TM 11-900

U.S. WAR DEPARTMENT

TECHNICAL MANUAL

POWER UNITS PE-75-A AND PE-75-B

June 9, 1942

TECHNICAL MANUAL
No. 11-900

WAR DEPARTMENT,
WASHINGTON, June 9, 1942.

POWER UNITS PE-75-A AND PE-75-B

Caution: **This equipment employs high voltages which are dangerous and may be fatal if contacted by operating personnel. When working on the equipment, always ground every part before touching it.**

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SECTION I

GENERAL DESCRIPTION

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General	1
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1. General.—*a.* Power units PE–75–A and PE–75–B are self-contained, portable generators capable of supplying 2,500 watts of a-c power at 110 volts, 60 cycles, through 50 feet of cord. Figure 1 shows three views of the machines. The two models are alike except for very slight differences in several minor parts; the different suffix letters merely indicate different procurements. For the sake of convenience, reference will be made throughout this manual only to the power unit PE–75–A, and it will be understood that the same information applies equally to the power unit PE–75–B, unless otherwise stated.

b. The power unit consists essentially of a self-excited generator, directly coupled to and driven by a gasoline engine. The gasoline engine and the generator, complete with its filter box and output terminations, are mounted on skid type spring mountings. The output terminals include two twistlock receptacles and two binding posts. In addition to the regular packing crate, a plywood collapsible carrying case is provided for the protection of the unit during transportation and storage. A tool box of ample size, equipped with a hinged door, is normally carried in the top of this case. Neither cord CD–409 nor cord CD–415 is part of power unit PE–75–A. However, for convenience, provision is made for carrying one or two of either, in the top of the case. Detailed instructions are included in this manual, giving the procedure to be followed in operating the unit in the carrying case whenever it is desired to reduce the acoustical noise produced by the power unit.

2. Integral components of power unit.—*a. Gasoline engine.*—The gasoline engine supplied is a Homelite Corporation model HTR, 3,600 rpm, 2-cycle, 2-cylinder, air-cooled, horizontally opposed type, firing simultaneously (see fig. 2). A starting rope with grip is used for placing the engine in operation.

b. Generator.—The generator is a Homelite Corporation model HTRA, self-excited, 110-volt, 60-cycle, single-phase, a-c generator of 2,500 watts rating and incorporates a filter box assembly attached thereto. (See fig. 3.)

c. Mounting and fuel tank assembly.—This assembly is designed for mounting the gasoline engine and generator to make an integral unit. The assembly consists of a fan housing, spring steel skid mountings, and fuel tank. (See fig. 4.)

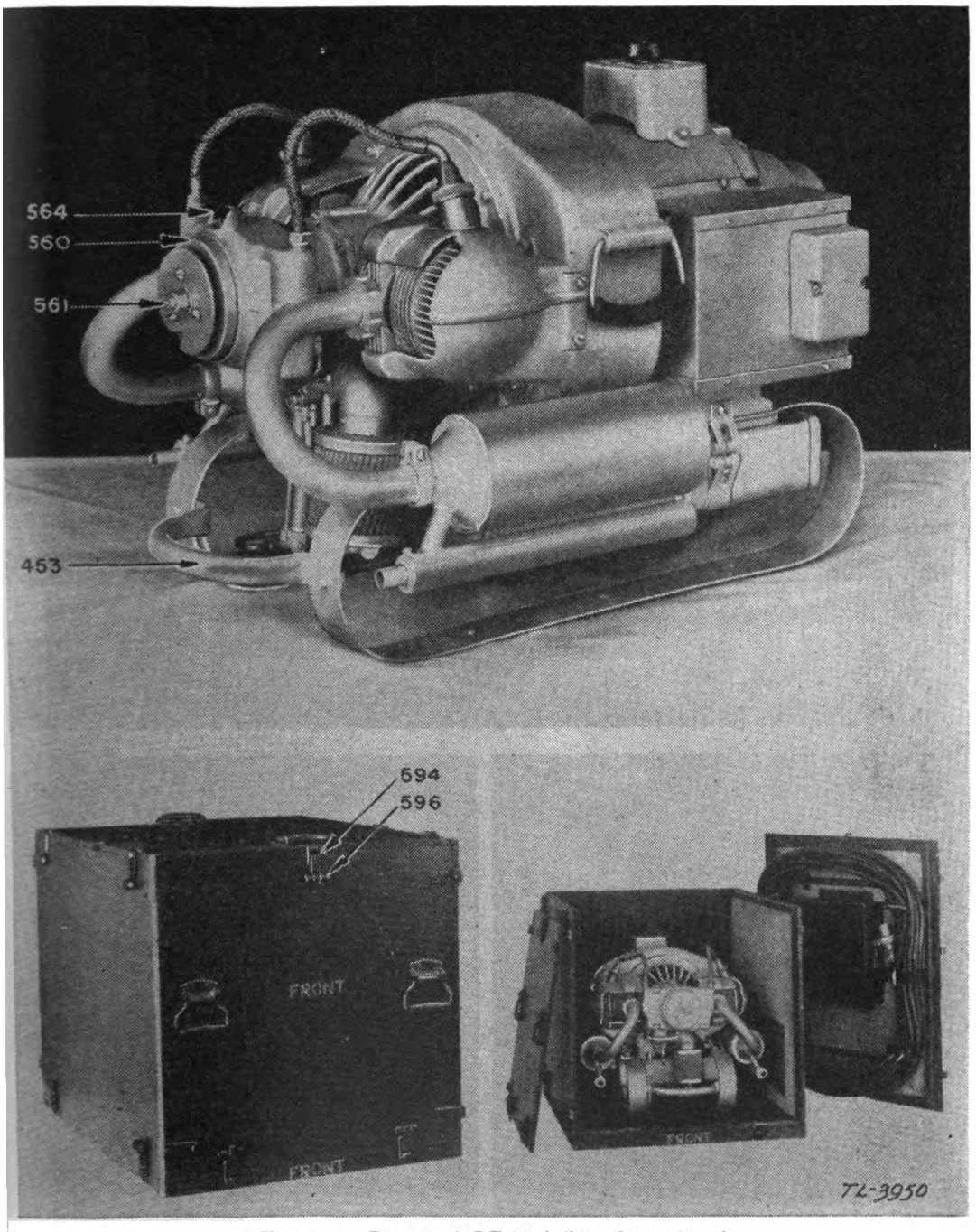

FIGURE 1.—Power unit PE-75-A (in and out of case).

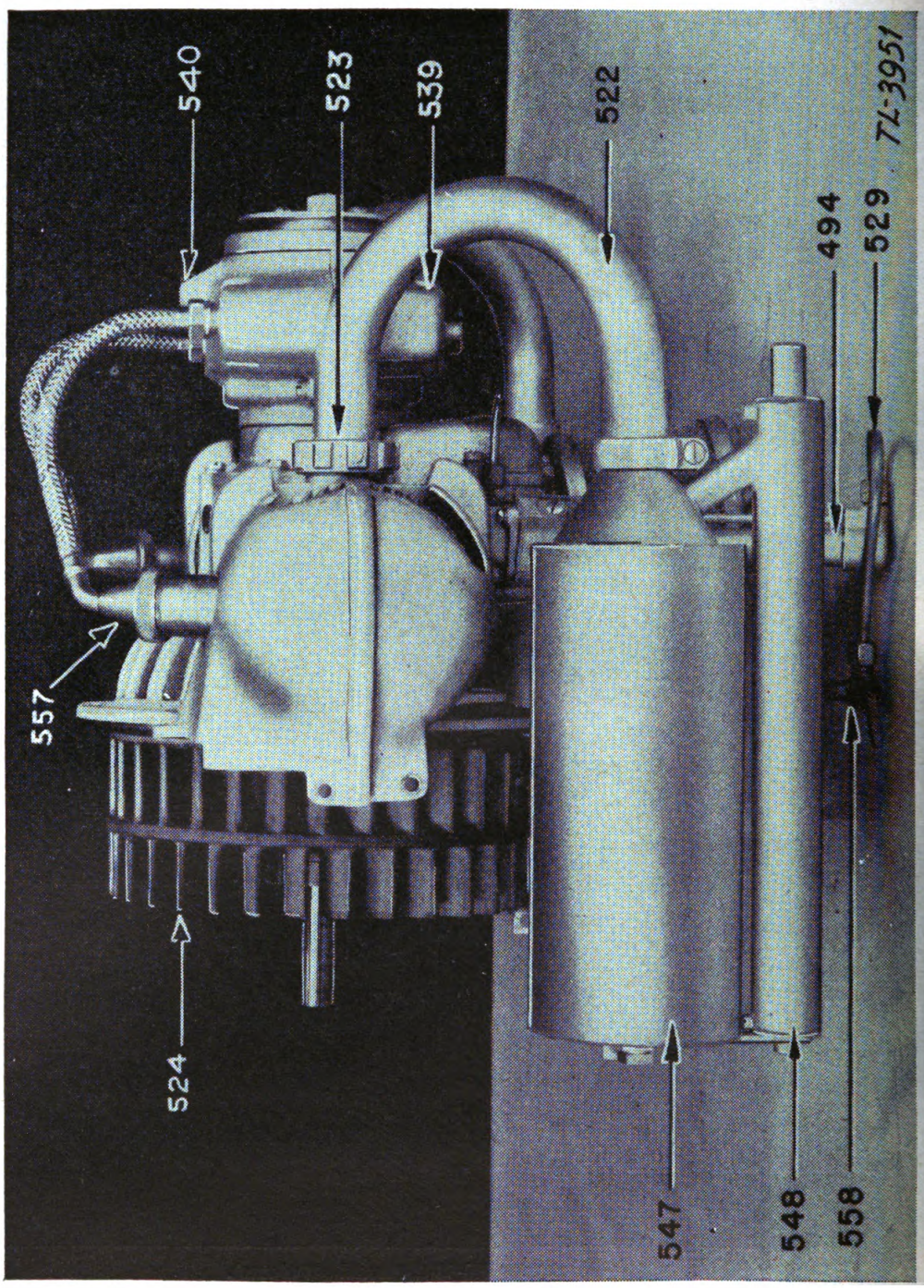

FIGURE 2.—Engine assembly.

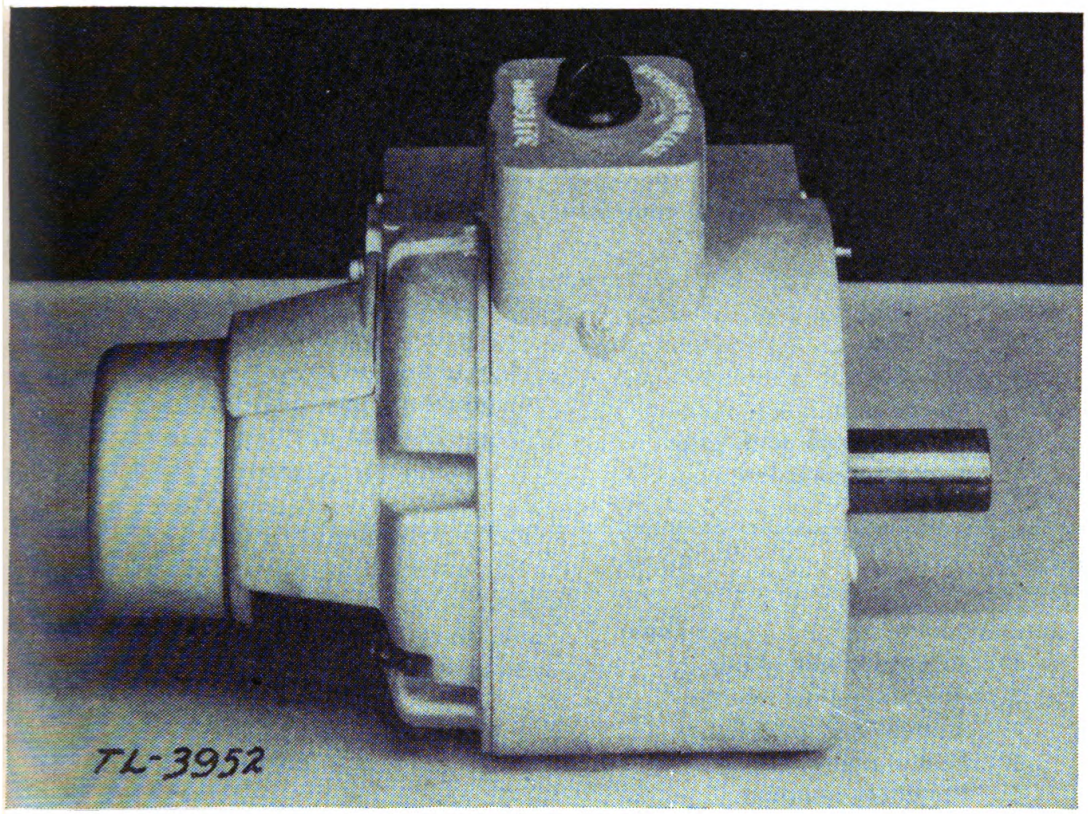

FIGURE 3.—Generator assembly.

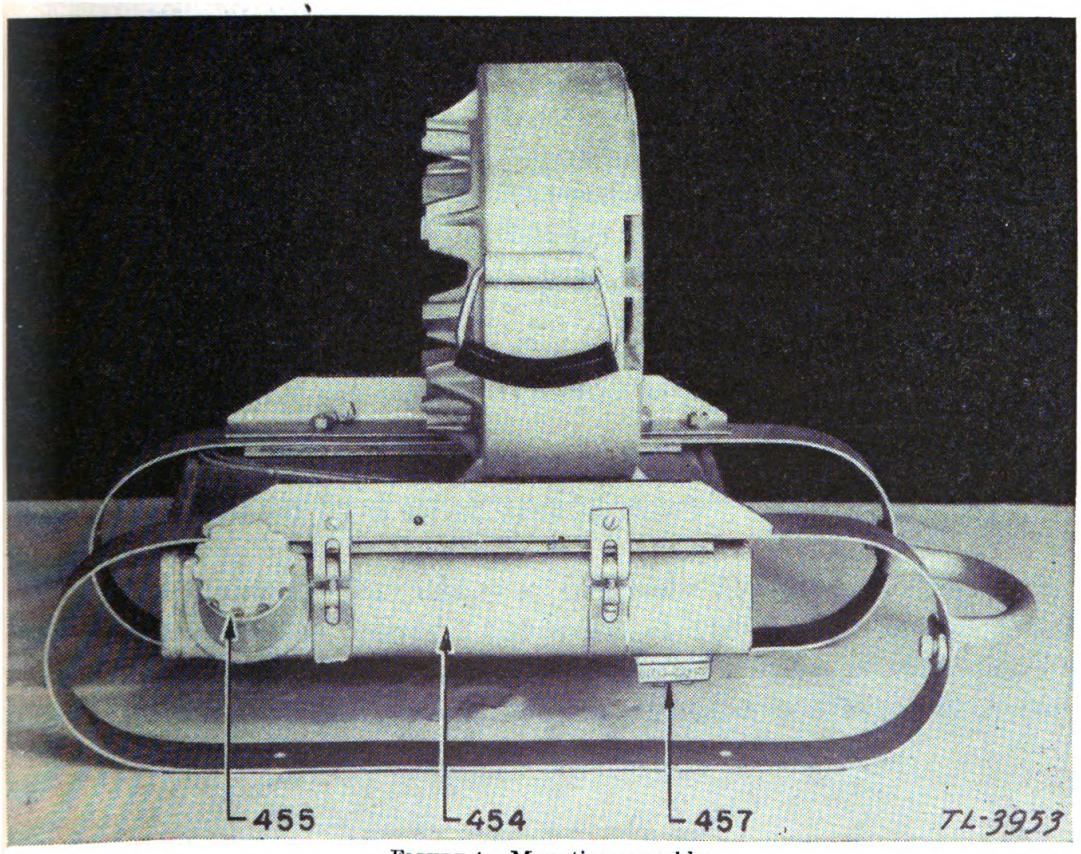

FIGURE 4.—Mounting assembly.

3. Component parts with dimensions and weights.

Quantity	Article	Dimensions	Weight (pounds)
	Power unit PE–75–A complete	25½″ x 24½″ x 32″	279
1	Case	25½″ x 24½″ x 32″	89
1	Base	24½″ x 31″	25
2	End	24½″ x 24½″	8 (each)
2	Side	24½″ x 32″	14 (each)
1	Top	25½″ x 32″	20
1	Power unit	29¼″ x 21¼″ x 20″	167
1	Starting rope with grip	35″	
1	Tool box complete	12¼″ x 11″ x 4¼″	23

Quantity	Article	Dimensions
	Tools	
1	Armature pin—long	¼″ x 10″
3	Armature pin—short	5/16″ x ½″
1	Assembling fixture	
1	Feeler gage	0.016″
1	Flywheel remover	
1	Jack screw	¾″–16 x 4″
1	Jack screw	½″–13 x 5″
1	Jack screw	⅜″–15 x 2″
1	Magneto bracket bearing remover	13/16″ x 3¾″
1	Screw driver (large)	13½″
1	Screw driver (medium)	6″
1	Screw driver (small)	4½″
1	Shaft puller	
1	Spanner	2⅛″ diameter
1	Spark plug wrench with handle	
1	Wrench	7/16″
1	Wrench	½″ x ⅝″
1	Wrench	¾″ x 1″
1	Wrench	1 1/16″ x 1¼″
1	Wrench	13/16″ x ⅝″

Quantity	Article	Dimensions
	Spare parts	
1	Breaker contact assembly	
4	Brushes, a-c	
2	Brushes, d-c	
1	Gasket, carburetor flange	
1	Gasket, crankcase sealing	
2	Gasket, cylinder	
1	Gasket, fuel tank cap	
1	Gasket, magneto bracket	
2	Piston and pin assembly	
4	Piston ring	
8	Spark plug	
2	Starting rope and grip	
1	Gasket, carburetor cover	
1	Gasket, carburetor valve retainer	
1	Gasket, carburetor nozzle plug	
1	Gasket, fuel tank outlet fitting	

SECTION II

EMPLOYMENT

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4. Initial procedure.—*a.* As soon as the packing crate has been removed, inspect the case for damage during shipment. Should any items be unserviceable, report this fact immediately and procure replacements.

b. Remove the six wood dowel pins (596) from the six catches (594) on the top of the case; release catches to permit removal of the top. (See fig. 1.)

c. Release the two catches (593) on front of case (fig. 1). (The front is indicated by a stripe around case.) Then remove the front end by lifting up.

