, fig. 7).

(2) Remove the carburetor-to-pump pipe (6) by disconnecting the connector nut from the carburetor elbow and the fuel pump adapter (9).

(3) Loosen two metal locking bands that secure the electrical cable assembly to the carburetor-to-pump pipe, and remove the pipe.

(4) Disconnect the fuel line assembly (13) at the elbows (5 and 12) and remove the fuel line assembly.

b. Cleaning and Inspection.

(1) Clean the fuel line and pipe in an approved cleaning solvent and dry thoroughly.

(2) Remove dirt and foreign material from inside the fuel line and pipe by using compressed air.

(3) Inspect the fuel line and pipe for damaged threads, cracks, bends, or breaks. Replace a damaged fuel line or pipe.

c. Installation.

(1) Position the carburetor-to-pump pipe (6) on the engine with the ends of the pipe on the carburetor elbow and the fuel pump adapter (9). Tighten the connector nuts and the two metal locking bands that secure the cable assembly to the fuel line.

(2) Connect the fuel line assembly (13) to the elbows (5 and 12) on the plug cock (3) and the fuel pump (10).

(3) Open the fuel shutoff plug cock (3) and check for leaks at the connectors. Tighten any leaking connections.

43. Fuel Pump

a. Removal and Disassembly.

(1) Close the fuel shutoff plug cock (3, fig. 7).

(2) Disconnect the fuel line assembly (13) and carburetor-to-pump pipe (6) at the elbow (12, fig. 8) and the adapter (3).

(3) Remove two cap screws (11, fig. 7) with lockwashers. Remove the fuel pump (10) with the gasket.

(4) Loosen the thumbscrew (11, fig. 8) on the bail (10), and remove the bail, sediment bowl (9), gasket (8), and screen (7).

(5) Remove the elbow (12) and the adapter (3) from the fuel pump head (4).

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent and dry thoroughly.

(2) Inspect the bowl for cracks. Examine the lip of the bowl for chipped edges. Replace a defective sediment bowl.

(3) Clean the pump head and elbow with compressed air. Clean any clogged passages with a soft wire probe.

(4) Check the pump head, elbow, and bail for cracks, breaks, and worn or damaged threads. Replace any defective parts.

(5) Inspect the screen for tears or clogged mesh. Clean the screen. Replace a defective screen.

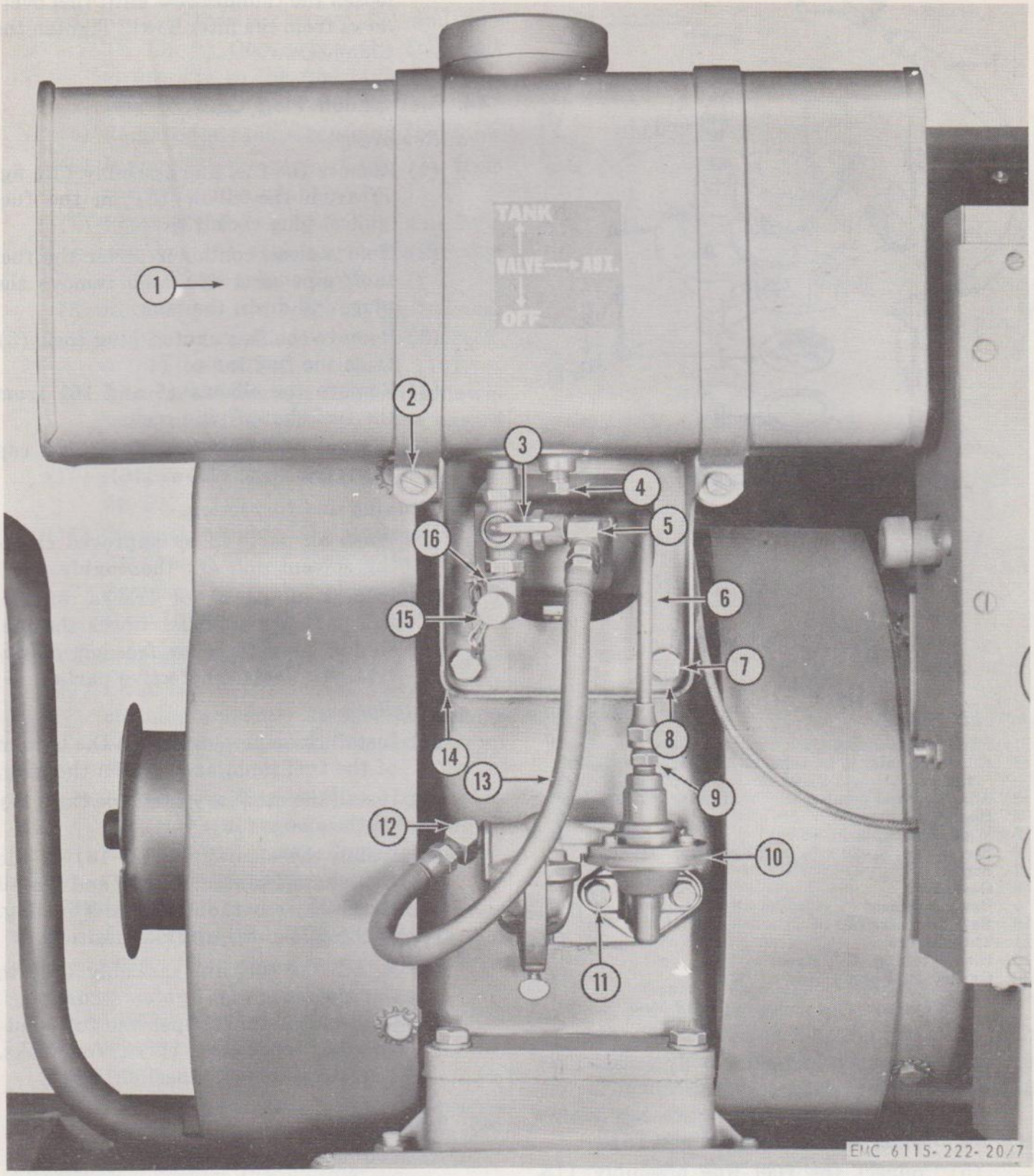
(6) Inspect the fuel pump and gasket for cracks, breaks, and other damage. Replace a defective fuel pump or gasket.

c. Reassembly and Installation.

(1) Install the elbow (12) and the adapter (3) in the threaded outlets in the fuel pump head (4).

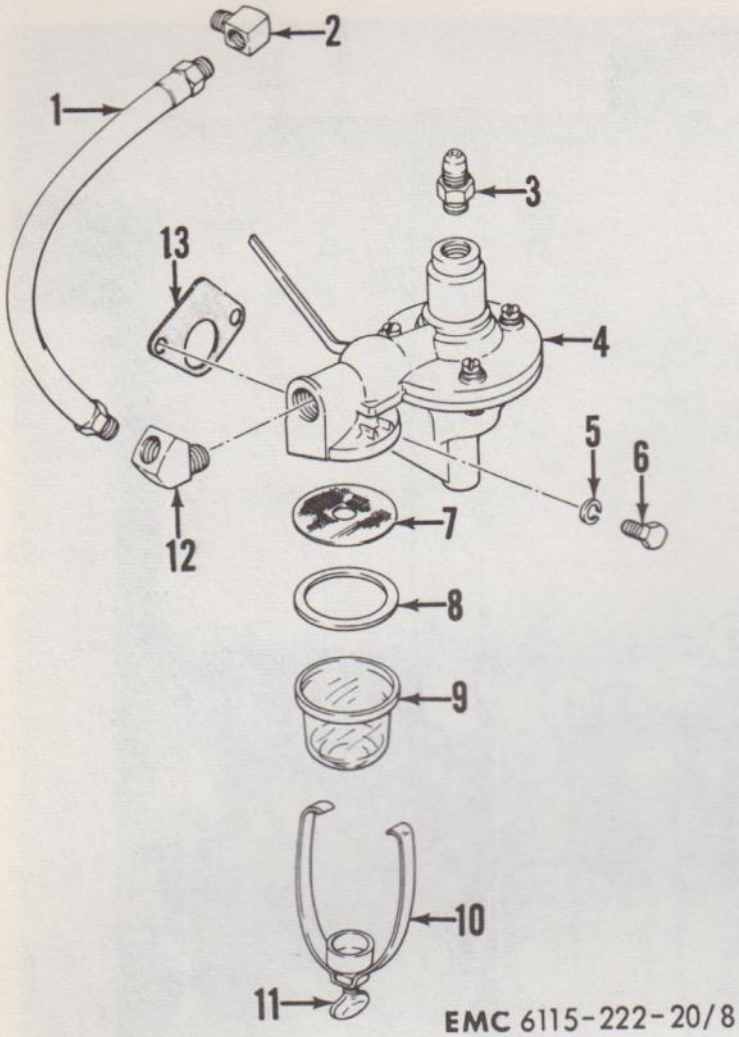
(2) Position the bail (10) on the fuel pump head, and install the screen (7) and gasket (8) in the fuel pump head.

(3) Position the sediment bowl (9) on the fuel pump head and swing the bail under the bowl. Tighten the thumbscrew (11) on the bail to make an airtright seal at the bowl gasket.



1 Fuel tank
2 Screw, machine, ¼–20 x 1½ in. (2 rqr)
3 Fuel shutoff plug cock
4 Pipe plug, fuel tank, ⅛–27
5 Elbow, pipe-to-tube, brass, ¼ in. tube, $\frac{7}{16}$–24 x ⅛–27
6 Carburetor-to-pump pipe
7 Bolt, machine, $\frac{5}{16}$–18 x ¾ in. (2 rqr)
8 Washer, lock, $\frac{5}{16}$ in. (2 rqr)
9 Fuel pump adapter
10 Fuel pump
11 Screw, cap, hex-hd, ¼–20 x ⅝ in. (2 rqr)
12 Elbow, tubing, 45°, street
13 Fuel line assembly
14 Fuel tank bracket
15 Auxiliary fuel pipe cap
16 Pipe-to-tube elbow

Figure 7. Fuel pump, plug cock, and fuel tank, removal points.



1 Fuel line assembly
2 Elbow, female, ¼ in. tube, $\frac{7}{16}$–24 thd; male, ⅛–27 thd
3 Adapter, fuel pump
4 Head, fuel pump
5 Washer, lock, ¼ in. (2 rqr)
6 Screw, cap, ¼–20 x ⅝ in. (2 rqr)
7 Screen
8 Gasket
9 Bowl, sediment
10 Bail, fuel strainer
11 Thumbscrew
12 Elbow, tubing, 45°, street
13 Gasket, fuel pump body

Figure 8. Fuel pump, exploded view.

(4) Mount the fuel pump body gasket (13) and fuel pump (10, fig. 7) on the engine and secure with two cap screws (6, fig. 8) and lockwashers (5).

(5) Connect the fuel line assembly (13, fig. 7) and the carburetor-to-pump pipe (6) to the elbow (12, fig. 8) and adapter (3) and tighten securely.

(6) Open the fuel shutoff plug cock (3, fig. 7). Inspect for leaks and tighten any leaking connections. If air bubbles appear after the unit is reassembled, loosen the thumbscrew until fuel overflows from the filter bowl. Tighten the thumbscrew.

44. Fuel Shutoff Plug Cock

a. Removal.

(1) Remove the fuel line assembly (13, fig. 7) from the elbow (5) on the fuel shutoff plug cock (3).

(2) Hold a clean container under the fuel tank pipe plug (4), and remove the plug, and drain the tank.

(3) Remove the fuel shutoff plug cock (3) from the fuel tank.

(4) Remove the elbows (5 and 16) from the fuel shutoff plug cock.

(5) Remove the auxiliary fuel pipe cap (15) from the elbow (16).

b. Cleaning and Inspection.

(1) Wash all parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect all parts for cracks, breaks, and damaged threads. Check the fuel shutoff plug cock for freedom of operation. Replace defective parts.

c. Installation.

(1) Install the pipe plug (4) in the bottom of the fuel tank, and tighten the plug.

(2) Install the auxiliary fuel pipe cap (15) on the elbow (16).

(3) Install the elbows (5 and 16) in the fuel shutoff plug cock (3) and install the cock on the fuel tank fitting. Tighten it to the original position.

(4) Attach the fuel line assembly (13) to the plug cock and tighten securely.

(5) Fill the fuel tank. Open the fuel shutoff plug cock and check for leaks. Tighten leaking connection.

45. Fuel Tank

a. Removal and Disassembly.

(1) Close the fuel shutoff plug cock (3, fig. 7).

(2) Hold a clean container under the fuel tank pipe plug (4), remove the pipe plug, and drain the fuel tank (1).

(3) Remove the fuel shutoff plug cock (par. 44).

(4) Remove the two screws (2) and nuts (3, fig. 9) that secure the fuel tank straps (2) to the fuel tank (13) and bracket (9).

(5) Remove the tank straps and fuel tank.

(6) Disconnect the pipe (6, fig. 7) from the fuel pump adapter (9).

(7) Remove the two bolts (7) and lockwashers (8) that secure the bracket (14) to the engine block.

(8) Remove the two bolts (2, fig. 10) that secure the upper portion of the bracket (1) to the cylinder head (10).

(9) Remove the bracket by moving downward until the pipe (11) has passed through the hole in the bracket.

(10) Remove the fuel tank filler cap (4, fig. 9).

(11) Spread the ends of the attached retaining chain (6) and remove the chain.

(12) Remove the fuel tank strainer (7) from the fuel tank filler opening.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent. Be sure to remove any gum or varnish deposits from the fuel tank.

(2) Inspect the fuel tank and pipe plug for cracks, dents, or weak spots which might cause leaks. Replace a defective tank or plug.

(3) Inspect all mounting screws and nuts for stripped or damaged threads. Inspect the fuel strainer for cracks, breaks, or other damage.

(4) Inspect the fuel tank cap, tank bracket, and fuel tank straps for cracks, bends, and other damage.

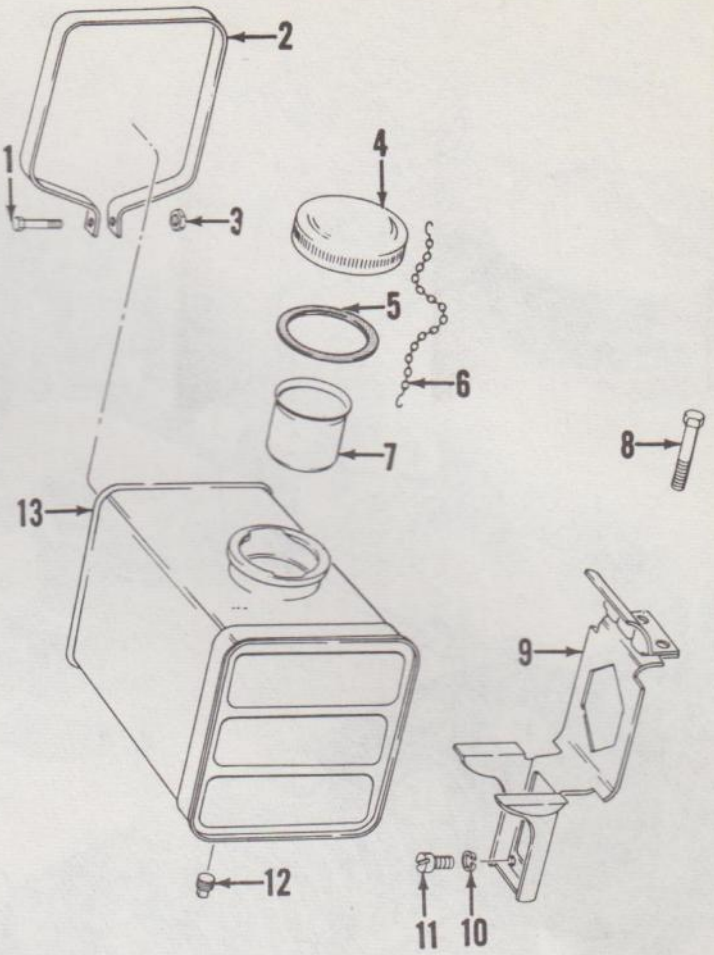
(5) Inspect the gasket for wear, cracks, and breaks. Replace a defective gasket.

c. Reassembly and Installation.

(1) Install the pipe plug (12) in the bottom of the fuel tank (13) and tighten securely.

(2) Position the fuel tank strainer (7) inside the fuel tank filler opening.

(3) Install the fuel cap gasket in the fuel tank filler cap (4).



EMC 6115-222-20/9

1 Screw, machine, ¼–20 x 1½ in. (2 rqr)
2 Strap, fuel tank (2 rqr)
3 Nut, plain, square, ¼–20 (2 rqr)
4 Cap, fuel tank filter
5 Gasket
6 Chain
7 Strainer, fuel tank
8 Bolt, machine, ⅜–18 x 2⅜ in. (2 rqr)
9 Bracket, fuel tank
10 Washer, lock, ⅜ in. (2 rqr)
11 Bolt, machine, ⅜–18 x ¾ in. (2 rqr)
12 Plug, pipe, ⅛–27
13 Tank, fuel

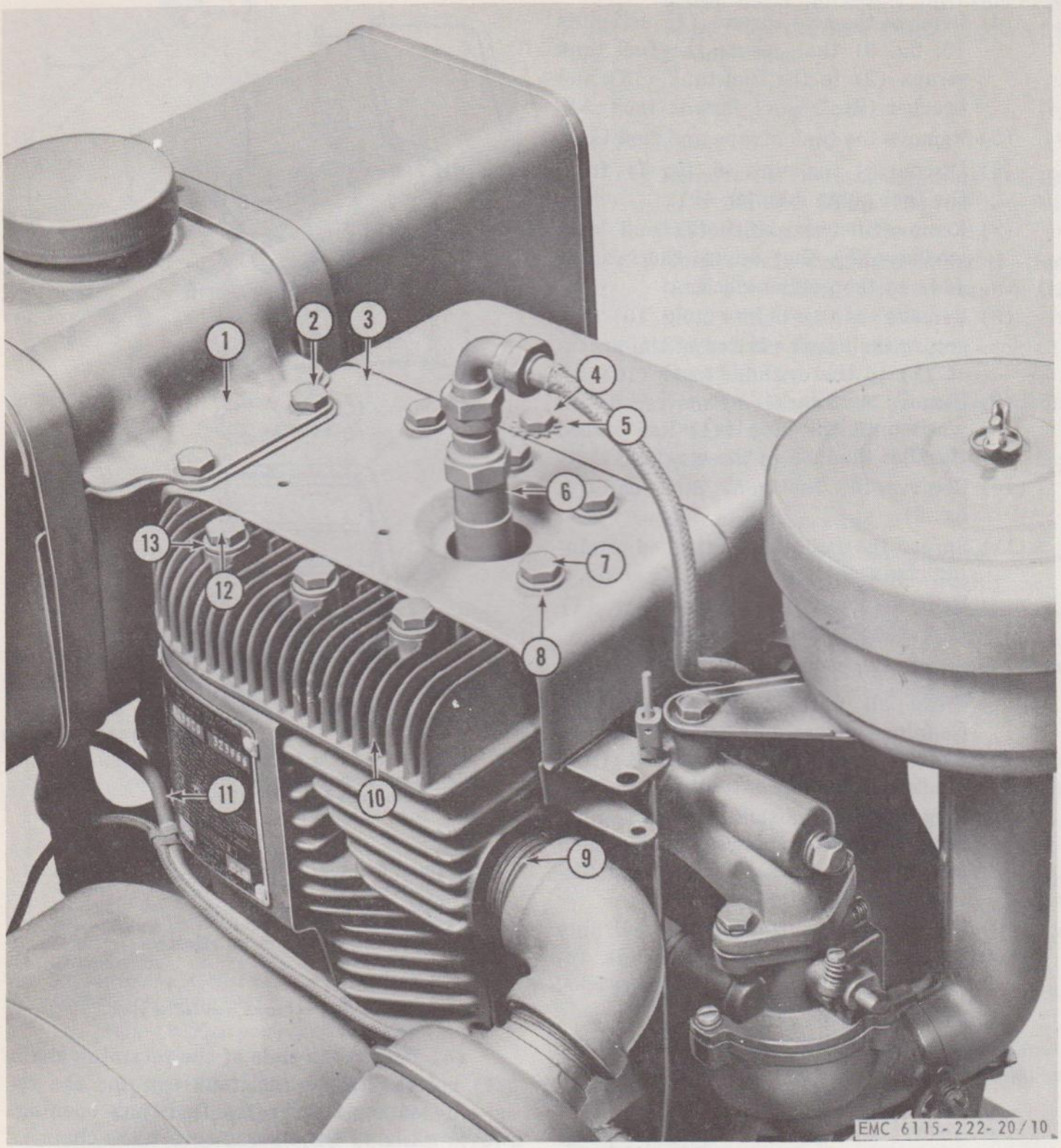
Figure 9. Fuel tank, exploded view.

(4) Fasten the ends of the retaining chain (6) to the fuel tank cap and the retainer ring in the fuel tank opening. Clamp the ends to secure the chain.

(5) Install the fuel tank cap on the fuel tank filler opening.

(6) Position the bracket (9) over the pipe (11, fig. 10) and in mounting position on the cylinder head (10) and against the engine block. Secure the bracket to the cylinder head with the two bolts (2).

(7) Tighten the bolts to a torque of 15 to 17 ft-lb.



1 Fuel tank bracket
2 Bolt, machine, $\frac{5}{16}$–18 x 2⅜ in. (2 rqr)
3 Cylinder head cover
4 Screw, cap, hex, ¼–20 x ½ in. (5 rqr)
5 Washer, lock, IET, ¼ in. (5 rqr)
6 Spark plug
7 Bolt, machine, $\frac{5}{16}$–18 x 2⅜ in. (4 rqr)
8 Washer, flat, $\frac{5}{16}$ in. (4 rqr)
9 Pipe, nipple, 1 x 2 in.
10 Cylinder head
11 Carburetor-to-pump pipe
12 Bolt, machine, $\frac{5}{16}$–18 x 2⅜ in. (3 rqr)
13 Washer, flat, $\frac{5}{16}$ in. (3 rqr)

Figure 10. Cylinder head and fuel tank bracket, removal points.

(8) Secure the bottom of the bracket assembly to the engine block with two bolts (11, fig. 9) and lockwashers (10).

(9) Place the fuel tank (13) in mounting position on the bracket (9).

