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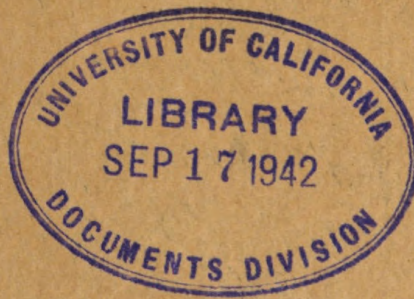
U.S. Dept. of Army

WAR DEPARTMENT

TECHNICAL MANUAL

CHARGING SET SCR-169

December 10, 1941





(US War Dept)

TM 11-302

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TECHNICAL MANUAL

CHARGING SET SCR-160

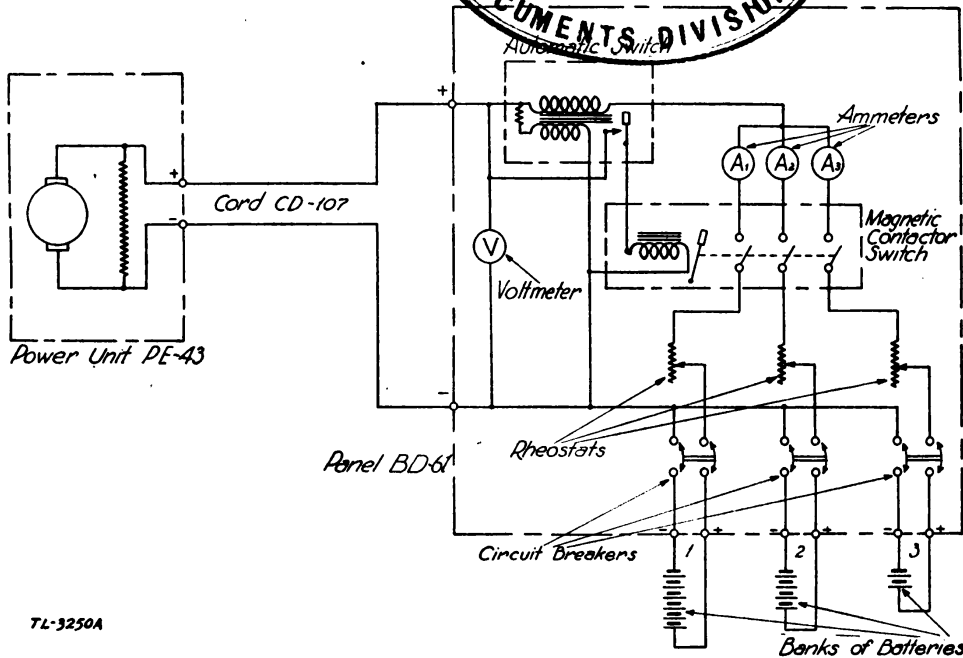
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1944

CHANGES
No. 1



TM 11-302, December 10, 1941, is changed as follows:



7L-3250A

FIGURE 16.—Charging set SCR-160—circuit diagram with batteries.

[A.G. 062.11 (4-6-43).] (C 1, May 12, 1943.)

9. Maintenance and repair of power unit PE-()-43.

* * * * *
a. Engine.

* * * * *
(2) PE-HB-43.—(a) Lubrication.

2. After every 50 hours of operation * * * with fresh oil. (See (3) (a) 2 below.)

(3) PE-HC-43, PE-HD-43, PE-HE-43, PE-HF-43, and PE-HG-43.—(a) Lubrication.

2. After every 50 hours of operation * * * been tightened securely.

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10¹/₄. (Added.) **Power units PE-HF-43 and PE-HG-43.**—These units are identical with power units PE-HD-43 and PE-HE-43. All information in paragraphs 1 to 10 inclusive pertaining to power units PE-HD-43 and PE-HE-43 applies to power units PE-HF-43 and PE-HG-43.

10¹/₂. (Added.) **Additional information and instructions on power units PE-HD-43, PE-HE-43, PE-HF-43, and PE-HG-43.**—*a. Ratings and capacities.*—The output ratings of these units is 550 watts at 32 volts and 17 amperes with an engine speed of 2,350 rpm. The output voltage can be varied from 30 to 40 volts by means of the throttle adjustment. It should be adjusted for 32 volts with a full load of 17 amperes (the load is the sum of the current readings on the three ammeters). Additional adjustment should not be required. The gas tank holds 1¹/₄ gallons. Gasoline consumption is ¹/₄ gallon per hour at full load. While it is preferable to use low test unleaded gasoline, standard issue gasoline may be used. When high test gasoline is used it may be necessary to wrap the gas line with asbestos to prevent the engine heat from causing a vapor lock in the line. When the crankcase is drained, refill it with 1 quart of SAE 20 engine oil. The oil should be changed after about every 50 hours of operation. An excellent way of keeping track of the running time is to keep a record of the amount of gasoline used. On this basis the oil should be changed after every 12 to 15 gallons of gas have been used. When adding gas to the tank, put in a quart at a time. After every 500 hours of operation (when ready for the eleventh oil change, or when 120 to 150 gallons of gas have been used) the carbon and lead should be removed and the valves ground.

b. *Internal connections of generator.*—The two leads from the field coils, the two jumpers between the brush holders, the two leads to the terminal board posts, and the two panel connecting straps must be connected as shown in figure 19 to assure proper functioning of the generator, and the polarized receptacle must be installed as shown to assure proper polarity.

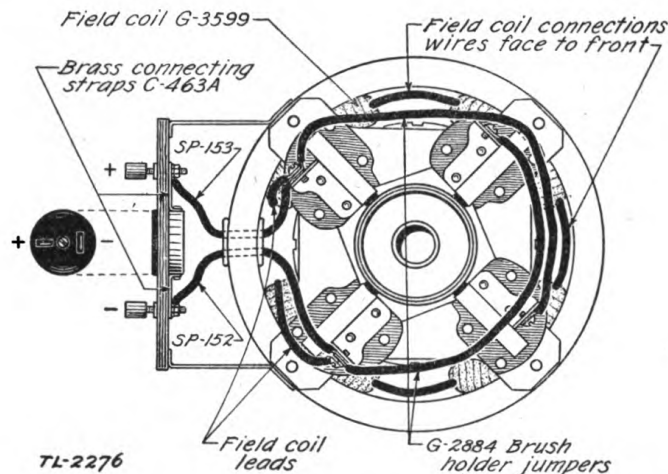
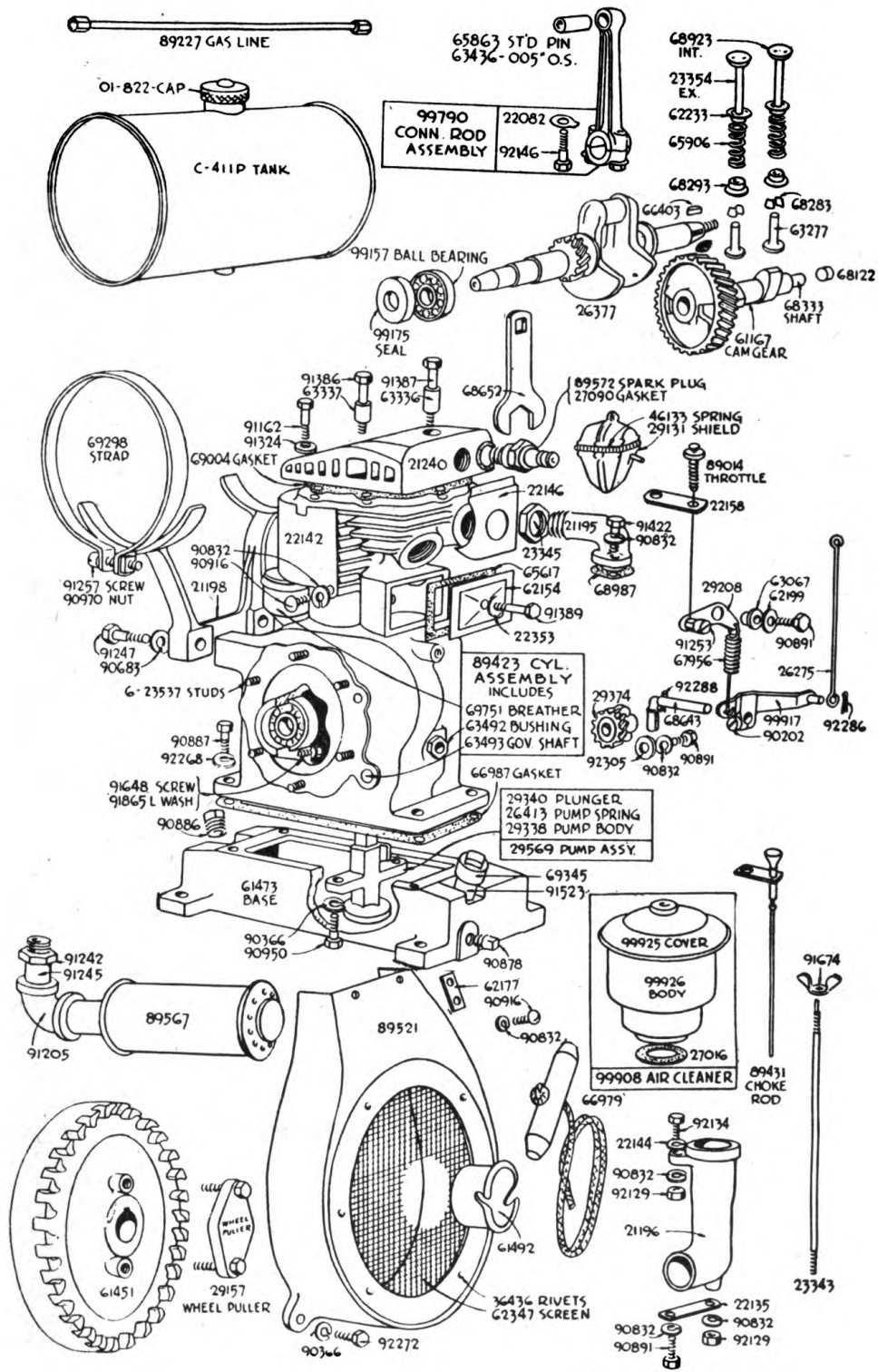


FIGURE 19.—Diagram showing internal connections of generator.

c. *Generator maintenance notes.*—(1) Six bolts (see fig. 20) (manufacturer's part No. 250) are used on some engines to attach the generator adapter (manufacturer's part No. C-641 L) to the engine. Note that two of the bolts are $\frac{3}{4}$ inch long and four of the bolts are $\frac{7}{8}$ inch long. The $\frac{3}{4}$ -inch bolts must be installed in the two holes at the extreme right (2 o'clock and 4 o'clock positions) when the adapter is in place against the engine. Other engines have studs (see fig. 21) mounted on the engine for attachment of the generator adapter.

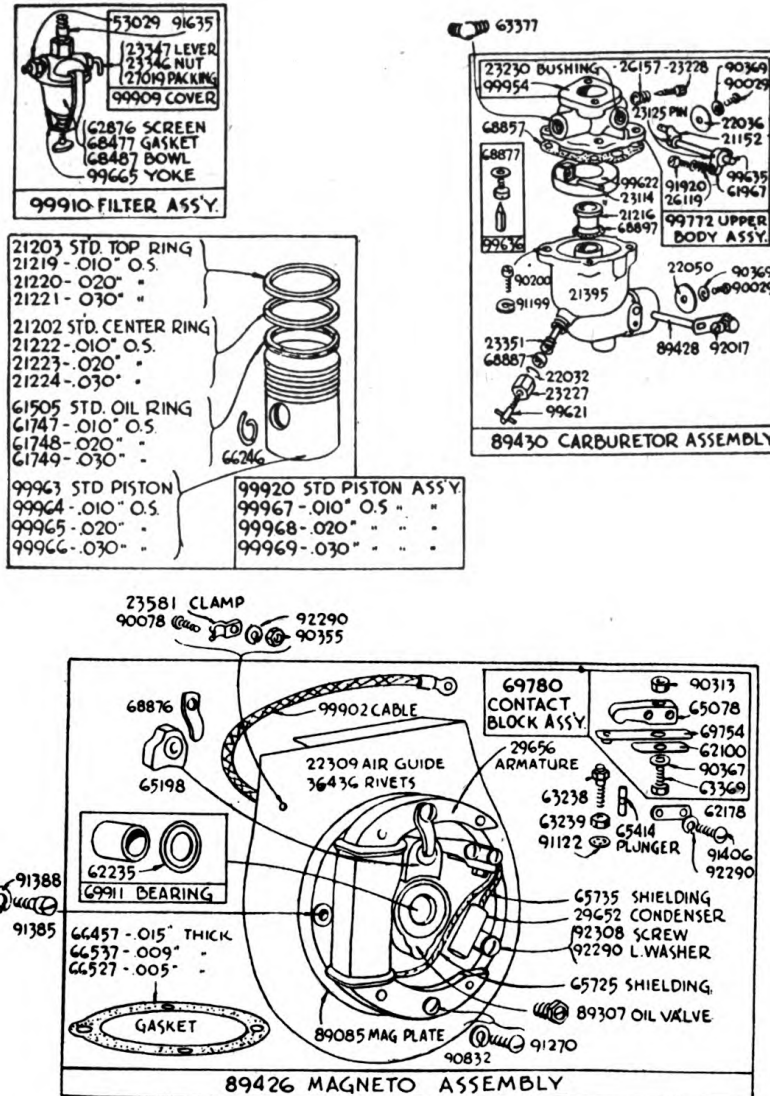
(2) To remove armature (manufacturer's part No. G-3596), remove brush holder bracket assembly (manufacturer's part No. G-3731); unscrew bolt (manufacturer's part No P-4150) and remove fan; replace bolt (P-4150), screw it in about three or four turns, and tap it gently on the head with a light hammer. This will loosen the armature from the tapered engine shaft. Remove bolt and lift off armature.

CHARGING SET SCR-169



TL-4787

FIGURE 21.—Engine parts.



TL-4786

FIGURE 22.—Piston, carburetor, and magneto parts.

11. List of replacement parts.—A list of replacement parts of power unit PE-()-43 and panel BD-()-61 is given below (*a* to *au*, incl.).

A	B	C	D	E	F
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43, PE-HE-43, PE-HF-43, PE-HG-43 Climax Engineering Corporation, Clinton, Iowa
40.	Piston, oil pump	.	RA-366	63207	.
46.	Spring, oil pump, small	.	RA-377	26413	26413.
46A.	Screw, 5/16"—24 x 3/4" hex. hd.	.			90950.
46B.	Lockwasher, 5/16", for item 46A	.			90366.
47.	Retainer, oil pump check ball	.	RA-368-A		.
59.	Cylinder	11399	RA-1-F		.
59A.	Tube, breather				69751.
60.	Valve, intake	.	RA-20-A	68923	68923.
79.	Shield, cylinder	10555		62335	22142.
79A.	Guide, air, front (intake manifold side).				22146.
79B.	Guide, intake valve (not illustrated).				61348.
79C.	Guide, exhaust valve (not illustrated).				61955.
k.	Louvre plate assembly	.	RA-1235-2		.
85.	Bearing, crankshaft, ball	.		99157	99157.
85A.	Screw, bearing retainer	.			91648.
85B.	Lockwasher, bearing retainer screw.	.			91865.
86.	Oil seal, crankshaft bearing	.		99175	99175.
106.	Plug, spark, 18 mm x 1.5 mm thread.	3H4413-7	RA-359	89572	89572.
106A.	Gasket, spark plug				27090.
107.	Screw, cylinder	10494			.
126.	Lever, governor	.	RA-55		99917.
126A.	Pin, cotter, 1/16" x 7/8" (for item 126).	.			92286.
127.	Spring, governor	.	RA-183		.
369A.	Cable, ignition (not included in assembly <i>aa</i>).	.		29147	29147.
369B.	Cable, ignition	.			99902.
370.	Brush holder, magneto	15309			.
386.	Valve, oil return	.		89307	89307.

A	B	C	D	E	F
Item reference No.	Name of Item	PE-HA-43	PE-HB-43	PE-HC-43	PE-HD-43, PE-HE-43, PE-HF-43, PE-HG-43
		Homelite Corporation, Port Chester, N. Y.	United States Motors Corporation, Oshkosh, Wis.		Climax Engineer- ing Corporation, Clinton, Iowa
386A	Clamp, for ignition cable on air guide.				23581.
386B	Screw, 10-32 x 5/16" round head, for cable clamp.				90078.
386C	Nut, 10-32 hex, for cable clamp screw.				90355.
386D	Lock washer, 13/64" x 1/16" x 3/64", (for items 386C and 386E).				92290.
386E	Screw, round head, contact block mounting.				91406.
386F	Rivet, for air guide.				36436.
ah	Fuel tank assembly		RA-2429-1		
397	Washer, fuel tank cap.		RA-311		65053 or C-589A.
405	Screw, fuel tank bracket.		4-G-05	91229	91247.
407	Nut and bolt, fuel tank strap.			91568	91568.
407A	Bolt 1/4"-20 x 1 1/2" round head (for item 403).				91257.
407B	Nut, 1/4"-20 square head (for item 403).				90970.
ak	Base assembly		RA-1015-5		
449	Housing, blower		RA-104-C	29098	1 99929 or 2 89521.
494	Receptacle	15100		10108	10108.
494A	Standard screw, 6-32 x 3/8" round head brass, (for item 494).				
494B	Standard lock washer, for 6-32 screw (for item 494A).				
494C	Strap connection, (for item 494)				C-463-A.
495	Nut, molder terminal	15071			
500	Bracket, terminal panel, right hand.			SC-34	C-394-D.
500A	Standard screw, 10-32 x 1/2" (round head) brass machine (for items 499 and 500).				
500B	Standard nut, 10-32 brass hex. (for item 500A).				
500C	Lock washer (for item 500A)				1910.
501	Cable, negative, long	11590			SP-152.
502	Cable, positive, short	11589			SP-153.
503	Cable, regulator to terminal plate	15051			

¹ Used with PE-HD-43 and PE-HE-43.

² Used with PE-HF-43 and PE-HG-43.