5. Preparation for use.—*a. Generator limitations.*—The generator is designed to deliver 2,500 watts at 110 volts, 60-cycle, single-phase alternating current. The unit should not be overloaded more than 20 percent and should not be operated continuously at any overload.

b. Operation in case, using cord CD–409 or CD–415.—(1) Set case with front directed away from equipment to be operated. Follow starting and stopping instructions in *e* below.

(2) Remove cord CD–409 or CD–415 if supplied (see par. 1) from inside the case top; place top so that it projects beyond front of case, the overhang to be such as to permit fastening catches to center catch staples on top. (See figs. 5 and 6.)

Caution: See safety notice on page 1.

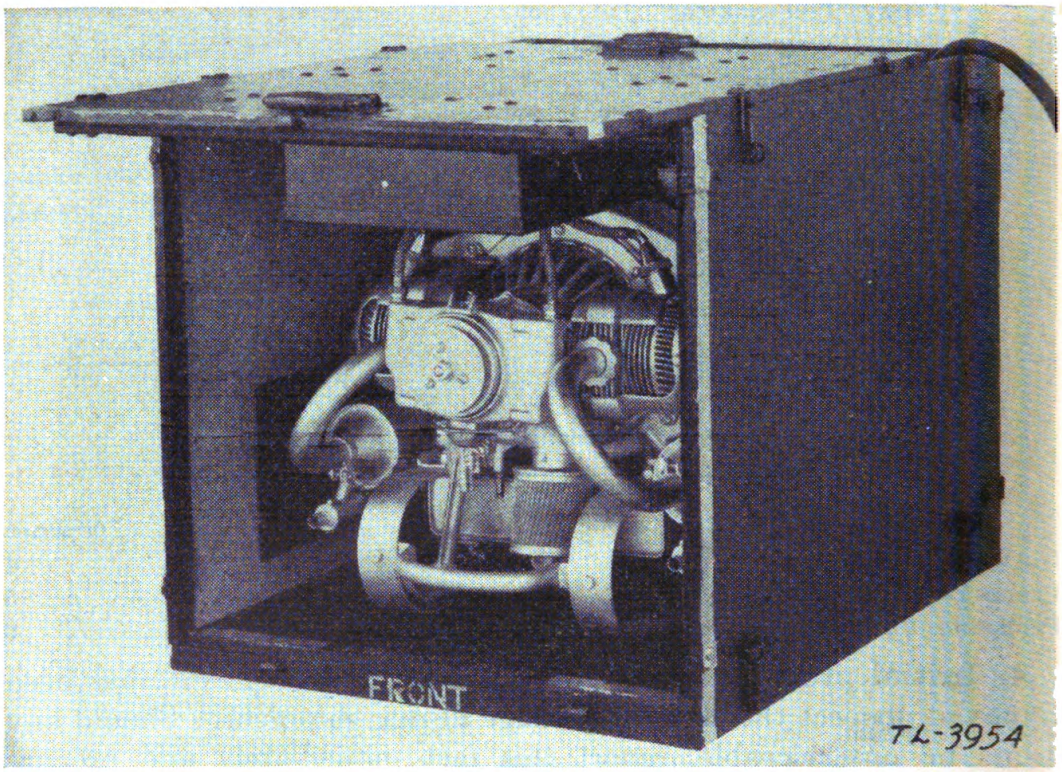

FIGURE 5.—Power unit PE–75–A, ready for operation in case.

(3) To place generator in operation, plug the cord into one of the twistlock receptacles (408) on the filter box (430). Attach ground wire on cord to binding post (411) on filter box (fig. 7). Current may be taken from both of the outlets at the same time, providing the total load does not exceed the rated capacity of the generator.

(4) Bring the cord up through rear opening at top. (See fig. 5.)

c. Operation out of case using cord CD–409 or CD–415.—(1) Remove rear end as described in paragraph 4*c*; then release catches holding sides to base for removal of these sections.

(2) The unit may be operated either on or off the base as required. To remove from base, take off the four wing nuts holding unit to base.

(3) Follow starting and stopping instructions in *e*(1) to (5), inclusive, below. Then proceed as outlined in *b*(3) above and *e*(6) below.

d. Operation using separate wires connected to binding posts.—Follow instructions in *b* or *c* above except for attaching cord. To obtain access to binding posts, remove side of case, if not already done; then remove filter box terminal cover (445). (See fig. 7.) Attach wires to binding posts, which are then exposed, running the wires through the cable clamp (426). (See fig. 19.)

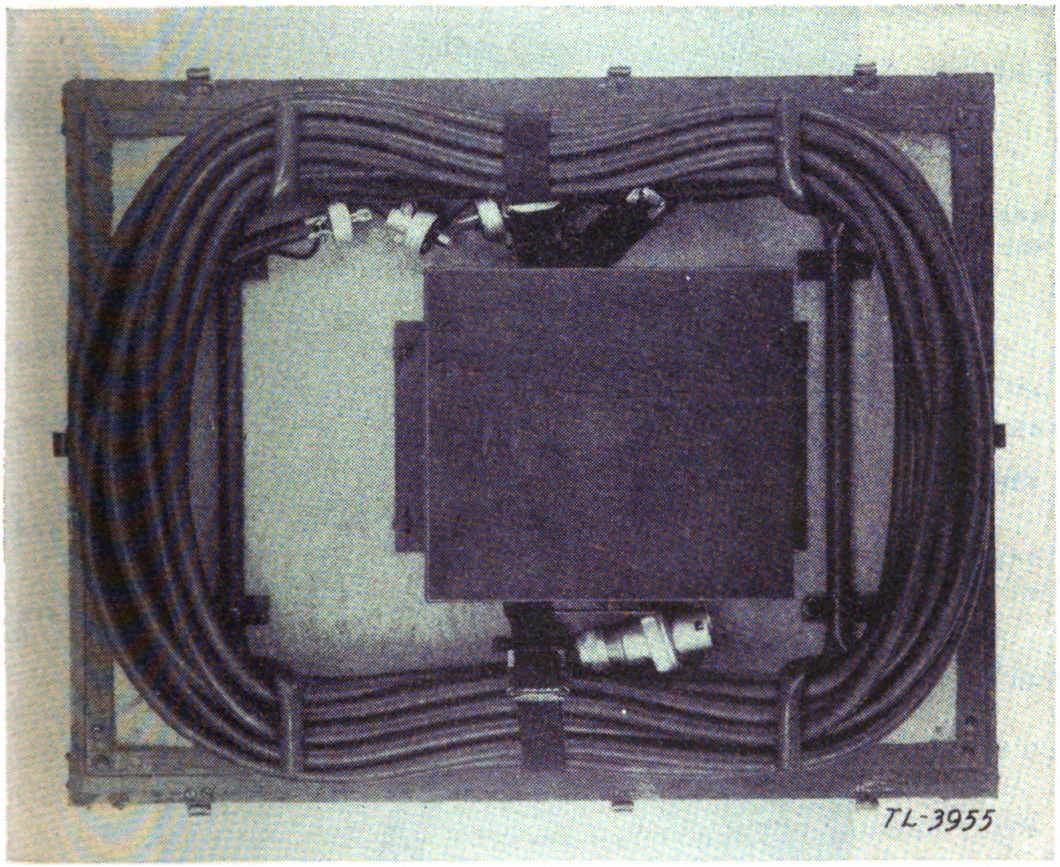

FIGURE 6.—Method of fastening cords to top of case.

e. Starting and stopping.—***Caution:*** Before starting for first time, turn starting pulley (560, fig. 1) by hand to insure that shaft turns freely.

(1) *Fuel mixture.*—Remove the fuel tank cap (455, fig. 4) and fill cap twice (capacity ¼ pint) with SAE 40 motor oil, thoroughly mixing with 1 gallon of gasoline in a clean can or other container. *For best results use regular gasoline (not high-test). Lubrication for the entire engine* is obtained by mixing oil with gasoline, and it is extremely important that the oil be *thoroughly mixed* with the gasoline. Pour the mixture into the fuel tank (454, fig. 4).

(2) Cut rheostat (401, fig. 7) out fully (turned completely in a counterclockwise direction) before starting engine.

(3) Open shut-off cock (558, fig. 2) beneath fuel tank as indicated.

(4) To choke, pull all the way up on carburetor plunger button (485, fig. 13) and release two or three times. In cold weather, operate pump five to eight times. There is practically no danger of flooding engine by too much priming.

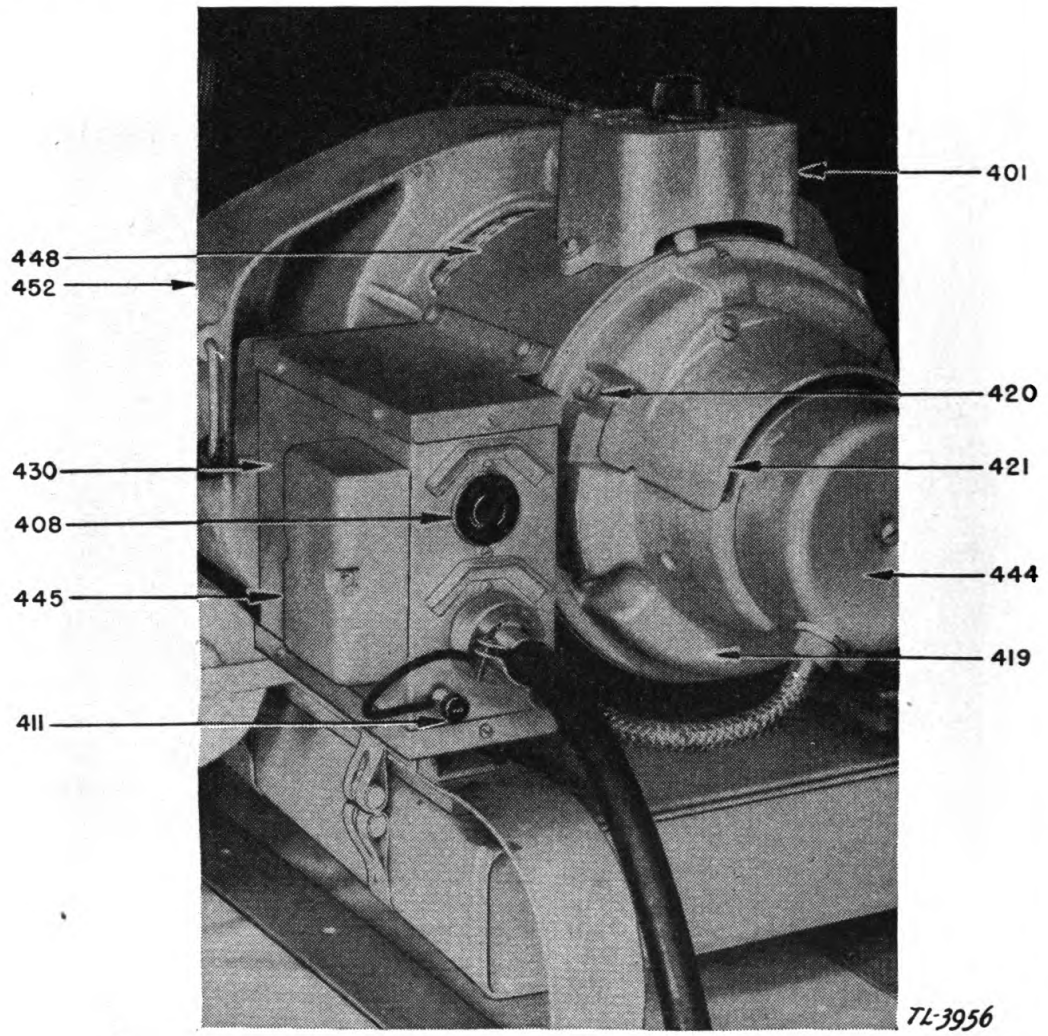

FIGURE 7.—Close-up of generator end, showing power cord in place.

(5) Wind starting rope (563, fig. 21) counterclockwise on pulley (560, fig. 1); place foot on footrest (453, fig. 1) and pull hard, giving the engine a quick spin.

Caution: If rope is pulled slowly, engine may kick back. Repeat if necessary until engine starts. After engine starts, it may be necessary in cold weather to keep operating the priming pump plunger at

short intervals when the engine falters, until it warms up enough to run smoothly. This should take about 1 minute.

(6) To obtain exact voltage, apply the load to the generator and then turn rheostat (401) clockwise until the desired voltage is obtained. (See fig. 7.)

(7) Once the unit is started, it should require no further attention other than refueling, and possible adjustment of the rheostat if the load is changed.

(8) To stop engine, press red stop button (564, fig. 1) and hold firmly until engine stops.

f. Starting and stopping procedure summarized.—(1) Fill with fuel and oil.

(2) Adjust rheostat.

(3) Open shut-off cock.

(4) Choke.

(5) Start with rope on pulley.

(6) Plug in cord.

(7) Press red stop button for stopping.

6. Procedure for packing.—*a. Unit operated in case.*—(1) Disconnect power cord or cords.

(2) Release catches holding top to sides and remove. Also release catches on end; lift up to remove. Then take off sides.

(3) Remove fuel tank cap, tip unit, and drain tank.

(4) Replace sides and then ends, making sure that all sections marked with stripe are at front, or engine end.

(5) Attach power cords, if supplied, to top (see fig. 6). Also attach tool box to top, if previously removed.

(6) Replace top. Make sure all catches are right and dowel pins in catches, if furnished.

b. Unit operated out of case.—(1) Disconnect power cord or cords.

(2) Remove fuel tank cap, tip unit, and drain tank.

(3) If unit has been removed from base, attach by means of four wing nuts.

(4) See *a* (4) to (6), inclusive, above.

SECTION III

DETAILED FUNCTIONING OF PARTS

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7. Generator theory.—*a.* Figure 8 shows a permanent bar magnet, with lines of flux leaving the north pole and entering the south

pole. If a wire is moved past the pole of the magnet at right angles to the pole as shown, a voltage will be induced in the wire.

b. The amount of this voltage depends on three things:

(1) Strength of magnet.
(2) Length of wire.
(3) Speed of movement of wire.

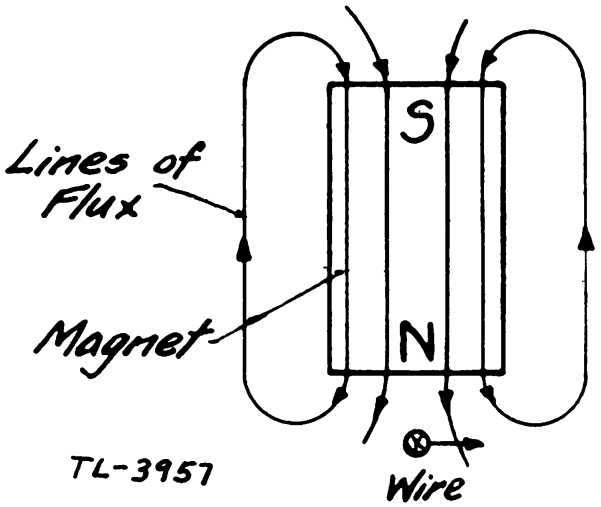


FIGURE 8.—Generator theory, permanent magnet.