(10) Install the fuel tank straps (2) over the ends of the fuel tank and bracket. Secure each strap with a screw (1) and nut (3).

(11) Install the fuel shutoff plug cock (par. 44).

(12) Connect the pipe (6, fig. 7) to the adapter (9) on the fuel pump (10).

(13) Fill the fuel tank (TM 5–6115–222–10). Open the shutoff plug cock and inspect all connections for leaks.

46. Air Cleaner

a. General. The air cleaner is an oil-bath air filter. In operation, air is drawn in under a lip near the top of the cover, and down to the oil level in the bowl where any dirt or moisture present is deposited. Air then passes through the filter element, down through the air cleaner pipe, and into the carburetor.

b. Removal and Disassembly.

(1) Remove the wingnut (1, fig. 11) and lift the air cleaner cover and filter (15) and bowl (13) up over the stud (2). Avoil spilling oil from the bowl.

(2) Separate the cover and filter from the bowl and remove the filter-to-bowl gasket (14). Empty the oil from the bowl.

(3) Remove the cork mounting washer (12).

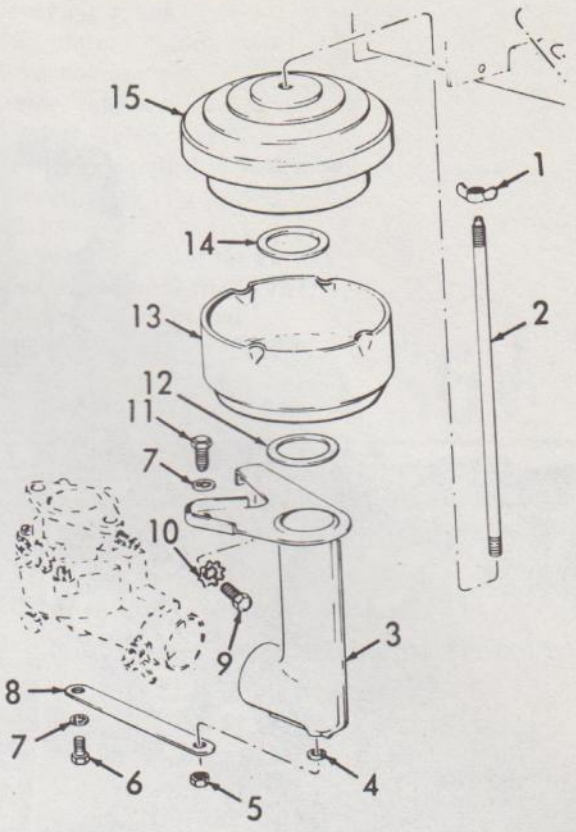
(4) Remove the nut (5) that secures the stud (2) to the strap (8). Remove the stud and gasket (4) from the strap and the pipe (3).

(5) Remove the screw (6) and lockwasher (7) that secure the strap (8) to the carburetor. Remove the strap.

(6) Remove the screws (9 and 11) and lockwashers (7 and 10) that secure the pipe to the manifold and blowers housing, and remove the pipe.

c. Cleaning, Inspection, and Repair.

(1) Clean all parts in an approved cleaning solvent and dry thoroughly. Shake the cover and filter to remove excess solvent, so the engine will not be flooded on starting.



EMC 6115-212-20/8

1 Nut, plain, wing, ¼–20
2 Stud, plain, special
3 Pipe, air cleaner
4 Gasket
5 Nut, plain, hex, ¼–28
6 Screw, cap, hex-hd, ¼–20 x ⅜ in.
7 Washer, lock, ¼ in. (2 rqr)
8 Strap
9 Screw, cap, hex-hd, ¼–20 x ½ in.
10 Washer, lock, IET, ¼ in.
11 Screw, cap, hex-hd, ¼–28 x ⅝ in.
12 Washer, nonmetallic, cork, ⅛ in. thk
13 Bowl
14 Gasket
15 Cover and filter

Figure 11. Air cleaner, exploded view.

(2) Inspect the pipe, strap, bowl, cover, and filter for dents, bends, and breaks. Repair or replace defective parts.

(3) Inspect all threaded parts for stripped or damaged threads. Replace defective parts.

(4) Inspect the gasket and washer for tears and breaks. Replace a defective gasket or washer.

d. Reassembly and Installation.

(1) Place the air cleaner pipe (3) in position and secure with the screw (11)

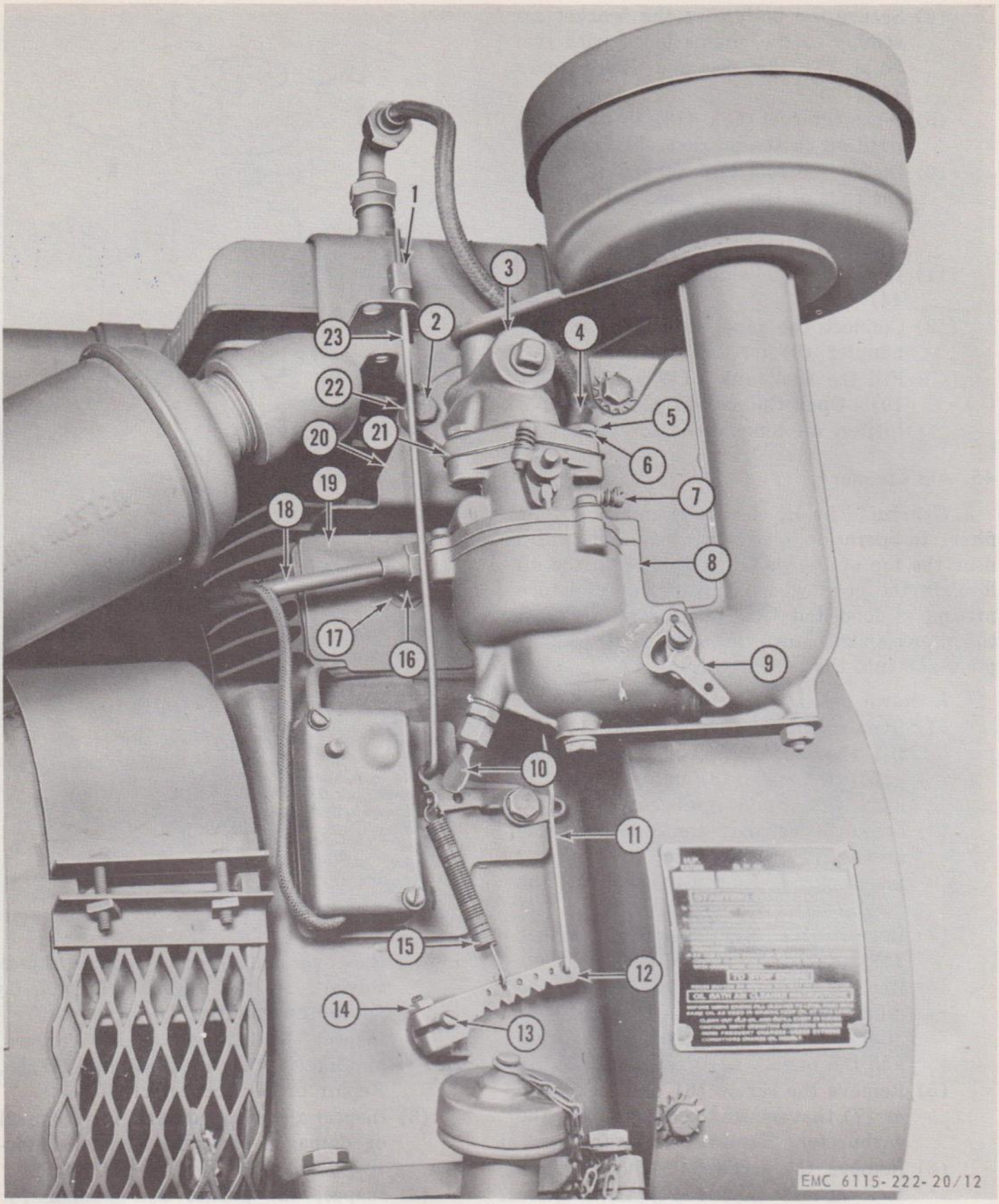


Figure 12. Carburetor and governor conirol linkage, removal points.

1 Governor adjusting nut
2 Screw, cap, hex-hd, ¼–20 x ¾ (2 rqr)
3 Intake manifold elbow
4 Clamp, spark plug cable assembly
5 Screw, cap, hex-hd, ¼–20 x ¾ in. (2 rqr)
6 Washer, lock, ¼ in. (2 rqr)
7 Idle valve
8 Carburetor
9 Choke shaft lever
10 Globe valve
11 Throttle link
12 Governor control lever
13 Governor crank
14 Nut, plain, hex, No. 10–24
15 Governor spring
16 Screw, cap, ¼–20 x 2¼ in.
17 Washer, valve cover
18 Pump-to-carburetor fuel pipe
19 Valve cover
20 Air guide
21 Carburetor mounting gasket
22 Washer, lock, ¼ in. (2 rqr)
23 Governor control rod
24 Screw, cap, hex-hd, ¼–20

Figure 12—Continued.

and lockwasher (7). Secure to the blower housing with the screw (9) and lockwasher (10).

(2) Install the gasket (4) over the end of the stud (2).

(3) Install the gasket and stud on the strap (8), and secure with the nut (5). Install the stud through the pipe (3).

(4) Secure the strap to the carburetor with the screw (6) and lockwasher (7).

(5) Place the cork mounting washer (12) over the stud (2).

(6) Place the bowl (13) in position over the mounting washer (12) and install the filter-to-bowl gasket (14) on the bowl.

(7) Fill the bowl to the proper level as specified in the current lubrication order.

(8) Install the cover and filter (15) and secure with the wingnut (1).

47. Carburetor

a. General. The carburetor (8, fig. 12) controls the fuel-air mixture delivered to the engine and is mounted on the carburetor intake manifold elbow (3).

b. Removal.

(1) Close the fuel shutoff plug cock (3, fig. 7).

(2) Disconnect the fuel pipe (18, fig. 12) from the carburetor (8).

(3) Remove the air cleaner (par. 46).

(4) Remove the two screws (5) and lockwashers (6) that secure the carburetor (8) to the carburetor intake manifold elbow (3).

(5) Hold the carburetor and unhook the throttle link (11) from the throttle shaft on the carburetor. Remove the carburetor and gasket (21).

(6) Unhook the throttle link from the governor control lever (12).

c. Cleaning and Inspection.

(1) Clean the throttle link and the outside of the carburetor with an approved cleaning solvent.

(2) Inspect the carburetor for secure mounting of upper and lower body sections. Inspect the body castings for cracks.

(3) Inspect the throttle shaft and the choke shaft lever for looseness or excessive play. Replace a defective carburetor.

(4) Inspect the throttle link for bends or damage. Straighten or replace a damaged link.

(5) Inspect gasket for tears and breaks. Replace a defective gasket.

d. Installation.

(1) Hook the throttle link (11) in the outside hole of the governor control lever (12) and into the throttle shaft of the carburetor.

(2) Place the gasket (21) in position on the carburetor mounting flange, and place the carburetor (8) in position on the carburetor intake manifold elbow (3). Secure with the two cap screws (5) and lockwashers (6). Tighten each cap screw equally, a little at a time, until both are tight.

(3) Install the air cleaner (par. 46).

(4) Connect the fuel pipe (18) to the carburetor and tighten securely.
(5) Open the fuel shutoff plug cock (3, fig. 7).

e. Adjustment.

(1) Close the carburetor high-speed globe valve (10, fig. 12) by turning it in a clockwise direction as far as possible.

***Caution:* Do not use force when closing the valve or the valve will be damaged.**

(2) From the closed position, open the high-speed globe valve 1 to 1¼ turns.
(3) Close the idle valve (7) by turning it in a clockwise direction as far as possible, but do not force the screw against the seat or damage will result.
(4) From the closed position, open the idle valve about ½ to ¾ of one-full turn.
(5) Start the engine and make a final adjustment after the engine has warmed to normal operating temperature. With the choke shaft lever (9) in the wide open position, turn the high-speed globe valve (10) in until the engine misses, then turn the valve out past the smooth operating point until the engine runs unevenly. Turn the high-speed globe valve in until the engine runs smoothly. If it is necessary to keep the choke shaft lever partially closed for several minutes before the engine runs smoothly, the carburetor setting is too lean, and the high-speed globe valve must be opened slightly by turning it counterclockwise.

48. Carburetor Intake Elbow and Air Guide

a. Removal.

(1) Remove the carburetor (par. 47).
(2) Remove the governor adjusting nut (1, fig. 12) from the governor control rod (23). Remove the control rod.
(3) Remove the two screws (2), lockwashers (22), and clamp (4).
(4) Remove the carburetor intake manifold elbow (3) and gasket.
(5) Remove the air guide and gasket.

b. Cleaning and Inspection.

(1) Clean the elbow and the air guide in an approved cleaning solvent and dry thoroughly.
(2) Inspect the elbow and the air guide for cracks and breaks. Replace a defective elbow or air guide.
(3) Inspect the gaskets for wear and breaks. Replace a defective gasket.

c. Installation.

(1) Place the air guide gasket and the air guide (20) in mounting position.
(2) Position the manifold elbow (3) and gasket on the air guide (20).
(3) Secure the manifold elbow and clamp (4) and air guide to the engine block with two cap screws (2) and lockwashers (22). Tighten each screw equally, a little at a time, until both are tight.
(4) Install the governor control rod (23) through the top air guide flange and in the right side hole and install the governor adjusting nut (1) on the control rod.
(5) Install the carburetor (par. 47).

49. Governor Adjustment

a. General. The engine speed is controlled by the engine governor. A tachometer must be used to set the correct engine speed.

b. Adjustment.

(1) Adjust the governor control lever (12, fig. 12) by loosening the hex nut (14) on the bolt that secures the governor lever to the governor crank (13).
(2) Turn the governor control crank (12) clockwise, until the throttle is in the full open position.
(3) Turn the governor crank countercockwise, until it strikes a "stop" inside the crankcase.
(4) With the throttle and shaft held in open position, tighten the hex nut on the bolt securing the governor control lever (12).

Note. Do not adjust the governor control lever unless it becomes loose.

(5) Attach a tachometer to the engine according to instructions included with the tachometer.
(6) Start the engine (TM 5–6115–222–10).

(7) Adjust the governor until a reading of 2400 rpm is obtained on the tachometer for the model JHGV2B and 2100 rpm for the model JHGV2B.

(8) To increase the engine speed, turn the adjusting unt (1) clockwise. If the correct setting cannot be obtained on the tachometer, move the governor spring (15) farther away from the governor crank (13).

(9) To decrease the engine speed, turn the adjusting nut (1) clockwise. If the the correct setting cannot be obtained on the tachometer, move the governor spring (15) closer to the governor crank (13).

(10) Adjust the carburetor (par. 47).

(11) If the engine speed is not steady after the carburetor has been adjusted, move the spring (15) farther away from the governor crank (13).

(12) Stop the engine (TM 5–6115–222–10).

(13) Remove the tachometer.

Section VI. COOLING AND EXHAUST SYSTEMS

50. General

The cooling system consists of a blower which is an integral part of the flywheel, and a blower housing (5, fig. 13) which directs a stream of air over the cooling fins on the engine block and the cylinder head. The exhaust system consists of a pipe nipple (9, fig. 10), pipe elbow (2, fig. 13), muffler (1), and pipe elbow (13). The muffler is mounted on the pipe elbow and serves the primary purpose of reducing engine exhaust noise.

51. Blower Housing

a. Removal.

(1) Remove the starter pulley (par. 62).

(2) Remove the screw (3, fig. 13) and lockwasher (4) that secure the air cleaner pipe and bracket to the blower housing (5).

(3) Remove the screw (4, fig. 10) and lockwasher (5) that secure the blower housing to the cylinder head cover (3).

(4) Remove the four screws (6, fig. 13) and lockwashers (7) that secure the blower housing to the internal back plate and air guide. Remove the blower housing.

Caution: **Never operate the generator set if the blower housing or cylinder head cover has been removed; improper air-cooling may cause severe overheating and consequent damage to the engine.**

b. Cleaning, Inspection, and Repair.

(1) Clean the blower housing in an approved cleaning solvent to remove all dirt and grease, and dry thoroughly.

(2) Inspect the blower housing for dents and breaks. Replace if defective beyond repair. Remove any loose paint, and repaint as instructed in TM 9–2851.

c. Installation.

(1) Position the blower housing (5) in position on the cylinder head cover (3, fig. 10) and back plate. Secure the housing with four screws (6, fig. 13) and lockwashers (7), and install the screw (4, fig. 10) and lockwasher (5) on the cylinder head cover.

(2) Install the screw (3, fig. 13) and lockwasher (4) through the air cleaner pipe and bracket mounting hole, and secure to blower housing.

(3) Install the starter puller (par. 62).

52. Flywheel

a. Removal.

(1) Remove the blower housing (par. 51).

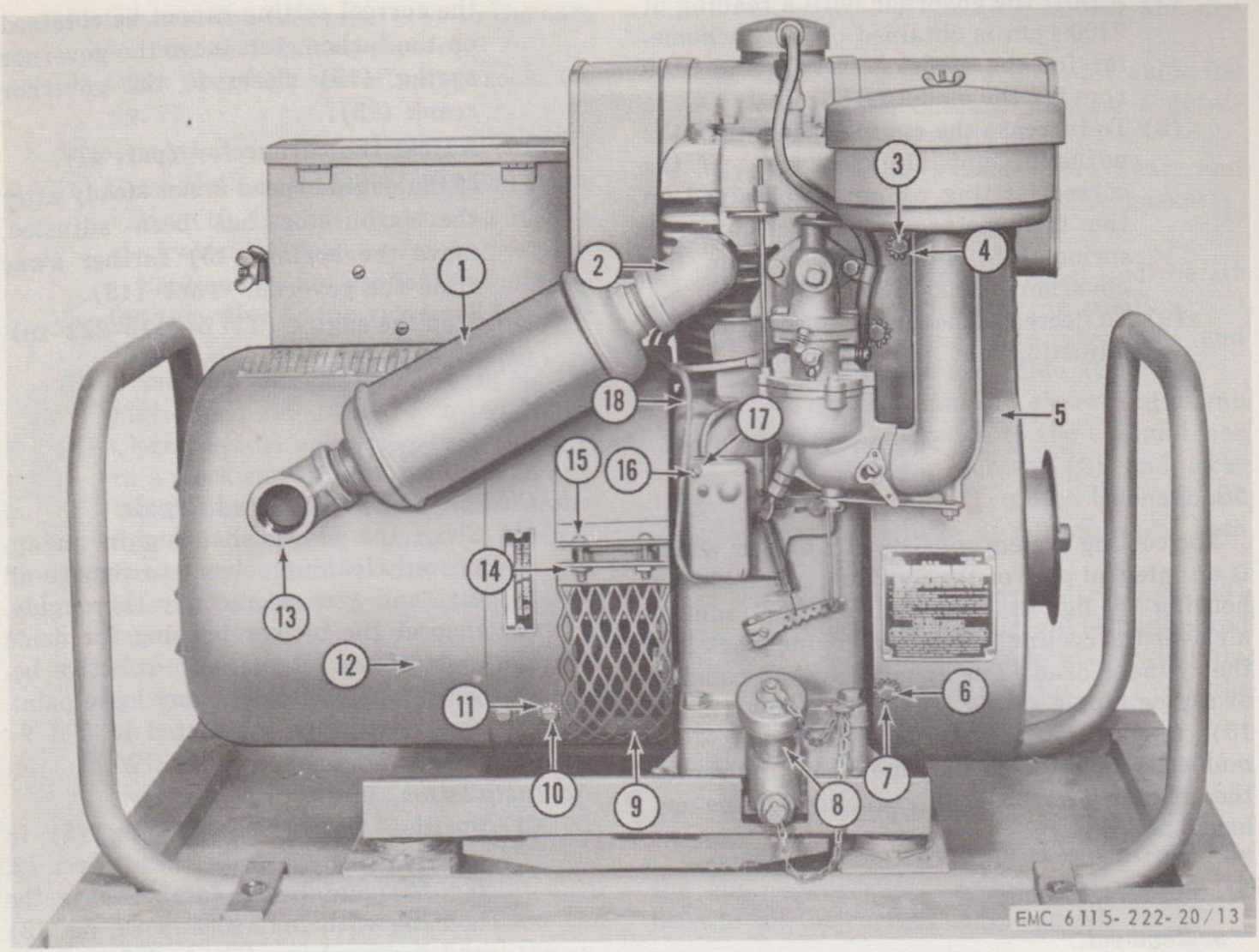
(2) Place the wooden block (5, fig. 14) under a fin on the flywheel (1) to hold the flywheel in place.

(3) Remove the flywheel nut (4). Take care not to damage the starter pin (2) on the flywheel.

(4) Remove the flywheel by use of a suitable puller.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent and dry thoroughly.



1 Muffler
2 Elbow, pipe, 1–11 x ½ thd
3 Screw, cap, hex-hd, ¼–20 x ½ in.
4 Washer, lock, ¼ in., IET
5 Blower housing
6 Screw, cap, hex-hd, ¼–20 x ½ in. (4 rqr)
7 Washer, lock, ¼ in., IET (4 rqr)
8 Oil filler neck
9 Generator ventilating cover
10 Screw, cap, 10–32 x ⅜ (3 rqr)
11 Washer, lock, IET, No. 10 (2 rqr)
12 Generator stator cover
13 Elbow, pipe, 1–11 x ½ thd
14 Nut, 10–24 (2 rqr)
15 Screw, machine, 10–24 x 1 in. (2 rqr)
16 Screw, machine, 8–32 x ⅜ (2 rqr)
17 Washer, lock, No. 8 (2 rqr)
18 Stop switch cable assembly

Figure 13. Generator set, right side view, removal points.

(2) Inspect the flywheel and bore for cracks, nicks, or other flaws. Check the nut for worn or damaged threads. Replace a defective flywheel or nut.

c. Installation.

(1) Install the flywheel (1, fig. 15) on the crankshaft (3, fig. 14) with the starter pin (3, fig. 15) in the 10:30 o'clock position to establish the original cranking position of the starter pulley. This flywheel position may be changed when a different cranking position is desirable.

(2) Install and tighten the flywheel nut (4, fig. 14), fingertight, then lock the flywheel with the wooden block (2, fig. 15) and tighten the nut securely.