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A	B	C	D	E	F
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43, PE-HE-43, PE-HF-43, PE-HG-43 Climax Engineering Corporation, Clinton, Iowa
505.....	Binding post, terminal.....			45.....	45.
505A.....	Lock washer (for item 505).....				1910.
505B.....	Washer, brass (for item 505).....				10S.
505C.....	Standard nut, hex. 10-32 brass, (for item 505).....				
at.....	Armature Assembly..... Includes items.....	10758..... 506, 507.....		G-3596.....	G-3596.
506.....	Armature.....	15155.....			
507.....	Fan and bushing assembly.....			G-3597.....	G-3597.
507A.....	Bolt, fan.....				P-4150.
507B.....	Lock washer, fan bolt.....				P-3849.
au.....	Field frame and coil assembly..... Includes items.....	10766.....	508, 509.....		
508.....	Casting, field frame.....			P-5746.....	P-5746.
508A.....	Studs, field frame.....				C-554-C.
508B.....	Standard nuts, 1/4"-28 NF hex. (for item 508A).....				
508C.....	Lock washers (for item 508A).....				1225.
509.....	Coil assembly, field.....			G-3599.....	G-3599.
*	*	*	*	*	*
514.....	Grommet, insulating.....			GR-A-5848.....	GR-A-5848.
514A.....	Shim, field pole.....				SM-A-6175.
av.....	Brush assembly.....	11476.....			
*	*	*	*	*	*
517.....	Holder, brush.....	15120.....		G-3731.....	G-3731.
517A.....	Screw, brush holder.....				P-3851.
518.....	Screw, brush holder.....			P-4581.....	P-4581.
*	*	*	*	*	*
532.....	Cover, generator.....			P-5743.....	P-5743.
532A.....	Name plate, instruction.....				C-401-S.
532B.....	Standard pin, escutcheon, 1 1/4" brass.....				
532C.....	Name plate, power unit.....				C-401-AS.
533.....	Cover, generator end.....			P-5744.....	P-5744.
*	*	*	*	*	*
535.....	Lock washer, end plate screw.....	10485.....		P-3515.....	P-3852.
535A.....	Screw, end cover.....				P-5763.
535B.....	Lock washer, end cover screw.....				P-3515.
536.....	Adapter, generator.....			P-I-550-A.....	C-641-L.
536A.....	Stud, for mounting item 536.....				23537.
536B.....	Standard nut, 5/16"-24 N. F. hex. for item 536A.....				
536C.....	Standard cap screw, 5/16"-24 hex. hd., for mounting item 536.....				
536D.....	Lock washer (for item 536A or 536C).....				1330.
537.....	Screw, shell.....			P-5734.....	P-5734.
*	*	*	*	*	*

A	B	C	D	E	F
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43	PE-HC-43	PE-HD-43, PE-HE-43, PE-HF-43, PE-HG-43 Climax Engineering Corporation, Clinton, Iowa
541.....	Skid base assembly.....			SC-31.....	¹ C-576-B or ² C-576-J. C-643-AG. C-434-C.
541A.....	Support, generator.....				
541B.....	Spacer, generator support (center).....				
541C.....	Standard cap screw, 3/8"-16 N. C. x 1 1/2" hex. head for item 541B.				
541D.....	Standard lock washer, 3/8" (for item 541C).				
541E.....	Spacer, generator support (ends).....				C-434-B.
541F.....	Lock washer (for item 541E).....				1218.
541G.....	Standard nut, 5/16"-18 N. C. hex. head (for item 541E).				
542.....	Mounting, rubber.....			DA-1090-70.	DA-1090.
542A.....	Handle, carrying "U" (see fig. 6).....				C-612-A.
542B.....	Lock nut, carrying handle.....				C-425-A.
542C.....	Angle iron (for item 540).....				2522.
542D.....	Plate, back (for item 540).....				C-567.
543.....	Handle, crate.....			2082-J-4.....	108.
*	*	*	*	*	*

[A. G. 062.11 (4-6-43).] (C1, May 12, 1943.)

¹ Used with PE-HD-43 and PE-HE-43.

² Used with PE-HF-43 and PE-HG-43.

12. (Added.) **Tools and spare parts for power units PE-HD-43, PE-HE-43, PE-HF-43, and PE-HG-43.**—The following tools and spare parts are furnished with each of the above power units and are packed in the tool box on the skid base. The manufacturer is Climax Engineering Company, Clinton, Iowa.

1 set of tools as follows:

- 1 6-inch gas plier (thin nose).
- 1 8-inch screw driver.
- 1 9-inch carbon scraper.
- 1 3/8- by 1/16-inch open-end wrench.
- 1 1/2- by 9/16-inch open-end wrench.
- 1 1 1/32- by 1 1/16-inch open-end wrench.
- 1 5/8- by 3/4-inch open-end wrench.
- 1 29157 wheel puller.
- 1 1 1/4-inch manifold wrench (3/16-inch thick).
- 1 1-inch spark plug wrench, 68652.
- 1 1/4-inch magneto wrench with 0.002-inch gap gages.
- 1 1/16-inch connecting rod wrench.

CHARGING SET SCR-169

- 1 set spare parts as follows:
- 2 89572 spark plugs (Champion type 6M)
 - 1 29652 condenser.
 - 1 69780 contact block assembly.
 - 1 envelope containing—
 - 4 G-2963 generator brushes.
 - 1 envelope containing—
 - 1 63238 contact point screw.
 - 1 66987 base gasket.
 - 1 66457 magneto plate gasket 0.015-inch thick.
 - 1 66537 magneto plate gasket 0.009-inch thick.
 - 1 66527 magneto plate gasket 0.005-inch thick.
 - 1 69004 cylinder head gasket.
 - 1 65617 valve cover plate gasket.
 - 1 68477 gasoline filter gasket.
 - 1 27016 air cleaner gasket.
 - 1 68987 carburetor gasket.
 - 1 68877 inlet valve seat gasket.
 - 1 68897 venturi gasket.
 - 1 68887 needle valve packing.
 - 1 68857 carburetor body gasket.
 - 1 69754 contact point and spring.
 - 1 65053 gasoline tank cap gasket.
 - 1 C-589A fuel tank cap gasket.
 - 1 starting rope.

[A. G. 062.11 (4-6-43).] (C 1, May 12, 1943.)

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

TECHNICAL MANUAL }
No. 11-302 }

WAR DEPARTMENT,
WASHINGTON, December 10, 1941.

CHARGING SET SCR-169

Prepared under direction of the
Chief Signal Officer

	Paragraph
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1. Use.—The charging set SCR-169 is intended primarily to provide a portable means for charging storage batteries where an internal-combustion engine-driven generator with a d-c power output of not more than 550 watts at 32 volts is required. This set may be readily transported by truck or wagon and may be used in any location where sufficient space to install it is available.

2. Description.—Each charging set SCR-169 consists of one power unit PE-()-43, one panel BD-()-61, and one cord CD-107. The power unit and the panel are manufactured under the general nomenclature of power unit PE-()-43 and panel BD-()-61, in accordance with so-called “performance specifications” which allow the various manufacturers to furnish equipment of their own design provided certain requirements as to performance are satisfied. The parentheses in the nomenclature are replaced on name plates by code letters identifying the particular design furnished on any order, for example, PE-HC-43. These letters differentiate each design supplied under the specifications from the various other models produced. At the time of printing the following power units and panels for charging set SCR-169 have been procured: Power units PE-HA-43, PE-HB-43, PE-HC-43, PE-HD-43, and PE-HE-43; and panels BD-LL-61, BD-LM-61, BD-LN-61, BD-LO-61, and BD-LP-61. In the field when not in use the cord CD-107 is normally carried in the panel BD-()-61; this allows the set to be carried in two sections.

a. One part is the power unit which consists of a wooden packing crate containing the engine-generator unit and a box for carrying the

*This pamphlet supersedes TR 1215-6, July 14 1932.

tools and spare parts, both of which are attached to a common base which also forms the bottom of the packing crate (fig. 17). The dimensions of the power units PE-()-43 are as follows:

	Width (inches)	Length (inches)	Height (inches)	Height without crate (inches)	Weight without crate (pounds)	Weight including crate (pounds)
PE-HA-43.....	17¾	25¼	25½	21	169	185
PE-HB-43.....	20	25½	22¼	18½	110½	150
PE-HC-43.....	22½	20½	24	22	115	153
PE-HD-43.....	20¾	22¾	22½	20½	110	150
PE-HE-43.....	20¾	22¾	22½	20½	110	150

b. The second part is the panel BD-()-61 which consists of a sheet steel cabinet in which is permanently mounted an insulating panel board with its electrical measuring instruments, rheostats, switches, and terminals. Dimensions of panels are approximately as follows: width, 10¼ inches; length, 22¼ inches; height, 22½ inches; and weight 100 pounds.

c. The third part is the cord CD-107 (fig.15), which is used to connect the power unit to the panel (par. 3c).

3. Major units.—*a. Power unit PE-()-43.*—(1) *Power unit PE-HA-43.*—(a) This engine-generator unit is of commercial design, manufacturer's type *D*, manufactured by the Homelite Corporation, Port Chester, N. Y. It consists of an internal-combustion gasoline engine, generator, voltage regulator, and fuel supply tank, built as a single unit and inclosed in one case. The unit is fastened to a wooden base by shock mountings.

(b) The single-cylinder two-cycle engine is inverted, air-cooled, and of the removable-cylinder type. The engine develops 1½ horsepower, has a stroke of 2½ inches, and a bore of 2½ inches. The engine end of the main shaft is mounted on ball bearings. The carburetor is a commercial Tillotson type MS-52-A. Ignition is provided by means of a Bosch high-voltage magneto. The spark plug is 18 millimeters in diameter with 1½-millimeter pitch thread. No governor is used as the voltage regulator automatically controls the fuel feed. The 1-gallon fuel tank is contained in the base and provides sufficient fuel for 5 hours' operation. Constructional details of the unit are shown in figure 1.

(c) The six-pole shunt-wound generator and the engine are contained in the same case. The generator armature is mounted on the main shaft of the engine. The entire main shaft runs in ball bearings.

(2) *Power unit PE-HB-43.*—(a) This unit is manufactured by United States Motors Corporation, Oshkosh, Wis. It is composed of a Lauson type RAY gasoline engine and a two-pole, 550-watt, 32-volt, 2,000-rpm d-c generator, manufactured by Brown and Brockmeyer Co., Dayton, Ohio. The unit is mounted on a wooden base by special rubber mountings.

(b) The engine is a single-cylinder, $1\frac{1}{2}$ -horsepower, four-cycle, L-head, air-cooled unit, with a $2\frac{1}{4}$ -inch bore and a $2\frac{1}{4}$ -inch stroke. It is lubricated by a supply of oil, which should be of good quality with a viscosity of SAE 20, in the crankcase. The carburetor is a float-feed type which has only one adjustment, the needle valve for fuel regulation (figs. 2 and 3). The magneto is an Eisemann model 71-M, which is incorporated in the flywheel. The governor is an inclosed mechanical type, the adjustment of which is locked by a lock nut.

(c) The generator is a d-c shunt-wound two-pole type with a terminal board mounted on its frame. The voltage is controlled by the operating speed of the engine.

(3) *Power unit PE-HC-43.*—(a) This unit is manufactured by United States Motors Corporation, Oshkosh, Wis., and is made up of a Briggs and Stratton model AP type No. 25466 gasoline engine and a 32-volt, 550-watt, 2,350 rpm generator manufactured by Pioneer Gen-E-Motor Corporation, mounted on a wooden base by special shock mountings.

(b) The engine is a single-cylinder, $1\frac{1}{2}$ horsepower, four-cycle, L-head, air-cooled unit with a $2\frac{1}{4}$ -inch bore and a $2\frac{1}{4}$ -inch stroke (figs. 4 and 5). Lubrication is accomplished by means of a supply of oil, which should be of good quality with a viscosity of SAE 20, in the crankcase. The carburetor is an especially designed adjustable float-feed type. The air cleaner is to protect the engine from dust and dirt. The governor is an adjustable mechanical type, fully inclosed, which runs in oil. It has been tested and set for an operating speed of 2,350 rpm under full load. Ignition is accomplished by a magneto which together with contact points and capacitor is contained in the flywheel.

(c) The generator is a d-c, shunt-wound, four-pole type with a terminal panel mounted on its frame. The voltage is controlled by the operating speed of the engine.

(4) *Power units PE-HD-43 and PE-HE-43.*—(a) These units are identical and are manufactured by Climax Engineering Corporation, Clinton, Iowa. Each is made up of a Briggs and Stratton model AP gasoline engine and a generator manufactured by Pioneer Gen-E-

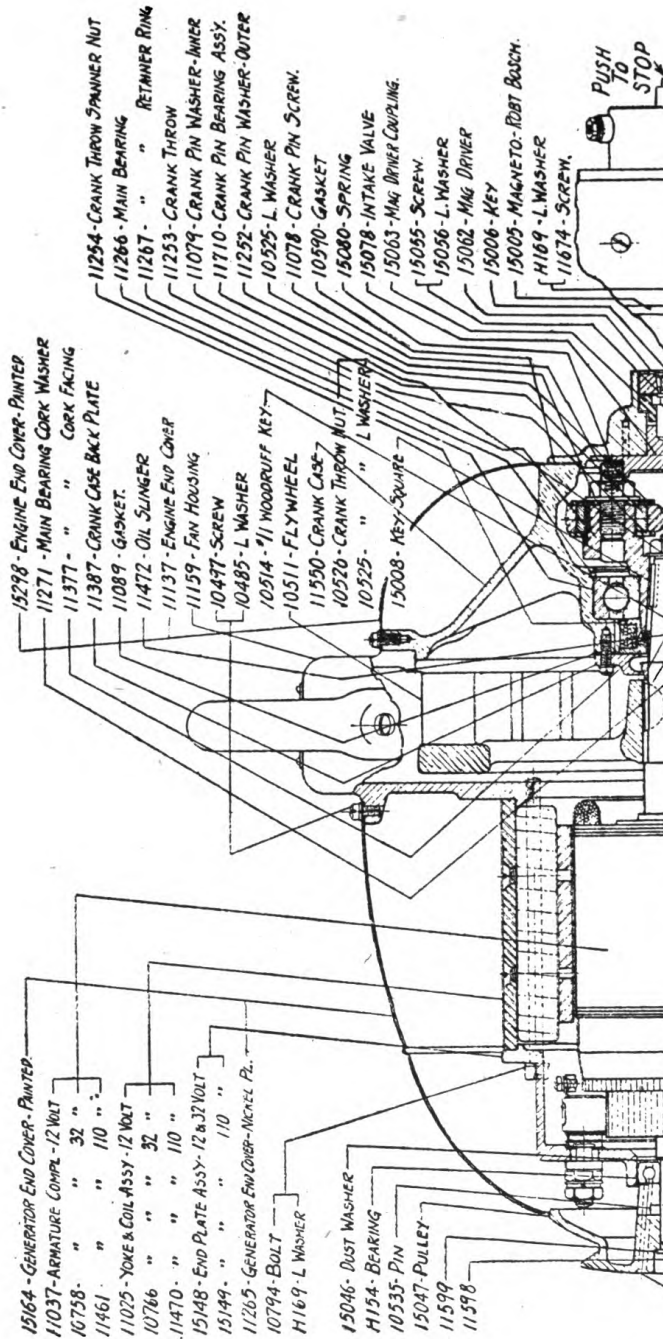


FIGURE 1.—Power unit PE-HA-43—sectional view.

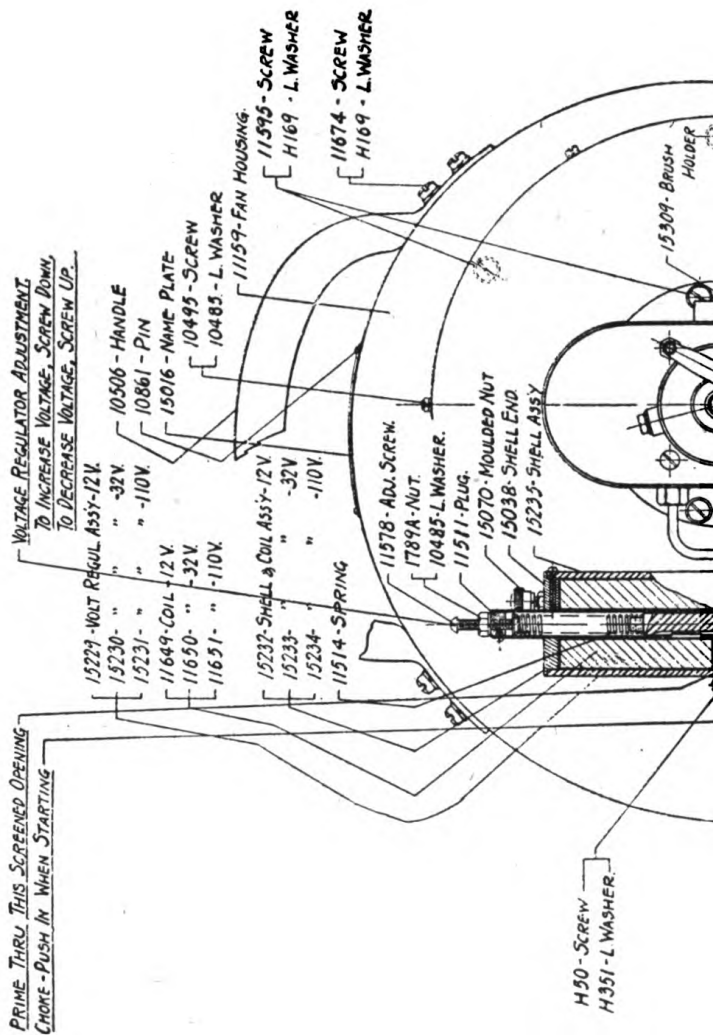


Figure 1.—Power unit PE-HA-43—sectional view—Continued.

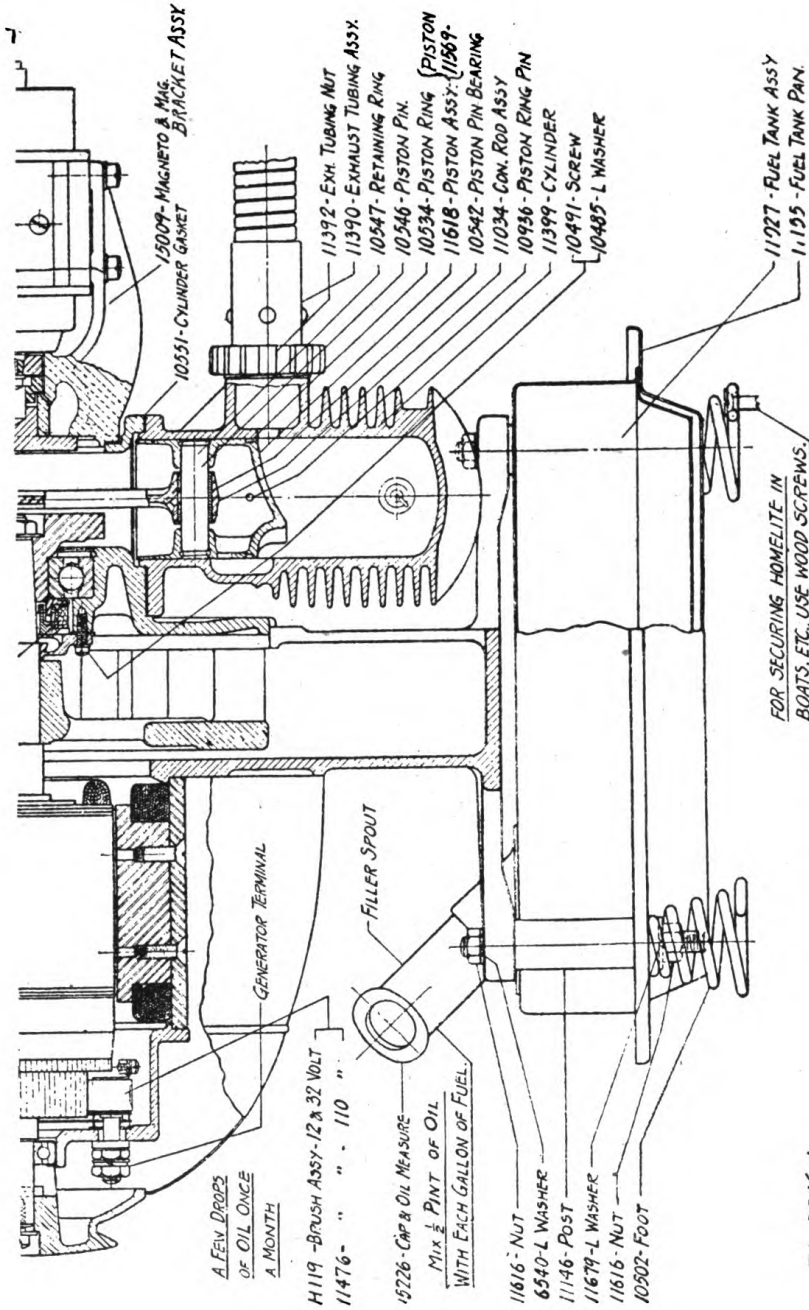


FIGURE 1.—Power unit P E-HA-43—sectional view—Continued.