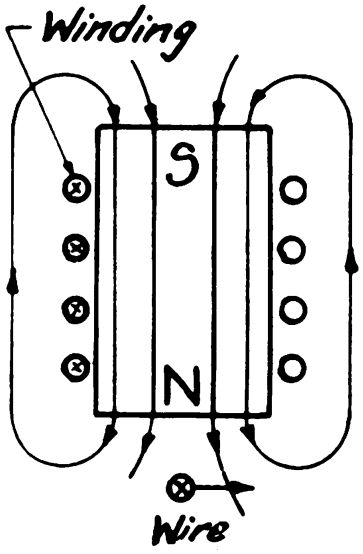


FIGURE 9.—Generator theory, electromagnet.

c. The stronger the magnet (the greater the density of the lines of flux) and the faster the wire is moved, the greater will be the voltage induced in it per unit of length. This is the simple fundamental principle of operation of any generator, either direct current or alternating current.

d. In practice, an electromagnet (fig. 9) is used instead of a permanent magnet. The reason for its use is that a permanent magnet tends to lose its strength over a period of time. Also, the strength of an electromagnet can be controlled by the number of turns of wire wound on it and by the amount of current (amperes) supplied through this wire.

e. In an actual generator (fig. 10) the field poles (437) serve as electromagnets. The armature winding (414) acts the same as the wire shown moving by the end of the magnet in figures 8 and 9. This movement is spoken of as "cutting the lines of flux" of the magnet. This motion induces a voltage in the armature winding which is connected to the armature commutator (404). The carbon brushes (402) and (403) mounted in the brush holder assemblies (423 and 424) serve to pick up this voltage from the armature as it rotates; and wires from the brushes (403) make the voltage available at the terminals of the generator.

f. In power units PE-75-A, the field poles are magnetized by the field windings to which current is supplied by connecting them to the d-c brushes. For this reason, generators of this type are called "self-excited."

g. Once the field poles are magnetized in the factory they retain some of this magnetism (called "residual magnetism") even though there is no current in the field winding when the generator is not running. When the armature starts to rotate, the armature windings pass through, or cut, the field flux of this residual magnetism. This generates a small amount of voltage in the armature windings. This voltage starts to add to the strength of the residual magnetism in the field, thereby increasing the voltage in the armature. This action keeps increasing as the armature comes up to speed until the full rated voltage of the generator is reached.

h. Figure 11 shows the principal parts of a generator and illustrates the function of the armature and field windings. The lines of field flux pass from a north pole through the air gap between the armature and field pole, through the armature, back through the air gap into a south pole, and through the yoke back to the starting point. As the armature rotates, the armature windings cut through these lines of flux, thereby generating a voltage in the armature windings.

i. This field flux is greatest during operation of the generator but is present in a small amount even when the generator is stopped because of the residual magnetism which remains in the pole pieces.

j. This explains why the pole pieces should always be put back in the generator on a service job in the same relative position as before they were removed. Once a pole is magnetized, it becomes either a

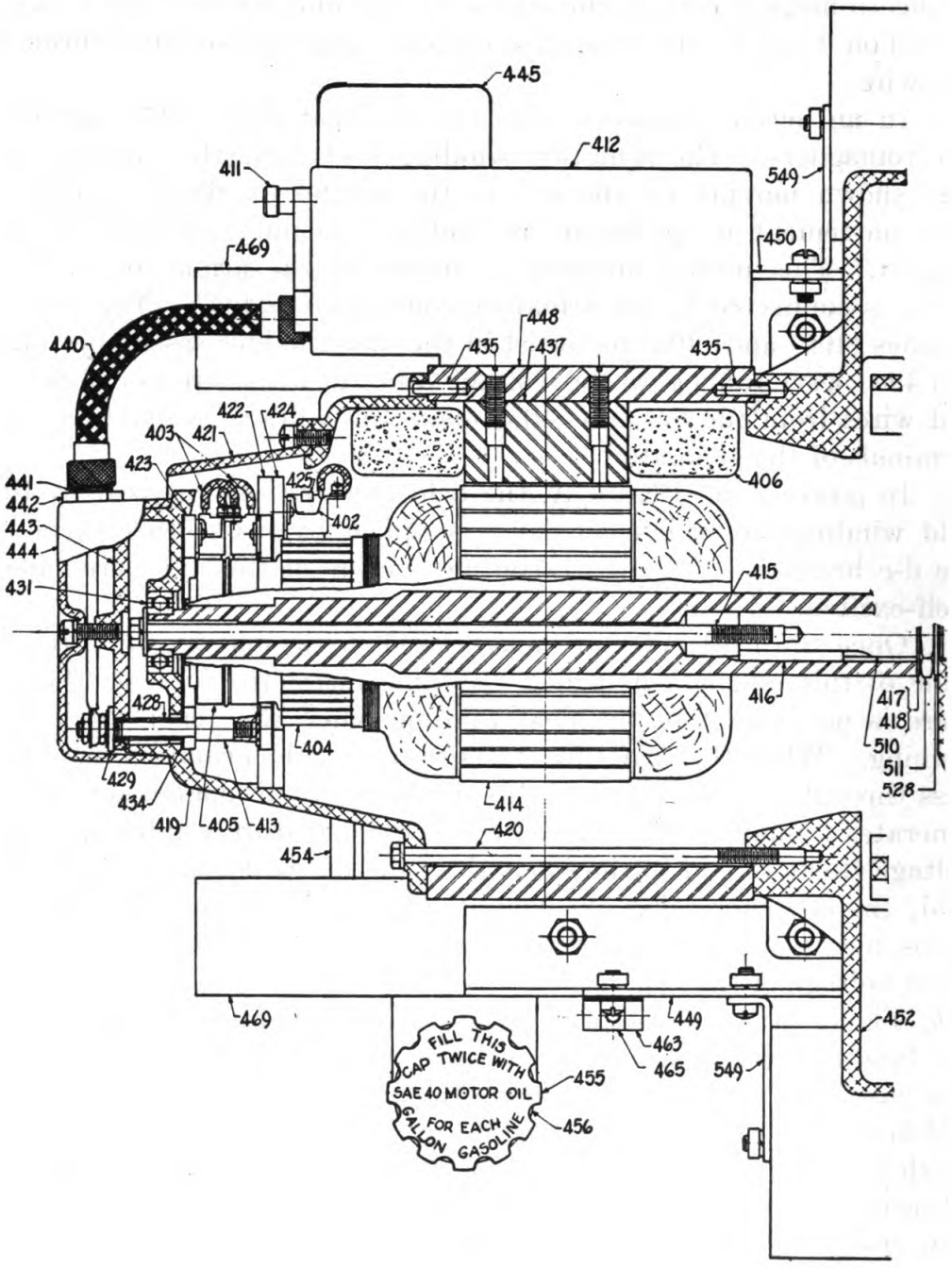
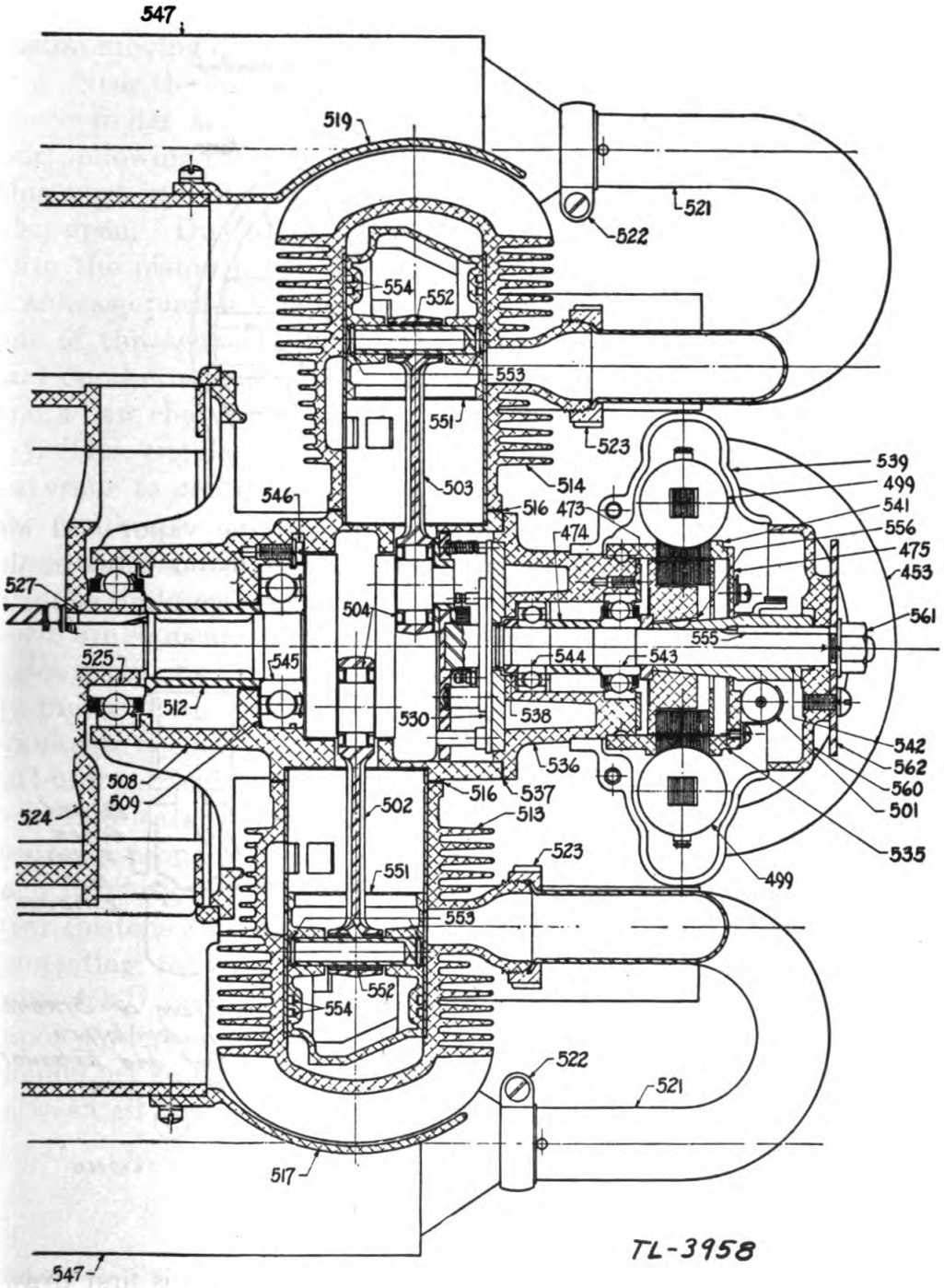


FIGURE 10.—Power unit

north pole or a south pole and cannot be changed except by the application of an external supply of voltage as from a storage battery. Even with this method it is sometimes difficult to change the magnetism of the field poles if they have been in service for some time.

8. Engine operating principle.—*a.* In all internal combustion engines a complete cycle consists of the four operations of intake,



PE–75–A (sectional drawing).

compression, explosion, and exhaust. In the 2-cycle engine as used on power unit PE–75–A (properly called "two-stroke" cycle) these four operations are completed in one revolution or one down stroke

and one up stroke of the piston. (The up stroke in this horizontally opposed type engine, which fires simultaneously, is considered the stroke with the piston moving toward the cylinder head.) (See fig. 12.)

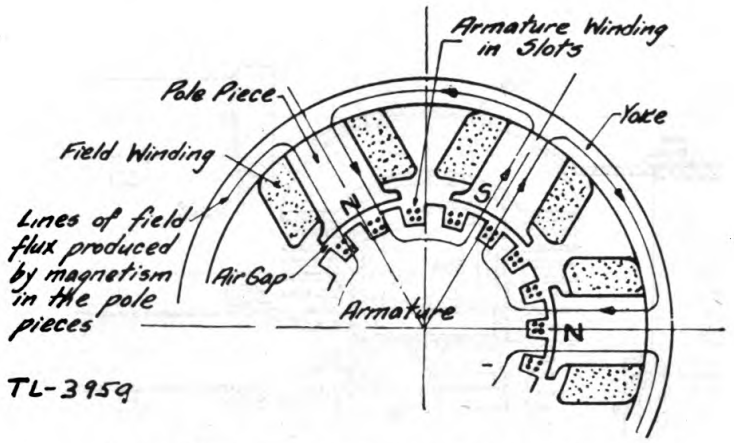


FIGURE 11.—Generator armature and field windings.

b. The explosive charge is a mixture of gasoline vapor and air. Suction created in the engine by movement of the piston draws in air. This air is drawn in through the carburetor, where gasoline vapor is mixed with the air to form an explosive mixture.

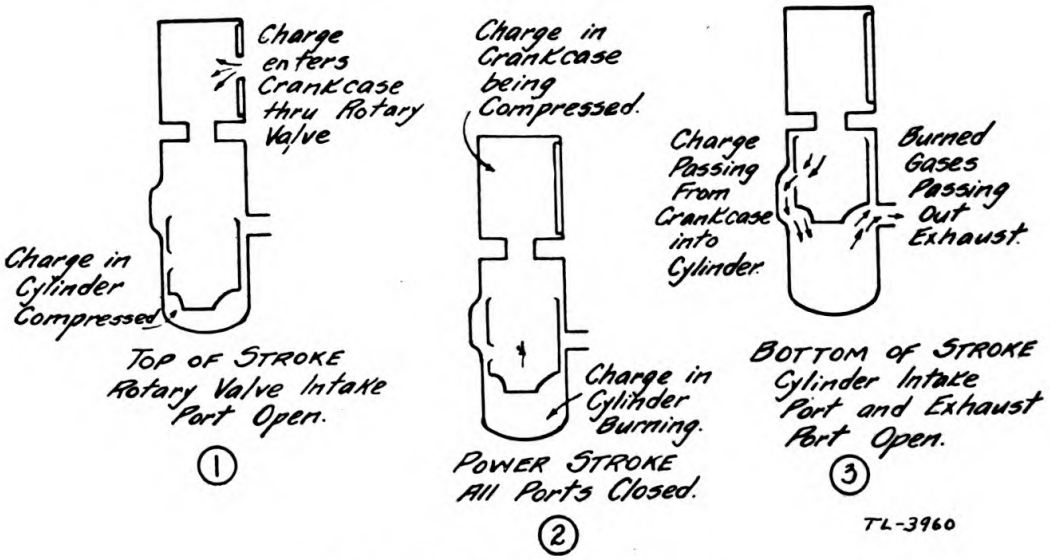


FIGURE 12.—Engine operating principle.

c. In the engine of power unit PE–75–A, the charge is first drawn into the crankcase. This occurs on an up stroke of the piston and on this same up stroke a charge already in the cylinder is compressed. This is the compression stroke, since it compresses the charge in the

cylinder, but at the same time it serves to draw a second charge into the crankcase.

d. The compressed charge in the cylinder is then ignited and the following down stroke is the power stroke. At the same time the piston moving down compresses the charge in the crankcase.

e. Near the end of this down stroke of the piston, when the gases in the cylinder are completely burned, the piston uncovers the intake port, allowing the compressed charge in the crankcase to flow through this port into the cylinder. At the same time the exhaust port is also open. Due to the shape of the intake port and the baffle built onto the piston head, the charge flowing into the cylinder from the crankcase pushes the burned gases ahead, forcing these burned gases out of the exhaust port. This completes the cycle in two strokes, and on the next up stroke the charge in the cylinder is compressed and a new charge is drawn into the crankcase.

f. This engine has a combination independent rotary valve and governor to control admission of the charge from the carburetor to the crankcase. The use of this independent intake valve allows for proportioning and locating the cylinder admission and exhaust ports to give the most perfect performance. The admission and exhaust ports are so located and proportioned that proper scavenging of waste gases is obtained without loss of any incoming charge. Furthermore, by means of this independent rotary intake valve, the intake of the crankcase is controlled to give a smooth, even flow of air through the carburetor, resulting in more perfect carburetion.

g. Lubrication of the engine by means of oil mixed with the fuel insures a proper and sufficient oil film on all moving parts. During each revolution of the 2-cycle engine, all the moving parts subject to wear (pistons and piston pin assemblies (551), cylinders (513 and 514), connecting rod bearings (504), main bearing (545), rotary intake valve (530), and magneto shaft (542)) are subjected to a spray of oil vapor under pressure (see fig. 10). This pressure is as high as 3 pounds per square inch. Under such pressure the oil vapor is forced between all friction surfaces giving perfect lubrication.

SECTION IV

SERVICING AND REPAIR

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9. Engine.—*a. Spark plugs.*—Inspect plugs every 50 hours for cleanliness and adjustment. To inspect plugs, remove cap from spark plug shield (557, fig. 2) and take out plug with wrench (582, fig. 22). Clean both points and porcelain and adjust to 0.025 inch. If points are badly worn, replace the plug, always using a Champion J–10, or equivalent. Note that in replacing plug, copper gasket goes outside of the metal shield surrounding the plug.

b. Magneto.—The only adjustment is at the contact points, which are to be inspected every 200 hours to see that the gap is exactly 0.016 inch. To adjust, proceed as follows:

(1) Turn pulley (560) until engine is under compression, place wrench (586) on starting pulley nut (561), and give the wrench a hard blow to loosen nut (see fig. 1). Remove the starting pulley nut and take off the pulley, thus exposing the contact assembly.

(2) Remove the spark plugs to relieve engine compression and turn flywheel (524, fig. 2) slowly in a counterclockwise direction until breaker lever fiber rests on the highest point of the cam (approximately ¼ inch past breaking edge of cam). Although the contact points remain open during entire travel of the cam from breaking edge to closing edge, being closed only while the flat section of the cam is passing the breaker lever fiber, the cam must be in the position described above when gaging the contact point gap.

(3) Check gap with feeler gage (572, fig. 22).

(4) Loosen the contact plate setscrew and adjust points to 0.016 inch. Tighten setscrew.

(5) Recheck gap with feeler gage. Readjust if necessary. Tightening of setscrew sometimes changes adjustment.

(6) Uneven or pitted contact points may be restored to a true, even condition by using a smooth carborundum stone, after which all dust particles should be removed with a dry cloth. *Do not use a steel file*

on contact point surfaces. Stiff paper or cardboard will remove the oxide formation on contact points resulting from long idleness.

10. Generator.—*a. Commutator (404) and collector rings (405)* (fig. 10).—(1) To inspect commutator and collector rings, remove brush head cover plate (421, fig. 7). The commutator should require no cleaning for several hundred hours of operation. It need be cleaned only when excessively carbonized, when too much arcing occurs, or if scored.

(2) To clean commutator, first start engine and then insert a strip of very fine sandpaper (00 to 8/0) (*not emery*), ¾ inch wide, on top of commutator, using rubber end of lead pencil to guide sandpaper. Hold one end of sandpaper (end away from direction of rotation) and exert light pressure with lead pencil on sandpaper, against commutator, moving pencil back and forth across width until commutator is clean.

(3) Collector rings very seldom require cleaning. Clean only if badly threaded or scored.

(4) To clean, follow same procedure on both rings as on commutator, except sandpaper should be ⅜ inch wide.

b. Brushes (402 and 403, fig. 10).—(1) Brushes should be inspected every 300 hours, and require replacement only if brush spring rides on brush holder.

(2) To inspect, remove the brush head cover plate.

(3) New brushes are formed to shape of commutator and collector rings to eliminate arcing and to insure perfect electrical contact. Ordinarily in replacing either a-c or d-c brushes, no special care in wearing in brushes is required. However, when new brushes are installed, if the unit does not generate voltage the d-c brushes on the commutator should be held down simultaneously by exerting a light pressure, using two pieces of wood, for a few moments with no load on generator.

(4) If above procedure is followed and intermittent or no current is obtained, or excessive arcing occurs, proceed as follows:

(*a*) Stop engine and disconnect shielded high-tension cables (557, fig. 2) at spark plugs.

(*b*) Place a ¾-inch strip of very fine sandpaper (00 to 8/0) (*not emery*) beneath one of the two d-c brushes, and adjust to position with rubber end of lead pencil making sure sandpaper lies flat on commutator, rough side to brush. Brush spring should be in place to hold brush against sandpaper. (No additional pressure is required.)