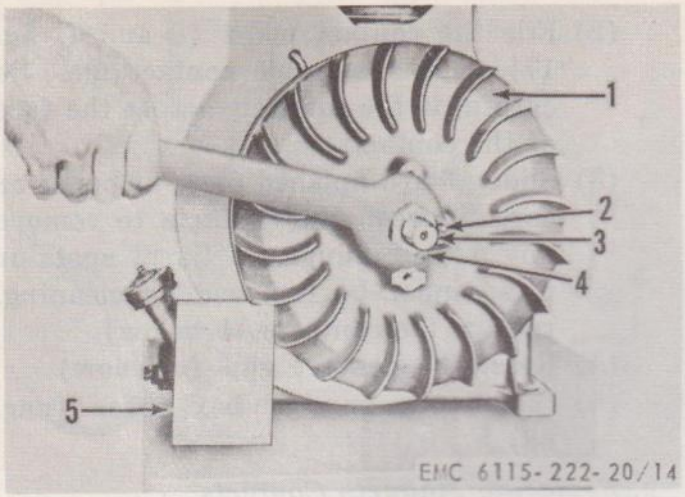
(3) Install the blower housing (par. 51).

53. Muffler

a. Removal.

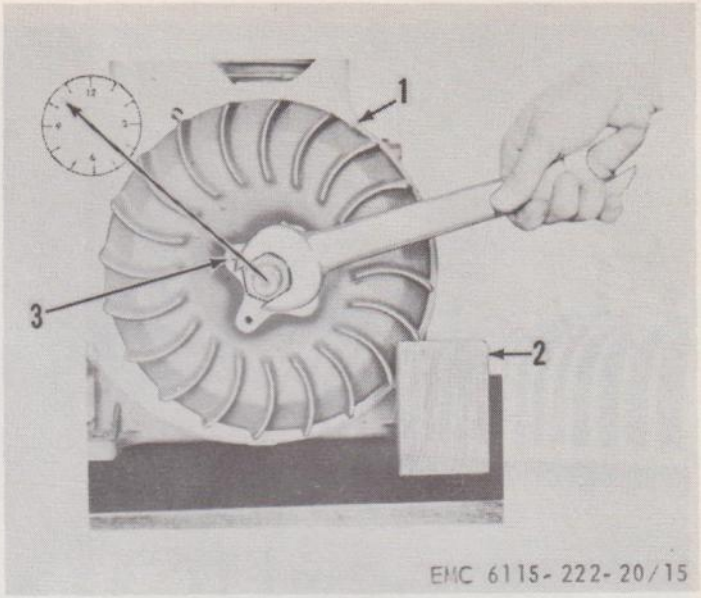
(1) Remove the muffler (1, fig. 13) from the pipe elbow (2).

(2) Remove the pipe elbow from the pipe nipple (9, fig. 10) and remove the pipe nipple from the engine block exhaust hole.



1 Flywheel
2 Starter pin
3 Crankshaft
4 Flywheel nut
5 Wooden block

Figure 14. Flywheel removal.



1 Flywheel 2 Wooden block 3 Starter pin

Figure 15. Flywheel installation.

(3) Remove the pipe elbow (13, fig. 13) from the muffler.

b. Cleaning and Inspection.

(1) Clean all parts with an approved cleaning solvent and dry thoroughly.

(2) Inspect the muffler for holes, cracks, and excessive rust. Inspect the nipple and elbows for stripped or damaged threads. Replace a defective muffler, nipple or elbow.

c. Installation.

(1) Install the pipe elbow (13) on the muffler (1).

(2) Install the pipe nipple (9, fig. 10) in the engine block exhaust hole and install the pipe elbow (2, fig. 13) on the pipe nipple.

(3) Install the muffler on the pipe elbow.

Section VII. IGNITION SYSTEM

54. General

The ignition system provides a properly timed spark to ignite fuel-air mixture in the combustion chamber of the engine. The current for the ignition is produced by a magneto composed of an armature, coil, and rotor. The timing of this current for the spark plug is controlled by a breaker box containing a breaker contact set and a capacitor. The breaker box cover contains a pushbutton switch for stopping the engine.

55. Testing Ignition for Spark

a. Unscrew the electrical connector shield nut (4, fig. 16) from the spark plug (1), and remove the ignition cable assembly (5) from the spark plug.

b. Hold the terminal spring (2) of the ignition cable assembly (5) ⅛ inch from any metal part of the engine. Rotate the crankshaft with the starter rope (TM 5–6115–222–10). If a spark jumps the ⅛ inch gap, the ignition system of the spark plug is operative.

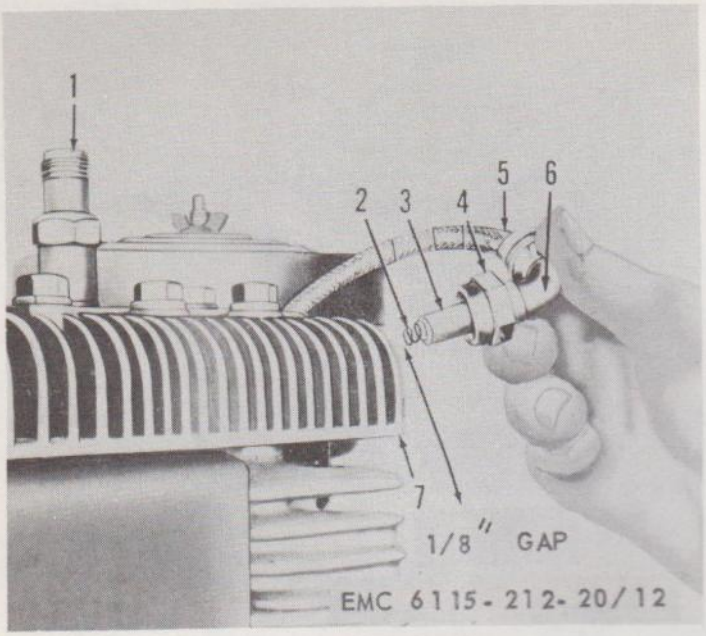
c. If no spark occurs, remove the breaker box cover (par. 58). Inspect all components, including the ignition cable assembly, for loose connections or short circuits. Check the gap of the magneto contacts (par. 56). Test the capacitor (9, fig. 17) with a capacitor tester.

d. After the proper spark has been obtained, attach the ignition cable assembly (5, fig. 16) to the spark plug, and secure with the electrical connector shield nut (4).

56. Magneto Contact Set

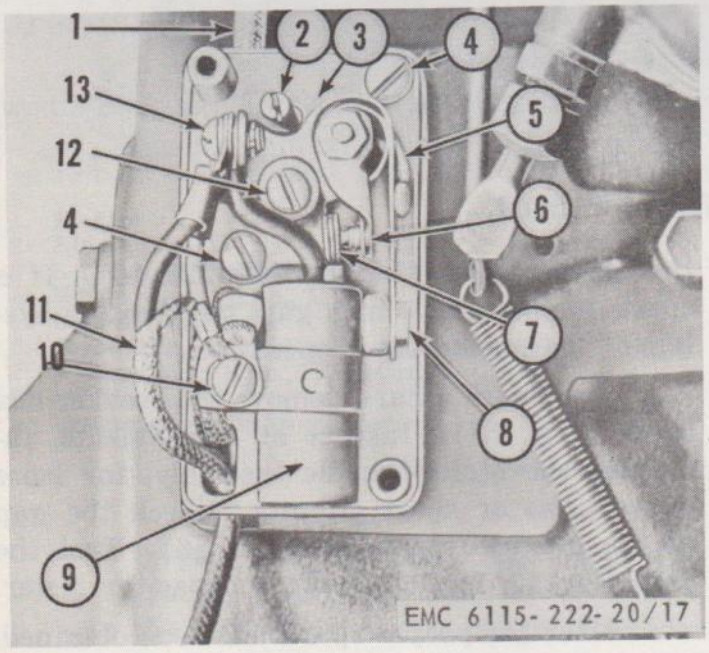
a. Cleaning. The magneto contacts may be cleaned without being removed from the breaker box. Clean the contacts as follows:

(1) Remove the breaker box cover (par. 58).



1 Spark plug
2 Terminal spring
3 Terminal
4 Electrical connector shield nut
5 Ignition cable assembly
6 Electrical connector shield nut
7 Cylinder head

Figure 16. Checking ignition spark.



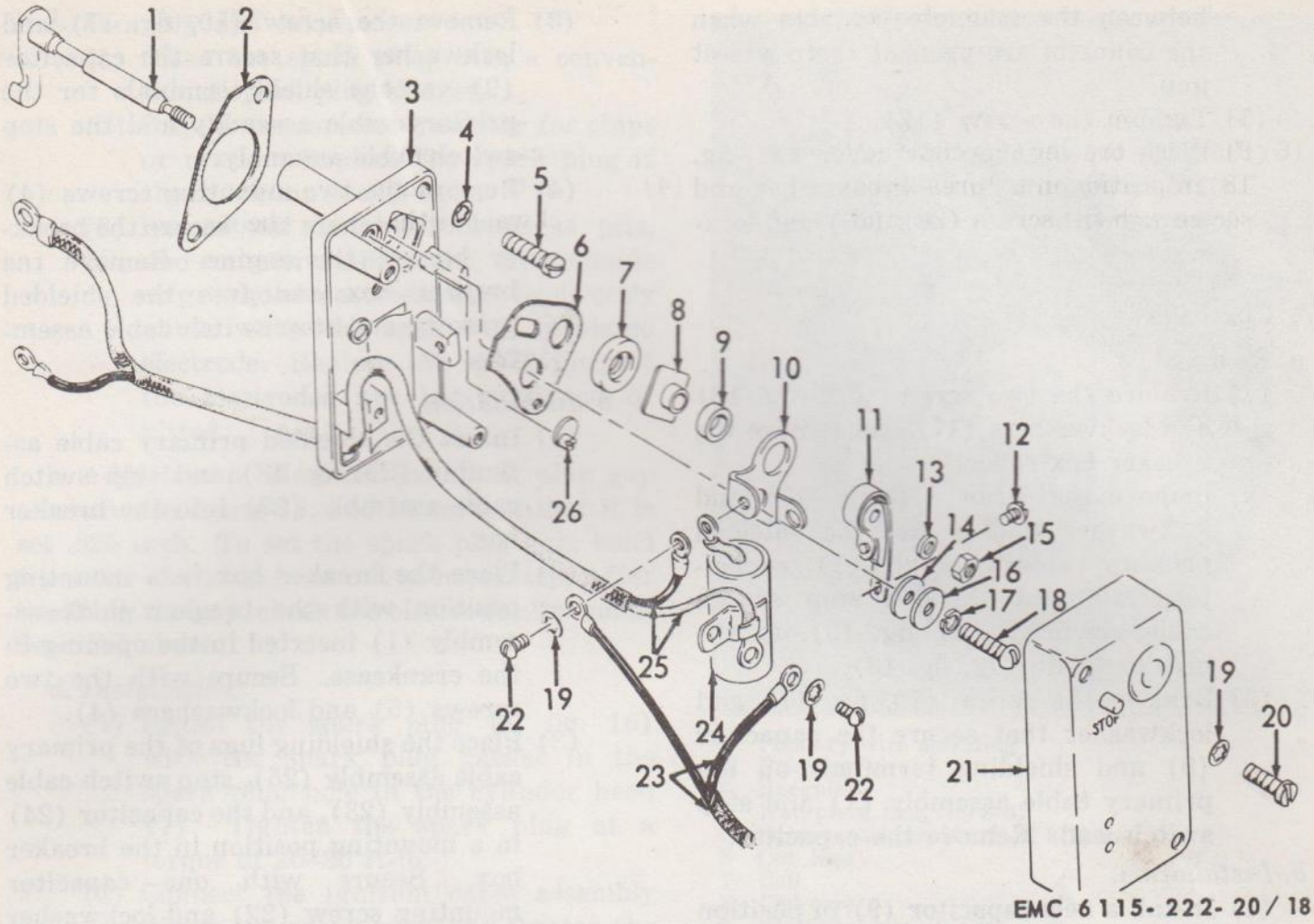
1 Primary cable assembly
2 Distributor cam
3 Plate insulator
4 Screw, machine, No. 10–24 x 5/8 in. (2 rqr)
5 Contact spring
6 Contact point and spring
7 Contact point and plate
8 Screw, machine, No. 8–32 x 3/16 in.
9 Capacitor
10 Screw, machine, No. 8–32 x 5/16 in.
11 Remote stop switch ground wire assembly
12 Screw, machine, No. 8–32 x 5/8 in.
13 Screw, machine, No. 8–32 x 1/16 in.

Figure 17. Breaker box assembly, with cover removed.

(2) File the contact point (6 and 7, fig. 17) with a suitable contact file. Be careful to file squarely across the face of the contacts.
(3) Slide a hard finished piece of paper or card between the contacts to remove any dirt or filings. If burnt spots or pits cannot be removed by cleaning, replace the contacts (*b* below).
(4) Reset the contact gap (*c* below).
(5) Install the breaker box cover (par. 58).

b. Replacing Magneto Contacts.

(1) Remove the breaker box (par. 58).
(2) Rotate the crankshaft with the manual starting rope until the contacts are at their widest gap.
(3) Remove the screw (13), lockwasher, and screw (8).
(4) Loosen the nut (15, fig. 18) on the breaker shaft assembly (1) until the top of the nut is flush with the threaded end of the shaft. Tap the nut lightly to free the breaker contacts.
(5) Remove the breaker shaft nut (15), lockwasher (13), and contact point and spring (6, fig. 17).
(6) Remove the screw (18, fig. 18), lockwasher (17), breaker plate washer (16), insulating washer (14), and remove the breaker plate (10).
(7) Place a new breaker plate (10) on top of the insulator plate (6). Be sure the dowel in the breaker plate engages the hole in the plate insulator.
(8) Install the breaker plate screw (18), lockwasher (17), breaker plate washer (16), and insulating washer (14). Tighten enough to put a slight tension on the insulator.
(9) Turn the distributor cam (eccentric) (2, fig. 17) so that the left edge of the plate insulator is parallel to the edge of the breaker box. This adjustment positions the breaker plate for proper setting of the contact gap.
(10) Turn the breaker shaft assembly (1, fig. 18) in a clockwise direction as far as possible. Place a new magneto contact (11), lockwasher (13), and



1 Breaker shaft assembly
2 Gasket, breaker box
3 Body, breaker box
4 Washer, lock, IT, No. 10 (2 rqr)
5 Screw, breaker box mounting (2 rqr)
6 Plate, insulator
7 Seal, oil
8 Bushing, oil seal
9 Bushing, breaker plate pivot
10 Plate, breaker
11 Contact, magneto
12 Screw, mach, rd-hd, No. 8–32 x 3/16 in.
13 Washer, lock, No. 6
14 Washer, breaker plate insulating
15 Nut, breaker shaft, No. 6–32
16 Washer, flat, breaker plate
17 Washer, lock, No. 8
18 Screw, mach, rd-hd, No. 8–32 x 5/8 in.
19 Washer, lock, IT, No. 8 (4 rqr)
20 Screw, mach, fil-hd, No. 8–32 x 3/8 in. (2 rqr)
21 Cover, breaker box
22 Screw, mach, fil-hd, No. 8–32 x 1/16 in.
23 Cable assembly, stop switch
24 Capacitor
25 Cable assembly, primary
26 Cam, distributor

Figure 18. Breaker box, exploded view.

breaker shaft nut (15) on the shaft assembly. Tighten the nut securely.

(11) Install one screw (12) securing the magneto contact spring, and one screw (22) and lockwasher (19) securing the cable assemblies (23 and 25) and the capacitor lead to the magneto contact.

(12) Adjust the magneto contacts (*c* below).

(13) Install the breaker box cover (par. 58).

c. Setting the Magneto Contact Gap.

(1) Remove the two screws (16, fig. 13) and lockwashers (17), and remove the breaker box cover.

(2) Rotate the crankshaft with the manual starting rope until the contacts are opened to their widest gap.

(3) Loosen the screw (12, fig. 17).

(4) Turn the distributor cam (eccentric) (2) until a 0.020 inch gap exists between the magneto contacts. A 0.020 inch feeler gage must make a snug fit

between the magneto contacts when the contacts are open at their widest gap.

(5) Tighten the screw (12).

(6) Place the breaker box cover (21, fig. 18) in position on the breaker box and secure with two screws (20) and lockwashers (19).

57. Capacitor

a. Removal.

(1) Remove the two screws (16, fig. 13) and lockwashers (17) and remove the breaker box cover.

(2) Remove the screw (13, fig. 17) and lockwasher that secure the shielded primary cable assembly (1), capacitor lead, and shielded stop switch cable assembly (18, fig. 13), to the breaker plate (10, fig. 18).

(3) Remove the screw (10, fig. 17) and lockwasher that secure the capacitor (9) and shielding terminals on the primary cable assembly (1) and stop switch lead. Remove the capacitor.

b. Installation.

(1) Install a new capacitor (9) in position in the breaker box. Secure the capacitor and shield terminals for the primary cable assembly (1), and the stop switch cable assembly with the screw (10) and lockwasher.

(2) Attach the capacitor lead, stop switch cable assembly, and primary cable assembly (1) to the breaker plate terminal, and secure with the screw (13) and lockwasher.

(3) Install the breaker box cover (21, fig. 18) on the breaker box, and secure with the two screws (20) and lockwashers (19).

58. Breaker Box

a. Removal.

(1) Remove the two screws (16, fig. 13) and lockwashers (17) and remove the breaker box cover.

(2) Remove the terminal screw (13, fig. 17) and lockwasher that secure the primary cable assembly (1), capacitor lead, and stop switch cable assembly (18, fig. 13).

(3) Remove the screw (10, fig. 17) and lockwasher that secure the capacitor (9) and the shield terminals for the primary cable assembly and the stop switch cable assembly.

(4) Remove the two mounting screws (4) and lockwashers that secure the breaker box to the engine. Remove the breaker box and free the shielded primary and stop switch cable assembly.

b. Installation.

(1) Insert the shielded primary cable assembly (25, fig. 18) and stop switch cable assembly (23) into the breaker box.

(2) Place the breaker box in a mounting position with the breaker shaft assembly (1) inserted in the opening in the crankcase. Secure with the two screws (5) and lockwashers (4).

(3) Place the shielding lugs of the primary cable assembly (25), stop switch cable assembly (23), and the capacitor (24) in a mounting position in the breaker box. Secure with one capacitor mounting screw (22) and lockwasher (19).

(4) Place the capacitor lead, stop switch cable assembly lead, and the lead of the primary cable assembly in position on the terminal of the breaker plate (10), and secure with the other screw (22) and lockwasher (19).

(5) Adjust the magneto contacts (par. 56).

(6) Install the breaker box cover (21) and secure with the two screws (20) and lockwashers (19).

59. Spark Plug

a. Removal.

(1) Remove all dirt and other foreign matter from the area around the spark plug (6, fig. 10).

(2) Disconnect the connector shield nut (4, fig. 16) from the spark plug (1), and remove the ignition cable assembly (5).

(3) Remove the spark plug with the spark plug gasket from the cylinder head (7).

b. Cleaning and Inspection.

(1) Clean the spark plug with a conventional spark plug cleaner.

(2) Inspect the ceramic insulator for chips or cracks. Replace the spark plug if the insulator is defective.

(3) Inspect the electrodes for burns, pits, and corrective alinement. The outside or grounded electrode must be directly alined with the inside or insulated electrode. Replace the spark plug, if the electrodes are badly burned or pitted.

c. Adjustment. Measure the spark plug gap as shown in figure 19, and be certain that it is set .025 inch. To set the spark plug gap, bend the outer electrode in or out as necessary. After resetting the gap, check the electrode alinement. See *b* (3) above.

d. Installation.

(1) Install the spark plug (1, fig. 16) with the spark plug gasket in the spark plug hole in the cylinder head (7). Tighten the spark plug at a torque of 20–25 ft-lb.

(2) Connect the ignition cable assembly (5) to the spark plug, and tighten the connector shield nut (4).

60. Magneto and Ignition Cable

a. Removal.

(1) Remove the blower housing and flywheel (pars. 51 and 52).

(2) Remove the hex nut (4, fig. 20) that secures the breaker box primary wire (2) and the coil lead (6) to the screw (5) on the backplate (3). Remove the primary wires from the terminal screw.

(3) Remove the screw (8, fig. 21) that secures the coil ground wires to the armature and support (18, fig. 20).