CHARGING SET SCR-169

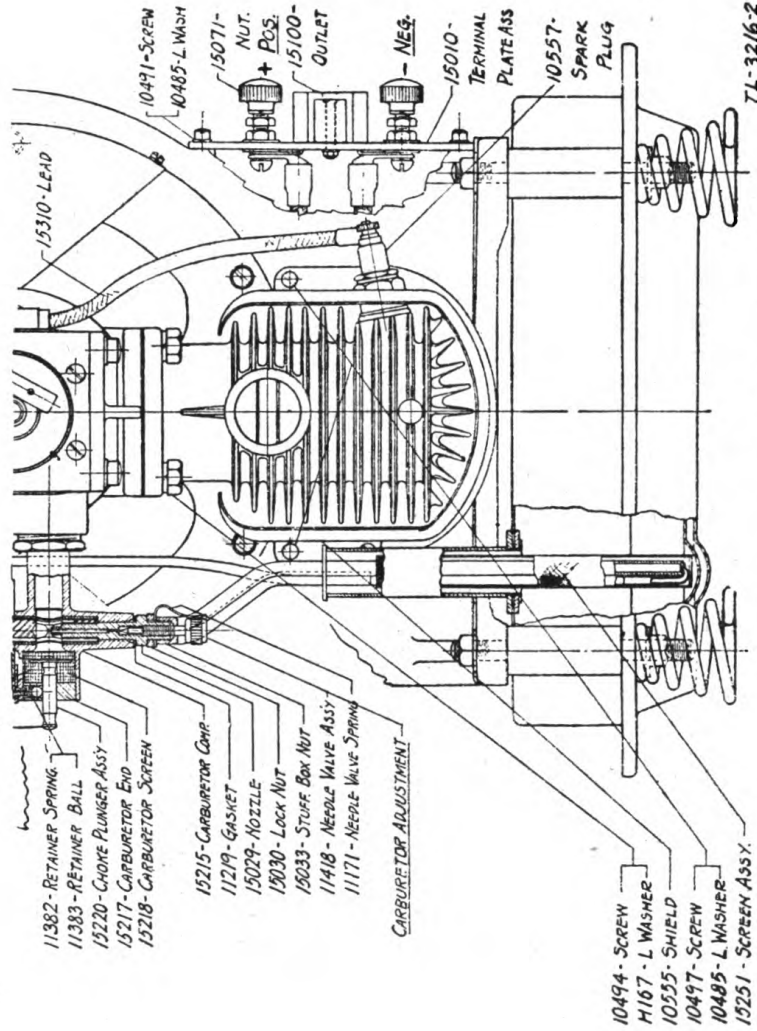


FIGURE 1.—Power unit PE-HA-43—sectional view—Continued.

Motor Corporation, mounted on a wooden base by special shock mountings (fig. 6).

(b) The engine is a single-cylinder, 1½-horsepower, four-cycle, L-head, air-cooled unit with a 2¼-inch bore and a 2¼-inch stroke. Lubrication is accomplished by means of a supply of oil, which should be of good quality with a viscosity of SAE 20, in the crankcase. The carburetor is a Tillotson adjustable float-feed type. An air cleaner is used to protect the engine from dust and dirt. The governor is an

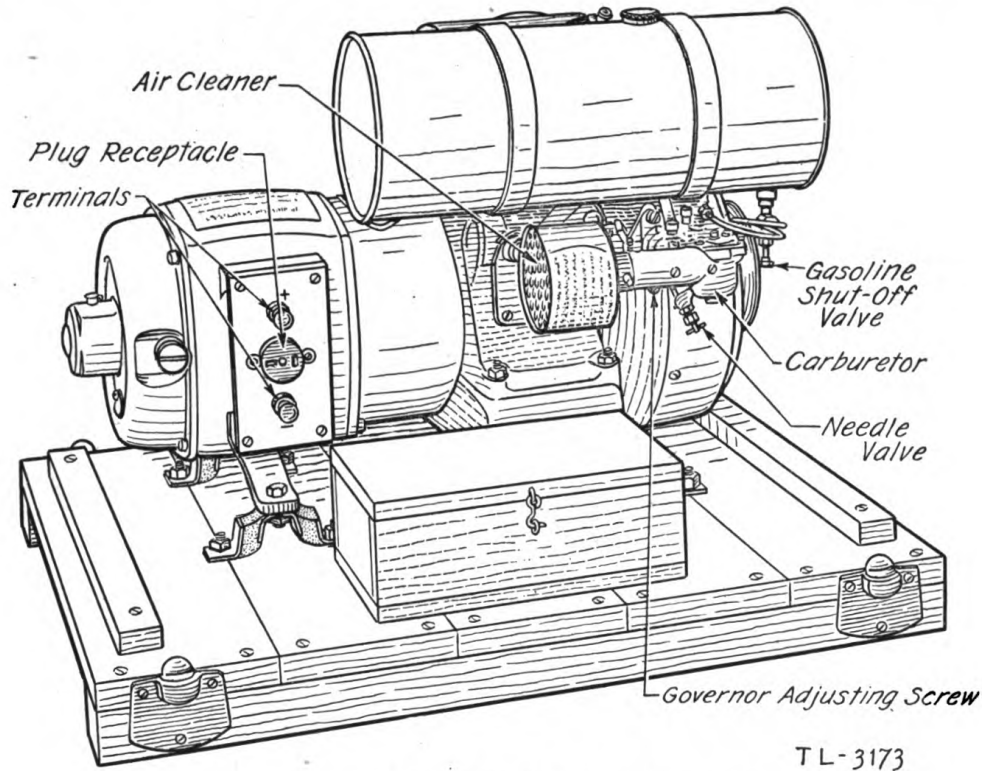


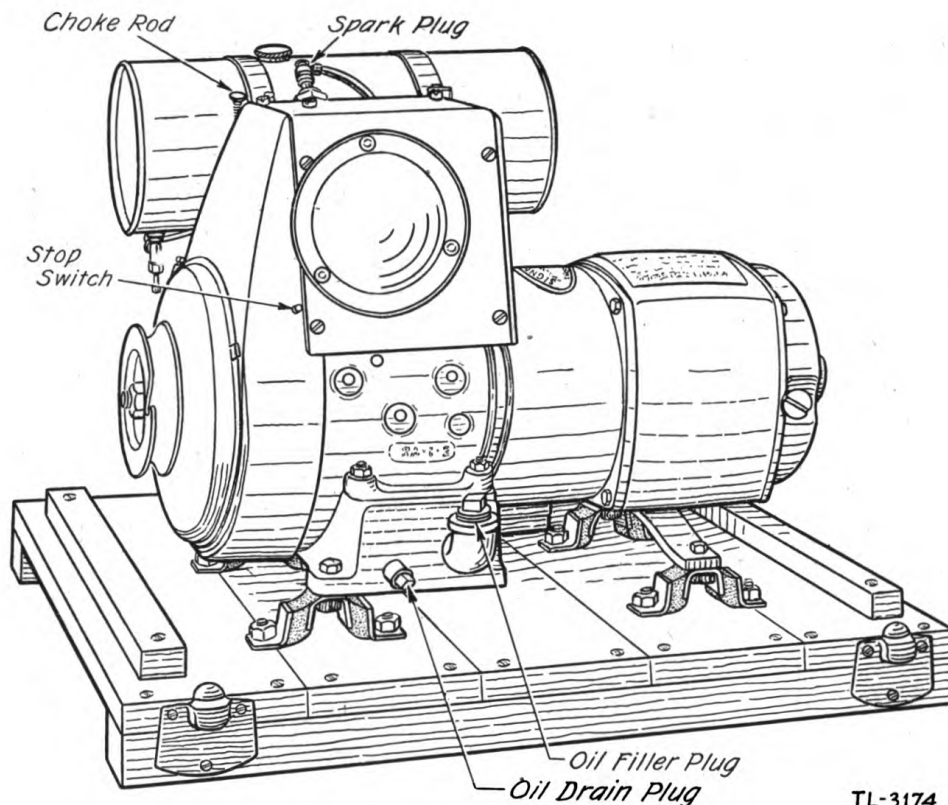
FIGURE 2.—Power unit PE-HB-43—front view.

adjustable mechanical type, fully inclosed, which runs in oil. Ignition is accomplished by a magneto which together with contact points and capacitor is contained in the flywheel.

(c) The generator is a d-c shunt-wound four-pole type with a terminal panel mounted on its frame. The voltage is controlled by the operating speed of the engine.

b. Panel BD-()-61.—(1) Panel BD-LL-61.—The insulated panel board is made of ½-inch asbestos wood and is permanently fastened to the steel case (figs. 7 and 8). A voltmeter IF-47, 0-50 volts, direct current; three ammeters IF-16, 0-10 amperes, direct current, marked "1," "2," and "3"; a magnetic contactor switch; an auto-

matic switch; three rheostat control handles marked "1," "2," and "3"; and three fused, double-pole, single-throw switches marked "BAT 1," "BAT 2," and "BAT 3" are mounted on the face of the panel. Three rheostats of 12.5 ohms each are mounted on the back of the insulating panel (fig. 9). The ammeter, rheostat, and switch in each circuit are marked with the same number. A circuit diagram of the panel is shown in figure 10.



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FIGURE 3.—Power unit PE-HB-43—rear view.

(2) *Panels BD-LM-61, BD-LN-61, BD-LO-61, and BD-LP-61.*—The insulated panel board is made of $\frac{1}{2}$ -inch black phenolic plate, fastened to the steel case (figs. 8 and 12). A voltmeter IF-47, 0-50 volts, direct current; three ammeters IF-17, 0-15 amperes, direct current, marked "1," "2," and "3"; an inclosed magnetic contactor switch; an inclosed reverse current relay (automatic switch); three rheostat control handles marked "1," "2," and "3"; and three inclosed 10-ampere double-pole single-throw circuit-breakers marked "BAT 1," "BAT 2," and "BAT 3" are mounted on the face of the panel. Three rheostats of 12.5 ohms each are mounted on the back of the panel (fig. 13). The ammeter, rheostat, and circuit-breaker in

each circuit are marked with the same number. A circuit diagram for these panels is shown in figure 11.

c. *Cord CD-107.*—This cord connects the panel to the power unit as shown in figure 14. It is 15 feet long and consists of two conductors

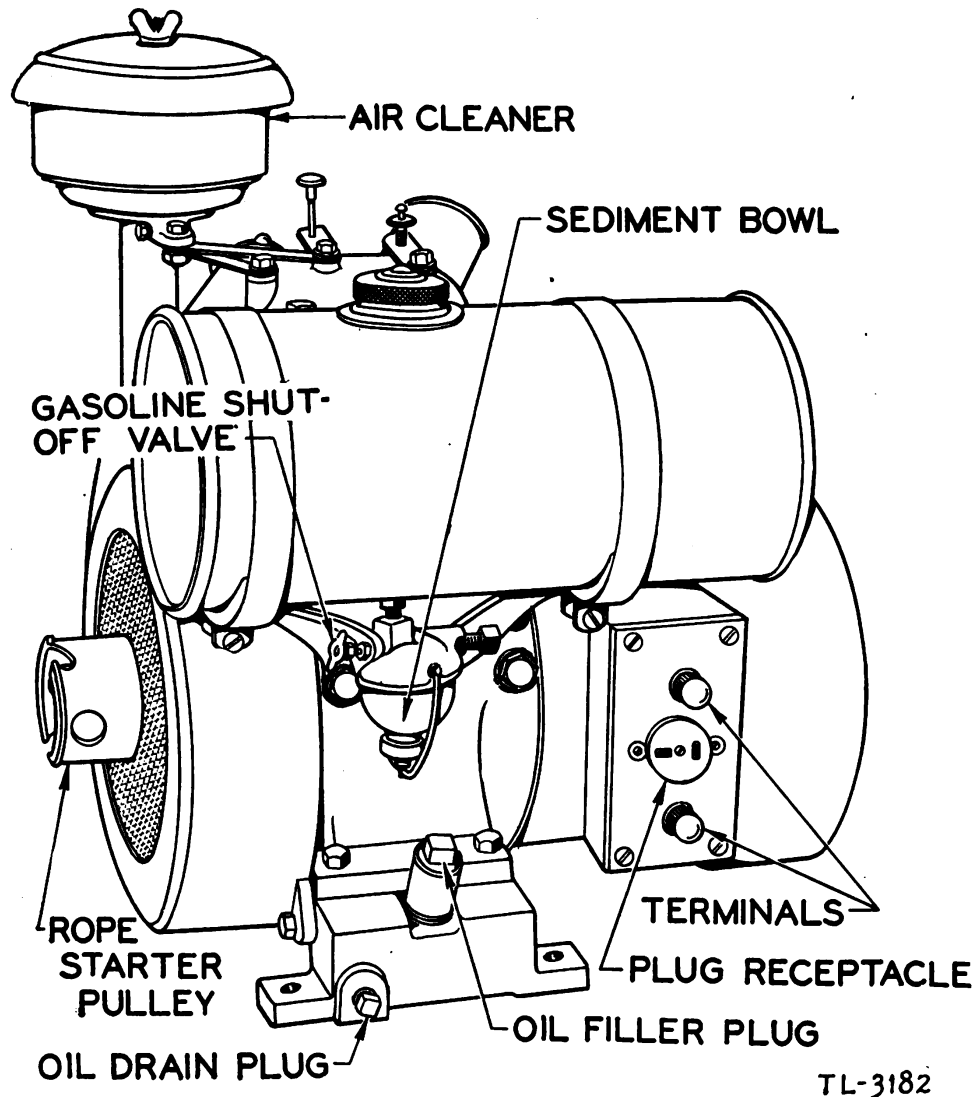


FIGURE 4.—Power unit PE-HC-43—front view.

twisted together with an outer covering of waterproof cotton braid. Latest procurements of cord CD-107 have rubber covering over the two twisted leads (fig. 15). Each conductor consists of 104 strands of No. 30 B. & S. gage annealed copper wire insulated with new code rubber and covered with a close cotton braid. One end of the cord is equipped with two hook-type terminals marked + and -, respec-

tively. The other end of the cord is equipped with a 15-ampere polarized plug.

4. Installation for service.—*a. General.*—(1) *Transportation.*—The bulk and weight of the parts comprising this set require suitable transportation for its movement.

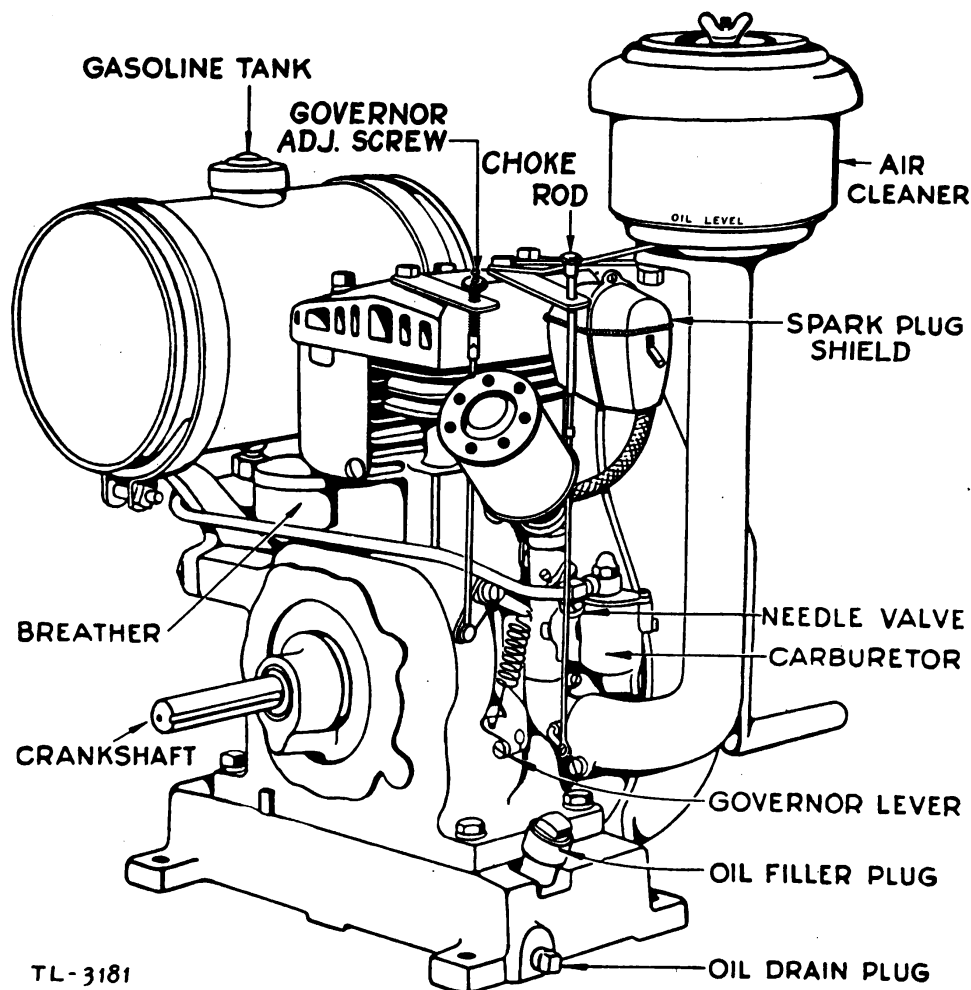


FIGURE 5.—Power unit PE-HC-43—engine details.

(2) *Personnel.*—Two men are required to unload the equipment and to set it up for operation. These men, in addition to being qualified storage battery men, should be especially trained in the care, maintenance, installation, testing, and inspecting for serviceability of the component parts of the set.

(3) *Location.*—The location of the set should be one that provides a reasonable amount of protection against the elements, is centrally

situated with respect to the territory served by the set, and is at least 50 feet from any radio set.

b. Preparing set for service.—Reference should be made to figure 14 in connection with these instructions. Place the power unit in a level position where there is a good circulation of air. Unfasten the four trunk catches located at the bottom corners of the packing crate

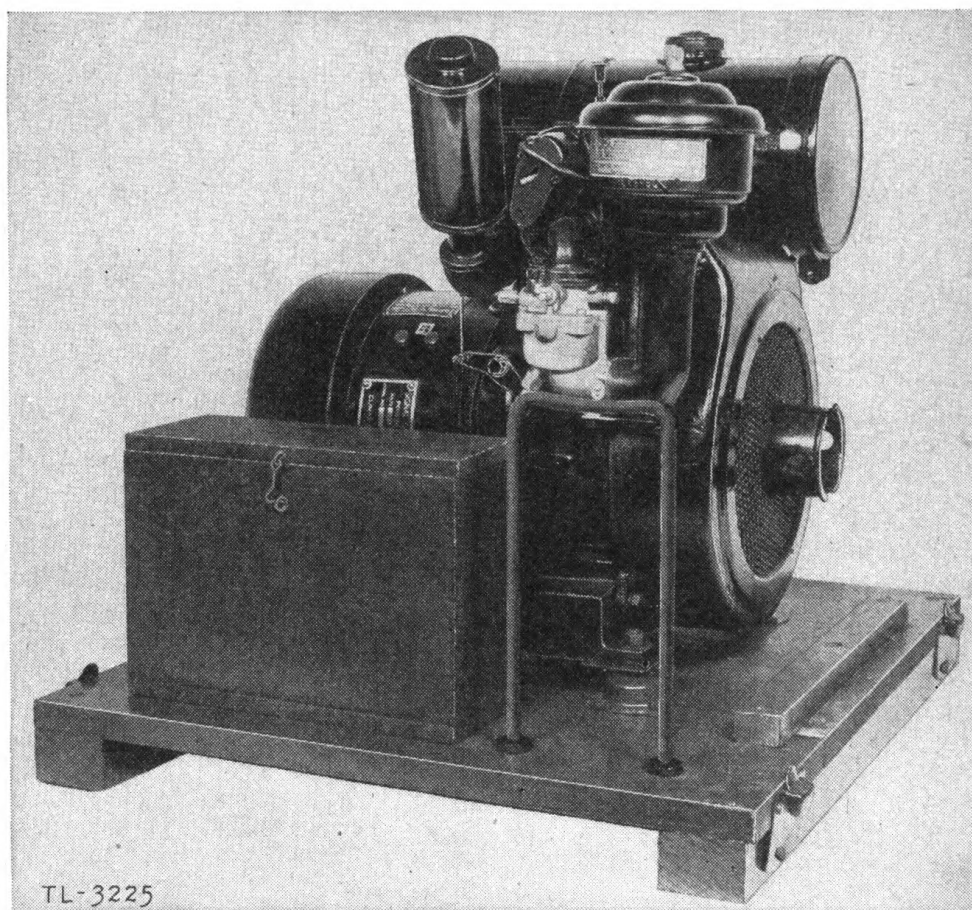


FIGURE 6.—Power unit PE-HD-43 or PE-HE-43—rear view.

and remove the top part of the crate. Place the panel in the desired position. Using the cord CD-107, connect the + and - hook-type terminals to the respective binding posts marked "GEN+" and "GEN-" located at the top of the insulated panel board. Insert the plug of the cord in the receptacle provided on the power unit PE-43. The receptacles on the various units are located as follows:

(1) PE-HA-43 in the power unit case just to the right of the spark plug.