(*c*) Rock engine back and forth about ½ inch by turning starting pulley (560, fig. 1), keeping sandpaper in position with pencil. Continue to rock engine until carbon appears on sandpaper for full width

of brush. To remove sandpaper lift up brush to relieve tension and release slowly to prevent brush chipping on commutator. Repeat operation on other d-c brush.

(*d*) For the a-c brushes, insert a strip of sandpaper ⅜ inch wide under one of four brushes at a time, rough side to brush, brush spring in place. Keep sandpaper flat on collector ring; rock engine back and forth the same as for d-c brushes and release in the same manner (see (*c*) above).

(5) Brushes must fit freely in holders. If binding or drag occurs, remove a few thousandths of an inch with sandpaper from the side or sides of the brush showing binding marks.

11. Inspection.—*a.* Inspect the power unit at least once a month for general condition, cleanliness, and proper operation. If it does not deliver 2,500 watts at 110 volts, 60 cycles, consult trouble chart, paragraph 17, and then paragraphs 13 to 16, inclusive.

b. Take care in servicing this power unit. Servicing should be attempted only by competent personnel, supplied with adequate equipment. All attempts at servicing by a given individual should be limited to what he is capable of performing properly. It is possible for an inexperienced operator, in attempting to locate and repair a minor trouble which a competent service man could care for in a very few moments, to damage this equipment to such an extent that it would have to be shipped to a depot for repair.

12. Lubrication.—The unit requires no lubrication other than the oil mixed with the gasoline (see par. 5*e*(1)), and oiling the magneto cam follower felt. This requires a very few drops of SAE 30 oil after 100 to 200 hours of operation, or if the magneto is dismantled for any reason. This felt is not to be saturated but oiled just enough so that oil comes to the surface when pressed between the fingers. Do not over-oil, as too much oil is detrimental to the contact points, resulting in burning and pitting.

13. Procedure in case of power unit failure.—*a. Engine.*— Most important for proper engine performance are fuel, spark plugs, ignition, carburetion, and compression. If trouble develops, check it in that order, consulting the trouble chart, paragraph 17*b*, and then check the following items in the order listed. Before removing or testing any part of the engine, make sure first that the failure isn't due merely to an empty fuel tank.

(1) *Spark plugs.*—In locating engine trouble it is always advisable to install new spark plugs first to see if this corrects the difficulty. If it does not, leave new spark plugs in while checking further.

(*a*) Failure of the plugs may be due to improper adjustment of points (0.025 inch correct) or to cracked or dirty porcelain. (See par. 9*a*.)

(*b*) If new spark plugs fail to correct the difficulty, look for trouble due to weak ignition. (See (2) below.)

(*c*) Spark plugs are made in a wide range of types to suit the temperature requirements of different engines. It is extremely important that spark plugs of the proper heat range be used with the PE-75-A engine. Always use the Champion J-10 commercial, or equal.

(*d*) Fouling of a spark plug may be caused by an excessive amount of oil, or an unsatisfactory type or grade of oil. For correct type of oil see paragraph 5*e*(1).

(2) *Ignition* (see fig. 10).—(*a*) The ignition is a high-voltage flywheel type magneto (535) mounted as a complete assembly at the end of the magneto shaft (542). This consists of a magnet mounted on the rotor (556) and two high-voltage coils (499) with laminated cores mounted on the magneto housing (541), together with contact assembly and capacitor (501). (The spark plugs fire simultaneously.) For adjustment see paragraph 9*b*.

(*b*) *Replacing cables.*—Replace chafed or broken cables which are a cause of continuous or intermittent misfiring.

(*c*) *Coils and capacitor.*—If no spark, or only a weak one, is obtained after adjusting the points, the trouble is most likely to be in the capacitor or coils, although failure of these parts is not a common cause of trouble. Replace either one or both to obtain a strong spark only after checking spark plugs, cables, connections, and contact points. The capacitor can be removed after the starting pulley is removed as per instructions in paragraph 9*b*(1). If coils are to be removed, take out the two screws on the back of magneto cover (539 and 540, fig. 2). Remove lower half of cover. Remove both high-tension wires at the coil end by pushing upward on bakelite terminals one at a time. Swing the cover away from the magneto, leaving wires attached, or take the cover away entirely by removing terminals at spark plugs. In these operations, do not pull on shielded assembly (557, fig. 2) to remove it from the coils; to do so will pull wires out of bakelite terminals. If a wire is accidentally pulled out of its terminal, unscrew the two parts of the terminal, straighten the end of the stranded wire projecting beyond the insulation, twist the wires together compactly, and reassemble terminal. About ¼ to 5/16 inch of bare wire should extend beyond the insulation. Coils can then be removed by loosening the two set-

screws at each end and disconnecting leads. Have coils and capacitor checked at a signal depot or other suitable signal repair agency. (Coils are not furnished separately, but only as an assembly with laminated core.) To reassemble, reverse dismantling instructions, being sure to tighten securely coil-holding screws. When replacing top half of magneto cover, guide the terminals to line up with connection on coils and gently push cover into position. This should insure tight connections at coils. Make sure that terminals fit over coil connections tightly, and that the nuts on both ends of high-voltage shielding conduit are tight.

(*d*) In normal use the magnet will retain its magnetism indefinitely, and therefore no trouble should be expected from this source. If it becomes demagnetized, replace it.

(*e*) *Lubrication.*—See paragraph 12.

(3) *Carburetor* (*476*) (see fig. 21).—(*a*) The carburetor is the fixed jet type and requires no adjustment whatever.

(*b*) Fuel is fed to the carburetor from the fuel tank by crank-case pressure which forces the fuel through the feed line (493) inside the carburetor to the venturi, where it is vaporized and drawn into the cylinder.

(*c*) Choking, or priming, of the carburetor is accomplished by pulling up and releasing the black plunger button (485, fig. 13) on the priming pump which extends upward from the top of the carburetor.

(*d*) If trouble is experienced with the fuel supply (providing there is fuel in the tank and shut-off cock (558, fig. 2) is open) remove the hex plug in the carburetor body and crank the engine to see if fuel spills out at this point. If fuel is being delivered but does not reach the cylinders, take out the nozzle (located above hex plugs) and clean.

Caution: Use extreme care not to bur nozzle with improper screw driver when removing. Use screw driver (578, fig. 22). Clean nozzle by blowing through it. Do not use a wire, as scratches or burs on nozzle are damaging and will affect carburetion. If the nozzle is burred, replace it. When replacing nozzle be sure to use a nozzle with the same number stamped on barrel.

(*e*) If no fuel is being supplied to the carburetor, remove plug at base of standpipe (494, fig. 2) to see if fuel flows to that point. If fuel does not flow freely, disconnect fuel line (529, fig. 2) at tank and drain tank. Then remove outlet fitting (457, fig. 4) on tank to permit cleaning strainer in tank.

(*f*) Clean air filter (471, fig. 13) on carburetor intake monthly. Take apart and rinse in gasoline. Then dip upper end of screen in engine oil and reassemble.

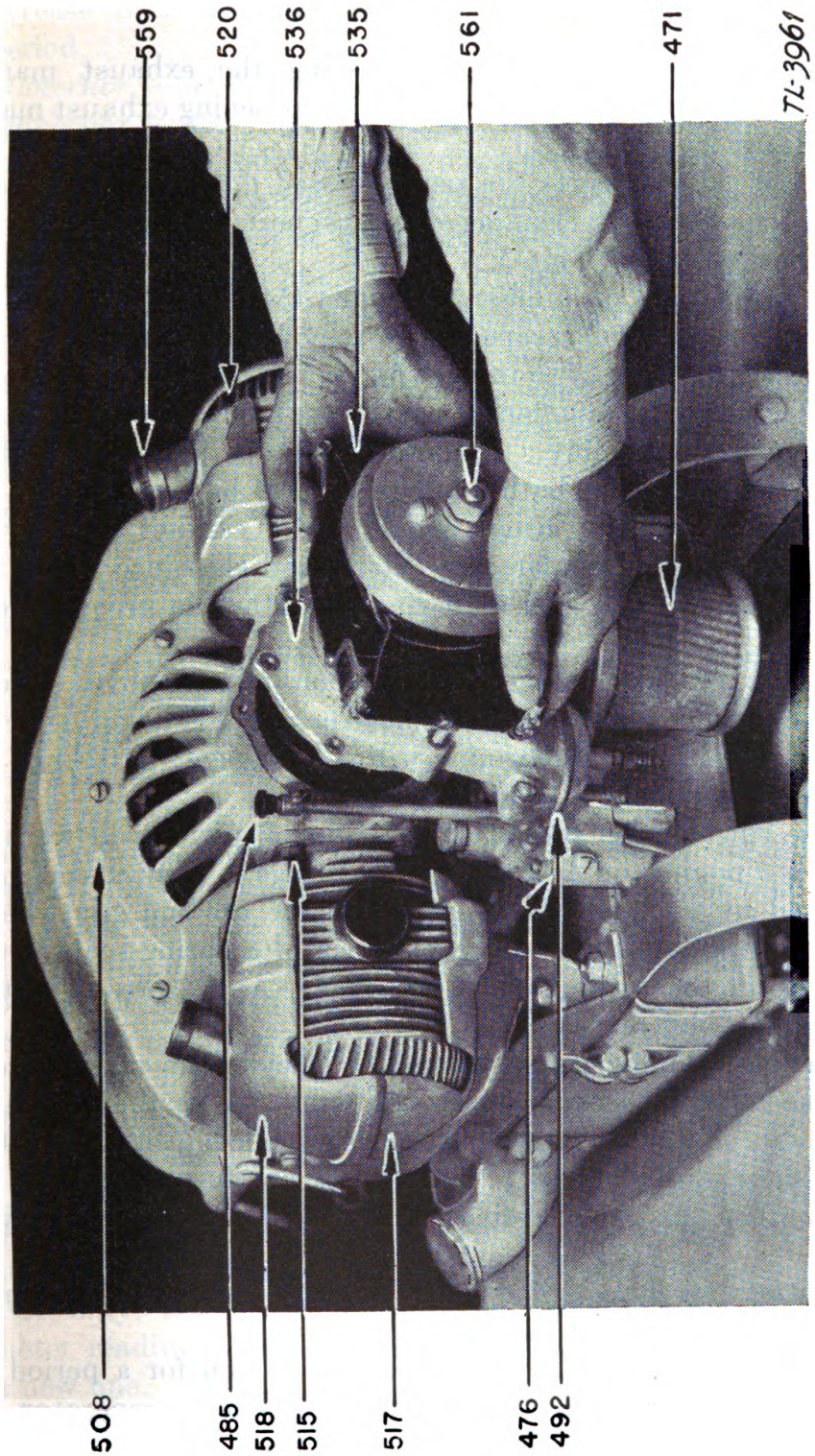

FIGURE 13.—Removing magneto and carburetor assembly.

(4) *Carbon removal.*—(*a*) It is important that the cylinder ports be kept free from carbon, since an excess of carbon will reduce the engine power to a marked degree.

(*b*) Inspect exhaust ports by removing the exhaust manifolds (522, fig. 2). Use wrench (581, fig. 22) for loosening exhaust manifold nuts (523, fig. 2).

(*c*) If the exhaust ports are partly closed due to carbon, remove cylinders for a thorough cleaning of exhaust ports, pistons, and cylinder heads. See paragraph 14*b*(1).

(*d*) If outlet tube on muffler, auxiliary (548, fig. 2), is badly carbonized, take apart and scrape. Also remove exhaust manifold from large muffler (547, fig. 2) to inspect for carbon. If badly carbonized, replace it. Checking mufflers for carbonization can best be done by installing a new assembly. If power output is increased with new assembly, replace one or both mufflers, as may be necessary.

(5) *Piston rings.*—(*a*) Rings should make contact with cylinder wall around entire circumference. If the end clearance, when in the cylinder, exceeds 0.020 inch or if rings are stuck in grooves, replace rings.

(*b*) Before replacing rings clean carbon from grooves carefully. The side clearance in grooves for replacement rings should be between 0.002 and 0.0035 inch (determine with feeler gage; 0.002-inch feeler should enter freely and 0.003-inch fit snugly).

(*c*) The ring tension should not be below 3 pounds on worn rings nor above 5 pounds on new replacement rings. The tension may be determined by the pressure required to close the end gap when one side of the ring is placed on the platform of a spring scale with the gap 90° from the point contact on scale. Apply pressure at 180° from contact point on scale.

(*d*) In reassembling piston assembles in cylinders make sure that the intake ports of pistons are on the same side as the intake ports in cylinders. To break in new piston rings, follow instructions below.

(6) *Pistons and pins.*—(*a*) These parts are furnished only as an assembly since pins are selectively fitted to pistons to give very light press fit.

(*b*) Piston wear is negligible. Replace only if scored, if ring grooves are damaged, or if piston pin is loose in bosses.

(*c*) New pistons, rings, or cylinders are to run for a period of at least 1 hour at idling speed before applying load to generator. The automatic governor will prevent engine from racing. If there is excessive arcing at the brushes (402 and 403, fig. 10) while idling, remove brushes from sockets. At end of first hour apply load (after

replacing brushes, if previously removed), 25 percent of rated capacity, and increase an additional 25 percent at end of each 15-minute running period.

(7) *Governor.*—(*a*) No adjustments are to be made on the governor. Each governor is set exactly for the requirements of the individual unit and should not require any attention during the life of the engine. Although to all appearances governors may look the same, there is, nevertheless, a difference in the weights and springs used which control the engine speed. The springs are not common springs which may be purchased readily, but are special heat-treated springs individually tested.

(*b*) Governors must be ordered as complete assembles. It is necessary to give the serial number of the generator for which the governor is required.

b. Generator.—Consult paragraph 17*a*, and then check the following items:

(1) *Commutator (404) and collector rings (405).*—Refer to figure 10 and paragraph 10*a*.

(2) *Brushes (402 and 403).*—Refer to figure 10 and paragraph 10*b*.

(3) *Brush springs (425).*—See figure 10. The tension of the four a-c brush springs should be 10 ounces and the two d-c springs 8 ounces.

(4) *Circuit tests* (fig. 14 and table I or II).—If the generator fails to deliver a-c output, proceed in the following order to check the generator circuits, after first making sure that all of the d-c and a-c brushes are making good contact with the commutator and collector rings, respectively (see par. 10*b*); that the brush springs have the required tension ((3) above); and that the surfaces of the commutator and collector rings are in good condition (see (1) above).

(*a*) Stop the engine and disconnect filter box (430) from generator (par. 14*a*(1)(*a*)).

(*b*) Check the filter for short circuit, test No. 4, table I or II. If meter reading is zero, remove the filter box (par. 14*a*(1)(*b*)), remove covers, and examine leads for loose connections and broken insulation. If there is no obvious short circuit of wires or terminals, remove the capacitor (par. 14*a*(2)(*b*) to (*d*), inclusive) and repeat test No. 4 on capacitor only, from each terminal to capacitor cam. In case of zero meter reading on any terminal except ground, replace capacitor with a new one.

(*c*) Disconnect 0.1 μf dual capacitor leads from output terminals on generator. Apply test No. 4 from each capacitor terminal to ground. In case of zero meter reading on either terminal, replace the capacitor with a new one.

TABLE I.—*Tests on power unit PE–75–A* (with test set I–56 using M660 type 3 analyzer (or equal))

Test No.		Field rheostat	Switch setting	Pin jacks used	A-c OFF d-c switch	Normal meter readings
1	A-c output test					
	At terminals or across two top a-c brushes.	All in	VM–P. J	±, 140	A-c	85–105 volts.
		All out	VM–P. J	±, 140	A-c	125–145 volts.
2	D-c brush voltage test					
	No load	All in	VM–P. J	±, 140	D-c	95–115 volts.
	Across d-c brushes	All out	VM–P. J	±, 350	D-c	150–170 volts.
3	D-c field continuity test	All in	Resistance continuity.	High resistance	OFF	600–700 ohms.
	One brush removed from commutator.	All out	do	Low resistance	OFF	140–160 ohms.
4	Filter test					
	Each filter output terminal to frame		Resistance continuity.	High resistance	OFF	Infinity.
	Capacitor test					
	Each capacitor terminal to frame					
5	All other continuity tests		Resistance continuity.	Low resistance	OFF	

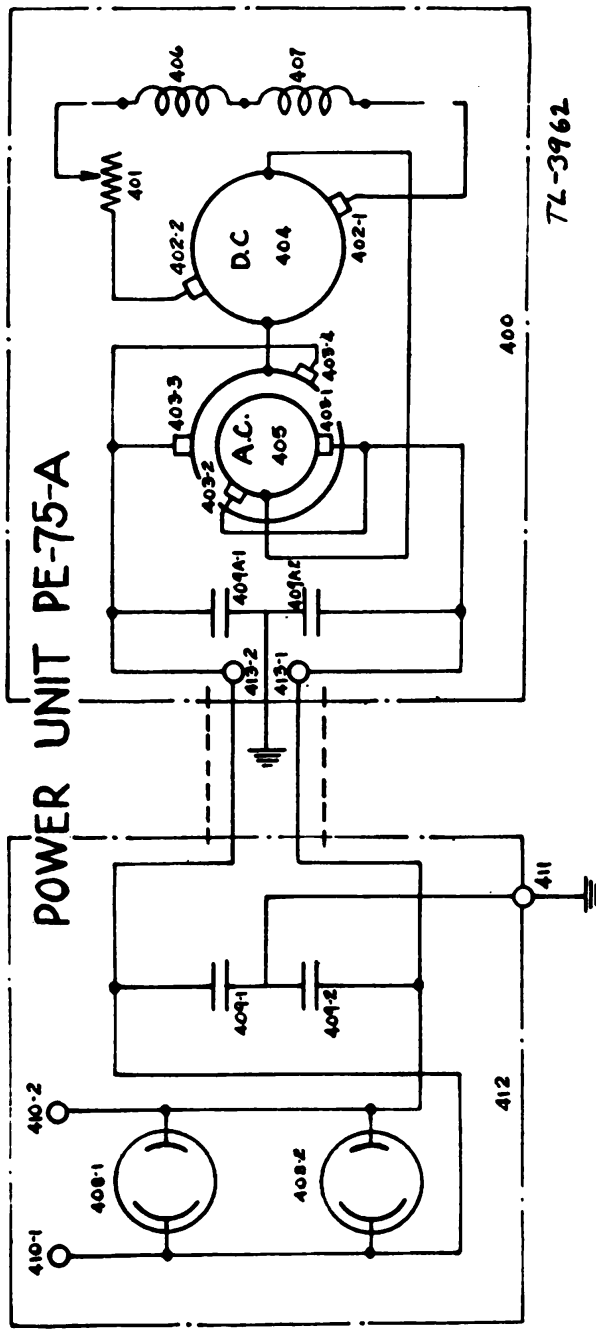

FIGURE 14.—Generator and filter, schematic diagram.