(4) Remove the nut (25) and two lockwashers (26) that secure the breaker

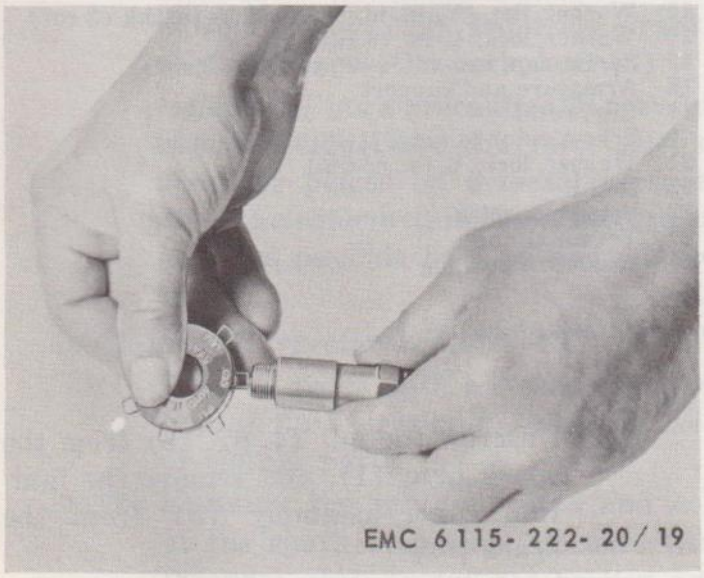
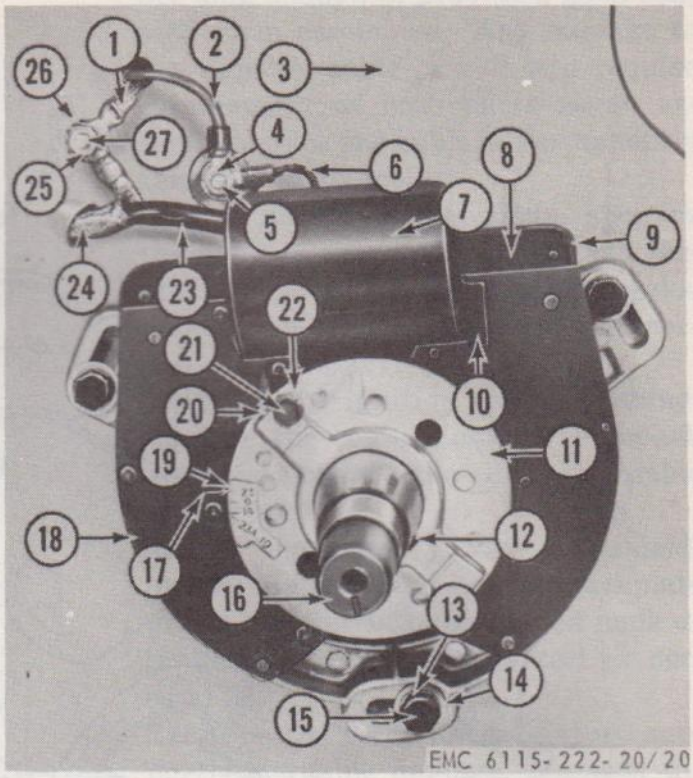
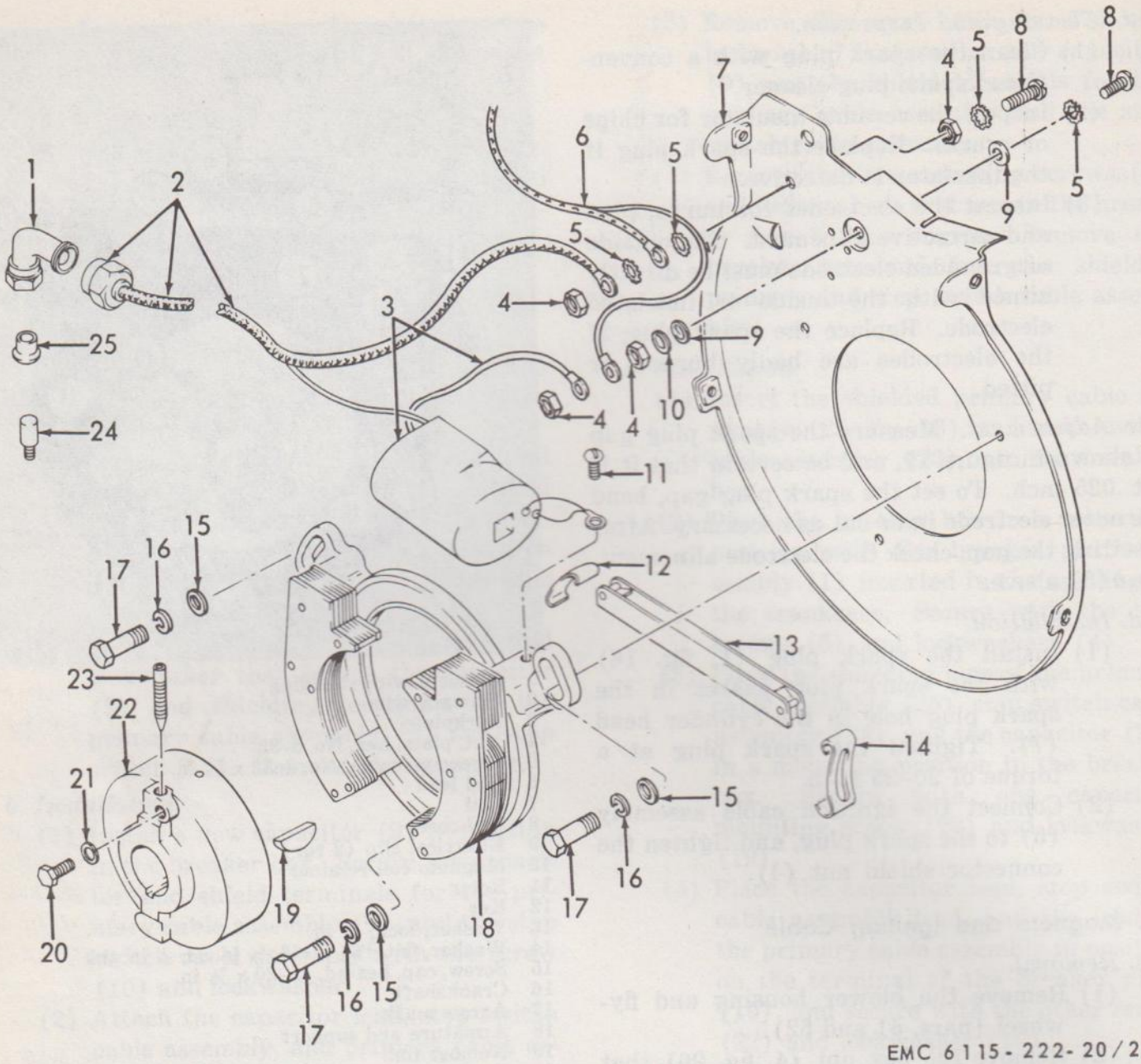


Figure 19. Setting spark plug gap.



1 Primary wire shielding
2 Primary wire
3 Backplate
4 Nut, plain, hex, No. 8–32
5 Screw, machine, No. 8–32 x 5/8 in.
6 Coil lead
7 Coil
8 Coil core
9 Electrical clip (2 rqr)
10 Magneto coil retainer
11 Rotor
12 Key
13 Washer, lock, 1/4 in.
14 Washer, flat, 19/64 in. id, 5/8 in. od, 1/16 in. thk
15 Screw, cap, hex-hd, 1/4–20 x 7/8 in.
16 Crankshaft
17 Arrow mark
18 Armature and support
19 Number line
20 Setscrew, rotor
21 Screw, rotor locking, 1/4–20 x 1.179 in.
22 Washer, lock, ET, 1/4 in.
23 Ignition cable leads
24 Ignition cable shielding
25 Nut, plain, hex, No. 8–32
26 Washer, lock, IET, No. 8 (2 rqr)
27 Screw, machine, No. 8–32 x 5/8 in.

Figure 20. Coil, rotor, and armature, removal points.



EMC 6115-222-20/21

1 Shield, electrical connector
2 Nut and shield, electrical connector
3 Cable and coil, ignition
4 Nut, plain, hex, 8–32
5 Washer, lock, No. 8, IET (4 rqr)
6 Primary cable assembly
7 Backplate
8 Screw, machine, 8–32 x 5/8 in.
9 Washer, nonmetallic, fiber, 0.170 in. id, 3/4 in. od, 1/16 in. thk (2 rqr)
10 Washer, lock, cadmium or zinc plated, No. 8
11 Screw, tapping, thread forming, cadmium or zinc plated, 6–18 x 1/4 in.
12 Retainer, magnetic coil
13 Core, coil
14 Clip, electrical (2 rqr)
15 Washer, flat, 10/64 in. id, 5/8 in. od, 1/16 in. thk (3 rqr)
16 Washer, lock, 1/4 in. (3 rqr)
17 Screw, cap, hex-hd, 1/4–20 x 7/8 in. (3 rqr)
18 Armature and support
19 Key, rotor
20 Screw, rotor locking, 1/4–20 x 1.179 in.
21 Washer, lock, 1/4 in., special
22 Rotor
23 Setscrew, rotor
24 Terminal, lug
25 Insulator, bushing

Figure 21. Magneto and backplate, exploded view.

box primary wire shielding (1) and ignition cable shielding (24) to the screw (27).

(5) Pull the shielded breaker box primary wire through the hole in the backplate.

(6) Unscrew the nut (4, fig. 16) from the spark plug (1), and remove the ignition cable assembly (5) from the spark plug.

(7) Remove the terminal (3) from the

spark plug end of the ignition cable assembly (5), and remove the rubber terminal bushing insulator (25, fig. 21) from the end of the cable.

(8) Unscrew the connector shield (1) from the connector shield and nut (2), and remove the shield.

(9) Remove the shielding from the ignition cable leads (23, fig. 20) by drawing the shielding from the cable through the hole in the backplate. Hold the ignition cable leads at the coil (7) to prevent damaging the connection between the cable and coil. Do not attempt to remove the cable from the coil as it would damage the coil.

(10) Pull the ignition cable through the hole in the backplate.

(11) Pry out the two electrical clips (9) that secure the core ends of the coil. Coil core (8), and magneto coil retainer (10). Slide the coil off the core.

(12) Remove the three cap screws (15), lockwashers (13), and flat washers (14) that secure the armature and support (18) to the engine. Slide the armature and support off the end of the crankshaft (16). Avoid contact with the rotor (11).

(13) Remove the rotor locking screw (21) and lockwasher (22) in the face of the rotor.

(14) Remove the setscrew (20) that secures the rotor to the crankshaft. Slide the rotor off the crankshaft. Remove the key (12) from the crankshaft. Remove the backplate (3).

Caution: **As a precaution to prevent loss of magnetism, the rotor should never be placed on a metal surface. Keep the rotor within the armature as much as possible both on and off the engine.**

b. Cleaning, Inspection, and Repair.

(1) Wipe all parts with a clean cloth. Do not use fluid on wiring, shielding, coil, or similar parts.

(2) Examine the ignition cable and coil at the spark plug end. Be sure that the wire strands are not broken and are long enough to provide a good contact when assembled. Any damage to the ignition cable or coil will require replacement of both parts as an assembly, since the cable is permanently fastened to the coil.

(3) Inspect all insulating parts, such as the nut and shield (2) and rubber terminal insulator for cracks, breaks, and evidence of oil or water, and correct as necessary.

(4) Examine the ignition cable shielding. Be sure the connections at the spark plug and between the elbow and cable are secure.

(5) Inspect the primary wire and shielding of the terminal on the backplate to the breaker box for frayed ends or broken insulation, and correct as necessary.

(6) Examine the rotor and armature support for visible damage. Replace the armature only, if it has been demagnetized or physical damage is evident. Replace a defective rotor.

c. Installation.

(1) Place the backplate (7, fig. 21) in position on the engine.

(2) Remove any burs from the crankshaft (16, fig. 20) and install the rotor key (19, fig. 21) in the keyway in the crankshaft.

(3) Slide the rotor (22) on the crankshaft, so that the rotor hole for the setscrew (23) alines with the hole in the crankshaft. Be sure the rotor key remains in place.

(4) Install the setscrew and tighten securely.

(5) Install the locking screw (20) and lockwasher (21) in the hole in the face of the rotor to prevent the setscrew from loosening.

(6) Install the armature and support (18) over the rotor and fasten with 3 cap screws (17), lockwashers (16), and flat washers (15) in the 3 mounting holes of the support. Do not tighten the cap screws.

(7) Assemble the ignition cable and coil (3) on the coil core (13).

(8) Install the assembled coil and core in the armature with a coil retainer (12) between the rear of the coil and armature and under the core. Secure both ends of the core to the armature with the clip (14).

(9) Place the electrical connector nut and shield (2) on the shielding with the threaded end pointing away from the coil. Pull the ground-connection end of the shielding through the backplate (7).

(10) Tape the exposed wire end of the ignition cable and coil (3), and insert it through the shielding.

(11) Attach the shield (1) to the nut and shield (2). Insert the ignition cable and coil (3) through the shield and the elbow until ½ inch of the cable protrudes. Remove the tape from the end of the ignition cable.

(12) Install the insulator (25) over the protruding end of the ignition cable. Insert the exposed wire at the end of the ignition cable through the tubular rivet inside the lug terminal (24), and bend the exposed wire ends over the rivet. Carefully push the electrical connector shield (1) over the insulator and against the lug terminal.

(13) Attach the inner lead of the primary cable assembly (6), from the breaker box and from the coil to the screw (8) on the backplate. Secure with the hex nut (4).

(14) Secure the coil ground wires to the armature support with the screw (11).

(15) Place one lockwasher (5) on the other screw (8) on the backplate and attach the shield lead of the primary cable assembly (6). Install a second lockwasher (5), attach the electrical connector nut and shield (2) and secure with the nut (4).

d. Rotor Timing. The rotor (11, fig. 20) and the armature and support (18) require timing only if they have been removed from the engine.

(1) Measure the magneto contact gap and adjust if necessary (par. 56).

(2) Find the exact position where the magneto contacts start to open by turning the crankshaft (16) and using a timing light. If a timing light is not available, insert a thin piece of paper, such as tissue paper, between the breaker contacts and turn the crankshaft to the exact position where tension on the paper is released.

(3) Loosen the three cap screws (15).

(4) Turn the armature and support (18) until the arrow mark (17) on the armature is in line with number line 23 (19) on the rotor (11), and tighten the three armature support mounting cap screws securely.

Section VIII. ENGINE AND ACCESSORIES

61. General

The engine (14, fig. 22) is a single-cylinder 4-cycle, L-head, air-cooled, splash-lubricated, gasoline driven unit. The engine can be started either manually or electrically (TM 5–6115–222–10). A pulley (13), used for manual starting, is mounted on the engine flywheel. A crankcase breather is located on the engine block behind the fuel tank bracket assembly. The breather filters the air that is drawn into the engine base, and also serves as an outlet for gases that are created by the hot oil and piston blowby.

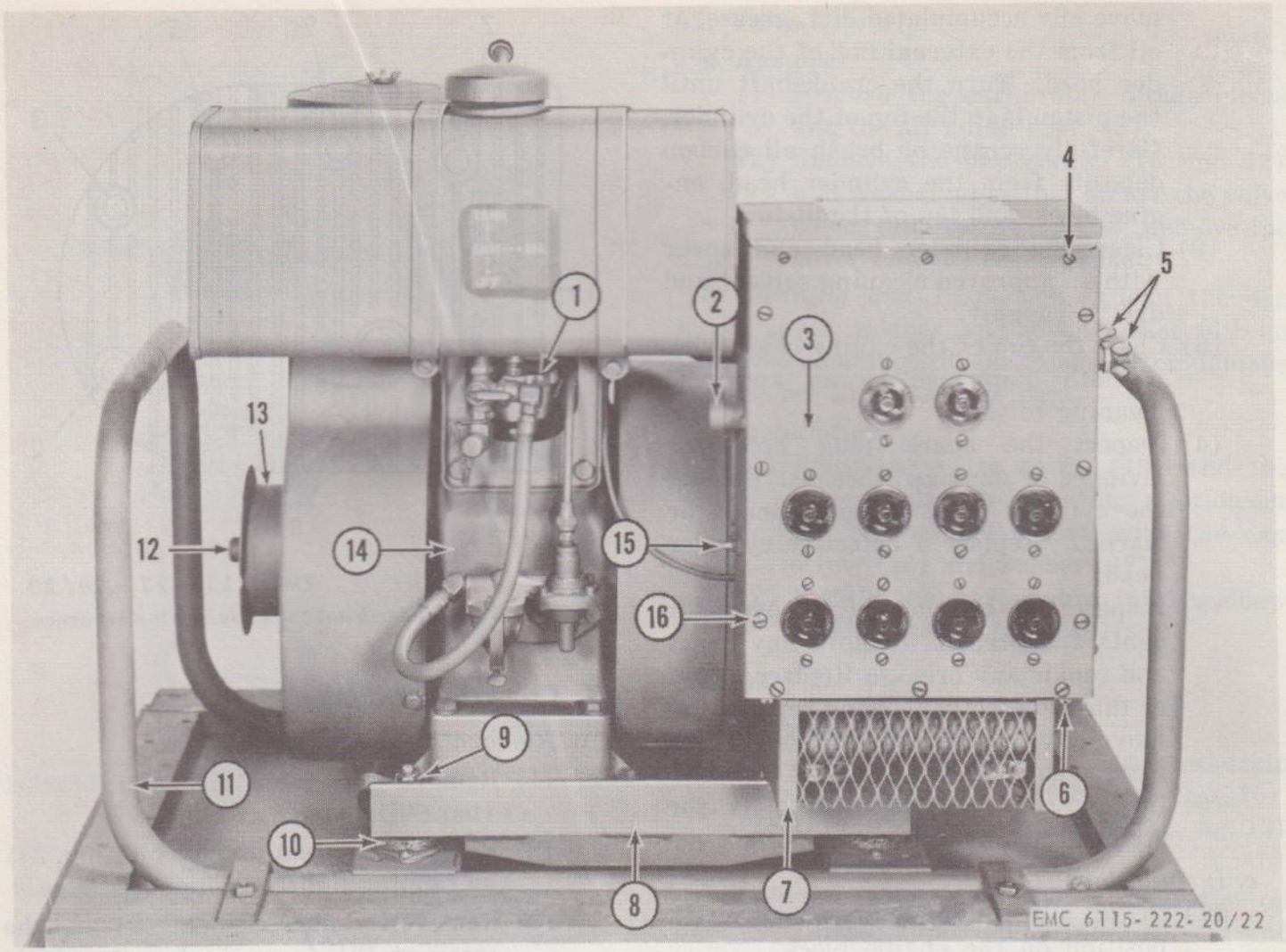
62. Starter Pulley

a. Removal. Remove the two bolts and lockwashers that secure the starter pulley (13, fig. 22) to the flywheel. Slide the pulley outward over the crankshaft (12) and remove it from the engine.

Warning: **Disconnect the ignition cable from the spark plug before removing the starter pulley.**

b. Cleaning and Inspection.

(1) Clean the starter pulley in an approved cleaning solvent and dry thoroughly.



1 Crankcase breather
2 Electrical starting switch
3 Control panel box
4 Screw, 8–32 x ⅜ in.
5 Electrical starting terminals
6 Screw, machine, cadmium or zinc plated, No. 8–32 (4 rqr)
7 Resistor cover
8 Angle support
9 Nut, plain, hex, cadmium or zinc plated, ⅜–16 (6 rqr)
10 Shock mount
11 Frame assembly cradle
12 Crankshaft
13 Starting pulley
14 Engine
15 Stop switch
16 Screw, tapping, thread forming, cadmium or zinc plated, No. 10–12 x ⅜ in. (9 rqr)

Figure 22. Generator set, left side view, component removal points.

(2) Inspect the starter pulley for wear, cracks, and breaks. Replace a defective pulley.

c. Installation. Position the starter pulley (13) over the crankshaft (12) and in the mounting position on the flywheel. Secure the pulley with two bolts and lockwashers.

63. Cylinder Head

a. Removal.

(1) Remove the spark plug (par. 59).
(2) Remove the blower housing (par. 51).
(3) Remove the fuel tank and bracket (par. 45).

Caution: **Never remove the cylinder head while the engine is hot as head warpage could result.**

(4) Remove the four cylinder head bolts (7, fig. 10) and washers (8) that secure the cylinder head cover (3) and the cylinder head (10). Remove the cylinder head cover.
(5) Remove the three remaining cylinder head bolts (12) and washers (13) and remove cylinder head with the cylinder head gasket. Discard the gasket.

b. Cleaning, Inspection, and Repair.

(1) Use a wire brush or scraper, to re-

move any accumulated dirt, grease, or oil from the external fins of the cylinder head. Turn the crankshaft until the piston is in the top of the cylinder. Carefully scrape or brush all carbon deposits from the cylinder head, engine block, and top of the piston.

(2) Clean the cylinder head and cover with an approved cleaning solvent and dry thoroughly.

(3) Clean the top of the engine block with a cloth dampened in an approved cleaning solvent.

(4) Inspect the spark plug hole for stripped or damaged threads. Be sure the cylinder head is not cracked or warped. Replace a defective cylinder head.

(5) Inspect the cylinder head cover for dents and breaks. Remove any dents and repair any breaks. Replace a cover that is defective beyond repair. Remove any loose paint, and repaint as instructed in TM 9–2851.

(6) Inspect the cylinder head bolts for stripped or damaged threads.

c. Installation.

(1) Install a new cylinder head gasket in position on the engine block.

(2) Place the cylinder head (10) in mounting position over the gasket. Be sure the holes in the cylinder head are alined with the holes in the gasket and the engine block. Install three cylinder head bolts (12) and washers (13) and tighten fingertight.

(3) Place the cylinder head cover on top of the cylinder head, and install four cylinder head bolts (7) and washers (8). Tighten the bolts fingertight.

(4) Install the fuel tank and bracket (par. 45). Tighten the two bolts (2) fingertight.

(5) Tighten all cylinder head bolts gradually and in the numbered sequence as shown in figure 23.

(6) Continue to tighten the bolts until they are each tightened to a torque of 15–17 ft-lb.

(7) Install the blower housing (par. 51).

(8) Install the spark plug (par. 59).

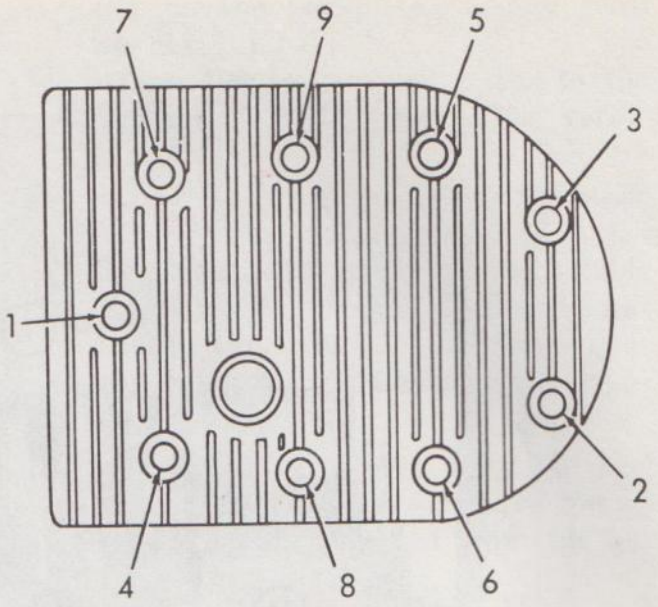


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Figure 23. Cylinder head bolts, tightening sequence.

64. Crankcase Breather

a. Removal.

(1) Remove the fuel tank and bracket (par. 45).

(2) Remove the breather cover (1, fig. 24) by tapping lightly on its outer edge.

(3) Remove the fiber element (2) and the retainer (3) from the breather body (4).

(4) Remove the body of the crankcase breather (1, fig. 22) from the engine (14).

b. Cleaning and Inspection.

(1) Clean all parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect the fiber element for dirt and damage. Replace a defective element.