(2) PE-HB-43, PE-HC-43, PE-HD-43, and PE-HE-43 in the terminal panel mounted on the generator frame.

c. Tests and inspections for serviceability and precautions to be observed.—(1) Before placing the set in operation see that the—

(a) Power unit is level and firmly seated and that the panel is upright and level.

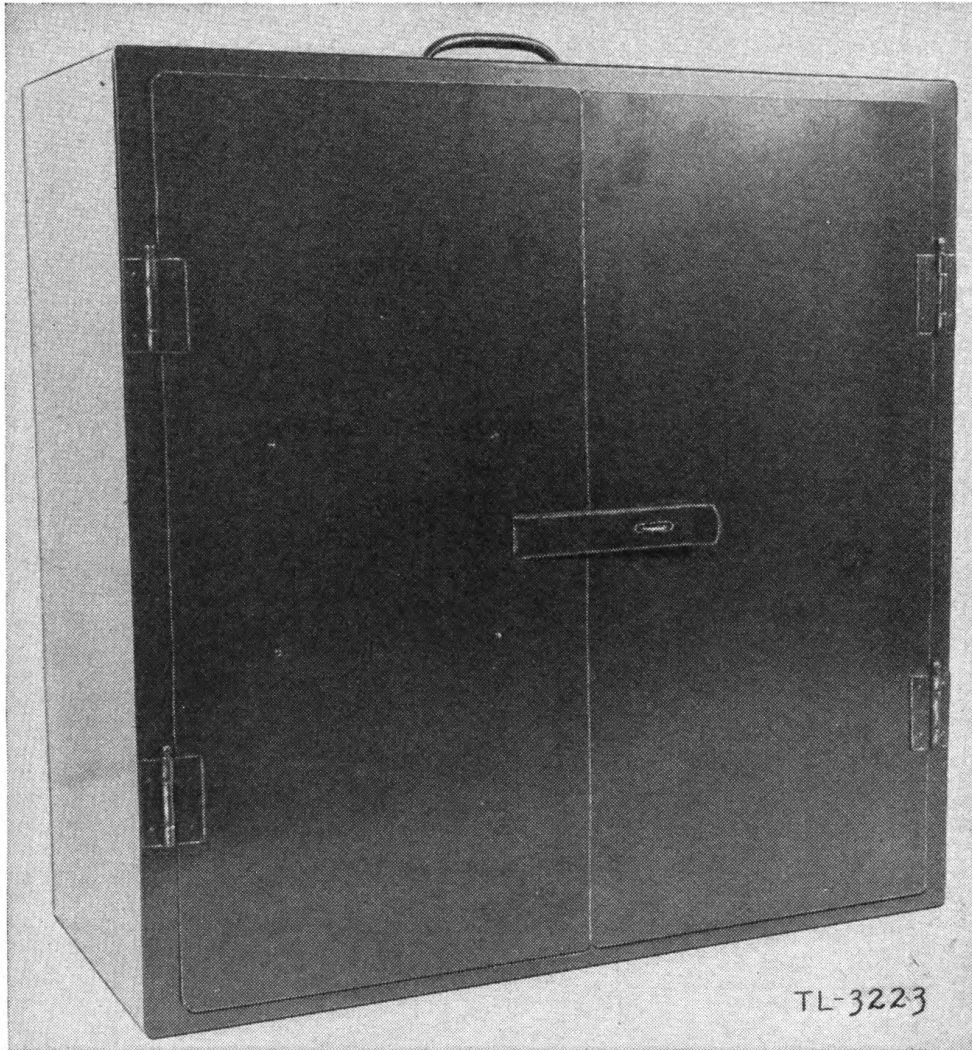


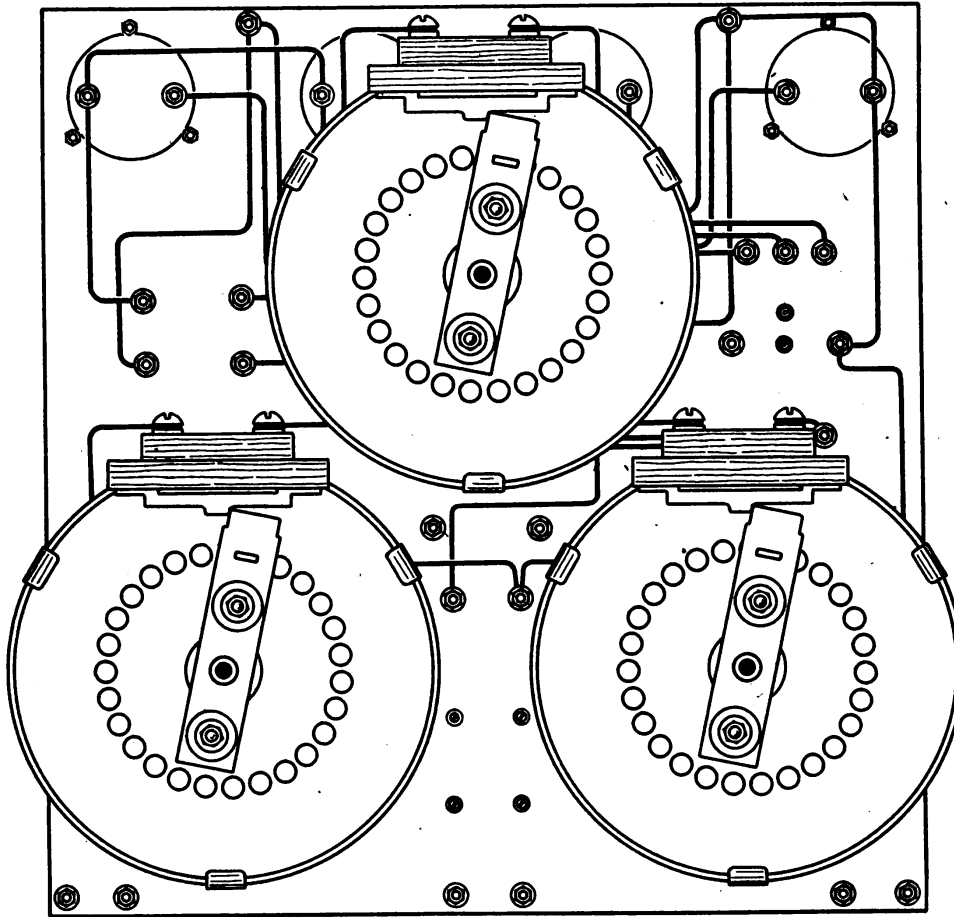
FIGURE 8.—Panel BD-()-61 ready for shipment.

(b) Power unit is to operate in an area with good air circulation to prevent danger to personnel.

(c) Electrical connections are made with proper polarity, and that all wires are protected from each other and are so placed that personnel cannot injure themselves by accidental contact.

CHARGING SET SCR-169

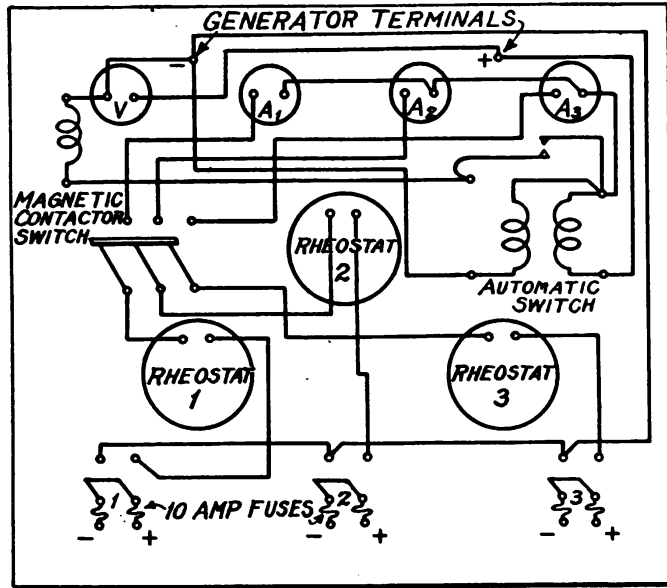
- (d) Fuel tank is filled and, if required, oil is mixed with the gasoline as specified in paragraph 5.
- (e) Oil is up to correct level, if specified, as in paragraph 5.
- (2) Remove any section of pipe or hose that may be attached to the muffler exhaust. If this is not done, the output will be reduced.
- (3) Do not fill the fuel tank above the bottom of the filler spout.



TL-3215

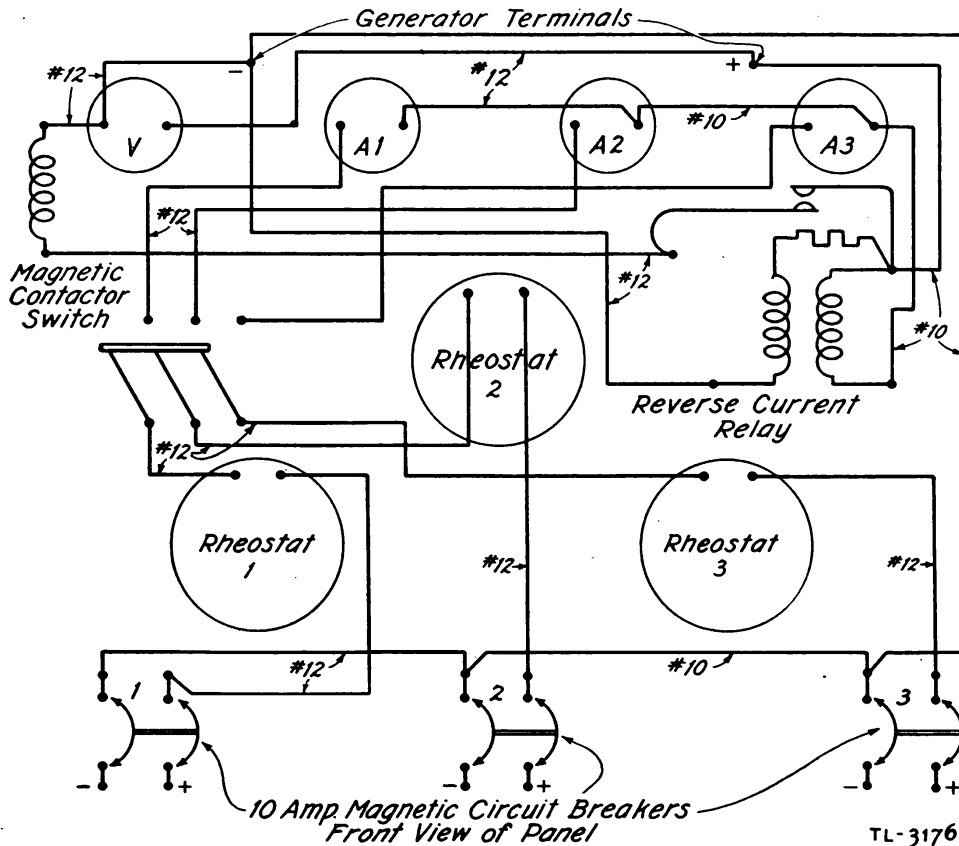
FIGURE 9.—Panel BD-LL-61—rear panel view.

- (4) Do not permit fuel to run too low in the tank; fill after 3½ hours of operation to obviate the necessity of readjusting the carburetor.
- (5) See that carburetor is properly adjusted for starting.
- (6) Readjust the carburetor, if no governor is used, whenever the charging rate is changed.
- (7) Always run the generator for about 5 minutes before connecting it to the load.



TL-1258

FIGURE 10.—Panel BD-LL-61—circuit diagram.



TL-3176

FIGURE 11.—Panel BD-LM-61, BD-LN-61, BD-LO-61, or BD-LP-61—circuit diagram.

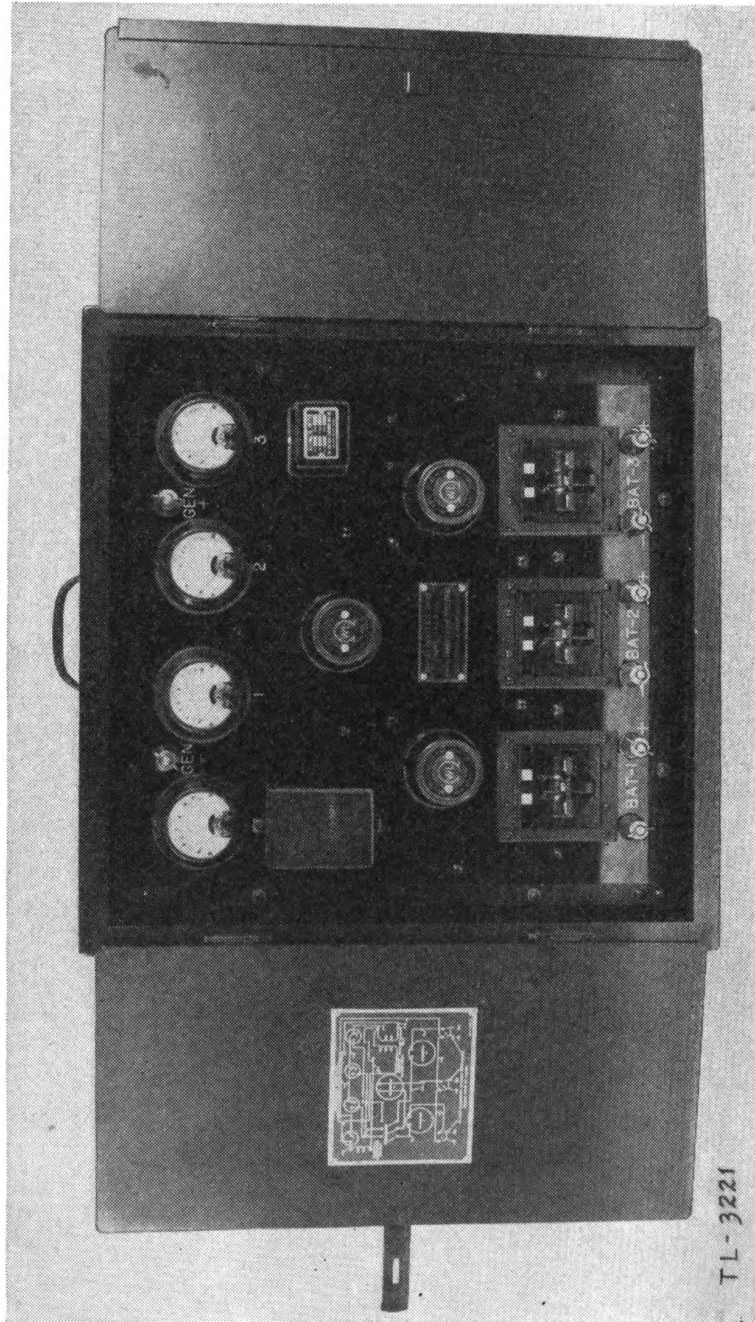


FIGURE 12.—Panel BD-LO-61—front view.

TL-3221

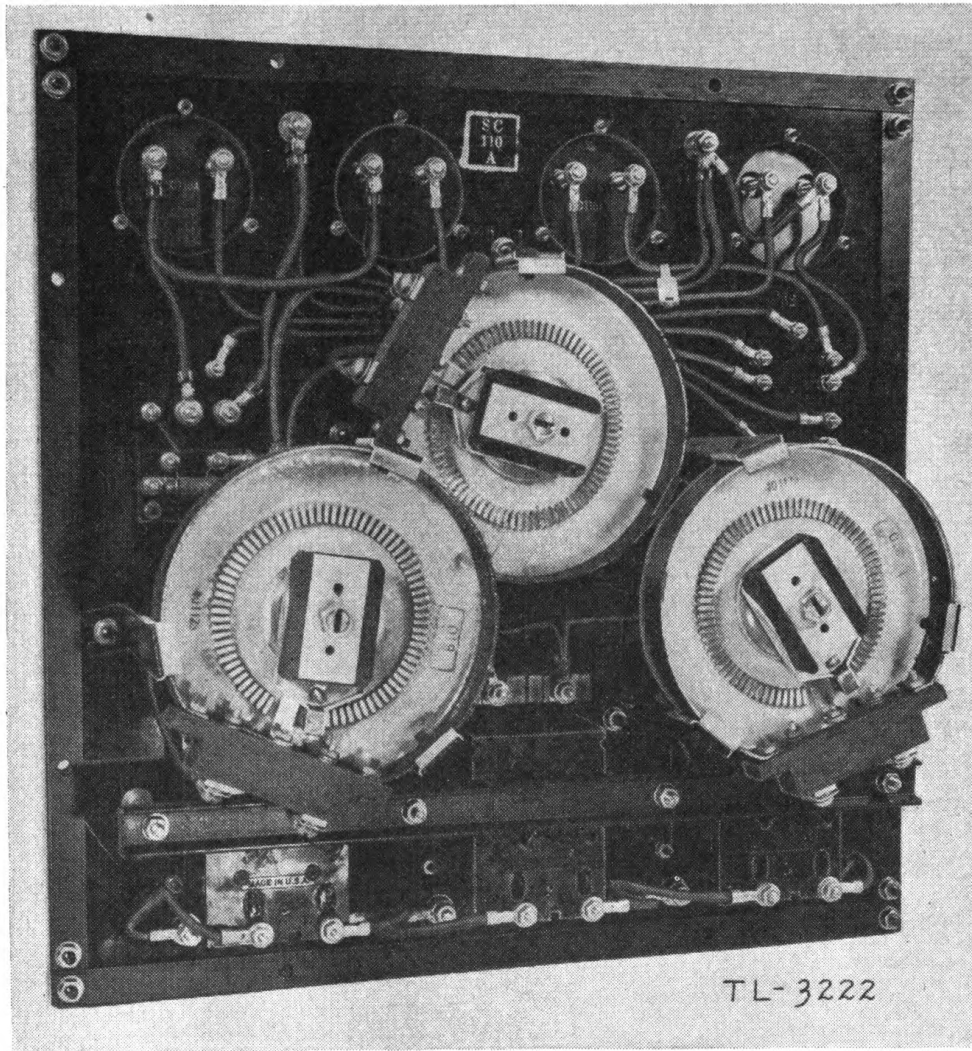


FIGURE 13.—Panel BD-LO-61—rear panel view.