TABLE II.— *Tests on power unit PE–75–A* (with test set I–56–A using M665 type 2 selective analyzer (or equal))

Test No.		Field rheostat	Switch position volts-MA, ohms	Pin jacks used	A-c d-c switch	Normal meter readings
1	A-c output test					
	At terminals or across two top a-c brushes.	All in	Volts—MA	±, 250 volts	A-c	85–105 volts.
		All out	Volts—MA	±, 250 volts	A-c	125–145 volts.
2	D-c brush voltage test					
	No load	All in	Volts—MA	±, 250 volts	D-c	95–115 volts.
	Across d-c brushes	All out	Volts—MA	±, 250 volts	D-c	150–170 volts.
3	D-c field continuity test	All in	Ohms	RX 10		600–700 ohms.
	One brush removed from commutator	All out	Ohms	RX 10		140–160 ohms.
4	Filter test					
	Each filter output terminal to frame		Ohms	RX 100		Infinity.
	Capacitor test					
	Each capacitor terminal to frame					
5	All other continuity tests		Ohms	Dependent upon resistance to be measured.		

(*d*) With the engine running and the filter disconnected, remove brush head cover plate (421, fig. 7) and check a-c output, test No. 1, table I or II.

(*e*) If there is no a-c output, check d-c brush voltage, test No. 2, table I or II.

(*f*) If there is no d-c voltage, apply pressure manually to both d-c brushes simultaneously to assure positive contact with commutator. If no voltage is obtained after following this procedure, stop engine and check d-c field continuity, test No. 3, table I or II.

(*g*) If d-c field is open (meter reading infinity, test No. 3, table I or II), examine the field wires near the d-c brush holders for broken leads. If these wires are all right, remove yoke and coil assembly (par. 14*a*(1)), and examine the entire field circuit for broken or loose connections. Check each element individually for continuity. Replace defective parts with new ones.

(*h*) A correct d-c voltage reading but no a-c voltage indicates that the connection from the commutator to the collector rings is broken (see fig. 14), and that the armature must be replaced. This is an uncommon cause of trouble.

(*i*) If there is no d-c or a-c voltage, while d-c field continuity is all right, the armature is defective and must be replaced. This is not a common cause of trouble. Check carefully all other possibilities of electrical trouble, including brushes, d-c field circuit, and filter, before replacing armature with a new one.

14. Dismantling.—Special tools supplied with the equipment will be adequate for complete dismantling and assembly operations (see fig. 22).

a. Generator end (see fig. 7).—(1) *To remove yoke (448) and coil assembly.*—(*a*) Remove the screw holding terminal cover (444) to brush head (419); remove the two outer brass nuts which are then exposed, to permit disconnecting the leads to filter box (430).

(*b*) Remove two screws holding the filter box to the generator yoke and loosen the screw beneath the filter box. The box can now be removed by lifting up.

(*c*) Lift brushes (402 and 403, fig. 10) out of sockets (2 d-c and 4 a-c).

(*d*) Remove four bolts (420) on brush head, insert screw drivers in the two notches on fan housing (452), and gently pry the yoke away.

(2) *To replace filter capacitor.*—If filter capacitor (409, fig. 19) is to be replaced—

(*a*) Take out cover screws and remove both covers of the filter box.

(*b*) Remove four hex nuts on the capacitor terminals and take off wires.

(*c*) Take off ground binding post (411) to free the ground lead.

(*d*) Remove two hex nuts holding capacitor brackets (427, fig. 19) and remove the capacitor from box.

(*e*) The twistlock receptacles (408) will then be exposed for examination of all terminals and loose connections.

(3) *To remove armature* (414, fig. 10).—Remove bolt (415) at end of the armature shaft which holds armature to engine crankshaft (510). In its place insert long pin (569) and then jack screw (576). Turn up screw as far as threads permit. Remove jack screw and insert one short pin (570), and repeat operation. Again repeat operation with remaining two pins successively. Armature should come free after last operation.

b. Engine end (see figs. 2 and 10).—Before dismantling engine, look for minor trouble as indicated in trouble chart, paragraph 17*b*.

(1) *Removing cylinders (513 and 514), pistons (551), and connecting rod (502 and 503) assemblies.*—(*a*) Remove muffler (547) assemblies.

(*b*) Disconnect shielded high-voltage cables at spark plugs. Also remove the two screws on back of magneto cover (540). Remove lower half of cover (539).

(*c*) Remove both high-voltage wires at the coil end by pushing upward on the bakelite terminals one at a time. Remove top half of cover. In these operations do not pull on shielded cables to remove from the coils (499); to do so will pull wires out of bakelite terminals. If a wire is accidentally pulled out of its terminal, refer to paragraph 13*a*(2)(*c*).

(*d*) Disconnect fuel line (529) at tank.

(*e*) Remove the six screws holding the magneto bracket (536) to the crankcase (508). Then magneto (535) and carburetor (476) can be removed as an assembly (fig. 13).

NOTE.—If magneto assembly is to be dismantled later, loosen starting pulley nut (561) before removal of this assembly.

'or work on magneto and magneto assembly see (2) below.

(*f*) Remove spark plugs and cylinder shields (517, 518, 519, and 20); with wrench (584), remove the cap screws (515) holding cylinder to crankcase.

(*g*) The front connecting rod and bearing (504) can now readily be removed, and the piston and connecting rod assembly taken out.

(*h*) Turn flywheel (524) so that crank end of rear connecting rod is exposed through opening in side of crankcase. Remove cap screws (use wrench (584)) holding two halves of connecting rod together, thus releasing piston and connecting rod assembly and half of roller

bearing, which is split. The remaining half of this and bottom part of connecting rod can then be removed.

NOTE.—Now carbon can be cleaned from cylinder ports, pistons, and rings (554).

If rings are stuck or not seating properly, replace according to paragraph 13*a*(5). If pistons are badly worn, or pins are loose in pistons, replace with new pistons and pins. (See par. 13*a*(6).)

(2) *To dismantle magneto and magneto bracket assembly.*—(*a*) Remove starting pulley nut and take off starting pulley (560).

(*b*) Take out clamping bolt at top rear of magneto. The entire magneto housing (541) may now be removed.

(*c*) Pull rotor and cam assembly (556) from the magneto shaft (542).

(*d*) Disconnect carburetor pressure line (492, fig. 13) from magneto bracket and remove two screws holding carburetor to bracket, thus permitting removal of entire carburetor assembly.

(*e*) Drive out magneto shaft by striking on threaded end with wood or lead mallet.

(*f*) Governor assembly (530) can now be removed from the magneto shaft by releasing the snap ring.

(*g*) Take out screws and remove brass bearing retainer plate (473) from front of magneto bracket.

(*h*) Remove both bearings (543 and 544) by inserting bearing remover (577) through rear bearing and drive out. (Do not disturb bearings unless worn.)

(3) *To remove crankshaft (510).*—(*Important:* Before dismantling crankshaft, dismantle generator end as in *a* above.)

(*a*) Remove large hex nut (511) and washer (528) from rear of flywheel. (Note that this has left-hand thread.)

(*b*) The front main bearing (545) is held in the crankcase by special screws (546) and washers. These must be removed before the shaft puller (580) is applied. These screws can be exposed by turning the crankshaft so that the cut-out section of the crank throw is opposite each screw in turn. After removal of the screws, place the shaft puller on the end of the crankcase so that it fits over crank throw. Insert jack screw (575) and screw it into center of shaft. Then by turning down the nut (fig. 15) the crankshaft will be drawn free of the crankcase, leaving the flywheel still securely in place in the crankcase. The front main bearing will usually come out on the shaft. Should this bearing remain in the crankcase, it may be removed as follows:

(*c*) Remove the flywheel as in (4) below. After the flywheel has been removed leave the bearing spacer (512) in the crankcase. Place a block of wood on this spacer on the flywheel side. By tapping this block with a hammer the bearing will be driven out.

(4) *Removing flywheel from crankcase.*—***Caution:*** The three holes in the face of the flywheel are *not* to be used in removing the flywheel, but are for the removal of the flywheel bearing (525) after the flywheel has been removed from the crankcase. See (5) below.

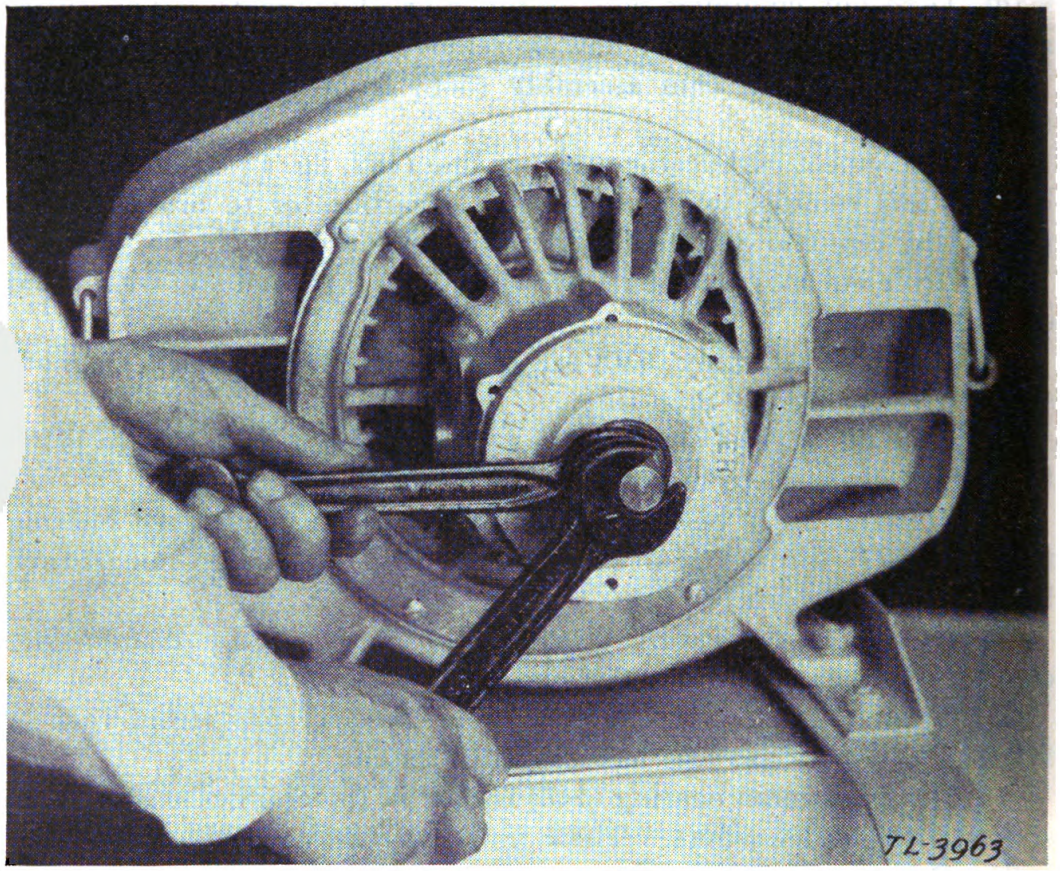

FIGURE 15.—Removing crankshaft.

(*a*) Remove the crankcase from the fan housing.

(*b*) Place the flywheel remover (573) so that the cross bar fits into the recess inside the crankcase and the bronze collar passes through openings in the crankcase and comes in contact with the crankshaft spacer (fig. 16).

(*c*) Now by turning down on the jack screw, the flywheel and bearing will be pressed from the crankcase.

(5) *Removing bearing from flywheel* (after flywheel has been removed from crankcase).—Use three ¼-inch by 20 screws in the holes in flywheel (after removing cork fillers) and screw down, being careful to

have equal pressure on each screw to avoid cramping the bearing on the hub of the flywheel.

NOTE.—This is only necessary in case of bearing failure where new bearing must be installed.

15. Repair.—*a. Generator end* (see fig. 19).—(1) *Armature (414).*—If defective, replace.

(2) *Field coils (406 and 407).*—If defective, replace.

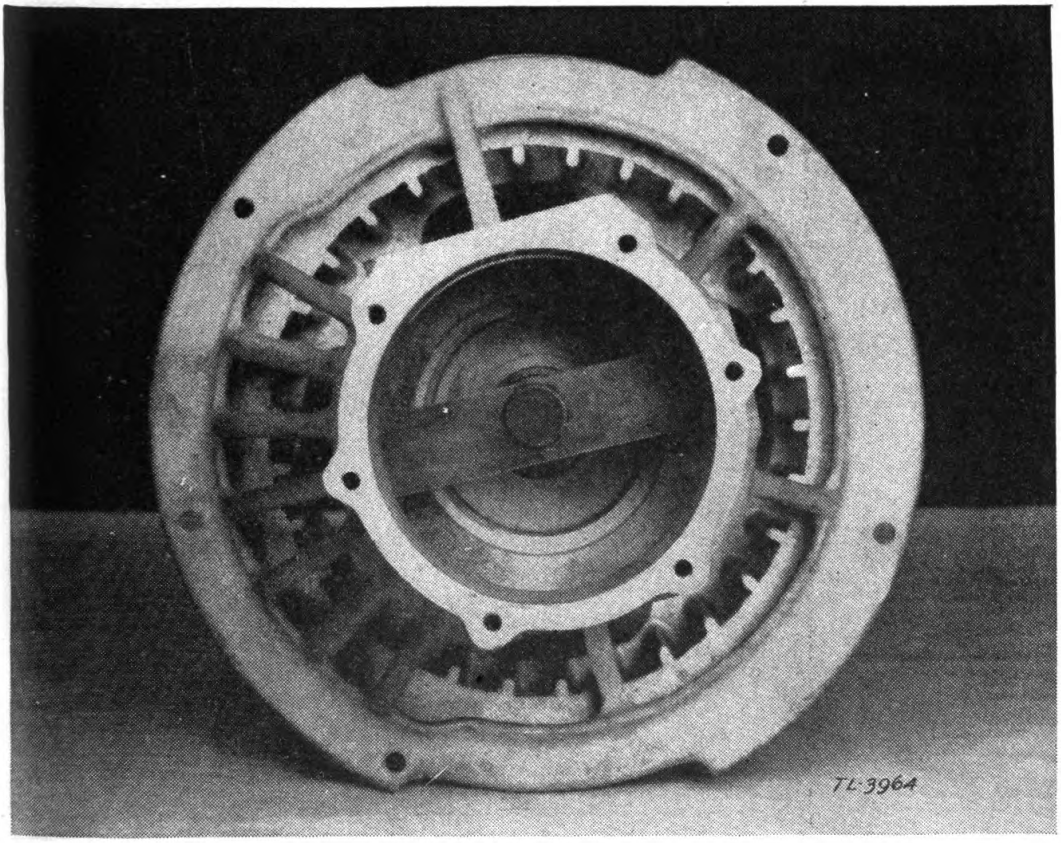

FIGURE 16.—Flywheel.

(3) *Brushes (402 and 403).*—If worn so that brush tension spring (425) rides on brush holder instead of brush, replace. (See par. 10*b*.)

(4) *Brush spring.*—See paragraph 13*b*(3).

(5) *Connections.*—Check all connections; if defective, replace. (See par. 13*b*(4).)

b. Engine end (see fig. 21).—(1) *Pistons (551) and cylinders (513 and 514).*—Minimum clearance 0.002 inch; maximum, 0.005 inch. If greater, replace cylinders. If pistons are scored, replace. (See par. 13*a*(6).)

(2) *Piston rings (554).*—Replace if stuck in grooves or worn. (See par. 13*a*(5).)

(3) *Piston pin bearing (552) in connecting rod (502 and 503).*—Replace if there is play at this point.

(4) *Open bearings (545, 504 and 544).*—Clean all open bearings thoroughly with kerosene and oil and coat immediately with a nonacid engine oil. Wrap in paper until ready for assembly. Bearings should rotate smoothly. If bearing is rough turning or has excessive radial play, replace.