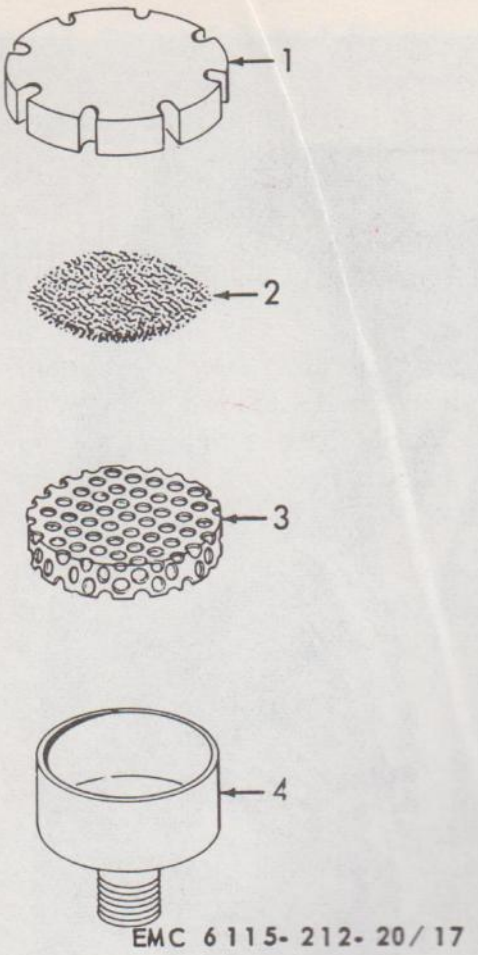
(3) Inspect the breather cover and retainer for cracks, breaks, and bends. Replace a defective cover or retainer.

(4) Inspect the breather body for cracks, breaks, and stripped or damaged threads. Examine the valve in the breather body. Replace a crankcase breather having a valve that does not operate freely.

c. Reassembly and Installation.

(1) Install the breather body (4, fig. 24) on the engine (14, fig. 22).

(2) Install the retainer (3, fig. 24) and



1 Cover, breather
2 Element, fiber
3 Retainer
4 Body, breather

Figure 24. Crankcase breather, exploded view.

the fiber element (2) inside the breather body.

(3) Install the breather cover (1).

(4) Install the fuel tank and bracket (par. 45).

65. Valve Cover

a. Removal.

(1) Remove the carburetor intake elbow and the air guide (par. 48).

(2) Remove the cap screw (16, fig. 12) and washer (17) that secure the valve cover (19) to the engine. Remove the cover and the cover gasket.

b. Cleaning and Inspection. Clean the cap screw, cover, washer, and cover gasket with an approved cleaning solvent. Inspect for damage and replace any defective part.

c. Installation.

(1) Place the valve cover (19) and the cover gasket in mounting position on the engine and secure with the cap screw (16) and washer (17).

(2) Install the carburetor intake elbow and air guide (par. 48).

66. Oil Filler Pipe

a. Removal.

(1) Remove the oil filler cap and drain plug assembly (TM 5–6115–222–10).

(2) Unscrew the oil filler neck (8, fig. 13) from the engine base.

b. Cleaning and Inspection. Clean the oil filler neck in an approved cleaning solvent and inspect for cracks and damaged threads. Replace a defective oil filler neck.

c. Installation.

(1) Install the oil filler neck (8) on the engine base.

(2) Install the oil filler cap and drain plug assembly (TM 5–6115–222–10).

Section IX. GENERATOR

67. General

The generator is an air-cooled, shunt-wound, 4-pole, self-excited unit that supplies a maximum of 2,000 watts of direct 12-volt current. A fan circulates cooling air through the generator. The generator brushes are mounted on a brush holder assembly inside the generator stator cover.

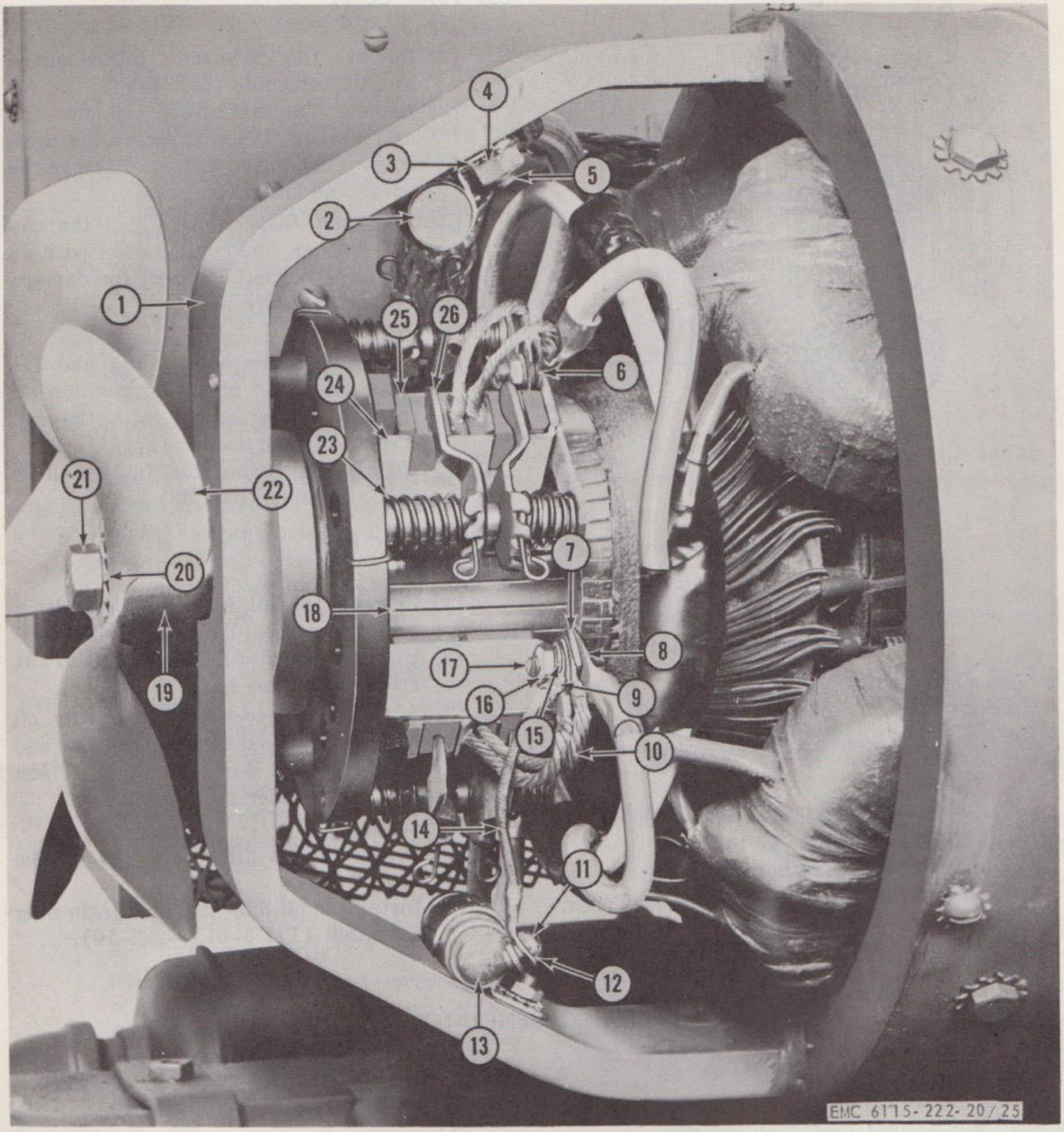
***Warning:* Always disconnect the spark plug cable assembly from the spark plug before servicing any part of the generator.**

68. Generator Fan

a. Removal.

(1) Remove two screws (10, fig. 13) and lockwashers (11) that secure the generator stator cover (12) to the generator frame. Loosen the screw underneath the cover, and slide the cover off the generator frame.

(2) Remove the bolt (21, fig. 25) and lockwasher (20) that secure the generator fan (22) and pilot washer (19) to the armature shaft.



1 Generator stator
2 Capacitor, fixed, paper dielectric, 0.1 mfd, 100 vdc
3 Washer, lock, IET, ¼–20 (6 rqr)
4 Nut, plain, hex, cadmium or zinc plated, ¼–20 (2 rqr)
5 Screw, machine, ¼–20 x ¾ in. (2 rqr)
6 Upper brush holder terminal
7 Brush holder terminal (4 rqr)
8 Lug
9 Lug
10 Brush leads
11 Screw, capacitor terminal, 8–32 x ¼ in. (2 rqr)
12 Washer, lock, IET, No. 8 (2 rqr)
13 Capacitor, fixed, paper dielectric, 0.1 mfd, 100 vdc
14 Capacitor lead
15 Washer, plain, brush holder terminal, No. 8 (4 rqr)
16 Nut, square, brush holder terminal, 8–32 (4 rqr)
17 Screw, brush holder terminal, 8–32 x ¼ in. (4 rqr)
18 Commutator
19 Washer, pilot, 1⅛ in. id, ⅞ in. od x 1⅛ in.
20 Washer, lock, IET, special
21 Bolt, machine, special
22 Fan
23 Tension spring (8 rqr)
24 Brush holder (4 rqr)
25 Brush (8 rqr)
26 Brush holder arm (8 rqr)

Figure 25. Generator fan, capacitor, and brushes, removal points.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect the generator fan for cracks and breaks. Replace a defective fan.

(3) Inspect the machine bolt for damaged threads. Replace a defective bolt or pilot washer.

(4) Inspect the generator stator cover for dents and breaks. Remove dents, repair breaks, or replace a defective cover. Remove any loose paint and repaint as instructed in TM 9–2851.

c. Installation.

(1) Install the lockwasher (20), fan (22), and washer (19) on the bolt (21) and secure to the armature shaft.

(2) Place the generator stator cover (12, fig. 13) in a mounting position and secure with two screws (10) and lockwashers (11). Tighten the screw underneath the cover.

69. Generator Brushes

a. Removal.

(1) Remove the generator stator cover (par. 68).

(2) Tag all leads to each of the four brush holder terminals (7, fig. 25).

(3) Remove the brush holder terminal screws (17), nuts (16), 2 washers (15), wiring lugs (8 and 9), and 2 brush leads (10) from the 4 brush holder terminals.

(4) Raise the two brush holder arms (26) on each of the 4 brush holders (24), and remove the 2 brushes (25) from each holder.

b. Cleaning and Inspection.

(1) Clean the brushes and brush holders with compressed air.

(2) Remove any oil or grease by wiping the brushes and brush holders with a cloth dampened in an approved cleaning solvent.

(3) Inspect the brushes for freedom of movement in the brush holder and be sure the brush holders are fastened securely. Be sure the brush leads are not broken or frayed, and that all connections are tight.

(4) Inspect the brushes for an oil-soaked, chipped, or burned condition. Replace damaged brushes or brushes that are worn to less than five-eighths of their original length. Never replace brushes individually. Always replace in complete sets of four pair.

c. Installation.

(1) Raise the 2 brush holder arms (26) and install 2 brushes (25) in each of the 4 brush holders (24).

(2) Place a brush holder terminal screw (17) on each brush holder terminal (7) along with wiring lugs (8 and 9), 2 brush leads (10), and 2 washers (15). Secure with the nuts (16).

(3) Seat the brushes, see *d* below.

d. Seating New Brushes.

(1) Cut a strip of No. 1 sandpaper to the width of the commutator (18). Place the sandpaper beneath the brush (25) and the commutator. Seat one brush at a time. Be sure the sandpaper lies flat on the commutator and the abrasive side is toward the brush.

Caution: **Never use emery cloth or any other metallic abrasives when seating brushes. Such abrasion may leave deposits which could cause electrical shorts.**

(2) With the brush holder arm (26) exerting the correct spring tension, as described in *e* below, slowly rotate the engine crankshaft in its normal operating direction by use of the starter pulley rope. Continue to rotate the crankshaft until the brush has been sanded to the same contour as the commutator.

(3) After the brush is roughly shaped, use No. 00 sandpaper for final sanding. To remove the sandpaper, lift up the brush holder arm and pull the sandpaper out in the direction of commutator rotation. Blow out the grit and carbon with low-pressure compressed air.

(4) Repeat the operation described in (1) through (3) above for each of the seven remaining brushes.

(5) After all brushes have been seated, check and adjust the spring tension, (*e* below).

e. Checking and Adjusting Spring Tension.

(1) Hook a small spring-type scale under the brush holder arm and pull it directly in line with the brush holder until the spring tension on the brush is just released. The correct brush spring tension is 32 to 44 ounces. For new brushes, the tension spring (23) should be set in the first notch on the brush holder arm (26).

(2) If the spring tension is weak, increase the tension by advancing the spring to successive notches on the brush holder arm. Notify field maintenance, if brush spring tension is so weak that correct tension cannot be obtained with the spring in the last notch on the brush holder arm.

(3) After correct tension has been obtained, install the generator stator cover (par. 68).

70. Commutator

a. Inspection. Remove the generator stator cover (par. 68), and inspect the commutator (18, fig. 25) for a dirty, rough, or pitted condition, and high mica between the commutator segments. The commutator should present a smooth polished surface, light brown in color. Even though the commutator appears to be in good condition when inspected, it may spark badly when running. If such sparking occurs, report it to field maintenance as serious damage may result.

b. Cleaning of Commutator. Clean any lubricant from the commutator (18) with an approved cleaning solvent and dry with compressed air. To polish the commutator, fold and tack several layers of canvas or duck over the end of a strong piece of hard wood. Hold this pad against the commutator while the battery charger is running. This method will polish the commutator without cutting its surface. If the commutator is rough, smooth with No. 00 sandpaper. To sand the commutator, fold a strip of sandpaper on a piece of hard wood, and use the sandpaper in the same manner as the canvas polisher. Blow out the grit with low-pressure air. Polish the commutator after sanding. If the commutator cannot be cleaned or has high mica, report the condition to field maintenance. After the commutator has been serviced, replace the generator stator cover (par. 68).

Caution: **Never use emery cloth or any other metallic abrasive to clean the commutator. Such an abrasive may leave deposits which could cause electrical shorts.**

71. Shunt and Electrical Lead

a. General. Model JHGV2B contains a square, enameled, copper shunt that connects the upper brush holder terminal (6, fig. 25), to the opposite lower brush holder terminal at the rear of the generator assembly. An electrical lead extends from this upper terminal to the upper capacitor mounting screw (5). Model JHGV2A contains the electrical equivalent, but utilizes heavily insulated wires and solder connections. For the removal of the shunt and ground wire on model JHGV2A, refer to field maintenance.

b. Removal. (Model JHGV2B)

(1) Remove the generator stator cover (par. 68).

(2) Remove the brush holder terminal screw at each end of the shunt (par. 69), and remove the shunt and electrical lead lug.

(3) Remove the screw (5), nut (4), and lockwasher (3), and remove the electrical lead terminal with the second lockwasher.

c. Installation.

(1) Install one end of the electrical lead terminal on the screw (5), and secure with the nut (4) and two lockwashers (3).

(2) Install the other end of the electrical lead terminal and one end of the shunt on the brush holder terminal (6). Install the other end of the shunt on the lower brush holder terminal at the rear.

(3) Install the generator stator cover (par. 68).

72. Generator Ventilating Cover

a. Removal.

(1) Remove the two screws (15, fig. 13)

and nuts (14) and remove the generator ventilating cover (9).

(2) Spread the cover enough to clear the generator frame and remove the cover from the left side of the generator set. Be careful not to damage the cable assembly (18) and the fuel pipe.

b. Cleaning, Inspection, and Repair. Clean the generator ventilating cover in an approved cleaning solvent. Inspect the cover for dents and breaks. Remove any dents and repair any breaks. Remove any loose paint and repaint as instructed in TM 9–2851. Replace the cover, if it is defective beyond repair.

c. Installation.

(1) Spread the cover (9) enough to clear the generator frame, and place in mounting position from the left side of the generator set.

(2) Secure the cover by installing two screws (15) and nuts (14).

Section X. CONTROL PANEL BOX

73. General

The control panel box (3, fig. 22) is located on the left side of the unit at the right of the fuel tank. It contains all electrical controls and components used in the battery-charging operation. Refer to the wiring diagram (fig. 26) for correct circuit connections.

74. Receptacle Connector Panel

a. Removal.

(1) Remove 9 screws (16, fig. 22) and 3 screws (4) with lockwashers and nuts.

(2) Pull the top of the panel (8, fig. 27) free of the control panel box, and tag

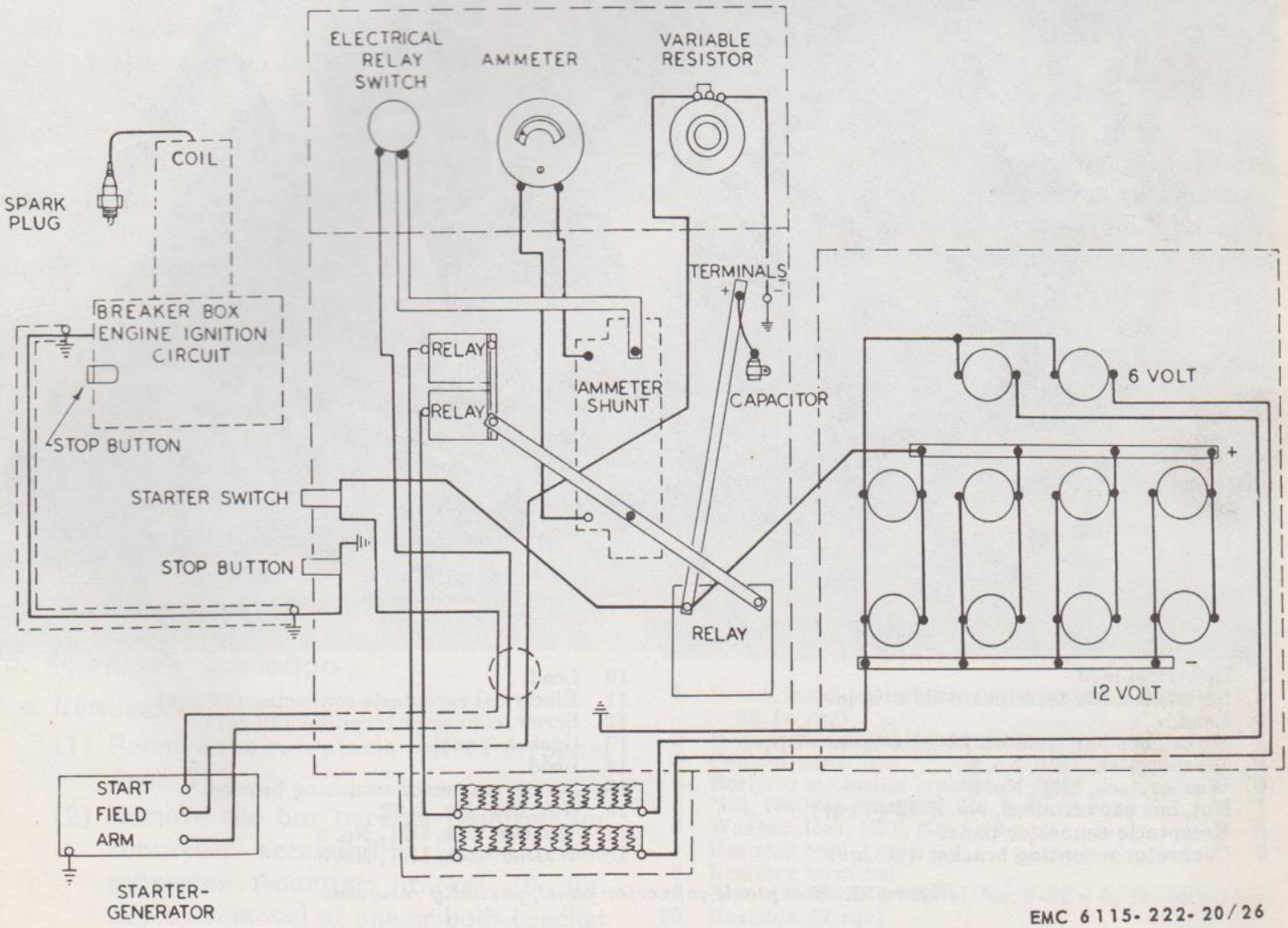
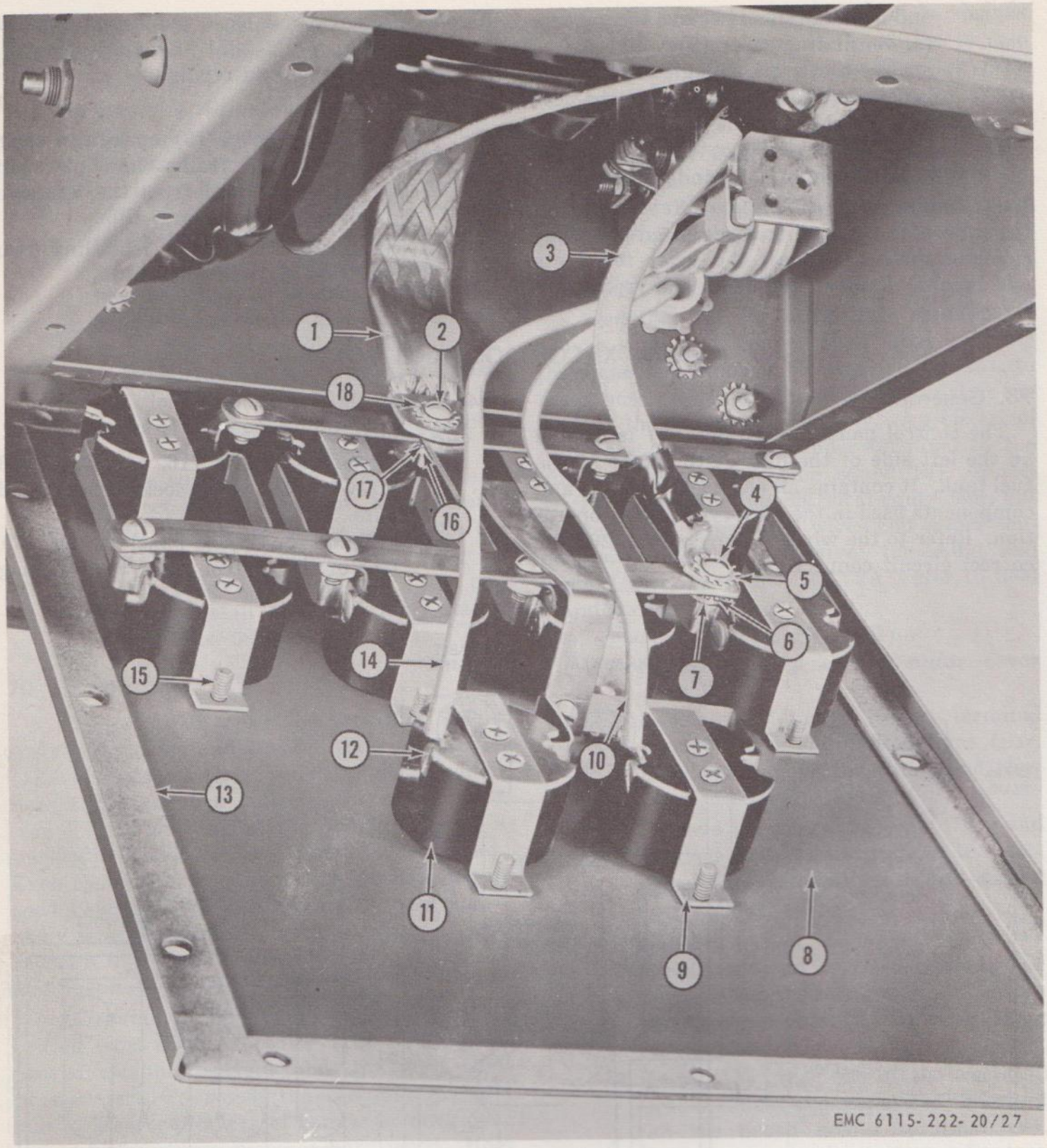


Figure 26. Wiring diagram.