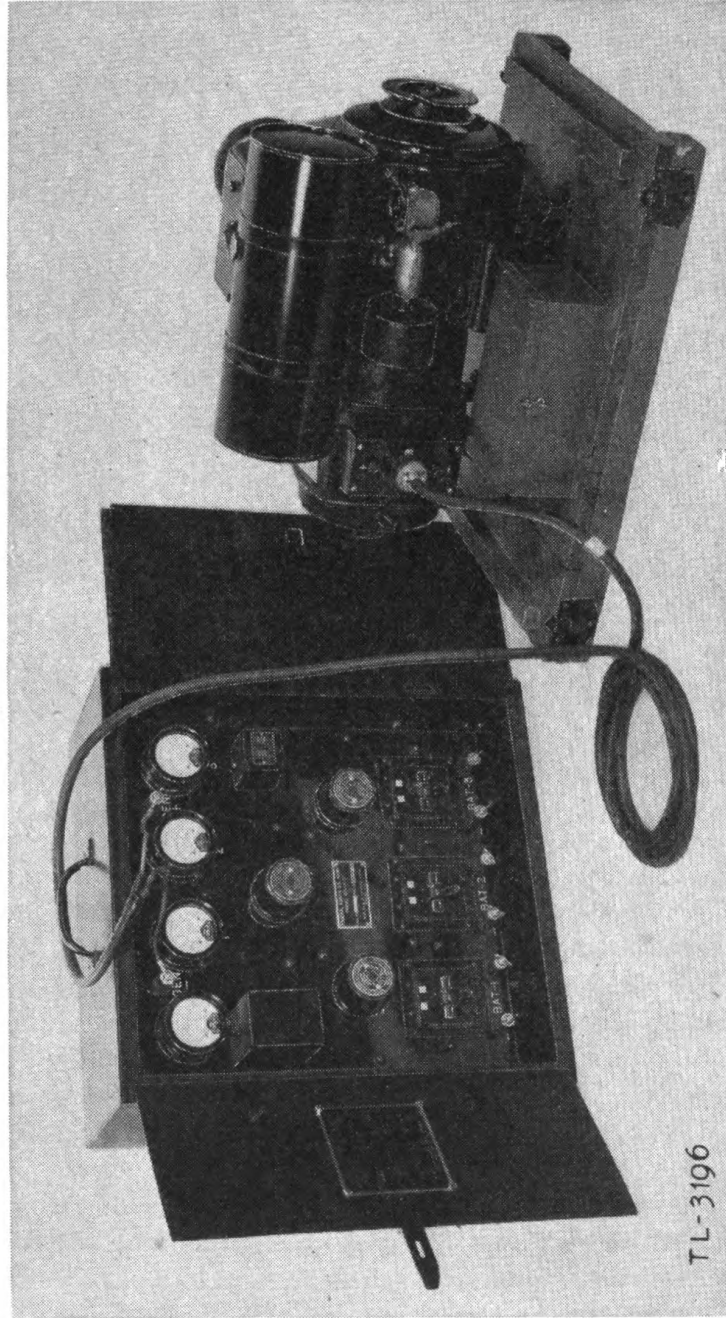


FIGURE 14.—Charging set SCR-169 set up for operation.

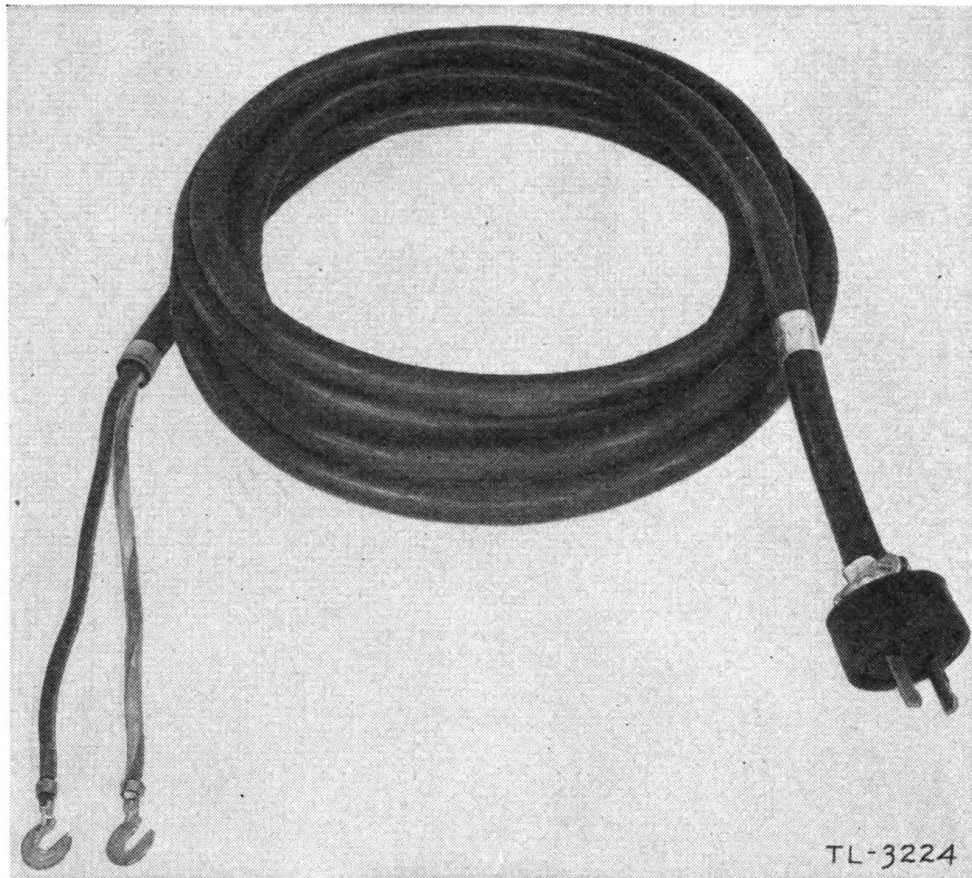


FIGURE 15.—Cord CD-107.

5. Operation.—*a. Starting and stopping engine.*—The operation of the engine is, in general, the same as that of any gasoline engine.

(1) To start the engine, proceed as follows:

(a) *PE-HA-43.*

1. Fill the fuel tank with gasoline and oil. Use $\frac{1}{2}$ pint of SAE 40 motor oil mixed with each gallon of gasoline (par. 9a(1) (a)). Always mix the gasoline and oil before filling the tank. **Caution:** Do not use ethyl (red) gasoline. The slow-burning properties of ethyl gasoline cause preignition in two-cycle engines (ignition of the gasoline by the still burning exhaust gas before compression is completed) resulting in engine overheating and loss of power.
2. Pull the choke plunger out (fig. 1).
3. Insert a few drops of gasoline through the screened opening in the choke body.
4. Push the choke plunger in.

5. Wind the starting rope clockwise on the flanged starting pulley and start the engine by pulling sharply on the rope.
6. Pull the choke plunger out when the motor starts.
7. Adjust the carburetor adjustment underneath the carburetor until the engine runs smoothly at normal operating temperature under load.

(b) *PE-HB-43*.

1. Fill the fuel tank with *regular* gasoline. **Caution:** Do not use ethyl (red) gasoline. Do not mix oil with the gasoline.
2. Fill the crankcase with a good quality oil of viscosity SAE 20 to the top of the filler fitting.

NOTE.—For heavy summer duty, involving full load conditions for long periods of time, oil of viscosity SAE 30 may be used instead of SAE 20.

3. Open the gasoline shut-off valve located on the bottom of the fuel tank at the point where the fuel line is connected to the tank (fig. 2) and allow the carburetor float chamber to fill up.
4. Slip the knotted end of the starter rope into the notch of the starter pulley and wind it around the pulley three or four times.
5. Pull the choke rod to choke the carburetor (fig. 3).
6. Pull the starter rope with a quick, steady pull to spin and start motor. The motor should start immediately and the choke should gradually be released as the engine warms up.

(c) *PE-HC-43, PE-HD-43, PE-HE-43*.

1. Fill the fuel tank with gasoline. **Caution:** Do not use ethyl (red) gasoline. Do not mix oil with the gasoline.
2. Fill the crankcase with a good quality oil of viscosity SAE 20 to the top of the filler fitting.
3. Open the gasoline shut-off valve located at the top of the sediment cup (fig. 4) and allow the carburetor float chamber to fill up.
4. Slip the knotted end of the starter rope into the notch of the starter pulley and wind it around the pulley three or four times.
5. Pull the choke rod to close the choke partly (fig. 5).
6. Pull the starter rope with a quick, steady pull to spin and start motor. The motor should start immediately and the choke should gradually be released as motor warms up.

(2) To stop the engine, proceed as follows:

- (a) *PE-HA-43*.—Press the button on the front end of the magneto (fig. 1) and hold until the engine stops.

(b) *PE-HB-43*.—Press the switch which is located in the flywheel housing near the muffler (fig. 3) and hold until the engine stops.

(c) *PE-HC-43*, *PE-HD-43*, *PE-HE-43*.—Press the switch which is mounted on the spark plug shield (fig. 5) and hold until engine stops.

b. Charging the batteries.—After the power unit and panel are connected by the cord as described in paragraph 4c, proceed as follows:

(1) Open the switches (or trip the circuit-breakers, if used) marked "BAT 1," "BAT 2," and "BAT 3" (figs. 7 and 12).

(2) Inspect all batteries in each bank to see that they are properly connected to each other.

(3) Connect the positive and negative leads from each bank of batteries to the respective + and — binding posts on the switch or switches selected. A circuit diagram of battery connections is shown in figure 16.

(4) Start the power unit.

(5) Turn all rheostat handles completely to the right.

(6) Close the battery switches or circuit breakers in use.

(7) Note the voltmeter and ammeter readings.

(8) Increase or decrease the charging current or currents to the proper rate by adjusting the rheostat or rheostats in series with the ammeters in use. Do not charge batteries at a rate exceeding $7\frac{1}{2}$ amperes.

(9) Never charge more than six nor less than two batteries BB-29 or their equivalent on any one charging circuit.

6. Removal from service.—*a. Repacking for transportation in field.*—To repack the set for transportation after it has been in operation in the field, proceed as follows: Open the switches (or trip the circuit-breakers, if used) marked "BAT 1," "BAT 2," and "BAT 3"; remove the leads from the banks of batteries; remove the connecting cord from the power unit and neatly roll it to fit inside the panel case; close the panel case; place the top of the packing crate over the power unit and fasten it by means of the four trunk bolts (fig. 17).

b. Preparation for storage.—Before placing the charging set in storage, check all parts for serviceability and repair or replace parts if necessary. Cover all metal tools and spare parts with cosmoline and cover all unpainted metal parts of the power unit with a light oil. Drain all gasoline and oil from the power unit. Take care that no oil gets on the electrical wiring. Check with the list of parts in paragraph 11 to see that no parts of the set are missing or are in excess.

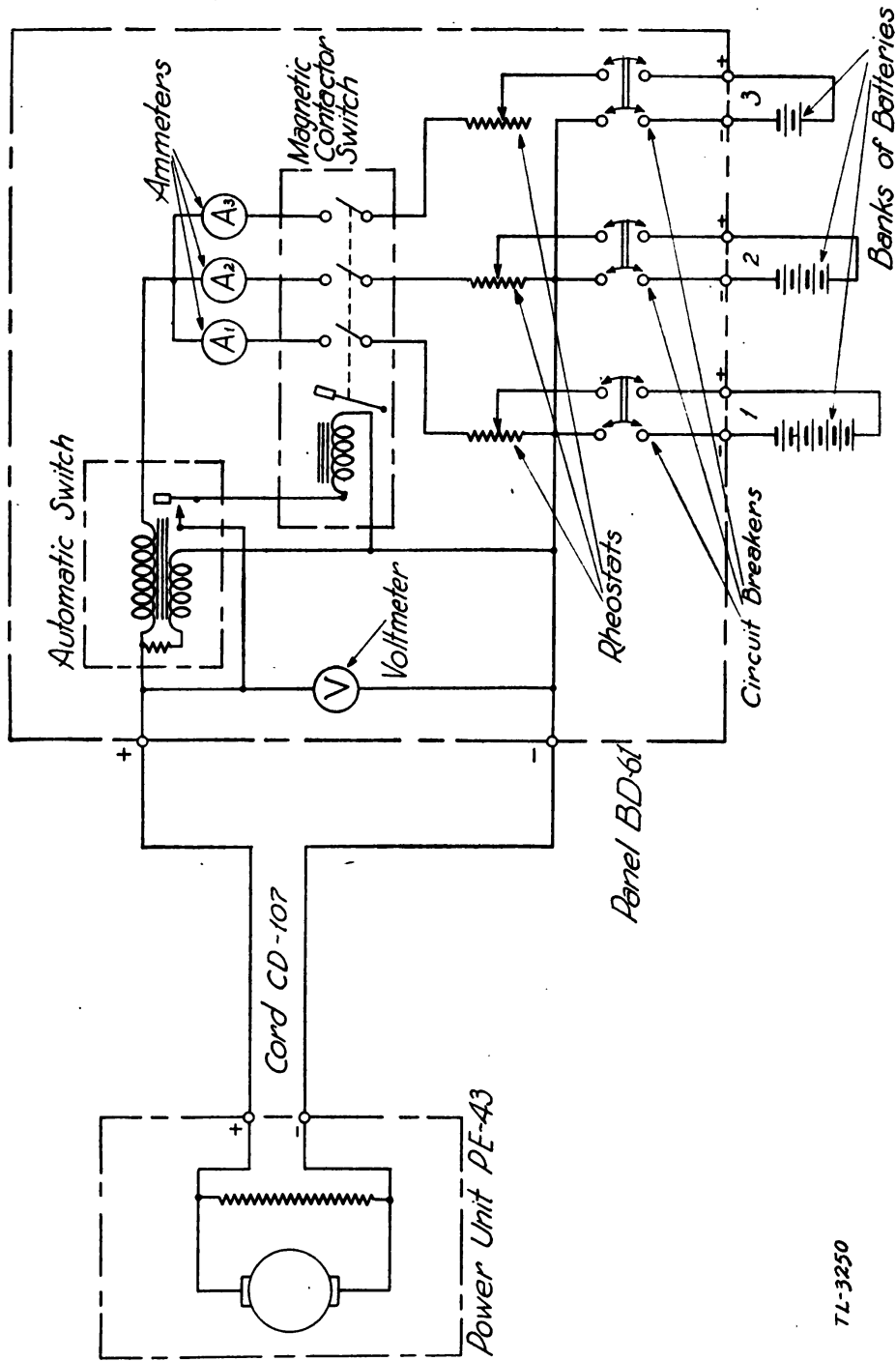
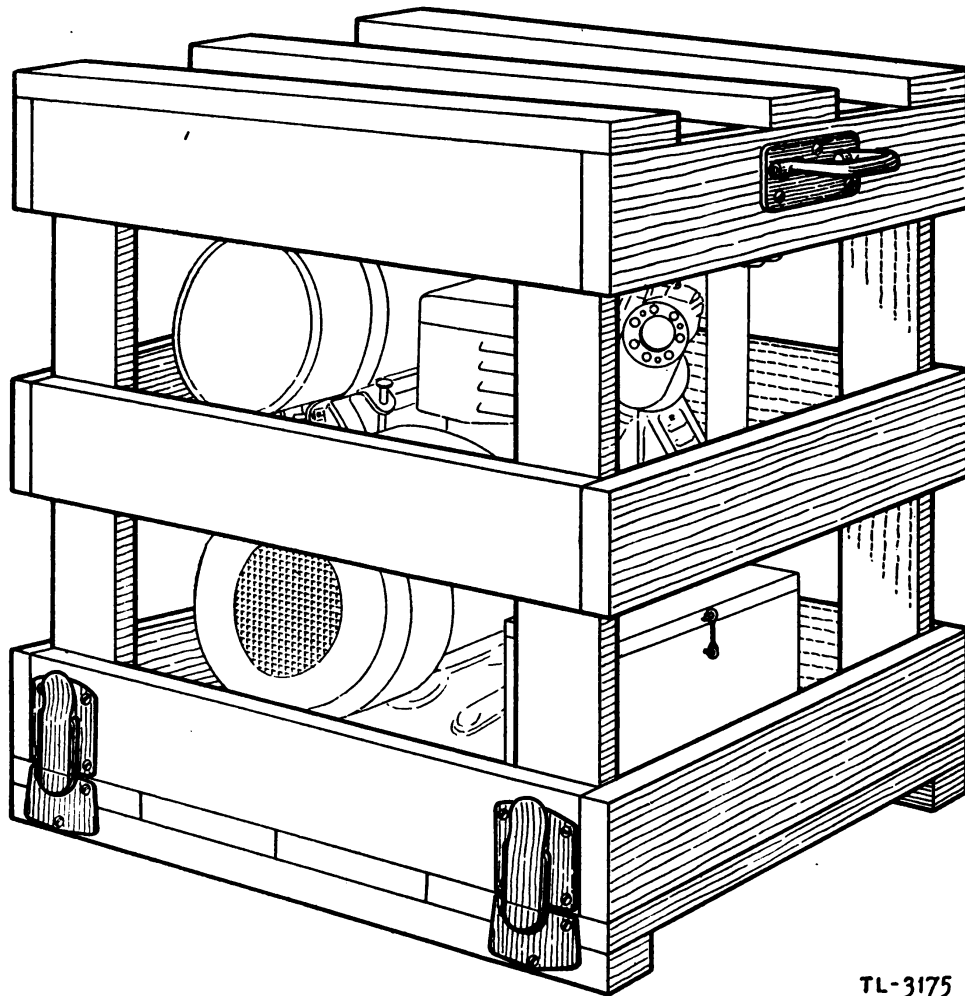


FIGURE 16.—Charging set SCR-169—circuit diagram with batteries.

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7. Function of parts.—*a. Power unit PE-()-43.*—(1) *Power unit PE-HA-43.*—(a) *Speed regulation.*—The automatic electric voltage regulator operates to control the fuel feed so as to maintain an engine speed between 1,500 and 1,600 rpm (fig. 1).

(b) *Voltage regulation.*—The voltage regulator is designed to maintain the output voltage of the generator between 32 and 40 volts



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FIGURE 17.—Shipping crate for power unit PE-()-43.

under load. It is adjusted at the factory to maintain 32 volts under full load when the armature is turning between 1,500 and 1,600 rpm. For further adjustment, if necessary, see paragraph 10*i*(1)(a) and *j*(1)(a).

(2) *Power unit PE-HB-43—voltage regulation.*—The voltage delivered by this power unit depends upon the speed. The speed is controlled by the governor spring tension. The adjustment for the

governor is a knurled and slotted screw with a lock nut and is located below and to the left of the carburetor (fig. 2). To raise the voltage, loosen the lock nut and turn the adjusting screw clockwise. To lower the voltage, turn the adjusting screw counterclockwise. Do not set for more than 40 volts at normal load. Always be sure to tighten the lock nut when the desired voltage is obtained.

(3) *Power units PE-HC-43, PE-HD-43, and PE-HE-43 voltage regulation.*—The voltage delivered by these power units depends upon the speed of the engine, which is controlled by the governor spring tension. The governor has been tested and set for an operating speed of 2,350 rpm with the generator delivering full load. This adjustment should not be disturbed unless further adjustment is necessary. In this case turn the knurled nut on the governor adjusting screw clockwise to increase speed, or counterclockwise to reduce speed (fig. 5).

b. Panel BD-()-61.—(1) Panel BD-LL-61.—(a) The function of the panel is to control and indicate the rate of charge to storage batteries; its circuit diagram is shown in figure 10. Provision is made for charging 1, 2, or 3 banks of batteries separately or simultaneously. An individual rheostat and an ammeter are provided for each of the three charging circuits.

(b) A magnetic contactor switch having three separately insulated and independent poles actuated by a single magnet is controlled by the automatic switch.

(c) The automatic switch controls the energizing circuit of the magnetic contactor switch in the following manner: The former closes the latter when the generator voltage reaches 40 volts; and opens it when the generator voltage falls below 32 volts, when the generator voltage fails, or when the current is reversed and flows from any one of the banks of batteries into the generator (fig. 16).

(2) *Panels BD-LM-61, BD-LN-61, BD-LO-61, and BD-LP-61.*—These panels perform the same functions as panel BD-LL-61 and are similar in design and appearance, except—

(a) Dimensions vary somewhat.

(b) Inclosed circuit-breakers are used instead of open switches and fuses.

(c) The magnetic contactor switch is inclosed.

A circuit diagram of these panels is shown in figure 11.

8. Care of set.—All parts of the set should be carefully handled. When installed, and at regular intervals thereafter, the set should be cleaned in order to keep it free from dirt and foreign substances. A daily inspection of all parts of the set should be made as a matter of routine in order to insure its best operating condition. This inspec-

tion should include an examination for worn, broken, or corroded connections or parts; dirty panel; and grease and oil on engine or generator of the power unit.