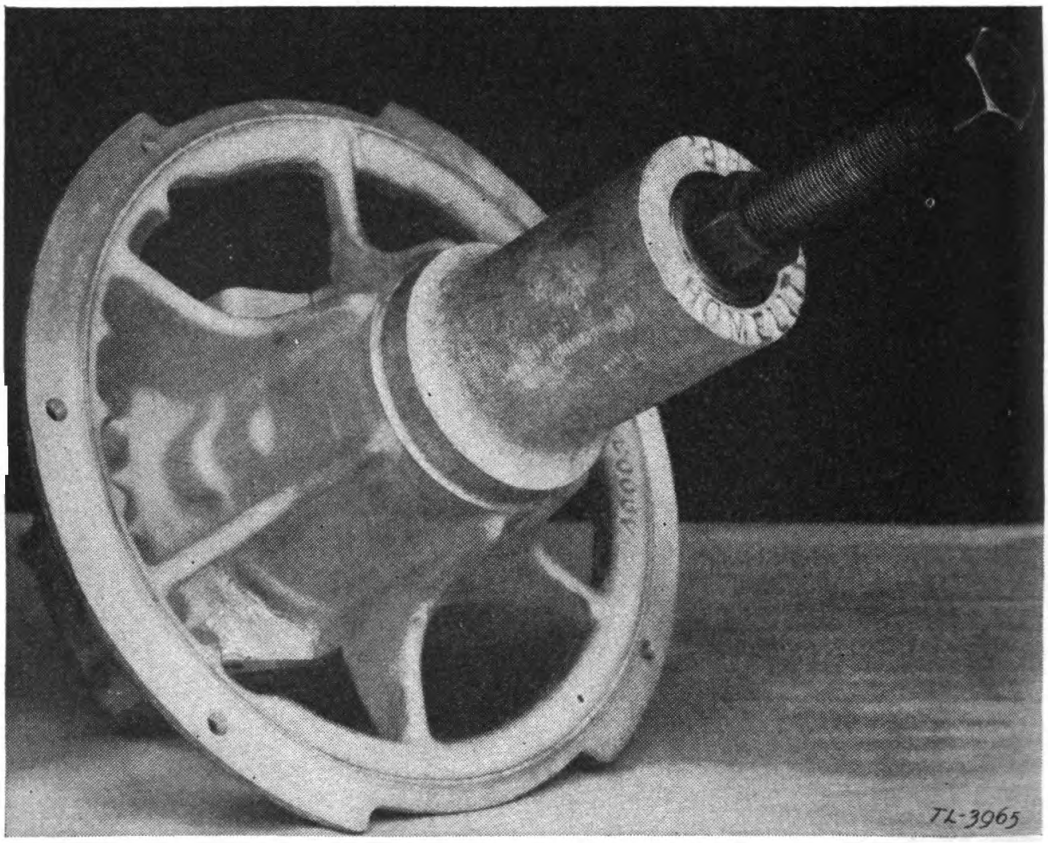

FIGURE 17.—Assembling crankshaft.

(5) *Mufflers (547 and 548).*—If engine speeds up when these are removed, mufflers are plugged with carbon and should be replaced. (See par. 13*a*(4)(*d*).)

(6) *Governor (530).*—Replace whole assembly if broken.

(7) *Crankshaft (510).*—Requires replacement only if keyways are worn or threads on ends are stripped.

(8) *Flywheel (524).*—Requires replacement only if broken or if keyways are so worn that it does not fit tightly on shaft.

(9) *Ignition system.*—See instructions, paragraph 13*a*(2).

(10) *Carburetor (476).*—See instruction, paragraph 13*a*(3).

16. Assembly.—For tool references, see figure 22.

a. Engine end (see figs. 2 and 10).—(1) *Assembling crankshaft (510) in crankcase (508).*—(*a*) Main bearing (545) at cylinder end of crankcase should first be assembled on crankshaft (groove side toward crank throw) with Vellumoid washer (509) behind it.

(*b*) Place the crankshaft through the crankcase as far as possible by hand.

(*c*) Place the assembling fixture (571) on flywheel end of crankcase (fig. 17); insert jack screw (574) and screw it into hole in the end of the crankshaft. Then hold head of the jack screw with wrench and by screwing down on nut, draw crankshaft into place.

(*d*) Remove assembling fixture and jack screw.

(*e*) Fasten the main front bearing in place with screws (546) and washers.

(2) *Assembling flywheel (524) on shaft and crankcase.*—(*a*) Put crankshaft spacer (512) in place on crankshaft, shoulder to flywheel end.

(*b*) Place flywheel on shaft, being very careful that all keyways are in proper alinement with keys (527) in shaft. Bearing (525) must be replaced on flywheel before assembling, if previously removed.

(*c*) Place the assembling fixture over end of crankshaft and against flywheel (fig. 18). Insert jack screw and screw it into hole in end of crankshaft. Then hold jack screw head with wrench and by screwing down on nut, press the flywheel solidly into place.

(*d*) Remove assembly fixture and jack screw and put flywheel washer (528) and nut (511) on crankshaft (left-hand thread).

(3) *Replacing engine assembly in fan housing (452).*—(*a*) Place in position and fasten crankcase to fan housing with screws.

(*b*) To install rear connecting rod (502) assembly, pack one-half of roller bearing (504) with an adequate amount of grease and insert in bottom half of connecting rod. Place these parts on crank pin and turn into position on back of crank pin. Then insert screw driver through hole in center of crankshaft to hold assembly in place. (To facilitate work, hold screw driver in position by a rubber band around it and with the other end attached to a cylinder cap screw (515).) Place the other half of the bearing in the connecting rod and screw to bottom half.

(*c*) Reassembly of piston (551) and front connecting rod (503) assembly, and also cylinders (513 and 514) may be done by reversing dismantling instructions (par. 14*b*(1)).

NOTE.—In reassembling pistons in cylinders, make sure intake ports of pistons are on the same side as the intake ports in cylinders.

(4) *To replace magneto (535) and magneto bracket (536) assembly.*—(*a*) If bearings (543 and 544) have been removed from magneto bracket, insert short spacer (538), place the rear bearing into position, and drive home with bearing tool (577). Then insert bearing spacer (474) and drive home front bearing with same tool.

(*b*) Replace brass bearing retainer plate (473) and fasten holding screws.

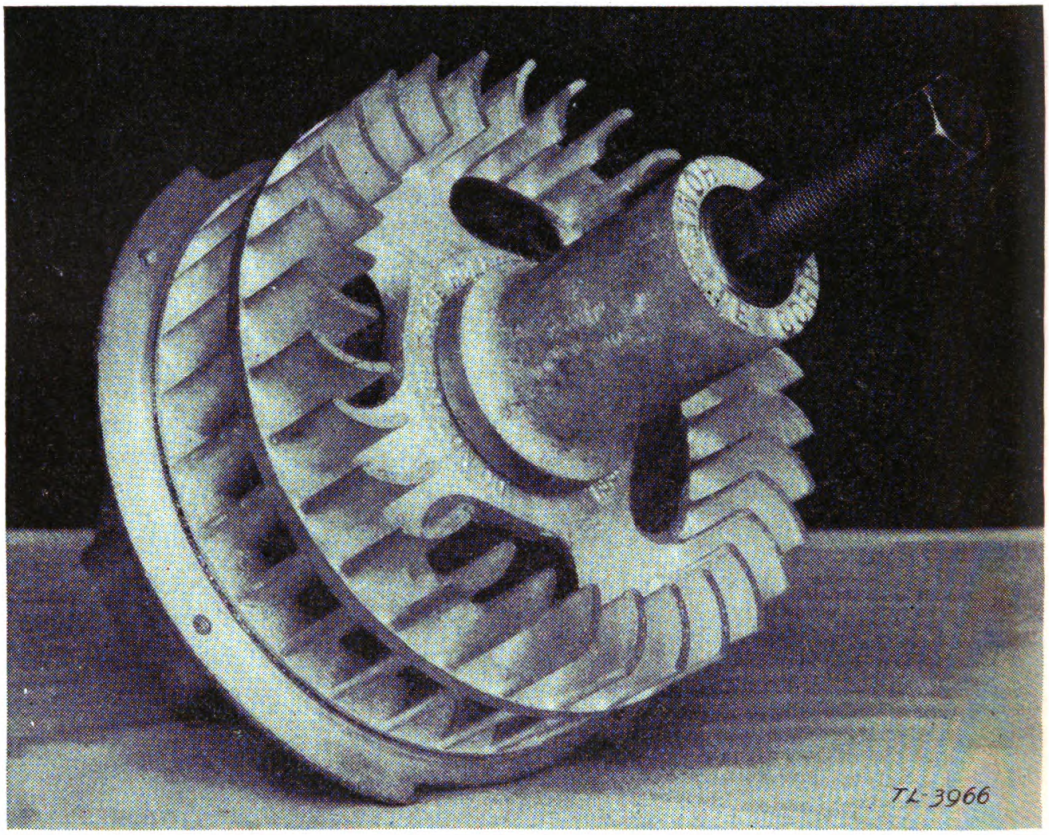

FIGURE 18.—Assembling flywheel.

(*c*) If bearings were replaced as in (*a*) above, insert bearing tool at the rear of magneto bracket and drive rear bearing until spacer between bearings is tight.

(*d*) In assembling governor (530) on magneto shaft (542), place hole in governor over locating pin on shaft head. Place three springs in their respective holes. Push governor down on shaft, at the same time moving the governor weight so that it clears shoulder on shaft. Replace snap ring in groove.

(*e*) Drive shaft home through magneto bracket.

(*f*) To attach magneto bracket assembly to crankcase, turn magneto shaft until hole in head lines up with crank pin on end of crankshaft. Then attach this assembly to crankcase with cap screws.

(*g*) Install carburetor (476, fig. 13) on magneto bracket.

(*h*) Reverse magneto dismantling operations (par. 14*a*(2)(*a*) to (*c*) incl.), *making certain* that the magneto housing (541) is properly indexed by alining the marks on the magneto bracket with the slot on magneto housing clamp.

(*i*) To replace top half of magneto cover (540), see paragraph 13*a* (2)(*c*).

b. Generator end (see fig. 10).—Reverse dismantling instructions as in paragraph 14*a*, making sure key (416) is in place in crankshaft keyway before replacing armature (414) on shaft.

NOTE.—If full rated output of 2,500 watts at 110 volts is not obtained, see trouble chart, paragraph 17.

17. Trouble, causes and remedies.—*a. Generator.*

Trouble	*Possible cause*	*Remedy*
(1) Arcing at brushes.	(1) (*a*) Dirty commutator or collector rings.	(1) (*a*) Clean. (See par. 10*a*.)
	(*b*) Worn-out brushes.	(*b*) Replace. (See par. 10*b*.)
	(*c*) Brushes stuck in holders.	(*c*) Free up.
	(*d*) Brushes not properly seated.	(*d*) See paragraph 10*b*.
(2) Fails to generate voltage. (See par. 13*b*(4).)	(2) (*a*) Brushes stuck in holders.	(2) (*a*) Free up.
	(*b*) Rheostat fully cut in.	(*b*) Turn counterclockwise.
	(*c*) Worn-out brushes.	(*c*) Replace. (See par. 10*b*.)
	(*d*) Brushes not properly seated (especially new brushes).	(*d*) See paragraph 10*b*.
	(*e*) Dirty commutator or collector rings.	(*e*) Clean. (See par. 10*a*.)
	(*f*) Broken connections.	(*f*) Rewire.
	(*g*) Defective armature.	(*g*) Replace. (See pars. 14*a*(1) and (3), and 16*b*.)
	(*h*) Defective coils.	(*h*) Replace. (See par. 14*a*(1).)

Trouble	*Possible cause*	*Remedy*
	(*i*) Defective filter capacitor.	(*i*) Replace. (See par. 14*a*(2).)
	(*j*) Defective capacitor 409–A.	(*j*) Replace.
	(*k*) Defective field rheostat.	(*k*) Replace.
(3) Fails to deliver rated output (2,500 watts, 110 volts) low voltage.	(3) (*a*) Engine not up to speed.	(3) (*a*) See *b* below.
	(*b*) Dirty commutator or collector rings.	(*b*) Clean. (See par. 10*a*.)
	(*c*) Worn-out brushes.	(*c*) Replace. (See par. 10*b*.)
	(*d*) Brushes not properly seated.	(*d*) See paragraph 10*b*.
	(*e*) Rheostat incorrectly adjusted.	(*e*) See paragraph 5*e*.
	(*f*) Defective capacitors (409 or 409–A).	(*f*) Replace.
	(*g*) Defective field rheostat.	(*g*) Replace.
(4) Noisy radio reception.	(4) (*a*) Defective filter capacitor.	(4) (*a*) Replace. (See par. 14*a*(2).)
	(*b*) Defective capacitor (409–A).	(*b*) Replace.
	(*c*) Loose connections in filter.	(*c*) Tighten connections.
	(*d*) Loose spark plug shielding assembly.	(*d*) Tighten.
	(*e*) Loose shielding conduit connections.	(*e*) Tighten.
b. Engine.		
Fails to start. Hard to start. Runs and stops. Not up to speed (3,600 rpm.).	Always check the fuel supply first. Then install new plugs and see if this corrects the difficulty. If it does not, leave the new plugs in while checking further.	

Trouble	*Possible cause*	*Remedy*
	(1) *Defective spark plugs.*	
Overheats.	(*a*) Carbon across points.	(*a*) Remove and clean.
	(*b*) Points badly worn.	(*b*) Replace.
	(*c*) Wrong type.	(*c*) Use Champion J-10 commercial or equivalent.
	(*d*) Cracked or dirty porcelain.	(*d*) Replace.
	(*e*) Points too close or too wide.	(*e*) Adjust to 0.025 inch.
	(2) *Fuel supply.*	
	(*a*) No fuel in tank.	(*a*) Fill.
	(*b*) Strainer in tank clogged.	(*b*) Remove and clean.
	(*c*) Fuel line clogged.	(*c*) Clean out.
	(*d*) Water or dirt in fuel.	(*d*) Drain and clean.
	(3) *Carburetor.*	
	Nozzle clogged.	Remove and clean. (See par. 13*a*(3)(*d*).)
	(4) *Ignition.*	
	(*a*) Contact points out of adjustment.	(*a*) Adjust to 0.016 inch. (See par. 9*b*(1) to (5), inclusive.)
	(*b*) Contact points pitted.	(*b*) Hone or replace. (See par. 9*b*(6).)
	(*c*) Broken high voltage cables.	(*c*) Replace. (See par. 13*a*(2)(*c*).
	(*d*) Loose connections.	(*d*) Tighten.
	(*e*) Coils defective.	(*e*) Replace. (See par. 13*a*(2)(*c*).)
	(*f*) Magnet weak.	(*f*) Replace.
	(*g*) Capacitor defective.	(*g*) Replace. (See par. 13*a*(2)(*c*).)
	(5) *Carbon.*	
	(*a*) Cylinder ports clogged.	(*a*) Remove cylinders and scrape. (See par. 13*a*(4)(*a*), (*b*), and (*c*).)

Trouble	*Possible cause*	*Remedy*
	(*b*) Piston and cylinder heads carbonized.	(*b*) Remove cylinders and scrape. (See par. 13*a*(4)(*a*), (*b*), and (*c*).)
	(*c*) Mufflers clogged.	(*c*) Clean or replace (See par. 13*a*(4)(*d*).)
	(6) *Overload on generator.*	Reduce load to maximum of 2,500 watts.

SECTION V

LIST OF REPLACEABLE PARTS

	Paragraph
Differences between power units PE–75–A and PE–75–B	18
List of replaceable parts	19
Names and addresses of manufacturers	20

18. Differences between power units PE–75–A and PE–75–B.— These two models which were procured at different times are different only to the extent that different manufacturers supplied some of the tools and small electrical parts; these are clearly identified in paragraph 19 by the use of * to indicate the PE–75–A and ** to indicate PE–75–B. All the other parts in paragraph 19 are used in both models.

19. List of replaceable parts (see par. 20 for names and addresses of manufacturers).—*a. Generator end* (see fig. 19).

Reference No.	Name of part	Description	Function	Manufacturer	Drawing No.
400	Generator assembly				
401	Rheostat	500 ohms, 100 watts	Voltage control	12	Model K No. 0455
402–1	Brush d-c	Carbon with lead	Take off current	7	11477–A
402–2	do	do	do	7	11477–A
403–1	Brush a-c	do	do	7	42015–A
403–2	do	do	do	7	42015–A
403–3	do	do	do	7	42015–A
403–4	do	do	do	7	42015–A
404	Commutator	Part of 414		5	B–519–A, Type BLR–58 Bar.
405	Collector ring assembly	Part of 414		5	3291
406	Coil, field (upper)	Winding	D-c excitation	7	42004–1
407	Coil, field (lower)	do	do	7	42004–2
408–1	Twistlock receptacle	20-amp, 2-wire, 250-v	Power outlet	6	7210
408–2	do	20-amp, 2-wire, 250-v	do	6	7210
409–1*	Capacitor	110-v a-c	Radio filtering	3	10041–A
409–1**	do	110-v a-c	do	17	HOC–A25M8
409–2*	do	110-v a-c	do	3	10041–A
409–2**	do	110-v a-c	do	17	HOC–A25M8
409A–1*	do	.1μf, 600-v working	do	14	XDRM
409A–1**	do	.1μf, 600-v working	do	17	RLO–6210
409A–2*	do	.1μf, 600-v working	do	14	XDRM
409A–2**	do	.1μf, 600-v working	do	17	RLO–6210
410–1	Terminal screw	¼″—20 x ¾″	Power outlet	7	11592–A
410–2	do	¼″—20 x ¾″	do	7	11592–A
411	Binding post		Filter ground	7	42041
412	Filter box assembly	Metal box on generator	Radio shielding	7	S–363
413–1	Terminal stud	Brass bolt ⅜″ x $2\frac{15}{16}$″	Current take-off	7	42023
413–2	do	Brass bolt ⅜″ x $2\frac{15}{16}$″	do	7	42023
414	Armature			7	42505–A

Reference No.	Name of part	Description	Function	Manufacturer	Drawing No.
415	Armature bolt	5/16"-24 x 10½"	Attach armature (414) to crankshaft (510).	7	42009-A
416	Armature key	3/16" square x 1¾"	Anchor armature (414) to crankshaft (510).	7	40125
417	Armature shim	1/32" brass	Spacer, number as required	7	18146
418	do	0.010" brass	do	7	18148
419	Brush head	Aluminum casting	Housing brush holder assembly (423 and 424).	7	42007-B
420-1	Brush head bolt	¼"-20 x 6¼"	Attach brush head (419) to yoke (448).	7	42010-A
420-2	do	¼"-20 x 6¼"	do	7	42010-A
420-3	do	¼"-20 x 6¼"	do	7	42010-A
420-4	do	¼"-20 x 6¼"	do	7	42010-A
421	Brush head cover plate	Aluminum casting	Weather protection	7	42008-A
422	Brush head ring	Fiber $3^{61}/_{64}$" ID x 5¼" OD	Insulation	7	42013
423	Brush holder assembly with a-c brushes.	Fiber ring with brushes in holders.	For commutation	7	S-213-4
424	Brush holder assembly with d-c brushes.	Phenolic ring with brushes in holders.	do	7	S-402
425-1	Brush spring	Bronze concentric	For brush tension	7	H-193
425-2	do	do	do	7	H-193
425-3	do	do	do	7	H-193
425-4	do	do	do	7	H-193
425-5	do	do	do	7	H-193
425-6	do	do	do	7	H-193
426-1	Cable clamp	Part of (412) filter box assembly.	Hold cable in place	7	42017
426-2	do	Part of (412) filter box assembly.	do	7	42017
427-1*	Capacitor bracket	1¾" x 5" including bolt	Attach capacitor (409) to filter box (430).	3	21770-A
427-1**	do	1¾" x 5⅛" including bolt	do	17	SHB-10
427-2*	do	1¾" x 5" including bolt	do	3	21770-A