1 Electrical lead
2 Screw, bus bar terminal, 8–32 x ⅝ in.
3 Lead
4 Screw, bus bar terminal, 8–32 x ½ in. (7 rqr)
5 Washer, lock, IET, No. 8
6 Washer, lock, IET, No. 8
7 Nut, bus bar terminal, No. 8–32 (7 rqr)
8 Receptacle connector panel
9 Connector mounting bracket (10 rqr)
10 Lead
11 Electrical receptacle connector (10 rqr)
12 Screw, connector terminal (20 rqr)
13 Gasket, panel
14 Lead
15 Screw, connector mounting bracket
16 Nut, hex, No. 8–32
17 Washer, lock, IET, No. 8
18 Washer, lock, IET, No. 8

Figure 27. Receptacle connector panel, partially removed.

the three leads (3, 10, and 14) and the electrical lead (1).

(3) Disconnect the two upper connector leads (10 and 14) by removing two connector terminal screws (12) at the receptacle connectors (11).

(4) Disconnect the heavy lead (3) by removing the bus bar terminal screw (4) with two locwkashers (5 and 6) and nut (7).

(5) Disconnect the electrical lead (1) by removing the bus bar terminal screw (2) with two lockwashers (17 and 18), and nut (16).

b. Cleaning and Inspection.

(1) Inspect the panel and panel gasket for breaks or other damage, and replace a defective panel or gasket.

(2) Blow out any dust or dirt that may have accumulated. Be sure that all bus bar connections are clean and tight.

c. Installation.

(1) Position the bottom edge of the panel (8) next to the bottom of the control panel box, and attach the electrical lead (1), with the bus bar terminal screw (2), lockwashers (17 and 18), and nut (16).

(2) Connect the heavy lead (3) with the bus bar terminal screw (4), lockwashers (5 and 6), and nut (7).

(3) Connect the two upper connector leads (10 and 14) with the connector terminal screws (12), and remove all lead tags.

(4) Hold the panel (8) in mounting position and secure with 9 screws (16, fig. 22) and 3 screws (4), with lockwashers and nuts.

75. Receptacle Connectors

a. Removal.

(1) Remove the receptacle connector panel (par. 74).

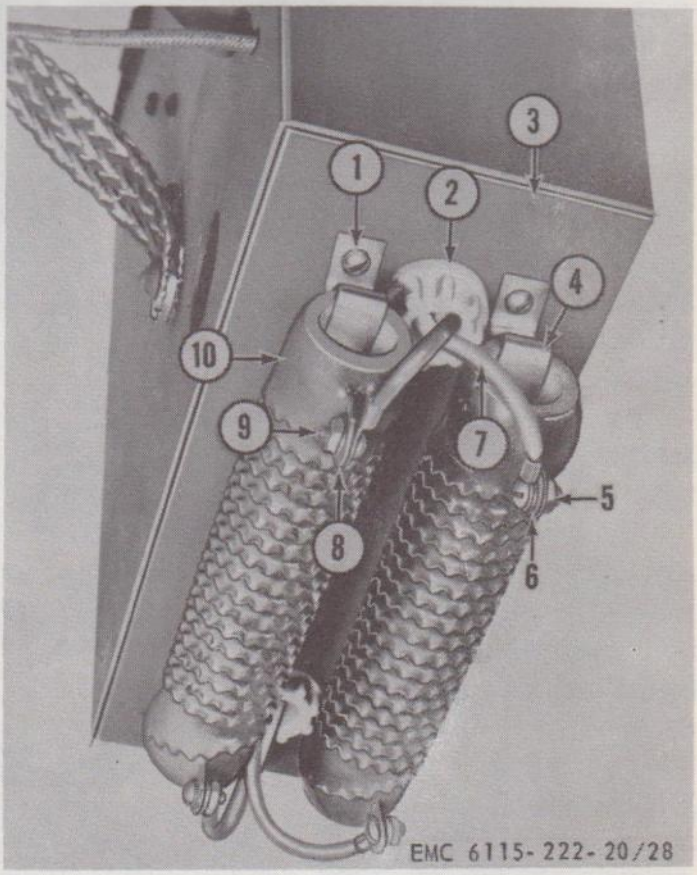
(2) Remove the bus bars as required for connector accessibility. Loosen the connector mounting bracket (9, fig. 27) by removal of one or both bracket mounting screws (15). Position the connector for access to the connector terminal screws (12).

(3) Remove the connector terminal screws (12), and remove the bus bar terminal or lead. Remove the connector (11) from the panel.

b. Installation.

(1) Position the connector (11) in mounting position on the panel. Be certain that the connector is positioned, so that the positive terminal faces toward the starter button on the control panel and the two holes in the top of the connector and in the top of the connector bracket (9) are positioned properly.

(2) Attach the bus bars or lead with two connector terminal screws (12).



1 Screw, mach, cadmium or zinc plated, 8–32 x ⅝ in. (4 rqr)
2 Resistor lead bushing (2 rqr)
3 Control panel box
4 Resistor mounting bracket (4 rqr)
5 Nut, resistor terminal, No. 8–32 (4 rqr)
6 Washer, lock, IET, No. 8 (8 rqr)
7 Resistor lead (4 rqr)
8 Resistor terminal
9 Screw, resistor terminal, No. 8–32 x ⅜ in. (4 rqr)
10 Resistor (2 rqr)

Figure 28. Resistor, removal points.

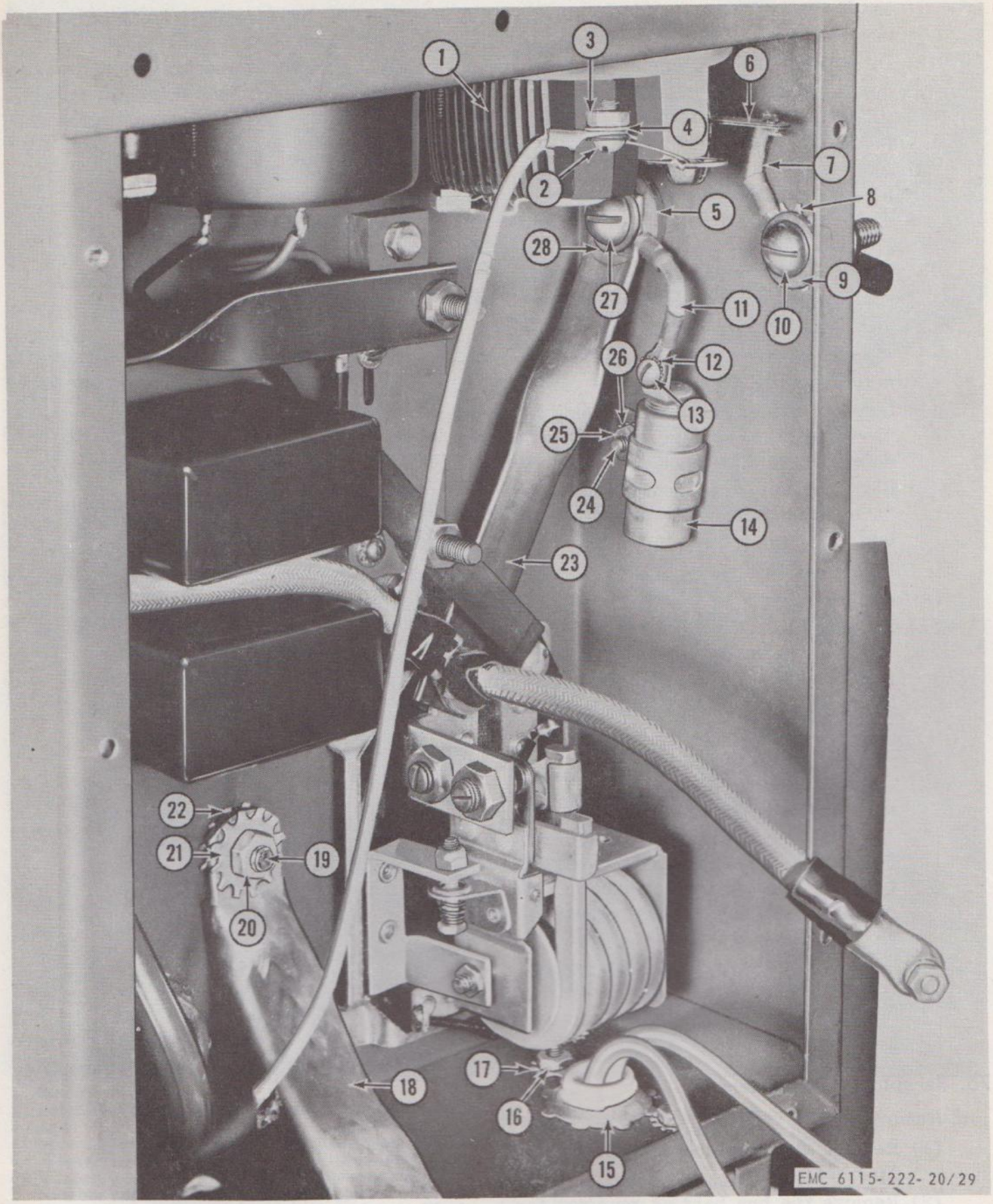


Figure 29. Control panel box, right side interior view.

1 Variable resistor
2 Screw, terminal, No. 8–32 x ⅜ in.
3 Nut, terminal, No. 8–32
4 Washer, lock, IT, No. 8
5 Washer, fiber
6 Variable resistor terminal
7 Negative electrical starting terminal lead
8 Washer, lock, IET, $\frac{5}{16}$ in.
9 Washer, flat, brass, nickel plated, $\frac{33}{64}$ id, ⅝ od, 0.064 in. thk
10 Screw, machine, brass, $\frac{5}{16}$–18 x 1¼ in.
11 Lead
12 Washer, lock, ET, No. 8
13 Screw, terminal, 8–32 x ¼ in.
14 Capacitor, fixed, 0.1 mfd, 100 VDC
15 Nut, resistor lead bushing
16 Nut, plain, hexagon, cadmium or zinc plated, 8–32 (4 rqr)
17 Washer, lock, cadmium plated, IET, No. 8 (4 rqr)
18 Electrical lead
19 Screw, terminal, ¼–20 x 1¼ in.
20 Nut, terminal, ¼–20
21 Washer, lock, IET, ¼ in.
22 Washer, lock, IET, ¼ in.
23 Bus bar
24 Screw, machine, 8–32 x ⅜ in.
25 Nut, plain, hex, cadmium or zinc plated, 8–32
26 Washer, lock, cadmium plated, IET, No. 8 (2 rqr)
27 Screw, machine, brass, $\frac{5}{16}$–18 x 1¼ in.
28 Washer, flat, brass, nickel plated, $\frac{33}{64}$ id, ⅝ od, 0.064 thk

Figure 29—Continued.

(3) Secure the connector to the panel by installing one or both connector mounting bracket screws (15).
(4) Install all bus bars that were removed for connector accessibility.
(5) Install the receptacle connector panel bar (par. 74).

76. Resistor Cover, Resistors, and Resistor Lead Bushings

a. Removal.
(1) Remove the receptacle connector panel (par. 74).
(2) Remove the resistor cover (7, fig. 22) by removing four mounting screws (6), lockwashers, and nuts.
(3) Tag the 4 resistor leads (7, fig. 28) and disconnect the leads at the resistor terminals (8) by removing the 4 resistor terminal screws (9), nuts (5), and 2 lockwashers (6) each.
(4) Remove the resistors (10) and the four resistor mounting brackets (4) by removing the four machine screws (1), with lockwashers (17, fig. 29) and nuts (16).
(5) Pull the resistor leads through the two lead bushings (2, fig. 28) from inside the control panel box (3).
(6) Unscrew the two lead bushings from the bushing nuts (15, fig. 29), and remove from control panel box.

b. Cleaning and Inspection.
(1) Inspect the cover and brackets for dents, cracks, or other damage.
(2) Inspect the resistors and bushings for broken or cracked porcelain.
(3) Replace all damaged or defective parts.

c. Installation.
(1) Install the resistor lead bushing (2, fig. 28) in mounting position in the control panel box (3), and secure with the bushing nuts (15, fig. 29).
(2) Insert the resistor leads (7, fig. 28) through the bushings from inside the control panel box.
(3) Install the resistors (10) in the resistor mounting brackets (4) and secure with 4 mounting bracket screws (1), nuts (16, fig. 29) and lockwasher (17).
(4) Attach the four resistor leads (7, fig. 28) with the resistor terminal screws (9), nuts (5) and two lockwashers (6) each. Remove the resistor lead tags.
(5) Install the resistor cover (7, fig. 22) in mounting position, and secure with four mounting screws (6), lockwashers, and nuts.
(6) Install the receptacle connector panel (par. 74).

77. Electrical Starting Terminals

a. Removal. (Negative Terminals)
(1) Remove the receptacle connector panel (par. 74) for access to the rear of terminals (5, fig. 22).

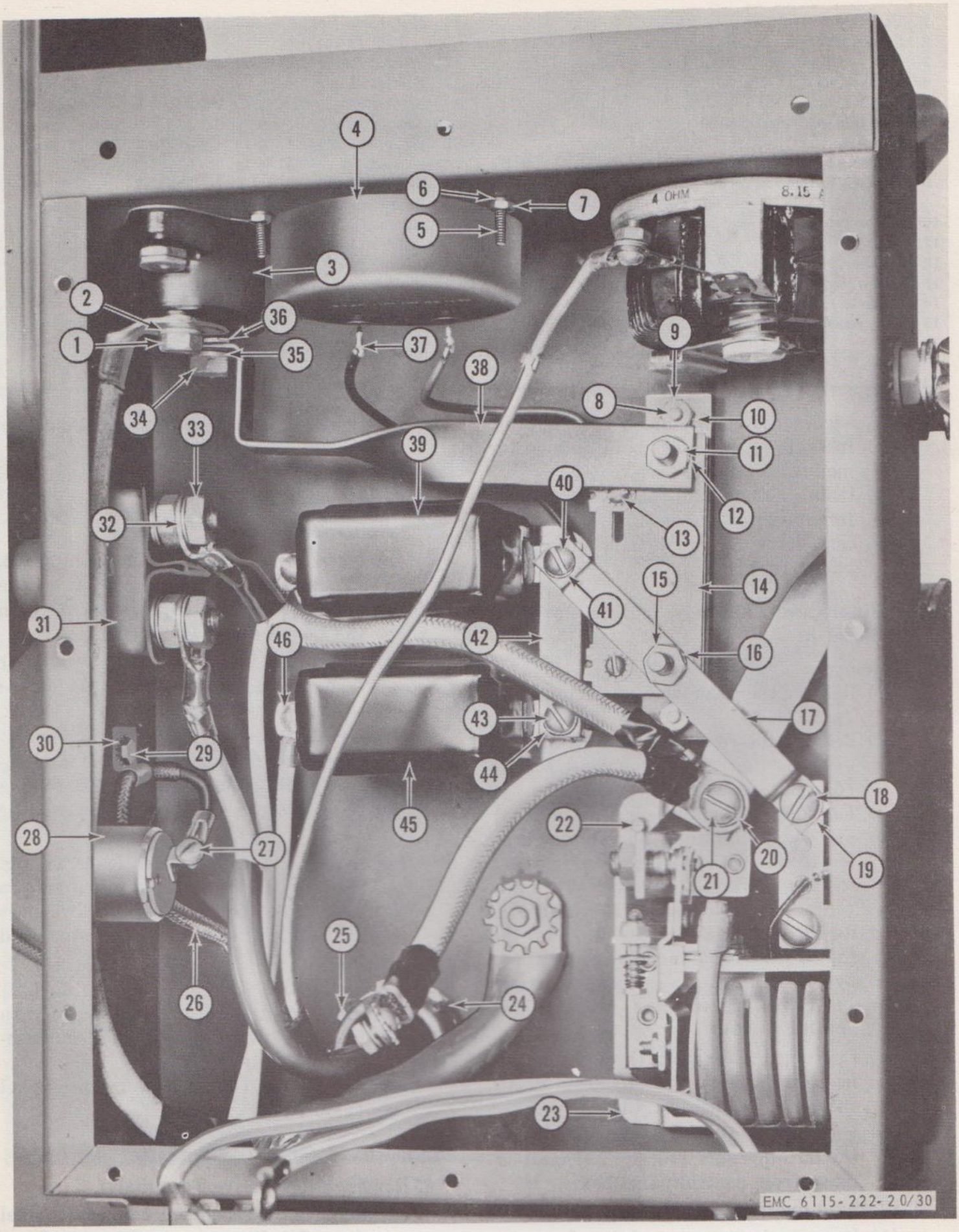


Figure 30. Control panel box, full interior view.

1 Nut, terminal, No. 10–24 x ½ in.
2 Washer, lock, No. 10
3 Electrical relay switch
4 Ammeter
5 Screw, machine, 8–32 x ⅜ in. (3 rqr)
6 Washer, lock, No. 8 (3 rqr)
7 Nut, plain, hex, 8–32 (3 rqr)
8 Screw, machine, cadmium or zinc plated, 8–32 x ⅝ in. (2 rqr)
9 Nut, plain, hex, cadmium or zinc plated, No. 8–32 (2 rqr)
10 Washer, lock, cadmium or zinc plated, No. 8 (2 rqr)
11 Nut, terminal, ¼–28
12 Washer, lock, IT, ¼ in.
13 Screw, shunt terminal, 8–32 x ⅝ in. (2 rqr)
14 Shunt
15 Nut, terminal, ¼–28
16 Washer, lock, ¼ in.
17 Bus bar
18 Screw, terminal, 10–24 x ⅝ in. (2 rqr)
19 Washer, lock, IT, No. 10
20 Washer, lock, IT, ¼ in.
21 Screw, terminal, ¼–28 x ½ in.
22 Screw, machine, cadmium or zinc plated, 8–32 x ⅝ in. (2 rqr)
23 Engine generator relay cutout
24 Bushing, electrical conduit
25 Locknut, electrical conduit
26 Stop switch lead
27 Screw, stop-switch terminal, 8–32 x ¼ in.
28 Stop switch
29 Screw, cap, hex-hd, ¼–28 x ⅜ in.
30 Washer, lock, IET, ¼ in.
31 Electrical starting switch
32 Washer, lock, ET, ¼ in. (4 rqr)
33 Nut, terminal, electrical starting switch, ¼–28 (4 rqr)
34 Screw, terminal, No. 10–24 x ½ in.
35 Washer, lock, No. 10
36 Washer, lock, IT, No. 10
37 Ammeter terminal
38 Bus bar
39 Armature relay
40 Screw, terminal, 10–32 x ⅝ in.
41 Washer, lock, No. 10
42 Bus bar
43 Screw, terminal, 10–32 x ½ in.
44 Washer, lock, No. 10
45 Armature relay
46 Screw, terminal, 10–32 x ⅜ in.

Figure 30—Continued.

(2) Remove the wingnut, two flat washers, hex nut, flat washer, and lockwasher on the external end of terminal.

(3) Pull the terminal screw (10, fig. 29) free of the mounting hole from inside control panel box, and remove the lockwasher (8), lead (7), and flat washer (9).

b. Installation. (Negative Terminal)

(1) Position the flat washer (9), lead (7), and lockwasher (8) on the terminal screw (10), and insert the terminal screw through the mounting hole from inside the control panel box.

(2) Install the lockwasher, flat washer, hex nut, two flat washers, and wingnut on the outside of control panel box.

(3) Tighten the hex nut securely, and install the receptacle connector panel (par. 74).

c. Removal. (Positive Terminal)

(1) Remove the receptacle connector panel (par. 74) for access to terminals (5, fig. 22).

(2) Remove the wingnut, two flat washers, hex nut, flat washer, and fibre washer on the external end of terminal.

(3) Pull the terminal screw (27, fig. 29) free from the mounting hole from inside the control panel box and remove fiber washer (5), lead (11), bus bar (23), and flat washer (28).

d. Installation. (Positive Terminal)

(1) Position the flat washer (28), bus bar (23), lead (11), and fibre washer (5) on the terminal screw (27), and insert the terminal screw through the mounting hole from inside the control panel box.

(2) Install fiber washer, flat washer, hex nut, two flat washers, and wingnut on the outside of the control panel box.

(3) Tighten the control panel box hex nut securely and install the receptacle connectors panel (par. 74).

78. Electrical Starting Switch

a. Removal.

(1) Remove the receptacle connector panel (par. 74) for access to the rear of switch (2, fig. 22), and tag the two switch leads.

(2) Remove the nut (33, fig. 30), lockwasher (32), and lead from both switch terminals.

(3) Remove two switch mounting screws with nuts and lockwashers, and remove the switch (31) from the control panel box.

b. Installation.

(1) Install the switch (31) in mounting position, and secure with two switch mounting screws, nuts, and lockwashers.

(2) Postion the tagged leads on each terminal, and secure with lockwasher (32) and nut (33). Tighten nuts securely, and remove tags from leads.

(3) Install the receptacle connector panel (par. 74).

79. Stop Switch

a. Removal.

(1) Remove the receptacle connector panel (par. 74).