9. Maintenance and repair of power unit PE-()-43.—The inspection outlined in paragraph 4c and the correction of any defects noted are generally all the maintenance required. However, the following instructions on the servicing of the power unit should be carefully observed in the maintenance of the unit:

a. *Engine.*—(1) *PE-HA-43.*—(a) *Lubrication.*—Only the oils issued for the purpose should be used in lubricating the engine. One-

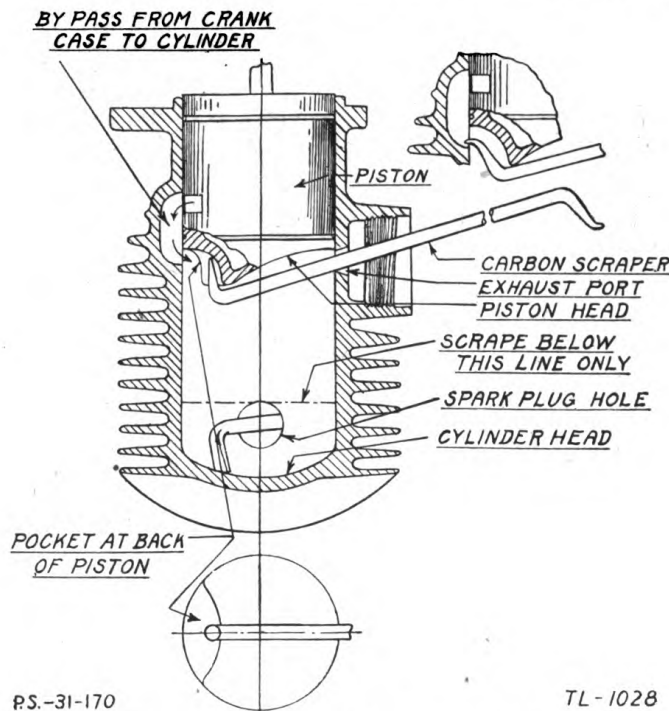


FIGURE 18.—Power unit PE-HA-43—use of carbon scraper.

half pint of good quality oil of viscosity SAE 40 should be mixed with each gallon of gasoline used as fuel. This provides automatic lubrication to all engine parts.

(b) *Removing carbon.*—To remove carbon from the engine remove the muffler and spark plug. Using the tool provided with the unit, carefully scrape the carbon deposits from the piston head, cylinder head, exhaust port, and spark-plug hole (fig. 18). The scraper should not come in contact with the cylinder wall. The cylinder should not be removed.

(c) *Care of magneto.*—Examine the contact breaker points at least

once every 100 hours of operation, and clean and dress them if necessary. Use No. 00 grade sandpaper for dressing the points. Do not use emery cloth.

(d) *Carburetor adjustment.*—The carburetor is properly attached and adjusted to the engine before leaving the factory. Readjustment is necessary to compensate for climatic changes and for changes in the load. If, when attempting to start the engine for the first time, it does not run perfectly, first check the ignition. If the ignition circuits and adjustments are correct, proceed as follows:

1. *Starting.*—Push the choke plunger in as far as possible after inserting a few drops of gasoline into the choke body (fig. 1). Then turn the carburetor adjustment at the bottom of the carburetor in a clockwise direction until it is tight and then back in a counterclockwise direction one turn. If the engine still fails to start, vary the carburetor adjustment by quarter turns until a point is found where the engine will operate.
2. *Adjustment for operation.*—After the engine has been run under load for a sufficient length of time to have developed normal operating temperature, adjust the carburetor until the engine runs smoothly.

(2) *PE-HB-43.*—(a) *Lubrication.*—For proper lubrication, an adequate supply of a high grade, well-refined oil in the crankcase is essential. A viscosity of SAE 20 is suitable for average duty requirements, which consist of intermittent full loading or sustained partial loads. In hot weather, when heavy duty is required, that is, full loading for long periods of time, the use of oil of viscosity SAE 30 is advisable. Never use heavier than SAE 20 in cold weather.

1. Check the level of the oil in the crankcase every time the fuel supply is replenished. Add sufficient oil to bring the level of the oil to the top of the filler fitting.
2. After every 100 hours of operation the crankcase should be completely drained and refilled with fresh oil. (See (3)(a)2 below.)
3. Whenever the drained oil shows signs of becoming thick or sticky, the crankcase should be removed and cleaned. (See (3)(a)3 and 4 below.)
4. After every 50 hours of operation, the generator end bearing should be lubricated. A hole is provided for the purpose in the end of the starting pulley. Do not use excessive oil; a few drops are sufficient.

(b) *Carburetor adjustment.*

1. The carburetor has only one adjustment, the needle valve for fuel regulation. Adjust for smooth operation when the engine is warmed up and under load. Avoid an over-rich mixture.
2. The air cleaner is to protect the engine from dust and dirt and should be cleaned occasionally by removing and washing in kerosene. Test to see if it is clogged by blowing through it or by noting if engine performs better with it off. If clogged it should be replaced.

(c) *Governor adjustment.*—The governor is located on the side of the engine below and to the left of the carburetor. If necessary to adjust, see paragraph 7a(2).

(d) *Magneto.*—To get at the breaker points, remove the flywheel housing cover and then the flywheel cover which is held in place by three small screws. Turn the flywheel until the breaker points are exposed to view between the flywheel spokes.

1. If points are worn or pitted, they should be dressed with No. 00 or finer sandpaper until both faces are clean and smooth. This is done best by inserting a piece of sandpaper, folded double with sand sides out, between the points and dressing both points at the same time, while holding the points together. This insures the points coming together squarely. Wipe or blow out all particles of sand after dressing.
2. To adjust the breaker points, turn the flywheel until the cam on the crankshaft causes the breaker points to open to their fullest extent. Loosen the lock nut on the stationary point and insert a feeler gage or some other strip of metal 0.010 inch thick between the breaker points. Holding the points together with the feeler gage between them, tighten the adjusting screw which carries one point, and lock it in position with the lock nut. The maximum space between the points should equal the thickness of the feeler gage, or 0.010 inch. Check this space carefully. A slight further adjustment may be necessary.

(3) *PE-HC-43, PE-HD-43, PE-HE-43.*—(a) *Lubrication.*—The most important point in the care of the gasoline engine is an adequate

supply of oil in the crankcase. A good quality oil with a viscosity of SAE 20 should be used for all year operation.

1. Check the oil in the base every time the fuel tank is filled. Add sufficient oil to bring the level of the oil to the top of the filler fitting.
2. After every 100 hours of operation the crankcase should be completely drained and refilled with fresh oil. Dilution of the oil by unburned fuel that may pass the piston rings and the gradual accumulation of dirt and small particles of metal in the crankcase make this a very necessary operation. The oil should be drained just after the engine has been run and while it is still hot. Always allow the crankcase to drain completely and do not use flushing solvents such as kerosene. Before refilling with the correct grade of fresh oil, make sure that the drain plug has been tightened securely.
3. Certain pockets in the crankcase will gradually accumulate a sediment that is the result of wear, carbon flaking, and dirt. In cold weather, water will collect in the crankcase when the moisture in the gasoline condenses as it passes the piston rings. This mixture of dirt, oil, water, and carbon, which is known as sludge, forms a gummy emulsion that will clog the oil strainer and pump valves and cause serious trouble if not removed in time. The condition of the drained oil should be carefully observed and whenever it shows signs of becoming sticky or thick, the crankcase should be thoroughly cleaned.
4. To clean the crankcase, remove the four screws that hold the crankcase to the base and clean out the sludge. Wash the oil pump at this time with a good grade of brush and naphtha. Do not use waste in cleaning the engine; if cloth must be used, it should be free of lint, as cheesecloth. If the gasket between the base and crankcase has been damaged in any way, replace it with a new gasket. Be sure to fill crankcase with clean oil to the top of the filler plug before starting engine.

(b) *Carburetor adjustment.*—The carburetor is an especially designed adjustable float-feed type. Adjustments should be made only when the engine is under load. Too rich a mixture should be avoided.

1. The sediment chamber should be cleaned whenever necessary. Close the shut-off valve in the line from the fuel

tank and loosen the knurled thumbscrew at the bottom of the glass receptacle. When replacing the chamber, make sure that the rim of the glass is clean and firmly seated against the gasket. Replace gasket if it is damaged.

2. The air cleaner is to protect the engine from dust and dirt and should be cleaned occasionally by removing and washing in kerosene. Test to see if it is clogged by blowing through it or by noting if the engine performs better with it off. If clogged it should be replaced. Keep the oil level in air cleaner up to the beading on the body.

(c) *Governor adjustment.*—The governor has been adjusted for an operating speed of 2,350 rpm and should not be disturbed unless further adjustment is necessary. If necessary to adjust, refer to paragraph 7a(3).

(d) *Magneto.*—While the magneto plate is on the engine, turn the crankshaft by hand to see if contact points open and close properly. Points must be clean and line up squarely to make a good electrical contact. Do not use a file or emery cloth for dressing contact points. No. 00 grade sandpaper or finer should be used for best results.

b. *Generator.*—(1) *PE-HA-43.*—(a) *Lubrication.*—After every 50 hours of operation place a few drops of oil in the oilhole in the starting pulley. The generator ball bearings at the engine end of the shaft are automatically lubricated if fuel directions are followed.

(b) *Cleaning.*—Clean the carbon dust from the commutators and brush holders after every 100 hours of operation. If wiping with a coarse cloth does not clean the commutator sufficiently, rub lightly and sparingly with No. 00 or finer sandpaper while the unit is running.

(c) *Brushes.*—Replace immediately any broken or worn-out brushes. Keep an extra set of brushes available at all times. Replace brushes as follows: Remove the generator cover; loosen the nuts between the starting pulley and the housing; turn the bakelite insulating disk and the brush ring and remove the brushes; install new brushes; aline the white lines on the housing, the bakelite insulation disk, and the brush ring; tighten the nuts and replace the generator cover. Improper alinement of the white lines will cause excessive arcing and loss of power.

(d) *Voltage regulator.*—The voltage regulator is of commercial design. The adjustment screw is located on top of the regulator. Turning the screw in a clockwise direction increases the voltage. Turning the screw in a counterclockwise direction decreases the voltage. Tighten the lock nut after adjustment.

(2) *PE-HB-43.*—(a) *Lubrication.*—Too much oil in the generator bearing may cause trouble, as the excess oil may get on the commu-

tator. The bearing has a reservoir and a substantial oil wick to carry oil to the shaft. A few drops of oil in the oil cup every 100 hours of operation will prove adequate.

(b) *Cleaning*.—Inspect commutator through inspection plate at bottom of end bell every 100 hours of operation. If dirty, wipe with coarse cloth; if this does not clean commutator sufficiently, rub lightly with No. 00 grade sandpaper or finer while unit is running.

(c) *Brushes*.—To remove brushes, remove slotted composition caps at sides of generator end bell and pull out brush. Brushes are marked R (right, facing generator) and L (left). Replace in same order and manner, letters up. Replace any broken or worn-out brushes. Keep an extra set of brushes available at all times.

(3) *PE-HC-43, PE-HD-43, PE-HE-43*.—(a) *Lubrication*.—Since there are no bearings in the generator, no lubrication is required.

(b) *Cleaning*.—Inspect commutator by removing the end cover which is fastened to the generator frame by three machine screws.

To clean the commutator, wipe with a coarse cloth; if this does not clean sufficiently, rub lightly with No. 00 or finer sandpaper while the unit is running.

(c) *Brushes*.—To remove brushes, remove lock wires holding brush and spring in brush holder. Remove the machine screw holding brush pigtail terminal to brush holder. Replace immediately any broken or worn-out brushes. Keep an extra set of brushes available at all times.

10. Troubles and their remedies.—Following are listed the most common troubles that may develop in the power unit PE-()-43, and their remedies:

<i>Trouble</i>	<i>Remedy</i>
<p>a. <i>Engine difficult to start, or stops after starting.</i></p> <p>(1) Fuel supply exhausted.</p> <p>(2) Gasoline flow obstructed.</p> <p>(3) Cylinder flooded.</p> <p>(4) Improper gas mixture.</p> <p>(5) Defective magneto.</p> <p>(a) Breaker points worn or pitted.</p>	<p>(1) Fill tank with proper fuel mixture.</p> <p>(2) Clean out fuel line.</p> <p>(3) Open choke, turn engine over a few times, and let stand a few minutes before starting.</p> <p>(4) Adjust carburetor.</p> <p>(a) PE-HA-43 (par. 9a(1)(d)).</p> <p>(b) PE-HB-43 (par. 9a(2)(b)).</p> <p>(c) PE-HC-43, PE-HD-43, PE-HE-43 (par. 9a(3)(b)).</p> <p>(5)</p> <p>(a) Clean and smooth points (par. 9).</p>

Trouble

Remedy

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| <p>(b) Breaker points out of adjustment.</p> <p>(c) Breaker cam out of time (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).</p> <p>(d) Switch wire loose or defective.</p> <p>(e) High-voltage wire loose or defective (PE-HA-43).</p> <p>(6) Voltage regulator stuck (PE-HA-43).</p> | <p>(b) Adjust points to proper clearance (par. 9).</p> <p>(c) Check flywheel shaft key.</p> <p>(d) Repair or replace switch wiring or insulation.</p> <p>(e) Repair or replace high-voltage wiring.</p> <p>(6) Tap outside of case lightly or remove plunger and clean.</p> |
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- NOTE.—Care should be exercised to prevent damage of plunger or sleeve while cleaning or reassembling unit. The long holding screw through the shell assembly and shell end should extend into but not through the opening provided in plunger shell.
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| <p>(7) Throttle valve stuck or out of adjustment (PE-HC-43, PE-HD-43, PE-HE-43).</p> <p>(8) Throttle rod loose (PE-HC-43, PE-HD-43, PE-HE-43).</p> <p>(9) Valve seats bad (PE-HC-43, PE-HD-43, PE-HE-43).</p> <p>(10) Valve sticking (PE-HC-43, PE-HD-43, PE-HE-43).</p> <p>(11) Water in fuel supply.</p> | <p>(7) Clean and oil or readjust valve.</p> <p>(8) Tighten setscrew.</p> <p>(9) Reseat valves (see TM 11-360).</p> <p>(10) Clean valves (see TM 11-360).</p> <p>(11) Drain carburetor (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43), and refill with fuel from tank. If water is still present, drain tank and refill with fuel.</p> |
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| <p>(12) Spark plug fouled or cracked.</p> <p>(13) Intake manifold leaking.</p> <p>(14) Improper timing.</p> | <p>(12) Clean or replace plug.</p> <p>(13) Replace gasket or manifold if necessary.</p> <p>(14) (a) PE-HB-43.—When the piston comes up on exhaust stroke</p> |
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Trouble

Remedy

the exhaust valve should be closed when the piston reaches top dead center. The next stroke is the intake stroke, and the intake valve should start to open after the crank has traveled from 4° to 5° past dead center, or the piston has traveled down from top dead center a distance of from 0.009 to 0.010 inch.

(b) *PE-HC-43, PE-HD-43, PE-HE-43.*—To check valve clearance, remove valve cover plate. The correct clearance of the exhaust valve is 0.008 inch and the intake valve 0.006 inch when the engine is cold. Tappet clearance is adjusted by grinding the required amount from the end of the valve stem. End of the stem must be square with stem proper. The valves are timed by the meshing of the camshaft gear with the gear on the crankshaft. These gears are properly meshed when the mark on the camshaft gear is in line with the mark on the crankshaft collar. To reseal valves grind in the same manner as automobile valves.

(15) Loose or defective wiring.

(15) Tighten, repair, or replace wiring.

b. Engine misses or stops suddenly.

(1) Fuel supply exhausted or fuel line clogged.

(1) Fill tank or blow out fuel line.

(2) Loose, broken, or fouled spark plug.

(2) Tighten, clean, or replace plug.

(3) Fouled magneto points.

(3) Clean or replace points (par. 9).

(4) Defective wiring.

(4) Replace wiring.

(5) Valves warped or sticking (*PE-HB-43, PE-HC-43,*

(5) Clean or replace valves (see

PE-HD-43, PE-HE-43).

TM 11-360).

<i>Trouble</i>	<i>Remedy</i>
(6) Valve tappets sticking or out of adjustment (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(6) See (8) below and TM 11-360.
(7) Carburetor out of adjustment.	(7) Adjust carburetor (a(4) above).
(8) Cylinder head gasket leaking (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(8) Replace gasket.
(9) Manifold gasket leaking.	(9) Replace gasket.
<i>c. Engine overheating.</i>	
(1) Poor grade of oil or insufficient oil.	(1) Use only specified oil in specified quantity (par. 5).
(2) Excessive carbon deposit.	(2) Remove carbon.
(3) Magneto points out of adjustment.	(3) Adjust points (par. 9).
(4) Carburetor out of adjustment.	(4) Adjust carburetor (par. 9).
(5) Choke partly closed.	(5) Open choke.
(6) Piston rings sticking.	(6) Use proper grade of oil. If still sticking, replace rings.
(7) Improper timing (PE-HC-43, PE-HD-43, PE-HE-43).	(7) Correct timing (a(14) above).
(8) Muffler clogged.	(8) Clean or replace muffler.
(9) Governor or thistle loose.	(9) Tighten setscrews and lock nuts.
(10) Air cleaner clogged.	(10) Remove and wash in kerosene.
(11) Excessive oil in fuel (PE-HA-43).	(11) Use only specified amount of oil (par. 5a(1)(a)).
<i>d. Engine knocks.</i>	
(1) Improper fuel mixture.	(1) Allow engine to reach normal operating temperature under load, open choke, and adjust carburetor (par. 9).
(2) Heavy carbon deposit in cylinder.	(2) Remove carbon. (a) PE-HA-43.—See paragraph 9a(1)(b). (b) PE-HC-43, PE-HD-43, PE-HE-43.—Remove cylinder head and remove carbon.

CHARGING SET SCR-169

<i>Trouble</i>	<i>Remedy</i>
(3) Overheated engine.	(3) See <i>c</i> above.
(4) Magneto points set too far apart.	(4) Set points to proper clearance (par. 9).
(5) Loose main bearings or connecting rod bearings.	(5) Replace loose bearings.
(6) Loose flywheel.	(6) Replace key and tighten flywheel.
(7) Lack of oil (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(7) Add sufficient amount of proper grade of oil to bring level up to top of filler fitting (par. 5).
(8) Loose valve tappets (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(8) Set tappets to proper clearance. (a) <i>Exhaust</i> .—.008 inch with engine cold. (b) <i>Intake</i> .—.006 inch with engine cold. Clearance is adjusted by grinding the required amount off the end of the valve stem, keeping end square with stem proper.
<i>e. Engine lacks power.</i>	
(1) Engine overheated due to excessive carbon.	(1) Remove carbon (<i>d</i> (2) above).
(2) Carburetor out of adjustment.	(2) Adjust carburetor (par. 9).
(3) Magneto points too close.	(3) Adjust points (par. 9).
(4) Poor compression.	(4)
(a) Valves not seating (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(a) Grind valves in same manner as automobile valves.
(b) Valves sticking (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(b) See TM 11-360.
(c) Valves tappets sticking (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(c) Clean in same manner as (<i>b</i>) above.
(d) Valve tappets set too close (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(d) Set to proper clearance (<i>d</i> (8) above).
(e) Piston ring defective.	(e) Replace piston ring.
(f) Loose, fouled, or cracked spark plug.	(f) Tighten, clean, or replace plug.

Trouble

Remedy

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| (5) Poor fuel. | (5) Replace with suitable fuel. |
| (6) Voltage regulator inoperative (PE-HA-43). | (6) Check leads that connect regulator to the output of the generator, If the regulator becomes unserviceable, remove it and its leads, plug the hole in the top of the carburetor with a cork, and continue to use the set. |
| (7) Muffler clogged by carbon. | (7) Clean muffler. |
| (8) Governor loose. | (8) Tighten governor lock nut or setscrew (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43). |
| (9) Improper timing. | (9) Correct timing (<i>a</i> (14) above). |
| (10) Oil badly diluted (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43). | (10) Change oil. |
| (11) Air cleaner clogged. | (11) Remove and wash in kerosene. If still clogged, replace. |

f. Explosion in carburetor or in intake manifold.