427-2**	Capacitor bracket	1¾" x 5⅛" including bolt	Attach capacitor (409) to filter box (430).	17	SHB-10
428-1	Fiber insulating tube	¼" ID x 1 3/16"	Insulate terminal stud (413)	7	42040
428-2	do	¼" ID x 1 3/16"	do	7	42040
429-1	Fiber insulating washer	⅜" ID	do	7	19202
429-2	do	⅜" ID	do	7	19202
430	Filter box	6¼" x 7¼" x 3"	Container for capacitor (409)	7	42019
431	Generator bearing	Shielded ball bearing	Armature support	11	77502
432	Generator jumper—long	No. 12 Stranded VC wire	Lead terminal stud (413) to filter box assembly (412).	7	S-366-3
433	Generator jumper—short	do	do	7	S-366-4
434	Insulating ring	2 9/16" ID x 3 15/16 OD	Insulation	7	10786
435-1	Locating pin	3/16" diameter x ¾" long	Aline yoke (448)	7	19252
435-2	do	3/16" diameter x ¾" long	do	7	19252
436-1	Molded nut	Phenolic binding post nut	Attach connecting cord	7	15071
436-2	do	do	do	7	15071
437-1	Pole piece	Laminated electric sheet	Part generator field	7	42003
437-2	do	do	do	7	42003
438	Rheostat housing	Aluminum casting	Weather protection	7	31043
439	Rheostat knob	do	Adjust rheostat	7	42043
440	Shielding conduit with connections.	Braided flexible	Radio shielding	16	A-27348
441	Shielding conduit connector.	1 1/16"-24 x ⅞" long	Attach shielding conduit (440) to terminal cover (444).	7	42026
442	Shielding conduit connector locknut.	1 1/16"-24 x ⅞" long		7	42027
443	Terminal bracket	Aluminum casting	To attach terminal cover (444) to brush head (419).	7	42021
444	Terminal cover	do	Weather protection	7	42022
445	Terminal cover filter box	do	do	7	42018
446	Twistlock receptacle jumper—long.	No. 10 copper wire—covered.	Connect twistlock receptacle (408) to capacitor (409).	7	S-366-1
447	Twistlock receptacle jumper—short.	do	do	7	S-366-2
448	Yoke	Steel housing generator		7	42002
449	Base angle iron—left (carb. side).	1½" x 1½" x 15" long	Mounting fan housing (452) to spring mounting (469).	7	40098-A
450	Base angle iron—right	1½" x 1½" x 15" long	do	7	40097-A

Reference No.	Name of part	Description	Function	Manufacturer	Drawing No.
451–1	Carrying handle assembly.	Steel wire and rubber grip		7	S–404
451–2	do	do		7	S–404
452	Fan housing	Aluminum casting	Flywheel (524) enclosure and mounting for yoke (448) and crankcase (508).	7	40009–A
453	Footrest	½″ conduit	Foot brace for starting	7	40114–A
454	Fuel tank and cap assembly.	18 gage terne plate		7	40166–SC
455	Fuel tank cap assembly	1½″ standard pipe thread		7	S–434
456	Fuel tank cap gasket	1⅞″ ID		7	40216
457	Fuel tank outlet fitting	Bronze casting	To install fuel tank strainer (460), fuel tank strainer cap (461), and shut-off cock (558).	7	40153–A
458	Fuel tank outlet fitting gasket.	Vellumoid		7	40200
459–1	Fuel tank spacer	Plywood ⅜″ x 1½″ x 13″	Vibration absorber	7	40151–A
459–2	do	Plywood ⅜″ x 1½″ x 13″	do	7	40151–A
460	Fuel tank strainer	50 x 70 mesh 1⅜″ diameter		7	40154
461	Fuel tank strainer cap	24 gage brass 1 7/16″ ID	Fasten fuel tank strainer (460) to fuel tank outlet fitting (457).	7	40175
462–1	Fuel tank strap	1″ x 20½″	Fasten fuel tank (454) to angle irons (449) and (450).	7	40122–A
462–2	do	1″ x 20½″	do	7	40122–A
463–1	Fuel tank strap clip	1″ x 4 3/16″	Fasten fuel tank (454) to angle irons (449) and (450).	7	40123
463–2	do	1″ x 4 3/16″	Fasten fuel tank (454) to angle irons (449) and (450).	7	40123
463–3	do	1″ x 4 3/16″	Fasten fuel tank (454) to angle irons (449) and (450).	7	40123
463–4	do	1″ x 4 3/16″	Fasten fuel tank (454) to angle irons (449) and (450).	7	40123

464–1	Fuel tank strap stud	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	18123–A
464–2	do	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	18123–A
464–3	do	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	18123–A
464–4	do	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	18123–A
465–1	Fuel tank strap stud, threaded.	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	50052
465–2	do	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	50052
465–3	do	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	50052
465–4	do	½″ diam x 1″	Fasten fuel tank strap (462) to fuel tank strap clip (463).	7	50052
466	Instruction plate	Mounted on fan housing (452).		7	40214
467	Name plate-Homelite	Mounted on fan housing (452).	Identification	7	42038
468	Name plate-Signal Corps	Mounted on fan housing (452).	do	7	42042
469–1	Spring mounting	2″ x 6½″ x 23½″	Vibration absorber	7	40092
469–2	do	2″ x 6½″ x 23½″	do	7	40092
470	Starting rope retainer plate.	2″ x 2½″ sheet iron	Rope container	7	40131

b. Engine end.—See Figure 21.

471	Air cleaner	Attachment to air cleaner elbow (472).	Filter	7	40038
472	Air cleaner elbow	Aluminum casting	To attach air cleaner (471) to carburetor (476).	7	40036
473	Bearing retainer plate	Brass disk 2⅞″ OD	Retainer	7	40089
474	Bearing spacer	15/16″ OD x 31/32″ long	Spacer	7	40105
475	Breaker plate	Part of magneto (535)		13	10–20489–Y

Reference No.	Name of part	Description	Function	Manufacturer	Drawing No.
476	Carburetor	Fixed jet type		7	40167
477	Carburetor body	Part of carburetor (476)		7	40116-C
478	Carburetor reservoir screen.	Part of carburetor (476)		7	40217
479-1	Carburetor body plug or standpipe drain plug.	Part of carburetor (476)		7	02744
479-2	do	Part of carburetor (476)		7	02744
480	Carburetor cover	Part of carburetor (476)		7	40117-D
481	Carburetor cover gasket	Part of carburetor (476)		7	40162
482	Carburetor flange gasket	Part of carburetor (476)		7	40152-A
483	Carburetor nozzle	Part of carburetor (476)		7	40168
484	Carburetor nozzle plug and gasket.	Part of carburetor (476)		7	0675
485	Carburetor plunger button.	Part of carburetor (476)		7	40146
486	Carburetor plunger cap	Part of carburetor (476)		7	40145
487	Carburetor plunger with packing.	Part of carburetor (476)		7	40142-4
488	Carburetor plunger spring	Part of carburetor (476)		7	40147
489	Carburetor plunger tube with valve retainer.	Part of carburetor (476)		7	40143-37.
490	Carburetor pressure line connector body—outer.	Part of carburetor (476)		7	S-399
491-1	Carburetor pressure line connector body—inner.			7	40176
491-2	do	Part of carburetor (476)		7	40176
492	Carburetor pressure line with connections.	Brass tubing	Utilize crankcase pressure for fuel supply.	7	40170
493	Carburetor pressure and feed line assembly.	Part of carburetor (476)		7	40160
494	Carburetor stand-pipe assembly.	Part of carburetor (476)		7	40171
495	Carburetor valve retainer gasket.	Part of carburetor (476)		7	40161

496	Carburetor vent screen—outer.	Part of carburetor (476)		7	40195
497-1	Carburetor vent screen—inner.	Part of carburetor (476)		7	40193
497-2	do	Part of carburetor (476)		7	40193
497-3	do	Part of carburetor (476)		7	40193
497-4	do	Part of carburetor (476)		7	40193
499-1	Coil assembly complete	Part of magneto (535)		13	10-21801
499-2	do	Part of magneto (535)		13	10-21801
500-1	Coil clamp assembly	Part of magneto (535)		13	10-14854
500-2	do	Part of magneto (535)		13	10-14854
500-3	do	Part of magneto (535)		13	10-14854
500-4	do	Part of magneto (535)		13	10-14854
501*	Capacitor	Part of magneto (535)		13	10-20651
501**	do	Part of magneto (535)		13	10-23186
502	Connecting rod—back	Drop forged steel		7	40074
503	Connecting rod—front	do		7	40053
504-1	Connecting rod roller bearing.	Split bearing		9	Z-100
504-2	do	do		9	Z-100
505*	Connector for primary leads.	Part of magneto (535)		13	10-21805
505**	do	Part of magneto (535)		13	10-23403-14409
506	Contact assembly adjustable.	Part of magneto (535)		13	10-3320
507	Contact and cam follower assembly.	Part of magneto (535)		13	10-4123
508	Crankcase	Aluminum casting		7	40003-D
509	Crankcase sealing gasket	2 1/16" OD Vellumoid	Compression seal	7	19179
510	Crankshaft	Forging		7	40002-C
511	Crankshaft lock nut	7/8"-18 hexagonal steel	Fasten flywheel (524) to crankshaft (510).	7	18660
512	Crankshaft spacer	Sleeve 1 5/8" OD x 2" long	Spacer for flywheel bearing (525) and main bearing (545).	7	18663-D
513	Cylinder with liner—left (carburetor side).	Aluminum, air-cooled		7	11399-FL
514	Cylinder with liner—right.	do		7	11399-FR

Reference No.	Name of part	Description	Function	Manufacturer	Drawing No.
515–1	Cylinder cap screw	5/16″–18 x 3/4″	Fasten cylinders (513) and (514) to crankcase (508).	7	19265
515–2	do	5/16″–18 x 3/4″	Fasten cylinders (513) and (514) to crankcase (508).	7	19265
515–3	do	5/16″–18 x 3/4″	Fasten cylinders (513) and (514) to crankcase (508).	7	19265
515–4	Cylinder cap screw	5/16″–18 x 3/4″	Fasten cylinders (513) and (514) to crankcase (508).	7	19265
515–5	do	5/16″–18 x 3/4″	do	7	19265
515–6	do	5/16″–18 x 3/4″	do	7	19265
515–7	do	5/16″–18 x 3/4″	do	7	19265
515–8	do	5/16″–18 x 3/4″	do	7	19265
516–1	Cylinder gasket	2 17/32″ ID Vellumoid	Seal between cylinders (513) and (514) and crankcase (508).	7	19427
516–2	do	2 17/32″ ID Vellumoid	do	7	19427
517	Cylinder shield—left—lower.	Aluminum casting	Air director	7	40113
518	Cylinder shield—left—upper.	do	do	7	40112
519	Cylinder shield—right—lower.	do	do	7	40111
520	Cylinder shield—right—upper.	do	do	7	40110
521–1	Exhaust manifold	Tubing 1 1/4″ OD	Connect cylinders (513) and (514) to muffler (547).	7	40106
521–2	do	Tubing 1 1/4″ OD	do	7	40106
522–1	Exhaust manifold clamp	1 3/8″ ID malleable iron	Fasten exhaust manifold (521) to muffler (547).	7	19434
522–2	do	1 3/8″ ID malleable iron	do	7	19434
523–1	Exhaust manifold nut	Serrated nut 2 1/8″ OD	Fasten exhaust manifold (521) to cylinders (513) and (514).	7	19375–A
523–2	do	Serrated nut 2 1/8″ OD	do	7	19375–A
524	Flywheel	Aluminum casting	Cool engine	7	40055–C

525	Flywheel bearing	Grease seal ball bearing		11	88507
526–1	Flywheel guard	3¾″ x 1½″ wire lath		7	40070–A
526–2	do	3¾″ x 1½″ wire lath		7	40070–A
526–3	do	3¾″ x 1½″ wire lath		7	40070–A
526–4	do	3¾″ x 1½″ wire lath		7	40070–A
527–1	Flywheel key	3/16″ square x 1 3/16″	Anchor flywheel (524) to crankshaft (510).	7	40183
527–2	do	3/16″ square x 1 3/16″	do	7	40183
528	Flywheel washer	1⅜″ OD		7	18662
529	Fuel line with connections.	Brass tubing ¼″		7	40172
530	Governor and intake valve assembly.	Disk with plate and springs	Speed control	7	S–398
531	Governor snap ring	Steel wire, 17 gage	Position governor to shaft	7	40177
532	Grounding lug	Part of magneto (535)		7	40186
533–1	High-tension cable with connector.		Spark plug lead	7	40197
533–2	do		do	7	40197
534	Insulator	Part of magneto (535)		13	10–13432
535	Magneto		Ignition	13	10–20650–2
536	Magneto bracket	Aluminum casting	Attach magneto (535)	7	40075–C
537	Magneto bracket gasket	Vellumoid	Seal between magneto bracket (536) and crankcase (508).	7	40045–B
538	Magneto bracket spacer	Sleeve 15/16″ OD x ¼″ long	To locate bearing	7	19385
539	Magneto cover—lower	Aluminum casting	Weather protection	7	40102–A
540	Magneto cover—upper	Aluminum casting	Weather protection	7	40101–A
541	Magneto housing	Stator assembly	Part of magneto (535)	13	10–18353
542	Magneto shaft	Steel forging	Drive shaft magneto (535)	7	S–518
543	Magneto shaft bearing—front.	Grease seal ball bearing		11	88603
544	Magneto shaft bearing—rear.	Open ball bearing		11	3203
545	Main bearing	Shielded ball bearing		11	47306
546–1	Main bearing retaining screw.	¼″–20 x ⅝″ special head	To fasten main bearing (545)	7	19238
546–2	do	¼″–20 x ⅝″ special head	do	7	19238
547–1	Muffler	3 15/16″ OD x 11″ long		7	19144–K
547–2	do	3 15/16″ OD x 11″ long		7	19144–K

Reference No.	Name of part	Description	Function	Manufacturer	Drawing No.
548–1	Muffler, auxiliary	1¼″ tube x 12¾″ long		7	40192–A
548–2	do	1¼″ tube x 12¾″ long		7	40192–A
549–1	Muffler, bracket	⅛″ steel strap	Fasten muffler (547) to angle irons (449) and (450).	7	40130
549–2	do	⅛″ steel strap	do	7	40130
550–1	Muffler bracket auxiliary	⅛″ steel strap	Fasten muffler, auxiliary (548) to muffler (547).	7	40210
550–2	do	⅛″ steel strap	do	7	40210
551–1	Piston and pin assembly	2⅜″ Vanasil		7	S–428
551–2	do	2⅜″ Vanasil		7	S–428
552–1	Piston pin bearing	Bronze ⅝″ OD x 15/16″ long	Insert small end connecting rod (502) and (503).	7	10542
552–2	do	Bronze ⅝″ OD x 15/16″ long	do	7	10542
553–1	Piston pin retaining ring	Wire spring clip	Retainer for piston pin (551)	7	10547
553–2	do	do	do	7	10547
553–3	do	do	do	7	10547
553–4	do	do	do	7	10547
554–1	Piston ring	2⅜″ x ⅛″		7	19398
554–2	do	2⅜″ x ⅛″		7	19398
554–3	do	2⅜″ x ⅛″		7	19398
554–4	do	2⅜″ x ⅛″		7	19398
555	Cam drive key	⅛″ x ⅛″ x 1⅝″	Fasten rotor and cam (556) to magneto shaft (542).	7	40128
556	Rotor and cam assembly	Part of magneto (535)		7	S–336
557–1*	Shielding assembly for spark plug.	Shielded conduit with connections.	Eliminate radio interference	16	B–27347
557–1**	do	do	do	16	B–27934
557–2*	do	do	do	16	B–27347
557–2**	do	do	do	16	B–27347
558	Shut-off cock	⅛″ IPT bronze cock	Fuel shut-off	7	19245
559–1	Spark plug	Champion J–10 commercial		4	
559–2	do	do		4	
560	Starting pulley	Aluminum casting	Start engine	7	40087–A

561	Starting pulley nut	½″ 20 hexagonal nut	Attach starting pulley (560) to magneto shaft (542).	7	40129
562	Starting pulley plate	3¾″ diameter steel	Used with starting pulley (560).	7	40205
563	Starting rope and grip	Sash cord with handle	To start engine	7	S–429
564	Stop button assembly	Phenolic button and clip	To short-circuit ignition	7	S–430

c. Tools.—See figure 22.