(2) Remove the terminal screw (27, fig. 30) and remove the lead.

(3) Remove the switch mounting nut from the outside of the control panel box. Remove the stop switch (28) with one mounting lockwasher from the control panel box.

b. Installation.

(1) Install the switch (28) with the lockwasher in mounting position and secure with the mounting nut from outside of control panel box.

(2) Position the lead on the switch terminal, and secure with terminal screw (27).

(3) Install the receptacle connector panel (par. 74).

80. Electrical Relay Switch

a. Removal.

(1) Remove the receptacle connector panel (par. 74) for access to the relay switch (3, fig. 30).

(2) Remove the switch terminal nut (1) and lockwasher (2) and remove the lead.

(3) Remove the terminal screw (34) and lockwasher (35) at the switch bus bar terminal. Remove the nut (11) and lockwasher (12) on the shunt (14) at the opposite end of the bus bar (38). Remove the bus bar and the upper lockwasher (36).

(4) Remove the two switch mounting screws with the top lockwashers from the top of the control panel box, and remove the relay switch.

b. Installation.

(1) Install the relay switch (3) in mounting position and secure with two switch mounting screws and top lockwashers from the top of the control panel box.

(2) Position the switch terminal screw (34) and the lockwasher (35) through the switch terminal end of the bus bar (38) and install the upper lockwasher (36). Secure the bus bar to the switch terminal. Attach the opposite end of the bus bar to the terminal on the shunt (14) and secure with the nut (11) and lockwasher (12).

(3) Attach the lead with the terminal nut (1) and lockwasher (2).

(4) Install the receptacle connector panel (par. 74).

81. Ammeter

a. Removal.

(1) Remove the receptacle connector panel (par. 74) for access to the ammeter and tag the two leads.

(2) Remove the terminal nuts and flat washer at the ammeter terminals (37), or unsolder the terminal leads (dependent on ammeter model), and remove the leads.

(3) Remove three mounting screws (5), nuts (7), and lockwashers (6), and remove the ammeter from top of the control panel box.

b. Installation.

(1) Install the ammeter (4) in mounting position from top of the control panel box, and secure with three mounting screws (5), nuts (7), and lockwashers (6).

(2) Attach the two leads to the ammeter terminals (37) and secure with nuts

and flat washers or solder the leads securely. Remove tags on the leads.

(3) Install the receptacle connector panel (par. 74).

82. Variable Resistor

a. Removal.

(1) Remove the receptacle connector panel (par. 74) for access to variable resistor (1, fig. 29).

(2) Remove the lead (7) from the negative electrical starting terminal (par. 77).

(3) Remove the screw (2), nut (3), and lockwasher (4), and remove the lead.

(4) Remove the control knob and the shaft-mounting nut with the IT lockwasher from the top of the control panel box, and remove the variable resistor. Unsolder and disconnect the negative electrical starting terminal lead (7) from the variable resistor terminal (6).

b. Installation.

(1) Attach the lead (7) to the terminal (6) on the variable resistor (1), and solder securely.

(2) Install the variable resistor in mounting position with the guide on the resistor resting in the hole provided in the control panel box. Install the shaft mounting nut and IT lockwasher, and install the control knob.

(3) Attach the terminal lead with the screw (2), and secure with the nut (3) and lockwasher (4).

(4) Install the lead (7) on the negative electrical starting terminal (par. 77).

(5) Install the receptacle connector panel (par. 74).

83. Armature Relays (Two)

a. Removal.

(1) Remove the receptacle connector panel (par. 74) for access to the two relays (39 and 45, fig. 30) and tag each lead.

(2) Remove the terminal screw (46) on each of the two left relay terminals marked BAT, and remove the leads. Tag the leads.

(3) Remove the shunt bus bar terminal screw (40) and lockwasher (41) on the opposite side of the upper relay (39). Remove the bus bar nut (15) and washer (16) at bus bar center terminal on shunt (14). Remove the remaining bus bar screw (18), and lockwasher (19) and remove bus bar (17).

(4) Remove the relay bus bar terminal screw (43) and lockwasher (44) on the lower relay (45) and remove the bus bar (42) connecting the two relays.

(5) Remove the 4 relay mounting screws, nuts, and 2 IET lockwashers each from underneath the relay terminals. Slide the relays free, and remove from control panel box.

b. Installation.

(1) Install the 2 relays (39 and 45) in mounting position with terminals marked BAT pointing in the direction of the starting switch (31). Secure the relays with 4 mounting screws, nuts, and 2 IET lockwashers.

(2) Install the relay-terminal bus bar (42) in mounting position connecting the two relays. Secure the bottom relay-terminal bus bar connection with screw (43) and lockwasher (44).

(3) Install the shunt bus bar (17) in mounting position on the terminal of upper relay, on shunt (14), and on the far end terminal of the relay. Install the bus bar terminal screw (40) and lockwasher (41) on terminal of the relay. Install the nut (15) and washer (16) at the center hole shunt terminal. Install the screw (18) with lockwasher (19) on the remaining bus bar terminal.

(4) Attach the tagged lead to each relay with the terminal screw (46).

(5) Remove tags from the leads, and install the receptacle connector panel (par. 74).

84. Shunt

a. Removal.

(1) Remove the receptacle connector panel

(par. 74) for access to the shunt (14, fig. 30).

(2) Remove the nut (11) and lockwasher (12) on the shunt terminal holding bus bar (38), and free the bus bar from the shunt terminal.

(3) Remove the 12-volt, relay bus bar terminal screw (40) and lockwasher (41). Remove the nut (15) and lockwasher (16) on the shunt terminal connecting the bus bar (17) at the center. Remove the bus bar terminal screw (18) and lockwasher (19), and remove the bus bar.

(4) Tag the two shunt leads, and remove the leads at the ammeter terminals (par. 81).

Note. If a new shunt is installed, connect a suitable ammeter in series with a load on the generator set, and adjust the movable connection on the shunt until the generator set ammeter and the test ammeter read the same.

(5) Remove the two shunt mounting screws (8), nuts (9), and lockwashers (10), and remove the shunt from the control panel box.

b. Installation.

(1) Install the shunt (14) in mounting position, and secure with two mounting screws (8), nuts (9), and lockwashers (10).

(2) Attach the two shunt leads to the ammeter terminals (par. 81). Remove the lead tags.

(3) Install the shunt bus bar (17) in mounting position, and install the armature relay terminal screw (40), and lockwasher (41). Install the nut (15) and lockwasher (16) on the shunt terminal. Install the bus bar terminal screw (18) and lockwasher (19).

(4) Attach the bus bar (38) to the remaining shunt terminal and secure with nut (11) and lockwasher (12).

(5) Install the receptacle connector panel (par. 74).

85. Engine Generator Cutout Relay

a. Removal.

(1) Remove the receptacle connector panel (par. 74) for access to the relay cutout (23, fig. 30) and tag all leads. Remove the shunt bus bar terminal screw (18) and lockwasher (19).

(2) Remove the screw (21) and lockwasher (20) from the relay terminal connecting the bus bar (23, fig. 29) and the two leads.

(3) Remove the two relay mounting screws (22, fig. 30) with external lockwashers from the opposite corners of the relay. Slide the relay free and remove from control panel box.

b. Installation.

(1) Install the relay cutout (23) in mounting position, and secure at opposite corners with the two relay mounting screws (22) and external lockwashers.

(2) Install the shunt bus bar (17) on the relay terminal and secure with the terminal screw (18), and lockwasher (19).

(3) Install the two leads and the bus bar (23, fig. 29) on the remaining relay terminal, and secure with terminal screw (21, fig. 30) and lockwasher (20).

(4) Install the receptacle connector panel (par. 74).

86. Electrical Lead (Internal)

a. Removal.

(1) Remove receptacle connector panel (par. 74) for access to electrical lead (18, fig. 29).

(2) Remove the nut (20), lockwasher (21), electrical lead, and lockwasher (22) from the screw (19).

b. Installation.

(1) Place the lockwasher (22), electrical lead (18), and lockwasher (21) on the screw (19) and secure with the nut (20).

(2) Install the receptacle connector panel (par. 74).

87. Control Panel Box

a. Removal.

(1) Remove the receptacle connector panel (par. 74), and tag the three generator

leads and the shielded stop-switch lead (26, fig. 30).

(2) Remove the generator lead at the electrical relay switch (3) by removing the terminal nut (1) and lockwasher (2). Remove the generator lead at electrical starting switch (31) by removing terminal nut (33) and lockwasher (32). Remove the generator lead at variable resistor (1, fig. 29) by removing the terminal screw (2), nut (3), and lockwasher (4).

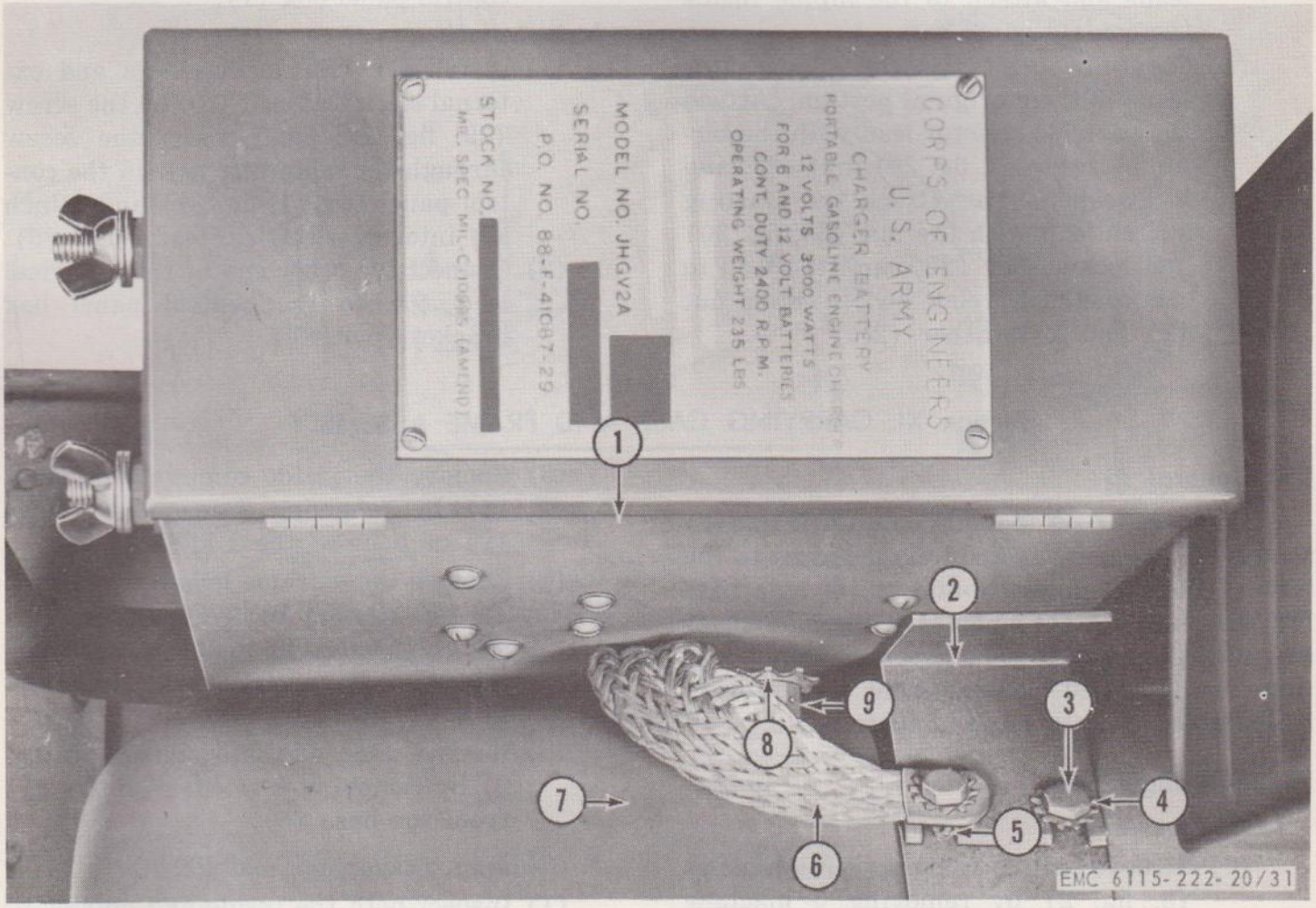
(3) Remove the shielded stop-switch lead by removing the stop-switch terminal screw (27, fig. 30). Disconnect the lead shield by removing the screw (29), lockwasher (30), external nut, and flat washer.

(4) Unscrew the electrical conduit bushing (24) and locknut (25) on the nipple (9, fig. 31) which extends from generator stator (7) into the control panel box (1). Bend the cable leads downward and straighten. Slide the electrical conduit bushing and the locknut off the generator leads.

(5) Remove the cap screws (3) and lockwashers (4) that secure the electrical lead (6) and control panel box mounting bracket (2) to the generator stator (7).

(6) Remove the electrical lead (6) and lockwasher (5).

(7) Remove the control panel box by lifting outward until free of the nipple, generator leads, and shielded stop-switch lead.



1 Control panel box
2 Mounting bracket
3 Screw, cap, ¼–20 x 1½ in. (2 rqr)
4 Washer, lock, IET, ¼ in. (2 rqr)
5 Washer, lock, IET, ¼ in.
6 Electrical lead
7 Generator stator
8 Nut, lock, 1 in.
9 Nipple, pipe, 1 x 11½ x 1½ in.

Figure 31. Control panel box, rear, removal points.

(8) Unscrew the nipple (9) with rear locknut (8) from the generator stator.

b. Installation.

(1) Install the nipple (9) with locknut (8) on the generator stator (7).

(2) Insert the generator leads and the nipple through the nipple hole in control panel box, and install the shielded stop-switch lead (26, fig. 30).

(3) Position the control panel box (1, fig. 31) on the stator (7) and secure with one cap screw (3) and lockwasher (4).

(4) Secure the electrical lead (6) to the stator and mounting bracket (2) with the lockwasher (5), and the other cap screw (3) and lockwasher (4).

(5) Slide the nipple locknut (25, fig. 30) and fiber bushing (24) over the cable leads and attach to the nipple inside the control panel box.

(6) Carefully bend the three generator leads to their original postion. Attach the variable resistor lead with the terminal screw (2, fig. 29), nut (3), and lockwasher (4). Attach the starting switch lead with the nut (33, fig. 30) and lockwasher (32), and the lead to the electrical relay switch with nut (1) and lockwasher (2).

(7) Connect the shield terminal of the stop-switch lead (26) to the control panel box with screw (29), and lockwasher (30), and external nut and flat washer. Connect the stop-switch lead to the stop-switch terminal with the terminal screw (27).

(8) Remove the lead tags, and install the receptacle connector panel (par. 74).

88. Electrical Lead (External)

a. Removal.

(1) Disconnect the electrical lead (6, fig. 31), at the control panel box bracket (par. 87).

(2) Remove the internal electrical lead (par. 86). Remove the screw (19, fig. 29), two IET lockwashers, and the electrical lead (6, fig. 31) from the control panel box (1).

b. Installation.

(1) Install the IET lockwashers and external electrical lead (6), on the screw (19, fig. 29), and insert the screw through the mounting hole in the control panel box (1, fig. 31) and attach the internal electrical lead (par. 86).

(2) Connect the other end of the electrical lead (6) to the control panel box bracket (par. 87).

Section XI. CARRYING CASE AND FRAME ASSEMBLY

89. General

The generator set is mounted on a frame assembly. The frame assembly is mounted to the base of the carrying case and serves as a base for the generator set when carrying case cover assembly is removed. The cover assembly contains an enclosed compartment for storing tools, cables, accessories, and spare parts.

90. Carrying Case

a. Disassembly.

(1) Remove each of the 4 carrying handles (3, fig. 2) by removing 5 machine screws (2) and T-nuts from the cover assembly (1).

(2) Remove each of the 4 catches (4, fig. 2) by removing 3 machine screws and nuts (3, fig. 4).

(3) Remove the inside compartment door (5) by removing 2 machine screws (7) on each of the 2 hinges (6).

(4) Remove the 4 frame hold-down straps (5, fig. 3) that secure the frame assembly cradle (4) to the base (8) by removing 4 carriage bolts (6) and nuts (7).

(5) Remove each of the 4 strikes (6, fig. 2) by removing 2 wooden screws (7) from the base (5).

b. Cleaning, Inspection, and Repair.

(1) Inspect both the inside and outside of the carrying case for cracks or other damage. Repair or replace any damaged parts such as the compartment door, door buttons, corner strips, or door supports. Inspect the metal cor-

ner strips on the outside of the cover assembly for looseness, and repair or replace, if necessary.

(2) Inspect the carriage-bolt holes for the hold-down straps for splits or excessive wear and repair if necessary.

c. Reassembly.

(1) Attach the inside compartment door (5, fig. 4) by installing 2 machine screws (7) at each of the 2 hinges (6).

(2) Attach the 4 catches (4, fig. 2) by installing the 3 machine screws and nuts (3, fig. 4) at each catch.

(3) Attach the 4 carrying handles (3, fig. 2) by installing the 5 machine screws (2) and secure with T-nuts from inside the cover assembly.

(4) Attach the 4 hold-down straps (5, fig. 3) by installing the 4 carriage bolts (6) and nuts (7).

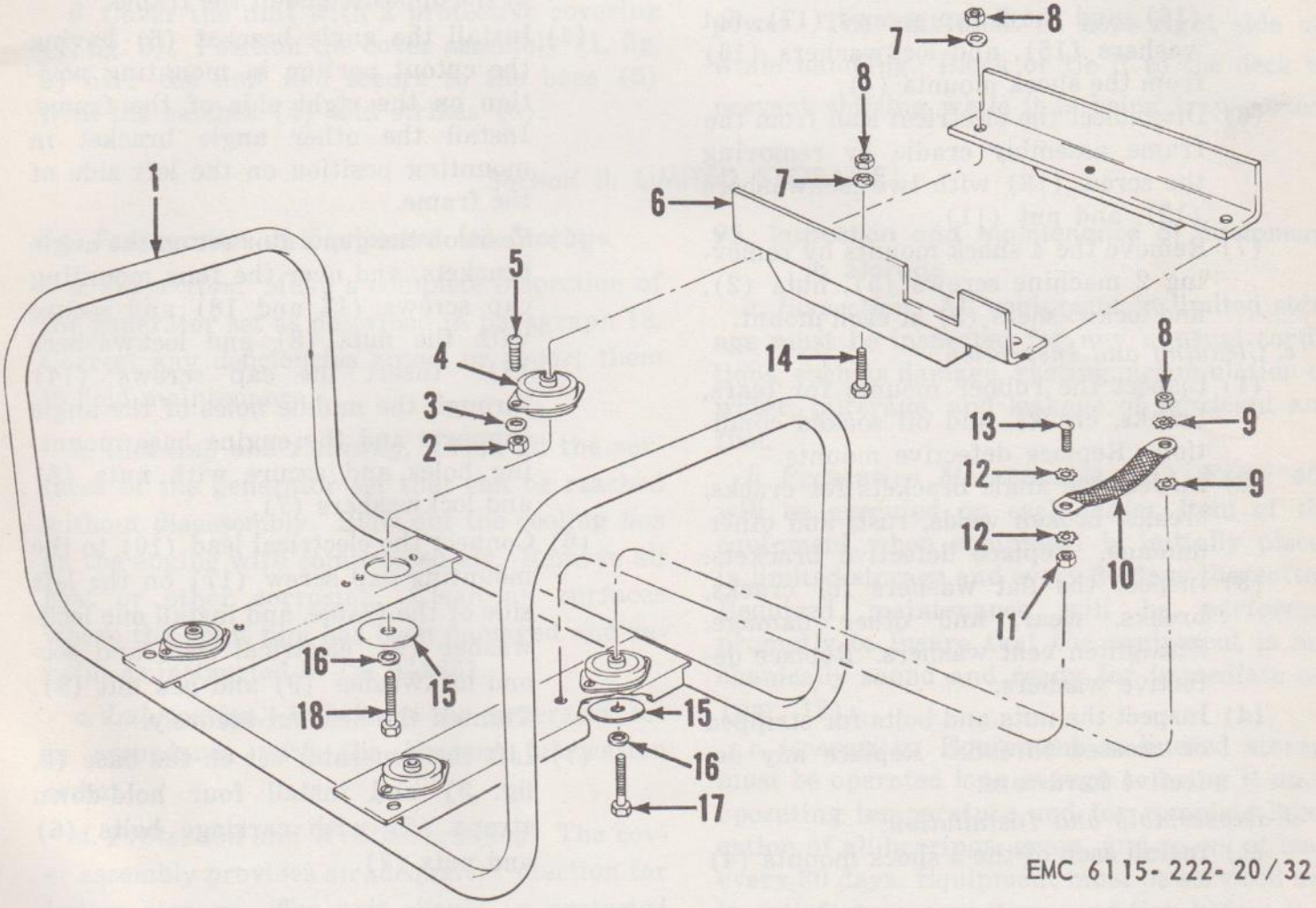
(5) Attach each of the 4 strikes (6, fig. 2) by installing 2 wooden screws (7).

91. Frame Assembly

a. General. The frame assembly consists of 4 rubber shock mounts (10, fig. 22) 2 angle brackets (8), and the frame assembly cradle (11).

b. Removal and Disassembly.

(1) Remove the hex nut (9) and lock-



1 Frame assembly cradle
2 Nut, plain, hex, 10–32 (8 rqr)
3 Washer, lock, No. 10 (8 rqr)
4 Shock mount (4 rqr)
5 Screw, machine, No. 10–32 x ½ (8 rqr)
6 Bracket, angle (2 rqr)
7 Washer, lock, ⅜ in. (5 rqr)
8 Nut, hex, ⅜–16 (6 rqr)
9 Washer, lock, IET, ⅜ in. (2 rqr)
10 Lead, electrical
11 Nut, hex, No. 8–32
12 Washer, lock, IET, No. 8 (2 rqr)
13 Screw, 8–32 x ½ in.
14 Screw, cap, hex-hd, ⅜–16 x 1½ in. (2 rqr)
15 Washer, flat, special (4 rqr)
16 Washer, lock, ⅜ in. (4 rqr)
17 Screw, cap, hex-hd, ⅜–16 x 2¾ in. (2 rqr)
18 Screw, cap, hex-hd, ⅜–16 x 2 in. (2 rqr)

Figure 32. Frame assembly, exploded view.

washer (9, fig. 32) at one end of the electrical lead (10). Disconnect the electrical lead, and remove second lockwasher (9).