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| (1) Fuel mixture too lean. | (1) Open needle valve slightly. |
| (2) Intake valve sticking, warped, or broken (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43). | (2) Clean or replace valve. |
| (3) Intake valve spring weak. | (3) Replace valve spring. |
| (4) Intake tappets set too close (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43). | (4) See <i>d</i> (8) above. |
| (5) Intake manifold leaking. | (5) Replace gasket or manifold. |
| (6) Cylinder head gasket leaking. | (6) Replace gasket. |

g. Excessive smoke from exhaust.

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| (1) Too much oil. | (1) |
| (a) In fuel (PE-HA-43). | (a) Use only specified quantity of proper grade of oil. |
| (b) In crankcase (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43). | (b) Use specified quantity of proper grade of oil. |
| (2) Carburetor needle valve open too far. | (2) Partly closed needle valve. |

<i>Trouble</i>	<i>Remedy</i>
(3) Carburetor float sticking or leaking (PE-HB-43, PE-HC-43, PE-HD-43, PE-HE-43).	(3) Clean or replace float.
(4) Worn piston or rings.	(4) Replace piston or rings.
<i>h. Generator gives no voltage.</i>	
(1) Open windings.	(1) Do not attempt to make repairs in the using organization.
(2) Broken brush leads or poor brush contact.	(2) Examine and repair or replace broken connections, or replace brushes as indicated in paragraph 9b(1)(c), (2)(c), or (3)(c).
<i>i. Generator voltage too high.</i>	
Engine speed too fast.	Decrease engine speed.
(1) PE-HA-43.	(1) Turn adjusting screw on top of the voltage regulator in a counter-clockwise direction until the proper voltage is obtained under load.
(2) PE-HB-43.	(2) See paragraph 9a(2)(c).
(3) PE-HC-43, PE-HD-43, PE-PE-HE-43.	(3) See paragraph 9a(3)(c).
<i>j. Generator voltage too low.</i>	
(1) Engine speed too slow.	(1) Increase engine speed.
(a) PE-HA-43.	(a) Turn adjusting screw on top of voltage regulator in a clockwise direction until proper voltage is obtained under load.
(b) PE-HB-43.	(b) See paragraph 9a(2)(c).
(c) PE-HC-43, PE-HD-43, PE-HE-43.	(c) See paragraph 9a(3)(c).
(2) Poor brush contact.	(2) Replace brushes.
(a) PE-HA-43.	(a) See paragraph 9b(1)(c).
(b) PE-HB-43.	(b) See paragraph 9b(2)(c).
(c) PE-HC-43, PE-HD-43, PE-HE-43.	(c) See paragraph 9b(3)(c).

11. List of replacement parts.—A list of replacement parts of power unit PE-()-43 and panel BD-()-61 is given below (*a* to *au*, incl.). Some parts of power units PE-HD-43 and PE-HE-43 are not included in this list since complete data are not available.

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43	PE-HE-43
a	Connecting rod and piston assembly. Includes items		RA-2005. 1 to 12			
b	Connecting rod assembly	11084	RA-1025. 8 to 12	99790 8 to 10	99790 8 to 12	99790. 8 to 12.
c	Piston assembly, standard. Includes items	7	7 to 12	29386 1 to 4; 6	99920 1 to 4; 6	99920. 1 to 4; 6.
1	Piston, standard	11569	RA-5.	69917	99963	99963.
2	Ring, piston compression, standard	10534	RA-14	65451	21203	21203.
3	Ring, piston center, standard		RA-111	65451	21202	21202.
4	Ring, piston oil retaining, standard		RA-484	61505	61505	61505.
5	Ring, piston, standard	10546	RA-27	66246	66246	66246.
6	Ring, piston pin retaining	10547	RA-23			
7	Bushing, piston pin	10542	RA-48			
8	Screw, connecting rod		RA-89	63689	92146	92146.
9	Nut, connecting rod screw		5-M	91643		
10	Cotter pin, connecting rod screw		4-P-06	92288		
11	Rod, connecting		RA-25-A			
12	Washer, connecting rod screw		RA-94		22082	22082.
13	Crank-pin bearing assembly	11710				
14	Screw, crank pin	11078				
15	Lock washer, crank pin screw	10525				
16	Washer, crank pin outer	11252				
17	Washer, crank pin inner	11079				
d	Piston assembly, 0.010 inch oversize 1. Includes items			99967 18 to 21	99967 18 to 21	99967. 18 to 21.
e	Piston assembly, 0.020 inch oversize 1. Includes items			99968 22 to 25	99968 22 to 25	99968. 22 to 25.
f	Piston assembly, 0.030 inch oversize 1. Includes items			99969 26 to 29	99969 26 to 29	99969. 26 to 29.
18	Piston, 0.010 inch oversize 1			99964	99964	99964.

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19	Ring, piston compression, 0.010 inch oversize ¹		61010	21219	21219
20	Ring, piston center, 0.010 inch oversize ¹		61010	21222	21222
21	Ring, piston oil retainer, 0.010 inch oversize ¹		61747	61747	61747
22	Piston, 0.020 inch oversize ¹		99965	99965	99965
23	Ring, piston compression, 0.020 inch oversize ¹		61012	21220	21220
24	Ring, piston center, 0.020 inch oversize ¹		61012	21223	21223
25	Ring, piston oil retainer, 0.020 inch oversize ¹		61748	61748	61748
26	Piston, 0.030 inch oversize ¹		99966	99966	99966
27	Ring, piston compression, 0.030 inch oversize ¹		61013	21221	21221
28	Ring, piston center, 0.030 inch oversize ¹		61013	21224	21224
29	Ring, piston oil retainer, 0.030 inch oversize ¹		61749	61749	61749
30	Pin, piston, 0.005 inch oversize ¹		63436	63436	63436
g	Crankshaft assembly	RA-1024-5			
	Includes items	31 to 35			
31	Crankshaft	RA-24-T	26291	26377	26377
32	Gear, timing on crankshaft	RA-12			
33	Collar, spacing on crankshaft	RA-40			
34	Pin, timing gear	RA-103			
35	Cone, bearing, on crankshaft	RA-428			
36	Key, flywheel		66403	66403	66403
37	Key, generator coupling		63159		
38	Nut, crank throw				
	Lock washer, crank throw nut				
h	Oil pump assembly	10526			
	Includes items	10525			
	Oil pump assembly, oil pump	RA-1193	29569	29569	29569
	Includes items	40 to 52	43 to 46	43 to 46	43 to 46
i	Piston assembly, oil pump	RA-1366			
	Includes items	40 to 42			
40	Piston, oil pump	RA-366	63207	63207	63207
41	Ball, oil pump check, 1/4 inch	8-AE			
42	Pin, oil pump ball stop	RA-367-A			
43	Plunger, oil pump	RA-364-B			
44	Body, oil pump		29340	29340	29340
45	Spring, oil pump, large	RA-375-B	29338	29338	29338
46	Spring, oil pump, small	RA-377			
47	Retainer, oil pump check ball	RA-368-A	26413	26413	26413
48	Guide, oil pump plunger	RA-426			
49	Body, oil strainer	RA-477			
50	Screen, oil strainer	RA-478	69120	69120	69120

¹ Denotes an oversize repair item which is not required except when replacing to compensate for wear in other parts.

A	B	O	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43	PE-HE-43
51	Retainer, oil strainer screen.....		RA-480.....	62082.....	62082.....	62082.....
52	Ball, oil pump check, 5/16 inch.....		10-AE.....			
53	Screw, oil pump.....		5-C-06.....			
54	Lock washer, oil pump screw.....		5-W.....			
55	Retainer, oil pump tube.....			62081.....	62081.....	62081.....
56	Rod, oil pump.....			29011.....	29011.....	29011.....
57	Tube, oil pump.....			29065.....	29065.....	29065.....
58	Connector, oil pump tube.....			63202.....	63202.....	63202.....
j	Cylinder assembly.....		RA-500103.....	99216.....	89423.....	89423.....
	Includes items.....		59 to 78.....	92, 93; L.....	92, 93; L.....	92, 93; L.....
59	Cylinder.....	11399.....	RA-1-F.....			
60	Valve, intake.....		RA-20-A.....	68923.....	68923.....	68923.....
61	Valve, exhaust.....		RA-20-A.....	68273.....	23354.....	23354.....
62	Cup, valve spring.....		RA-72.....	62233.....	62233.....	62233.....
63	Spring, valve.....	15080.....	RA-57-A.....	65906.....	65906.....	65906.....
64	Cap, valve spring retainer.....		RA-50.....	68293.....	68293.....	68293.....
65	Key, valve spring retainer.....		RA-258-A.....	68283.....	68283.....	68283.....
66	Guide, valve.....		RA-197-A.....			
67	Tappets, valve (lifter).....		RA-65-A.....	62377.....	63277.....	63277.....
68	Gear, cam.....		RA-26-A.....	61167.....	61167.....	61167.....
69	Cover, valve springs.....		RA-19-A.....	62154.....	62154.....	62154.....
70	Gasket, valve spring cover.....		RA-217-A.....	65617.....	65617.....	65617.....
71	Screw, valve cover plate.....		5-C-05.....	91389.....	91389.....	91389.....
72	Washer, valve cover plate.....		5-W.....	22353.....	22353.....	22353.....
73	Plug, camshaft.....			68122.....	68122.....	68122.....
74	Shaft, cam gear.....			68333.....	68333.....	68333.....
75	Nut, cam gear stud.....		9-K.....			
76	Stud, main bearing housing.....		RA-61.....			
77	Lock washer, cam gear stud.....		9-W.....			
78	Stud, cylinder head.....		RA-68-A.....			
79	Shield, cylinder.....	10555.....		62335.....	22142.....	22142.....

k	Louvre plate assembly.....		RA-1235-2.....		
80	Includes items.....		80, 81.....		
81	Louvre plate.....		RA-235-F.....		
82	Tapping plate.....		RA-489.....		
83	Top sheet.....		RA-236-J.....		
84	Side sheet exhaust side.....		RA-237-E.....		
85	Side sheet, carburetor side.....		RA-238-C.....		
86	Bearing, crankshaft, ball.....		99157.....	99157.	
87	Oil seal, crankshaft bearing.....		99175.....	99175.	
88	Screw, cylinder shield.....	10497	90916.....	90916.	
89	Lock washer, cylinder shield screw.....	10485	90832.....	90832.	
90	Screw, top sheet, round head machine.....				
91	Lock washer, top sheet screw.....				
92	Screw, fillister head, top sheet to cylinder head (plated).....				
93	Bushing, governor crank.....		5-G-010.....	63492.	63492.
94	Valve, oil.....		89307.....	89307.	89307.
95	Breather assembly.....		69751.....	69751.	69751.
96	Includes items.....				
97	Washer, breather check.....		RA-1393-1.....		
98	Disk, breather check.....		92 to 97.....		
99	Spacer, breather screen.....		RA-380.....		
100	Body, breather.....		RA-381-A.....		
101	Screen, breather.....		RA-382.....		
102	Gasket, breather body.....		RA-393-B.....		
103	Screw, fillister head, machine, breather.....		RA-396-A.....		
104	Washer, fiber, breather body screws.....		RA-397-A.....		
105	Moss.....		4-G-112.....		
106	Head, cylinder.....		RL-225.....		
107	Gasket, cylinder head.....		Dixie.....		
108	Gasket, cylinder.....		RA-4-B.....	21240.	21240.
109	Plug, spark, 18 mm x 1.5 mm thread.....		RA-114-A.....	69004.	69004.
110	Screw, cylinder.....	10551			
111	Screw, cylinder head, short.....	3H4413-7	RA-359.....	89572.	89572.
112	Screw, cylinder head, medium.....	10494			
113	Screw, cylinder head, long.....				
114	Washer, cylinder head stud.....				
115	Spacer, cylinder head, long.....				
116	Spacer, cylinder head, medium.....				
117	Spacer, cylinder head, washer.....				
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Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43	PE-HE-43 Climax Engineering Corporation, Clinton, Iowa
115	Shield, spark plug		29131	29131	29131	29131
116	Spring, spark plug shield		40133	40133	40133	40133
117	Nut, cylinder to base stud					
118	Lock washer, base stud nut					
119	Choke rod assembly			99824	89431	89431
m	Governor assembly		RA-1010			
	Includes items		131 to 135			
n	Governor housing assembly		RA-1053-2			
	Includes items		120 to 130			
o	Governor fork and lever shaft assembly		RA-1054-2			
	Includes items		124 to 130			
p	Governor sleeve assembly		RA-1472			
	Includes items		136, 137			
120	Screw, speed regulator		RA-44-B			
121	Housing, governor fork		RA-53-B			
122	Spring, governor lever return		RA-58			
123	Rod, throttle		RA-490			
124	Shaft, governor fork		RA-52			
125	Fork, governor		RA-54-B			
126	Lever, governor		RA-55			
127	Spring, governor		RA-183			
128	Screw, countersunk head		8-32-AK-04			
129	Pin, escutcheon		14-AN-04			
130	Nut, check (plated)		7/16" SAE			
131	Ball, governor		RA-10-C			
132	Head, governor		RA-56			
133	Stud, governor sleeve		RA-473			
134	Pin, governor ball		RA-7-A			
135	Stud, cam gear		RA-28-A			
136	Sleeve, governor		RA-472-C			
137	Bearing, ball		RA-481			

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138	Gasket, governor housing	RA-294			
139	Screw, governor control	5-G-06			
140	Lock washer, governor control screw	5-W	63493	63492	63439.
141	Shaft, governor		68643	68643	68643.
142	Bushing, governor crank		96543	28374	28374.
143	Crank, governor		92288	92288	92288.
144	Gear, governor		90202	90202	90202.
145	Pin, cotter		65126	67956	67956.
146	Screw, governor lever clamp		65986	26275	26275.
147	Spring, throttle		90891	90891	90891.
148	Link, throttle		90832	90832	90832.
149	Screw, governor gear		92305	92305	92305.
150	Lock washer, governor gear screw		22158	22158	22158.
151	Washer, governor gear screw		89014	89014	89014.
152	Strap, governor control		29208	29208	29208.
153	Control, governor		91253	91253	91253.
154	Bell crank assembly		63067	63067	63067.
155	Screw, bell crank		62199	62199	62199.
156	Bushing, bell crank		90891	90891	90891.
157	Washer, bell crank		67992		
158	Screw, bell crank		91196		
159	Clip, throttle spring		96831		
160	Screw, throttle spring clip	RAY-202-B	161 to 187	161 to 275	89430. 161 to 275.
q	Carburetor assembly		29632		
r	Includes items		183 to 187		
s	Carburetor cover assembly				
t	Includes items	RA-1350			
u	Choke wire assembly	283 to 287			
v	Includes items				
w	Fuel filter assembly		99910	99910	99910.
x	Includes items		288 to 275	288 to 275	288 to 275.
y	Air cleaner assembly		29447	99908	99908.
z	Includes items		281 to 287	281 to 284, 286	281 to 284, 286.
aa	Carburetor upper body assembly		99772	99772	99772.
ab	Includes items		248 to 262	248 to 262	248 to 262.
ac	Gasket, carburetor	RA-295	65667	68857	68857.
ad	Nozzle, carburetor	05479	23351	23351	23351.
ae	Valve, needle	03941	99621	99621	99621.
af	Nut, carburetor stuffing box				
ag	Screen, carburetor	0802			

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43	PE-HE-43
166	Bowl, carburetor.....			99573	21395	21395.
167	Float, carburetor.....		01459	69149	99622	99622.
168	Hinge, pin, carburetor float.....				23114	23114.
169	Screw, carburetor cover.....		054	90781		
170	Lock washer, carburetor cover screw.....		06922	90367		
171	Barrel, carburetor.....			69296		
172	Horn air.....			99825		
173	Screw, carburetor barrel.....			91282		
174	Lock washer, carburetor barrel screw.....			92290		
175	Screw, carburetor air bleed.....		052	63157		
176	Screw, carburetor body.....			91284	90200	90200.
177	Lock washer, carburetor mounting screw.....				91199	91199.
178	Plug, carburetor drain.....	15238		63165		
179	Screw, 5/32 x 1/2" fillister head.....			90558		
180	Screw, idle adjusting.....		03257	23164		
181	Spring, idle adjusting.....		0788	26185		
182	Screw, air horn.....			90202		
183	Cover and seat, carburetor.....	18020		29915		
184	Elbow, inlet connection.....			63745		
185	Washer, fiber inlet, lower.....			65724		
186	Washer, fiber inlet, upper.....			65734		
187	Nut, carburetor cover.....			91692		
188	Lock washer.....	4351				
w	Float bowl cover assembly.....		04971			
	Includes items.....		189 to 200			
189	Pin, float lever pinion.....		03369			
190	Cover, float bowl.....		01794			
191	Screw, float bowl cover vent.....		01454			
192	Lock washer, float bowl cover vent screw.....		0759			
193	Gasket, float bowl cover.....		01845			
194	Screw, float plug.....		02744			

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195	Connector, inlet.....	03453		
196	Screw, inlet connector.....	02409		
197	Gasket, inlet connector screw.....	02410		
198	Gasket, inlet seat.....	0337		
199	Inlet needle and seat assembly.....	04050		
200	Seat, inlet valve.....	04043		
201	Venturi.....		21216	21216
202	Gasket, venturi.....		68897	68897
203	Packing, needle valve.....		68887	68887
204	Washer, needle valve packing.....		22032	22032
205	Nut, needle valve packing.....		23227	23227
206	Choke valve, carburetor.....		22050	22050
207	Screw, choke valve (3/8 x 1/2" round head).....		90029	90029
208	Lock washer, choke valve (No. 4).....		90369	90369
209	Screw, swivel.....		92017	92017
210	Valve and seat, inlet.....		99636	99636
211	Gasket, inlet valve seat.....		68877	68877
x	Choke shaft and lever assembly.....	04865		89428
	Includes items.....	212 to 226		
212	Choke lever assembly.....	04911		
213	Shaft, choke.....	04912		
214	Shutter, choke.....	04863		
215	Screw, choke shutter retaining.....	0120		
216	Lever, choke stop.....	04106		
217	Pin, choke stop lever retaining.....	03208		
218	Choke lever and swivel assembly.....	05994		
219	Choke lever.....	01830		
220	Pin, choke lever retaining.....			
221	Screw, choke lever clamp.....	0240		
222	Peg, choke lever stop.....	05006		
223	Swivel, choke lever.....	06680		
224	Washer, choke lever swivel.....	04920		
225	Screw, choke lever swivel.....	058		
226	Spring, choke lever return.....	04122		
y	Throttle and lever assembly.....	04864		
	Includes items.....	227 to 248		
227	Shaft, throttle.....	05553		
228	Shutter, throttle.....	04119		
229	Screw, throttle shutter retaining.....	0120		
230	Throttle lever and swivel assembly.....	05992		

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43	PE-HE-43 Climax Engineering Corporation, Clinton, Iowa
231	Screw, throttle lever retaining.....		051.....			
232	Swivel, throttle lever.....		05680.....			
233	Washer, throttle lever swivel.....		04920.....			
234	Lever, throttle shaft.....		04107.....			
235	Peg, throttle lever stop.....		03517.....			
236	Tip, nozzle.....		04118.....			
237	Nozzle, shank.....		04202.....			
238	Gasket, main nozzle.....		02817.....			
239	Gland, main adjustment screw.....		0702.....			
240	Packing, main adjustment screw gland.....		0705.....			
241	Nut, main adjustment screw packing.....		0703.....			
242	Gasket, main adjustment screw gland.....		0676.....			
243	Screw, main adjustment.....		03076.....			
244	Cross bar.....		0700.....			
245	Stem.....		0701.....			
246	Needle.....		03075.....			
247	Plug, body.....		03575.....			
248	Body.....		05541.....			
249	Bushing, throttle shaft.....				23230.....	23230.
250	Upper body, carburetor.....				99954.....	99954.
251	Spring, idler valve.....				26157.....	26157.
252	Valve, idler needle.....				23228.....	23228.
253	Valve, carburetor throttle.....				22036.....	22036.
254	Screw, throttle valve (3/8 x 1/2" round head).....				90029.....	90029.
255	Lock washer, throttle valve screw (No. 4).....				90369.....	90369.
256	Stop, throttle.....				61967.....	61967.
257	Throttle shaft assembly.....				99635.....	99635.
258	Lever, throttle.....				21152.....	21152.
259	Pin, throttle stop and lever.....				23125.....	23125.
260	Spring, throttle stop.....				26119.....	26119.
261	Screw, throttle stop spring.....				91920.....	91920.

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43	PE-HE-43 Climax Engineering Corporation, Clinton, Iowa
286	Nut, air cleaner mounting screw.....			91208		
297	Lock washer, air cleaner mounting screw.....			90366		
298	Spacer, air cleaner pipe.....			63848		
299	Stud, air cleaner pipe.....			63849		
300	Nut, air cleaner pipe stud.....			91744		
301	Pipe, intake.....		RA-319-D			
302	Gasket, intake pipe.....		RA-293			
303	Gasket, carburetor to intake pipe.....		RA-295			
304	Screw, intake pipe.....		4-C-05			
305	Lock washer, intake pipe screw.....		4-W			
306	Nut, intake pipe.....	10567				
307	Spring, intake pipe nut retaining.....	15219		91691		
308	Screw, carburetor mounting.....			90632		
309	Lock washer, carburetor mounting screw.....				22135	22135.
310	Brace, air cleaner elbow.....				90691	90691.
311	Screw, elbow mounting brace.....				90632	90632.
312	Lock washer, elbow brace mounting screw.....				92129	92129.
313	Lock nut, elbow mounting brace.....				90632	90632.
314	Lock washer, elbow brace lock nut.....				92134	92134.
315	Screw, elbow mounting.....				90632	90632.
316	Lock washer, elbow mounting screw.....				22144	22144.
317	Washer, elbow mounting screw.....				92129	92129.
318	Lock nut, elbow mounting screw.....				89426	89426.
aa	Magneto assembly.....	15005				
	Includes items.....		28126			
ab	Magneto stator assembly.....		319 to 357			
	Includes items.....		28128			
ac	Magneto winding assembly.....		319 to 321			
	Includes items.....		322 to 327			
ad	Magneto capacitor assembly.....		328 to 334			
	Includes items.....					

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ae	Magneto breaker assembly.....	335 to 357.....	69780.....	69780.....	69780.....
	Includes items.....				
af	Contact block assembly.....	357 to 362.....	357 to 362.....	357 to 362.....	357 to 362.....
	Includes items.....				
ag	Spark plug wire assembly.....	RA-1207-1.....			
	Includes items.....	368, 369.....			
319	Casting, stator.....	23129.....			
320	Grommet, rubber, high-tension cable.....	17466.....			
321	Grommet, rubber, ground cable.....	20482.....			
322	Winding, magneto.....	21808.....			
323	Screw, winding core.....	20791.....			
324	Lock washer, winding core screw.....	20817.....			
325	Cable, high-tension with terminal.....	21313.....	99602.....	99602.....	99602.....
326	Cable, ground with solder clip.....	21978.....			
327	Clip, solder, ground cable.....	20490.....			
328	Capacitor.....	20549.....	20652.....	20652.....	20652.....
329	Screw, capacitor mounting.....	17183.....	92308.....	92308.....	20308.....
330	Lock washer, capacitor mounting screw.....	15126.....	92290.....	92290.....	92290.....
331	Strap, connecting.....	20127.....			
332	Nut, capacitor binding post.....	9407.....			
333	Lock washer, capacitor binding post.....	21031.....			
334	Screw, fastening, for capacitor.....	15137.....			
335	Point, screw contact.....	22887.....	63238.....	63238.....	63238.....
336	Lock nut, contact point screw.....	22944.....	63239.....	63239.....	63229.....
337	Lock washer, contact point screw.....	22615.....	91122.....	91122.....	91122.....
338	Plate, adjustable breaker.....	23019.....			
339	Screw, breaker plate.....	17393.....			
340	Contact, breaker.....	15308.....			
341	Contact point, breaker, long point.....	337.....			
342	Contact point, breaker, short point.....	336.....			
343	Magneto (United American Bosch) (replacing 15005).....	MCI1B.....			
344	Wrench and gage.....	15081.....			
345	Capacitor, magneto (Robt. Bosch Magneto Co.).....	2KO-24.....			
346	Washer, breaker plate screw.....	15024.....			
347	Lock washer, breaker plate screw.....	20975.....			
348	Washer, insulating, contact screw.....	22985.....			
349	Washer, insulating, contact screw.....	22986.....			
350	Lever, breaker, with contact point.....	22871.....			
351	Spring, breaker lever.....	22066.....			
352	Clip, breaker lever spring.....	20476.....			

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43 United States Motors Corporation, Oshkosh, Wis.	PE-HD-43 Climax Engineering Corporation, Clinton, Iowa	PE-HE-43 Climax Engineering Corporation, Clinton, Iowa
353	Washer, breaker lever spacing (0.050" thick)		20481			
354	Washer, breaker lever spacing (0.016" thick)		20547			
355	Washer, breaker lever spacing (0.006" thick)		20485			
356	Wick, breaker lever bearing oil		20484			
357	Plate, breaker, with contact screw		23018			
358	Screw, contact block			63369	63369	63369
359	Lock washer, contact block screw			90367	90367	90367
360	Stop, contact spring			62100	62100	62100
361	Point and spring, contact			69754	69754	69754
362	Block, contact spring			65078	65078	65078
363	Nut, contact block			90313	90313	90313
364	Bearing, magneto, with oil retaining ring			69911	69911	69911
365	Ring, oil retaining			62235	62235	62235
366	Screw, magneto mounting	11674		91385	91385	19385
367	Lock washer, magneto mounting screw	H-169		91388	91388	91388
368	Terminal, ignition cable		RA-518-A			
369	Cable, ignition	16310	RA-207-A	See 369A	See 369A	See 369A.
369A	Cable, ignition (not included in assembly aa)			29147	29147	*29147.
370	Brush holder, magneto	16309				
371	Gasket, magneto bracket	10590				
372	Gasket, magneto plate (0.005" thick)			66527	66527	66527.
373	Gasket, magneto plate (0.009" thick) 1			66537	66537	66537.
374	Gasket, magneto plate (0.015" thick) 1			66457	66457	66457.
375	Plate, magneto			69876	69876	89085
376	Armature, magneto			29656	29656	29656.
377	Plate, contact block connector			62178	62178	62178.
378	Insulator, armature lead			65725	65725	65725.
379	Insulator, capacitor lead			65735	65735	65735.
380	Screw, armature mounting			91270	91270	91270.
381	Lock washer, armature mounting screw			90832	90832	90832.
382	Olip, dust cover			68876	68876	68876.

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383	Dust cover, magneto point.....	65198	65198	65198	65198.
384	Plunger, magneto.....	65414	65414	65414	65414.
385	Air guide, magneto plate.....	22309	22309	22309	22309.
386	Valve, oil return.....	89307	89307	89307	89307.
ak	Fuel tank assembly.....				
	Includes items.....				
al	Bare fuel tank assembly.....				
	Includes items.....				
aj	Filler cap assembly.....				
	Includes items.....				
387	Flange, fuel line.....				
388	Flange, fuel tank filler.....				
389	Cap, fuel tank.....				
390	Head, fuel tank.....				
391	Sheet, fuel tank body.....				
392	Tank, fuel.....				
393	Pipe, fuel.....				
394	Sleeve, compression coupling.....				
395	Nut, compression coupling.....				
396	Cap, fuel tank.....				
397	Washer, fuel tank cap.....				
398	Screen, fuel tank cap.....				
399	Chain, fuel tank cap.....				
400	Pin, cotter, 3/32 x 3/8.....				
401	Cross bar, fuel tank cap.....				
402	Bracket, fuel tank.....				
403	Strap, fuel tank.....				
404	Screw, fuel tank strap.....				
405	Screw, fuel tank bracket.....				
406	Lock washer, fuel tank bracket screw.....				
407	Nut and bolt, fuel tank strap.....				
ak	Base assembly.....				
	Includes items.....				
al	Crankcase end plate assembly.....				
	Includes items.....				
am	Main bearing housing assembly.....				
	Includes items.....				
408	Pan, oil splash.....				

1 Denotes an oversize repair item which is not required except when replacing to compensate for wear in other parts.

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43 Climax Engineering Corporation, Clinton, Iowa	PE-HD-43	PE-HE-43
409	Base.....		RA-15-H.....	61473.....	61473.....	61473.....
410	Studs, crankcase to base.....		RA-68-A.....			
411	Ell, street, 3/4".....		6-AC.....	90878.....	90878.....	90878.....
412	Plug, oil drain pipe, 1/4".....		2-Z.....	90886.....	90886.....	90886.....
413	Plug, oil filler pipe, 3/4".....		6-Z.....			
414	Screw, base.....		5-C-06.....			
415	Lock washer, base screw.....		5-W.....			
416	Screw, round head cap.....		4-V-06.....			
417	Housing, main bearing.....		RA-109-F.....			
418	Cup, bearing.....		RA-427.....			
419	Cup, bearing.....		RA-427.....			
420	Plate, crankcase end.....		RA-64-K.....			
421	Nut, base.....	11616.....				
422	Lock washer, base nut, upper.....	6540.....				
433	Lock washer, base nut, lower.....	11679.....				
424	Foot.....	10502.....				
425	Stud, crankcase side plate.....		RA-68-A.....			
426	Gasket, crankcase and plate.....		RA-121-A.....			
427	Gasket, main bearing housing.....		RA-126.....			
428	Gasket, base.....		RA-132-B.....	66987.....	66987.....	66987.....
429	Gasket, crankcase end plate (thin).....		RA-246-A.....			
430	Gasket, breather body.....		RA-397-A.....			
431	Nut, crankcase end plate and bearing housing.....		5-K.....			
432	Lock washer, crankcase end plate and bearing housing nut.....		5-W.....			
433	Screw, breather.....		4-G-112.....			
434	Lock washer, breather screw.....		4-W.....	99175.....	99175.....	99175.....
435	Washer, oil seal.....		RA-167-A.....	91523.....	91523.....	91523.....
436	Nipple, oil filler.....			69345.....	69345.....	69345.....
437	Cap, oil filler.....			99157.....	99157.....	99157.....
438	Bearing, ball.....	11266.....				

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439	Screw, base.....				90887.	90887.	90887.
440	Lock washer, base screw.....				92268.	92268.	92268.
441	Ring, main bearing retainer.....	11267					
442	Washer, cork, main bearing.....	11271					
443	Facing, cork, main bearing.....	11377					
444	Gasket, crankcase back plate.....	11089					
445	Screw, crankcase.....	10491					
446	Lock washer, crankcase screw.....	10485					
447	Blower housing assembly.....						
448	Includes items.....			RA-2014-5.			
449	Stop switch assembly.....			447 to 455.			
450	Includes items.....			RA-1179.			
451	Blower housing back plate assembly complete.....			453 to 455.			
452	Includes items.....			RA-2101-2.			
453	Blower housing back plate assembly.....			456 to 459.			
454	Includes items.....			RA-1101-2.			
455	Flywheel and blower.....			456, 457.			
456	Bare blower housing assembly.....			23126.	61451.	61451.	61451.
457	Housing, blower.....			RA-1104-5.			
458	Plate, tapping.....			RA-104-C.	29098.	99929.	99929.
459	Deflector, air.....			RA-499.			
460	Rivets, stop switch.....			RA-289-A.			
461	Grommet.....			I-A-L.			
462	Spring, stop switch.....			RA-179.			
463	Plate, blower housing, back.....			RA-488.			
464	Plate, tapping.....			RA-180.			
465	Nut, switch screw.....			RA-101-F.			
466	Bushing, switch insulating.....			RA-499.			
467	Washer, switch insulator.....			8-32-AG.			
468	Screw, switch.....			RA-91.			
469	Lock washer, blower housing screw.....	11595.		RA-92.			
470	Screw, handle.....	H-169.		8-32-V-20.			
471	Lock washer, handle screw.....	11674.			92272.	92272.	92272.
472	Screw, handle.....	H-169.			90366.	90366.	90366.
473	Lock washer, handle screw.....						
474	Screw, Parker-Kalon, name plate.....						
475	Plate, name.....						
476	Cover, blower housing.....						
477	Bracket, blower housing mounting.....						
478	Screw, blower housing mounting.....						

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43	PE-HB-43	PE-HC-43	PE-HD-43	PE-HE-43
		Homelite Corporation, Port Chester, N. Y.	United States Motors Corporation, Oshkosh, Wis.			Climax Engineering Corporation, Clinton, Iowa
469	Lock washer, blower housing mounting screw			90832	90832	90832
470	Screen, blower			62347	62347	62347
471	Rivet, blower screen			36436	36436	36436
472	Puller, flywheel			29157	29157	29157
473	Lock washer, adjusting screw	10485				
474	Coil, 32 volt	11650				
475	Nut, molded	15070				
47	Muffler assembly		RA-1002	89567	89567	89567
	Includes items		476 to 480			
476	Plate, muffler inlet		WM-1			
477	Plate, muffler outlet		WM-2			
478	Coupling, muffler		RA-443			
479	Rivet		3-AL			
480	Burr		7-AM			
481	Elbow, muffler			91205	91205	91205
482	Muffler	18015				
483	Lock nut, muffler elbow			91242	91242	91242
484	Nipple, muffler		RA-483	91245	91245	91245
485	Rope, starting	11408		66979	66979	66979
486	Pulley, rope starter		RA-264-A	61492	61492	61492
487	Pin, starter pulley	10535				
488	Screw, starter pulley	11598				
489	Washer, pulley screw	11599				
490	Nut, extension, starter pulley		RA-263-A			
491	Nut, starter pulley		9-K			
492	Screw, engine end cover	10495				
493	Lock washer, engine end cover screw	10485				
as	Generator terminal panel assembly	15010				
	Includes items	494, 495				
494	Receptacle	15100		10108	10108	10108
495	Nut, molded terminal	15071				

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496	Screw, mounting.....	10491				
497	Lock washer, mounting screw	10485				
498	Panel, terminal (blank)		SC-30		C-669-A	C-669-A.
499	Bracket, terminal panel, left hand		SC-35		C-394-E	C-394-E.
500	Bracket, terminal panel, right hand		SC-34		C-394-D	C-394-D.
501	Cable, negative, long	11590				
502	Cable, positive, short	11589				
503	Cable, regulator to terminal plate	15051				
504	Regulator, voltage, 32 volt	15220				
505	Binding post, terminal		45		45	45.
at	Armature assembly	10758	G-3596		G-3596	G-3596.
	Includes items	506, 507				
506	Armature	15155				
507	Fan and bushing assembly		G-3597		G-3597	G-3597.
au	Field frame and coil assembly					
	Includes items	508, 509				
508	Casting, field frame		P-5746		P-5746	P-5746.
509	Coil assembly, field		G-3599		G-3599	G-3599.
510	Shoe assembly, pole		G-1610		G-1610	G-1610.
511	Retainer, field pole		P-2317		P-2317	P-2317.
512	Screw, field pole retainer		P-5592		P-5592	P-5592.
513	Lock washer, field pole retainer screw		P-5593		P-5593	P-5593.
514	Grommet, insulating		GR-A-5948		GR-A-5948	GR-A-5948.
av	Brush assembly	11476				
	Includes items	515, 516				
515	Spring, generator brush	H-193				
516	Lead, brush	15048				
517	Holder, brush	15120				
518	Screw, brush holder		G-2963		G-2963	G-2963.
519	Screw, brush terminal		G-3731		G-3731	G-3731.
520	Lead and lug assembly (jumper)		P-4581		P-4581	P-4581.
521	Retainer brush		P-5763		P-5763	P-5763.
522	Lock washer, brush holder screw		G-2884		G-2884	G-2884.
523	Lock washer, brush terminal screw		P-1886		P-1886	P-1886.
524	Screw, end plate	10794				
525	Washer, brass, plain	15142				
526	Washer, insulating fiber	15143				
527	Ring, insulating	10786				
528	Nut, binding post	15032				
529	Lock washer, end plate screw	H-169				

A	B	C	D	E	F	G
Item reference No.	Name of item	PE-HA-43 Homelite Corporation, Port Chester, N. Y.	PE-HB-43 United States Motors Corporation, Oshkosh, Wis.	PE-HC-43	PE-HD-43	PE-HE-43 Climax Engineering Corporation, Clinton, Iowa
530	Bearing.....	H-154				
531	Bushing, insulating.....	H-305		P-5743	P-5743	P-5743.
532	Cover, generator.....			P-5744	P-5744	P-5744.
533	Cover, generator end.....	10497		P-5734	P-5734	P-5734.
534	Screw, end cover.....	10485		P-3515	P-3515	P-3515.
535	Lock washer, end cover screw.....			P-I-550-A	C-641-L	C-641-L.
536	Adapter, generator.....			P-5734	P-5734	P-5734.
537	Screw, shell.....			P-3852	P-3852	P-3852.
538	Lock washer, shell screw.....			P-5745	P-5745	P-5745.
539	Bushing, shell screw.....			SC-33	C-645-B	C-645-B.
540	Crate assembly.....			SC-31	C-576-G	C-576-G.
541	Skid base assembly.....			DA-1090-70	DA-1090	DA-1090.
542	Mounting, rubber.....			2082-J-4	108	108.
543	Handle, crate.....			240		
544	Bolt, clamp, with latch.....				240-U	240-U.
545	Lever bolt, upper part.....				240-L	240-L.
546	Lever bolt, lower part.....					
547	Butt, tool box cover hook.....			719-M		
548	Gate hook and eye, tool box cover.....			40-M-9		
549	Hinges, tool box cover.....			12		
550	Scraper, carbon.....	11479				
551	Wrench, double end (Armstrong).....	25-A				
552	Wrench, socket.....	10865				

A Item	B Part name	BD-LL-61	BD-LM-61 BD-LN-61 BD-LO-61 BD-LP-61
		Number required	Number required
	<i>aw.</i> Panel BD-61		
553	Panel board	1	1
554	Voltmeter IF-47 (0-50 volts, d-c)	1	1
555	Ammeter IF-16 (0-10 amperes, d-c)	3	3
556	Contact switch (3-pole)	1	1
557	Automatic switch (reverse current relay)	1	1
558	Binding posts (No. 14-20 brass, with wing nuts and washers)	8	8
559	Phenolic stand-offs for binding posts (1 inch high)		8
560	Knife switches, double-pole single-throw, 125-volt, 15-ampere, each with two 15-ampere fuses and fuse clips	3	
561	Circuit-breakers, 0322-10, Heinemann Electric Co., Trenton, N. J., or equal		3
562	Rheostats, 12.5 ohms (approx.); 12-ampere capacity on first step, tapering to 3.4 amperes in 33 or more steps (Ward Leonard E. D. 28890 or equal)	3	3
563	Wire, stranded copper, equivalent to No. 12 A. W. G., rubber insulated and braided.		
564	Screws, brass, black nickel finish, peined over to prevent loosening, except parkerized steel screws holding panel in cabinet.		
<p><i>ax.</i> The following items are not issued with the set but are desirable accessories: 1 can, 1-gallon, with flexible spout. 1 cup, measuring ½ pint (PE-HA-43). 1 oiler, small (1 additional oiler for priming with PE-HA-43).</p>			

[A. G. 062.11 (5-9-41).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

E. S. ADAMS,
*Major General,
 The Adjutant General.*

DISTRIBUTION:

B2 (2); IR 2, 4 (2); IBn 4, 6, 11 (3); IC 2, 4, 6, 11 (3).
 (For explanation of symbols see FM 21-6.)