(2) Remove the remaining five hex nuts (8) with lockwashers (7).

(3) Lift the generator set free of the frame assembly cradle (1) and the two angle brackets. Remove the two angle brackets (6) from the frame, and remove the two cap screws (14).

(4) Free the frame assembly cradle (4, fig. 3) from the base (8) by removing four carriage bolts (6), nuts (7), and hold-down straps (5).

(5) Remove the 2 cap screws (18, fig. 32) flat washers (15), and lockwashers (16), and the 2 cap screws (17), flat washers (15), and lockwashers (16) from the shock mounts (4).

(6) Disconnect the electrical lead from the frame assembly cradle by removing the screw (13) with two lockwashers (12), and nut (11).

(7) Remove the 4 shock mounts by removing 2 machine screws (5), nuts (2), and lockwashers (3) at each mount.

c. Cleaning and Inspection.

(1) Inspect the rubber mounts for tears, breaks, cracks, and oil soaked condition. Replace defective mounts.

(2) Inspect the angle brackets for cracks, breaks, broken welds, rust, and other damage. Replace defective brackets.

(3) Inspect the flat washers for cracks, breaks, wear, and other damage. Straighten bent washers. Replace defective washers.

(4) Inspect the nuts and bolts for stripped or crossed threads. Replace any defective hardware.

d. Reassembly and Installation.

(1) Install each of the 4 shock mounts (4) in mounting position on frame assembly and secure with 2 machine screws (5), nuts (2), and bottom lockwashers (3).

(2) Install the electrical lead screw (13) in mounting position and install the lockwasher (12), one end of electrical lead, a lockwasher (12) and one nut (11). Tighten the nut securely.

(3) Install the 2 cap screws (18), flat washers (15), and lockwashers (16), from the bottom of the shock mounts at the generator end of the frame. Install the two cap screws (17), and flat washers (15), and lockwashers (16), from the bottom of the shock mounts at the opposite end of the frame.

(4) Install the angle bracket (6) having the cutout portion in mounting position on the right side of the frame. Install the other angle bracket in mounting position on the left side of the frame.

(5) Position the generator set on the angle brackets, and over the four mounting cap screws (17 and 18) and secure with the nuts (8) and lockwashers (7). Insert the cap screws (14) through the middle holes of the angle supports and the engine base mounting holes and secure with nuts (8) and lockwashers (7).

(6) Connect the electrical lead (10) to the mounting cap screw (17) on the left side of the frame, and install one lockwasher (9), electrical lead, and second lockwasher (9) and hex nut (8). Tighten the hex nut securely.

(7) Lift the generator set on the base (8, fig. 3) and install four hold-down straps (5) with carriage bolts (6) and nuts (7).

CHAPTER 4
SHIPMENT AND LIMITED STORAGE

Section I. SHIPMENT WITHIN ZONE OF INTERIOR

92. Preparation of Equipment for Shipment

a. Drain the fuel tank (TM 5–6115–222–10).

b. Clean the fuel strainer sediment bowl (TM 5–6115–222–10).

c. Remove the air cleaner, drain the oil from the bowl, and clean (par. 46).

d. Cover the unit with a protective covering (1, fig. 3). Position the cover assembly (1, fig. 2) over the unit and secure to the base (5) with the catches (4) and strikes (6).

e. Crate the generator set using the shipping dimensions shown in TM 5–6115–222–10.

93. Loading Equipment for Shipment

Load the generator set on the deck of the carrier using a hand truck, fork lift, or manpower. The unit must be kept right side up while handling. Block or tie it to the deck to prevent shifting while it is being transported.

Section II. LIMITED STORAGE

94. Preparation of Equipment for Storage

a. Inspection. Make a complete inspection of the generator set as described in paragraph 18. Correct any deficiencies noted, or report them to field maintenance.

b. Cleaning and Painting. Clean all the surfaces of the generator set that can be reached without disassembly. Blow out the cooling fins on the engine with compressed air. Remove all rust or other corrosion. Clean all surfaces where the paint film has been damaged and repaint as instructed in TM 9–2851.

c. Lubrication. Lubricate the generator set in accordance with the current lubrication order.

d. Protection and Weatherproofing. The cover assembly provides an adequate protection for indoor storage. The unit should be protected by a suitable covering if stored outdoors.

95. Inspection and Maintenance of Equipment in Storage

a. Inspection. All equipment in limited storage must be inspected for any unusual conditions, such as damage, rusting, accumulation of water, pilferage, and leakage of lubricant and fuel.

b. Preventive Maintenance. DA Form 464 will be executed on each major item of the equipment when equipment is initially placed in limited storage and every 30 days thereafter. Required maintenance will be performed promptly to insure that the equipment is mechanically sound and ready for immediate use (par. 18).

c. Operation. Equipment in limited storage must be operated long enough to bring it up to operating temperature and for complete lubrication of all bearings, gears, and so on, at least every 30 days. Equipment must be serviced and in satisfactory operating condition before it is operated.

APPENDIX I

REFERENCES

1. Dictionaries of Terms and Abbreviations

AR 320–50 ——— Authorized Abbreviations.
AR 320–5 ——— Dictionary of United States Army Terms.

2. Fire Protection

TM 5–687 ——— Inspection and Preventive Maintenance Services for Fire Protection Equipment and Appliances.
TM 9–1799 ——— Ordnance Maintenance: Fire Extinguishers.

3. Lubrication

LO 5–6115–222–20 ——— Generator Set, Gasoline Engine: 2 kw, dc, 12V, Skid Mounted (Hollingsworth Model JHGV2A and JHGV2B) w/Engine, Briggs and Stratton, Models 23FBP, Type 803520 and 23AFB, Type 703575 FSN 6115–561–6220 and 6115–557–3612.

4. Operating Instructions

TM 5–6115–222–10 ——— Generator Set, Gasoline Engine: 2 kw, dc, 12V, Skid Mounted (Hollingsworth Model JHGV2A and JHGV2B) w/Engine, Briggs and Stratton, Models 23FBP, Type 803520 and 23AFB, Type 703575 FSN 6115–561–6220 and 6115–557–3612.

5. Painting

TM 9–2851 ——— Painting Instructions for Field Use.

6. Preventive Maintenance

TM 5–505 ——— Maintenance of Engineer Equipment.

7. Publication Indexes

DA Pam 108–1 ——— Index of Army Motion Pictures, Film Strips, Slides and Phono-Recordings.
DA Pam 310–1 ——— Index of Administrative Publications.
DA Pam 310–2 ——— Index of Blank Forms.
DA Pam 310–3 ——— Index of Training Publications.
DA Pam 310–4 ——— Index of Technical Manuals, Technical Regulations, 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.

8. Radio Interference Suppression

TM 11–483 ——— Radio Interference Suppression.

9. Supply Publications

TM 5–6115–222–20P ---------Generator Set, Gasoline Engine: 2 kw, dc, 12V, Skid Mounted (Hollingsworth Model JHGV2A and JHGV2B) w/Engine, Briggs and Stratton, Models 23FBP, Type 803520 and 23AFB, Type 703575 FSN 6115–561–6220 and 6115–557–3612.

10. Training Aids

FM 215 ----------Military Training.
FM 21–6 ----------Techniques of Military Instructions.
FM 21–30 ----------Military Symbols.

APPENDIX II
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. General

This Maintenance Allocation Chart assigns maintenance functions and repair operations authorized to be performed by the lowest appropriate maintenance echelon.

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, to preserve, and to replenish fuel and lubricants.

b. Adjust. To regulate periodically to prevent malfunction.

c. Inspect. To verify serviceability and to detect incipient mechanical failure to scrutiny.

d. Test. To verify serviceability and to detect incipient mechanical failure by use of special equipment such as gages and meters.

e. Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

f. Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required, utilizing tools, equipment and skills available, to include welding, grinding, riveting, straightening and adjusting.

g. Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of each of its components parts and reassembling it, using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

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 are taken from the Corp of Engineers Functional Grouping Indexes, and appear on the Maintenance Allocation Chart in their correct numerical sequence. These indexes are normally set up according to their proximity to each other and their function.

b. Components and Related Operation. This column contains the functional index group heading, sub-group headings, and a brief description of the part starting with the noun name. It also designates the operation to be performed such as service, adjust, inspect, test, replace, repair, and rebuild.

c. Echelon of Maintenance.

Column 1. First Echelon: First echelon maintenance is that maintenance performed by the user or operator of the equipment, such as servicing, cleaning, lubricating, and limited adjustments. It also includes removal and replacement of items to accomplish servicing and lubrication.

Column 2. Second Echelon: Second echelon maintenance is that maintenance performed by trained personnel provided for that purpose in the using organization, such as replacement of all items in column 2, limited parts fabrication from bulk material, adjustments, and repair of assemblies, components, and end items that can be accomplished without extensive disassembly.

Column 3. Third Echelon: Third Echelon maintenance is that maintenance performed by specially trained units in direct support of the using organization, such as replacement of all items in columns 2 and 3, repair assemblies,

components, end items, and fabricate parts from bulk material.

Column 4. Fourth Echelon: Fourth echelon maintenance is that maintenance performed by units organized as semifixed or permanent shops to serve lower echelon maintenance within a geographical area, such as replacement of items in columns 2, 3, and 4, repair end items, rebuild assemblies, components, and fabricate general use common hardware and parts.

Column 5. Fifth Echelon: Fifth echelon maintenance is that maintenance authorized for rebuilding assemblies, components, end items, and replacement of all parts in columns 2, 3, 4, and 5.

d. Symbol X. The symbol X placed in the appropriate column indicates the lowest echelon maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level.

e. Remarks. The remarks column is used to explain why maintenance, that would normally be done at a lower echelon, is moved to a higher echelon because of some peculiarity in the construction of the end item.

MAINTENANCE ALLOCATION CHART

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
01	ENGINES						
0100	ENGINE ASSEMBLY						
	Engine, Gasoline						
	Service	X					
	Replace			X			
	Repair		X				
	Rebuild				X		
	Test					X	
	Inspect		X				
0101	CRANKCASE, BLOCK, CYLINDER HEAD						
	Engine Block Assembly						
	Replace			X			
	Repair			X			
	Head, Cylinder						
	Replace		X				
	Cover Assembly						
	Replace			X			
0102	CRANKSHAFT						
	Crankshaft, Bearings, Seals						
	Replace			X			
0103	FLYWHEEL ASSEMBLY						
	Flywheel						
	Replace		X				
0104	PISTONS, CONNECTING RODS						
	Piston, Rings, Pin						
	Replace			X			
	Connecting Rod Assembly						
	Replace			X			
0105.1	VALVES						
	Valves, Springs						
	Replace			X			
	Repair			X			
	Seat						
	Replace			X			
	Repair			X			

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
0105.2	ROCKER ARMS, TAPPETS						
	Cover, Gasket						
	Replace	-------	X				
	Lifters						
	Replace	-------	-------	X			
0105.3	CAMSHAFTS						
	Gear Assembly, Shaft						
	Replace	-------	-------	X			
0106.5	CRANKCASE VENTILATION						
	Breather						
	Service	-------	X				
	Replace	-------	X				
0106.6	OIL PAN, LINES, LEVEL GAGE						
	Base						
	Replace	-------	-------	X			
0108	MANIFOLDS						
	Intake Elbow, Gasket						
	Replace	-------	X				
0111.1	HAND OR CRANKCASE DEVICES						
	Pulley						
	Replace	-------	X				
	Rope						
	Replace	X					
03	FUEL SYSTEM						
0301	CARBURETOR, FUEL INJECTOR						
	Carburetor						
	Adjust	X					
	Replace	-------	X				
	Repair	-------	-------	X			
0302	FUEL PUMP						
	Pump						
	Service	X					
	Replace	-------	X				
0304	AIR CLEANER						
	Cleaner						
	Service	X					
	Replace	X					
	Pipe						
	Replace	-------	X				
0306	TANKS, LINES, FITTINGS						
	Cap or Strainer						
	Replace	X					
	Strainer						
	Service	X					
	Tank, Bracket						
	Replace	-------	X				
	Repair	-------	X				
	Cock or Lines						
	Replace	-------	X				
	Repair	-------	X				
0308	ENGINE SPEED GOVERNOR						
	Gear Assembly						
	Replace	-------	-------	X			
	Governor Crank						
	Replace	-------	-------	X			

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
0308.4	GOVERNOR CONTROLS						
	Levers, Rods, Spring						
	Adjust		X				
	Replace		X				
0312	INJECTOR, ACCELERATOR, THROTTLE, AND CHOKE CONTROLS						
	Carburetor Link						
	Replace		X				
04	EXHAUST SYSTEM						
0401	MUFFLER AND PIPES						
	Muffler, Elbows, Nipple						
	Replace		X				
05	COOLING SYSTEM						
0502	COWLING, DEFLECTORS, AIR DUCT, SHROUD						
	Cylinder Shield						
	Replace			X			
	Guide, or Head Cover						
	Replace		X				
	Blower Housing						
	Replace		X				
06	ELECTRICAL SYSTEM (ENGINE AND VEHICULAR)						
0604.2	MAGNETO						
	Stator and Support						
	Adjust		X				
	Replace		X				
	Rotor						
	Replace		X				
	Coil or Core						
	Test		X				
	Replace		X				
	Breaker Box Assembly						
	Replace		X				
	Contacts						
	Adjust		X				
	Replace		X				
	Capacitor						
	Test		X				
	Replace		X				
0605	IGNITION COIL: WIRING, SPARK PLUGS						
	Spark Plug						
	Service		X				
	Adjust		X				
	Replace		X				
0607	INSTRUMENT AND ENGINE CONTROL PANEL						
	Starter Switch						
	Replace		X				
	Stop Switch						
	Replace		X				
15	FRAME						
1501	FRAME ASSEMBLY						
	Frame Assembly						
	Replace		X				
	Repair		X				

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
17	BODY; CAB; HOOD; HULL						
1708	STOWAGE RACKS, BOXES, STRAPS						
	Carrying Case Assembly						
	Replace		X				
	Repair		X				
22	MISCELLANEOUS BODY, CHASSIS OR HULL, AND ACCESSORY ITEMS						
2210	DATA PLATES AND INSTRUCTION HOLDERS						
	Data Plates						
	Replace			X			
41	ELECTRIC GENERATORS						
4100	GENERATOR ASSEMBLY						
	Generator Assembly						
	Inspect		X				
	Test			X			
	Replace			X			
	Repair			X			
	Rebuild					X	
4100.1	ROTOR ASSEMBLIES						
	Armature Assembly						
	Test			X			
	Replace			X			
	Repair			X			
	Rebuild					X	
4100.2	STATOR ASSEMBLIES						
	Field Winding						
	Replace			X			
	Repair			X			
	Stator Assembly						
	Replace			X			
4100.3	BRUSH HOLDERS						
	Holder Assembly						
	Replace			X			
	Brushes						
	Adjust		X				
	Replace		X				
4100.4	VENTILATING SYSTEM						
	Fan						
	Replace		X				
4100.5	FRAME SUPPORTS AND HOUSINGS						
	Covers						
	Replace		X				
	Bearing						
	Replace			X			
4100.7	CONTROL PANELS, HOUSINGS, CUBICLES						
	Box						
	Replace		X				
	Repair		X				
	Panel						
	Replace		X				
	Repair		X				
4100.8	MASTER OR AUXILIARY CONTROL ASSEMBLY						
	Variable Resistor						
	Replace		X				

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
4100.9	CIRCUIT BREAKER ASSEMBLY						
	Relay Switch						
	Replace		X				
4100.12	RESISTORS						
	Resistors						
	Replace		X				
4100.13	RELAY OR ASSEMBLY						
	Cutout						
	Replace		X				
4100.19	RADIO INTERFERENCE SUPPRESSION						
	Capacitors						
	Test		X				
	Replace		X				
	Bond Leads						
	Replace		X				
42	ELECTRICAL EQUIPMENT						
4207	INSTRUMENTS						
	Ammeter						
	Replace		X				
4208	POWER RECEPTACLES						
	Connectors						
	Replace		X				
4214	MISCELLANEOUS WIRING; FITTINGS						
	Charging or Starter Leads						
	Replace	X					
	Repair		X				
	Jumper Leads						
	Replace	X					
76	FIRE FIGHTING EQUIPMENT						
7603	FIRE EXTINGUISHERS						
	Extinguisher, Fire						
	Service	X					
	Replace	X					

INDEX

[AG 412.5 (28 Nov 58)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

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Chief of Staff.

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Alaska Engr Dist (1)
Los Angeles Engr Dist (1)
New Orleans Engr Dist (1)
New York Engr Dist (1)
Louisville Engr Dist (1)
Pittsburgh Engr Dist (1)
San Francisco Engr Dist (1)
Omaha Engr Dist (1)
Seattle Engr Dist (1)
Kansas City Engr Dist (1)
Baltimore Engr Dist (1)
Ft Worth Engr Dist (1)
Eastern Ocean Engr Dist (1)
Philadelphia Engr Dist (1)
Rock Island Engr Dist (1)
St Louis Engr Dist (1)
St Paul Engr Dist (1)
Engr Fld Maint Shops (2)
AMS (3)
Engr Rd Lab (3)
Engr Cen (5)
Engr Maint Cen (36)
Engr Proc Cen (2)
Japan Engr Sup Cen (20)
USA Engr Sup Con Agcy (10)
Chicago Proc Ofc (10)
Engr Sup Con Ofc (10)
USAREUR ComZ (2)
Fld Comd, AFSWP (8)
Mil Dist (1)
USA Corps (Res) (1)
Sector Comd, USA Corps (Res) (1)
JBUSMC (1)
MAAG (5)
Units org under fol TOE:
3–32 (2)
3–47 (2)
3–67 (2)
3–77 (2)
3–217 (2)
3–266 (2)
3–500 (AA–FD) (2)
5–15 (2)
5–16 (2)
5–35 (2)
5–36 (2)
5–48 (2)
5–67 (2)
5–137 (2)
5–138 (2)
5–139 (2)
5–157 (5)
5–167 (2)
5–192 (2)
5–215 (2)
5–216 (2)
5–225 (2)
5–226 (2)
5–262 (5)
5–267 (1)
5–278 (5)

5–279 (2)
5–315 (2)
5–316 (2)
5–317 (2)
5–324 (2)
5–328 (2)
5–329 (2)
5–348 (2)
5–367 (2)
5–415 (2)
5–416 (2)
5–526 (2)
6–100 (2)
6–101 (2)
6–125 (2)
6–126 (2)
6–127 (2)
6–129 (2)
6–135 (2)
6–136 (2)
6–200 (2)
6–201 (2)
6–225 (2)
6–226 (2)
6–227 (2)
6–229 (2)
6–235 (2)
6–236 (2)
6–237 (2)
6–300 (2)
6–301 (2)
6–315 (2)
6–316 (2)
6–317 (2)
6–319 (2)
6–325 (2)
6–326 (2)
6–401 (2)
6–419 (2)
6–435 (2)
6–501 (2)
6–515 (2)
6–525 (2)
6–535 (2)
6–536 (2)
6–545 (2)
6–575 (2)
6–576 (2)
6–625 (2)
6–626 (2)
6–627 (2)
7–11 (2)
7–13 (2)
7–25 (2)
7–26 (2)
7–31 (2)
7–33 (2)
7–95 (2)
7–96 (2)
8–15 (2)
8–16 (2)
8–57 (2)
8–75 (2)
8–76 (2)
8–117 (2)
8–187 (2)
8–317 (2)
8–551 (2)
8–565 (2)
8–566 (2)
8–567 (2)
8–581 (2)
8–590 (2)
8–667 (2)
9–7 (2)
9–9 (2)
9–17 (2)
9–25 (2)
9–28 (2)
9–35 (2)
9–38 (2)
9–45 (2)
9–46 (2)
9–57 (2)
9–65 (2)
9–67 (2)
9–97 (2)
9–127 (2)
9–197 (2)
9–228 (2)
9–229 (2)
9–315 (2)
9–316 (2)
9–325 (2)
9–348 (2)
9–358 (2)
9–367 (2)
9–375 (2)
9–376 (2)
9–387 (2)
10–17 (2)
10–45 (2)
10–47 (2)
10–48 (2)
10–77 (2)
10–147 (2)
10–157 (2)
10–167 (2)
10–187 (2)
10–197 (2)
10–227 (2)
10–237 (2)
10–247 (2)
10–257 (2)
10–277 (2)
10–297 (2)
10–337 (2)
10–357 (2)
10–407 (2)
11–7 (2)
11–15 (2)
11–16 (2)
11–25 (2)
11–26 (2)

11–57 (2)
11–95 (2)
11–96 (2)
11–116 (2)
11–117 (2)
11–127 (2)
11–128 (2)
11–537 (2)
11–557 (2)
17–2 (2)
17–17 (2)
17–22 (2)
17–25 (2)
17–26 (2)
17–32 (2)
17–35 (2)
17–36 (2)
17–45 (2)
17–46 (2)
17–51 (2)
17–53 (2)
17–55 (2)
17–56 (2)
17–57 (2)
17–62 (2)
17–115 (2)
17–116 (2)
17–125 (2)
17–126 (2)
17–127 (2)
19–27 (2)
19–35 (2)
19–36 (2)
19–55 (2)
19–97 (2)
19–237 (2)
20–300 (2)
20–511 (2)
20–512 (2)
29–500 (2)
33–2 (2)
33–56 (2)
33–77 (2)
44–12 (2)
44–15 (2)
44–16 (2)
44–25 (2)
44–26 (2)
44–35 (2)
44–36 (2)
44–75 (2)
44–76 (2)
44–101 (2)
44–112 (2)
44–115 (2)
44–116 (2)
44–145 (2)
44–146 (2)
44–201 (2)
44–275 (2)
44–276 (2)
44–315 (2)
44–316 (2)
44–415 (2)
44–416 (2)
44–445 (2)
44–446 (2)
51–2 (2)
52–2 (2)
54–102 (2)
54–202 (2)
55–16 (2)
55–17 (2)
55–18 (2)
55–19 (2)
55–28 (2)
55–117 (2)
55–225 (2)
55–226 (2)
55–457 (2)
55–458 (2)
55–515 (2)
55–517 (2)
55–555 (2)
55–556 (2)
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57–57 (2)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: Same as Active Army except allowance is one copy to each unit.

For explanation of abbreviations used see AR 320–50.

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