569	Armature pin—long	¼″ diameter x 10″ long	To remove armature (414)	7	S–388
570	Armature pin—short	3⁵⁄₁₆″ diameter x ½″ long	do	7	S–389
571	Assembling fixture for crankshaft and flywheel.	Aluminum casting		7	S–391
572	Feeler gage	0.016″	To gage contact assembly (506)	7	S–431
573	Flywheel remover	Bolt with cross bar		7	S–390
574	Jack screw	¾″–16 x 4″	Used with assembly fixture (571)	7	S–392
575	do	½″–13 x 5″	Used with shaft puller (580)	7	S–393
576	Jack screw for armature	⅜″–16 x 2″	Used with armature pins (569) and (570).	7	S–394
577	Magneto bracket bearing remover.	1³⁄₁₆″ x 3¾″ long, tool steel 6″.		7	S–395
578	Screw driver	6″	For carburetor (476)	10	H–2
578A	do	4½″	For setscrew rheostat knob (439)	10	G–2
579	do	13½″		15	
580	Shaft puller	Aluminum casting	To remove crankshaft (510)	7	S–396
581	Spanner	2⅛″ diameter	For exhaust manifold nut (523)	7	19439
582	Spark plug wrench with handle.	Socket type		1	No. 7
583	Tool box	Sheet metal	Container	7	S–362
584*	Wrench	7⁄16″ box and open end	For cylinder screws (515) and rear connecting rod bolts.	2	No. 5701
584**	do	7⁄16″ box and open end	do	10	
585*	do	½″ x ⅝″ open end	Various	8	No. C–726
585**	do	½″ x ⅝″ open end	do	10	
586*	do	¾″ x 1″ open end	do	8	No. 732–A
586**	do	¾″ x 1″ open end	do	10	

Reference No.	Name	Description	Function	Manufacturer	Drawing No.
587*	Wrench	1 1/16" x 1 1/4" open end	For crankshaft nut (511) and jack screw (574).	8	No. 37
587**	do	1 1/16" x 1 1/4" open end	do	10	
588*	do	13/16" x 5/8" open end	For shaft puller (580)	8	No. 730
588**	do	13/16" x 5/8" open end	do	10	

d. Case.—See figure 23.

589	Base assembly less hardware.	Plywood with skids 24 1/2" x 31".		7	S–462
590	Cable hook	13/16" OD conduit	Fasten cords CD–409, CD–415 to top (607).	7	S–359
591	Cable strap	1 1/2" trunk strap	do	7	S–454
592	Carrying handle	Sargent #2082		7	S–451
593	Catch with straight staple	Corbin #15642–N	Hold case together	7	S–448
594	Catch with bent staple	Corbin #15642–N with bent staple.	do	7	S–449
595	Corner for case	Brass	Reinforce corners	7	S–416
596	Dowel	1 1/4" long, half round	Fasten catches (593 and 594)	7	S–442
597	End less hardware	Plywood 24 1/2" x 24 1/2"		7	S–463
598	Flanged bolt	5/16"–18 x 1 1/4" with 2" x 1" plate.	Fasten unit to base #589	7	S–460
599	Pipe strap	1/2"	Fasten cable hook (590) to top (607)	7	S–452
600	Pipe strap plate	2 1/2" x 1" x 1/16" CRS	Fasten pipe strap (599) to top (607)	7	S–453
601	Side assembly left less hardware.	Plywood 24 1/2" x 32" with INSULITE.		7	S–464
602	Side assembly right less hardware.	Plywood 24 1/2" x 32" with INSULITE.		7	S–465
603	Slot catch R. H	Female	Anchor end (597) to sides (601 and 602).	7	S–456
604	Slot catch L. H	do	do	7	S–457
605	Slot catch	Male	do	7	S–458
606	Strap clip	3" x 1/2" x 1/16" CRS	For cable strap (591)	7	S–455
607	Top assembly less hardware	Plywood 25 1/2" x 32" with INSULITE.		7	S–466

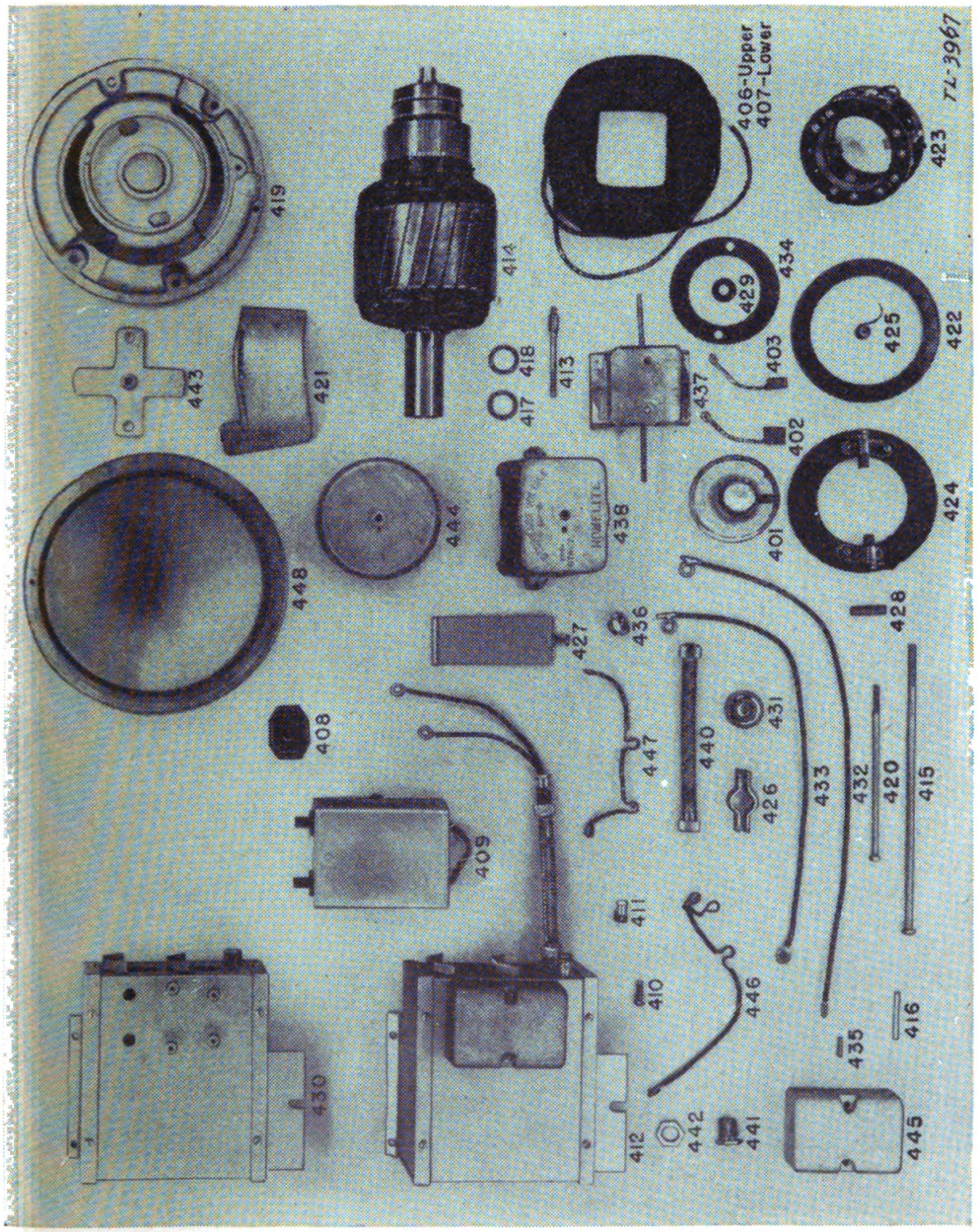

FIGURE 19.—Generator parts.

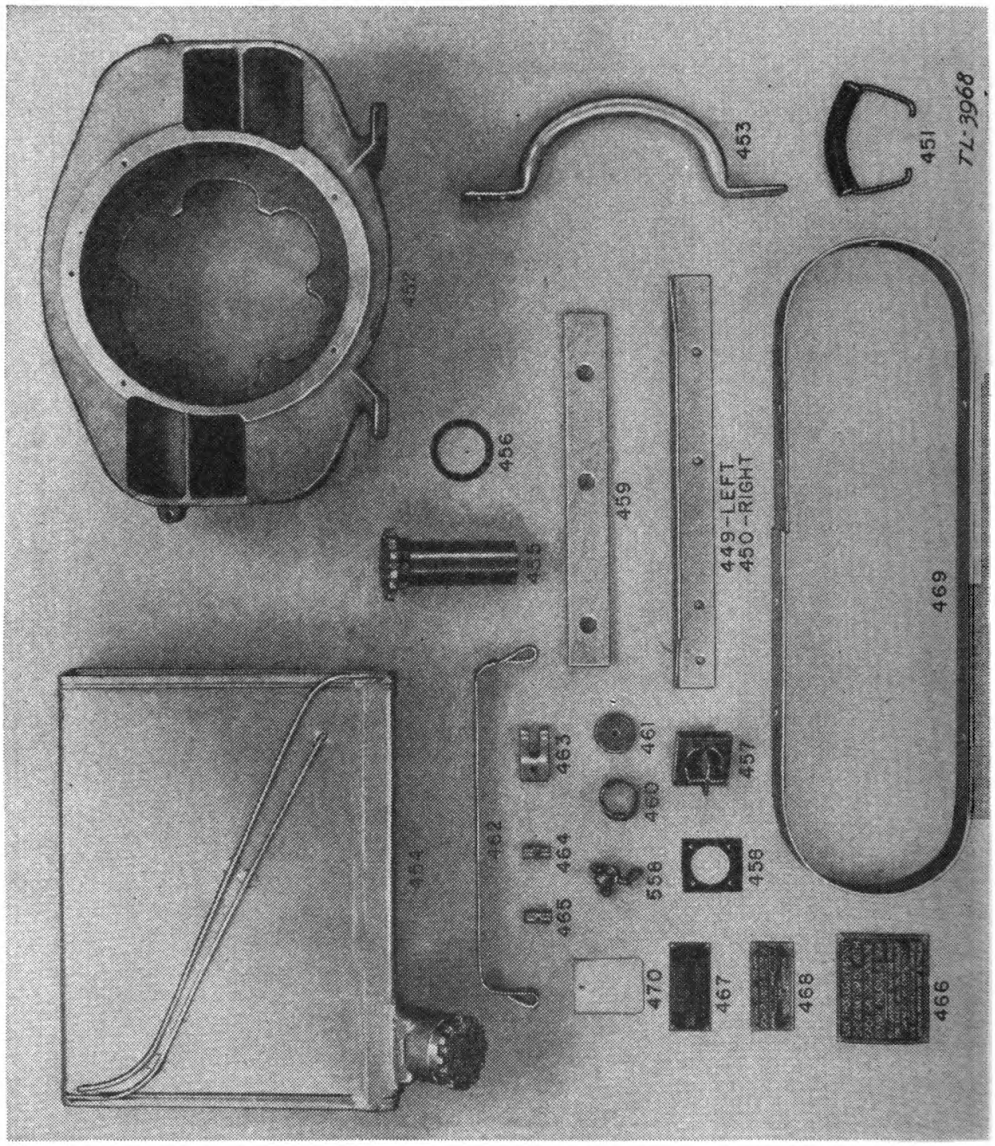

FIGURE 20.—Mounting and fuel tank parts.

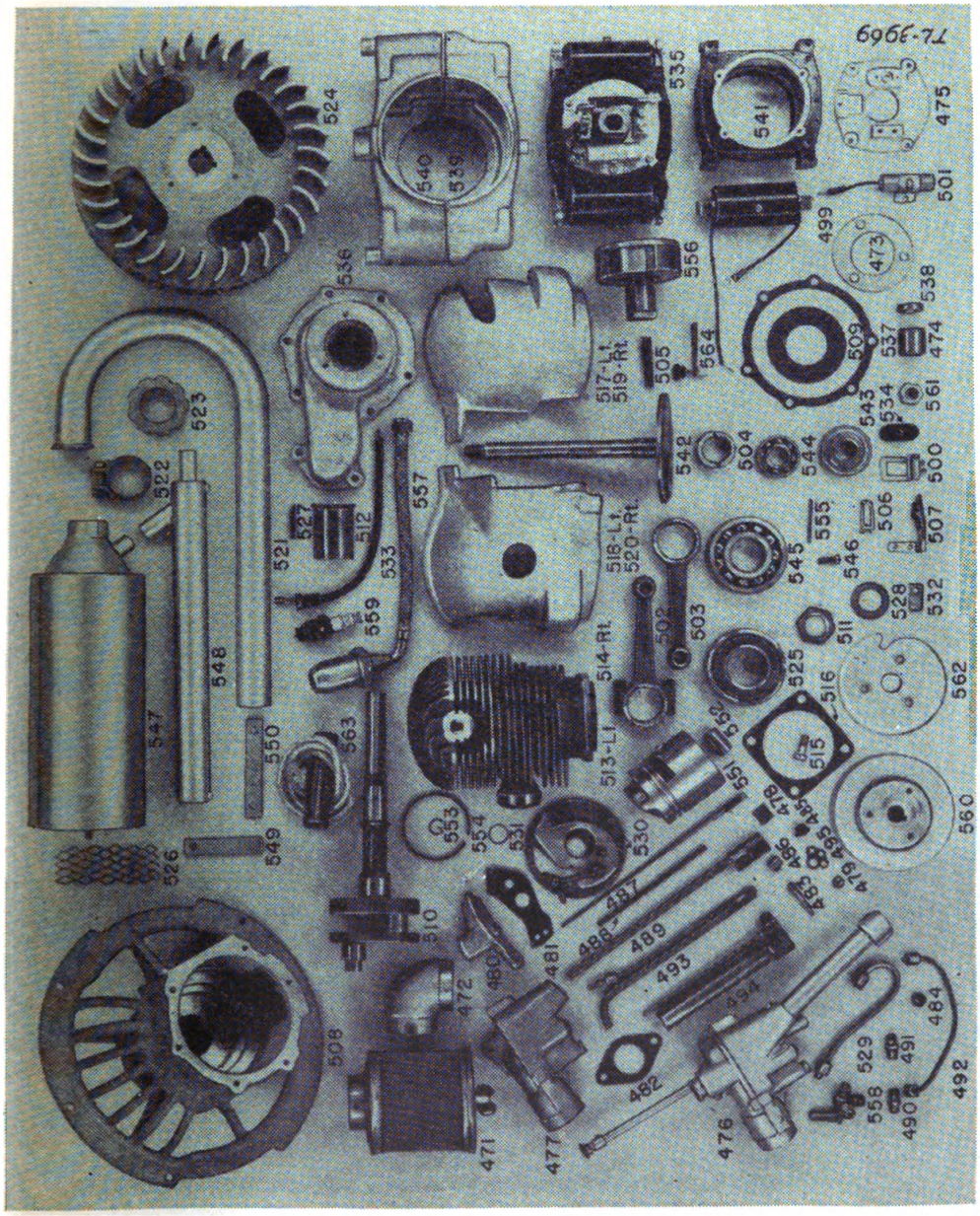

FIGURE 21.—Engine parts.

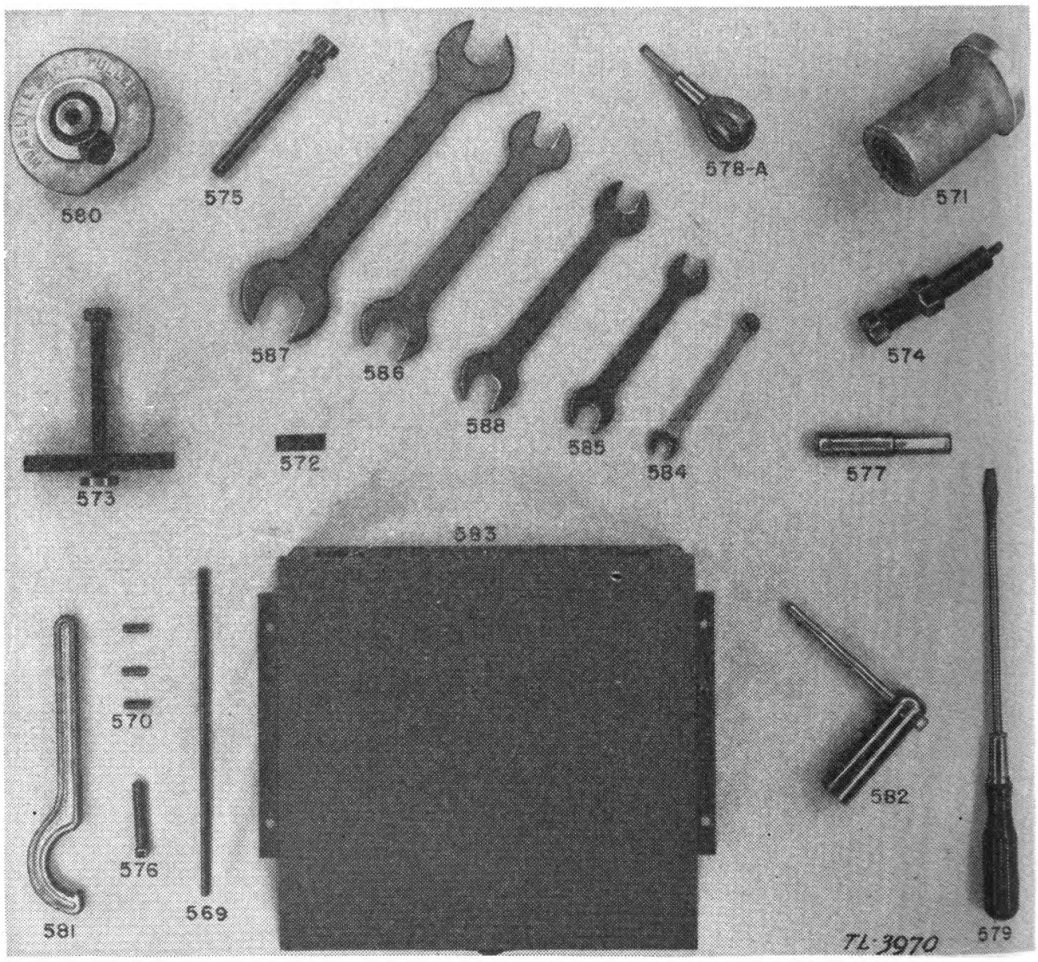

FIGURE 22.—Tools.

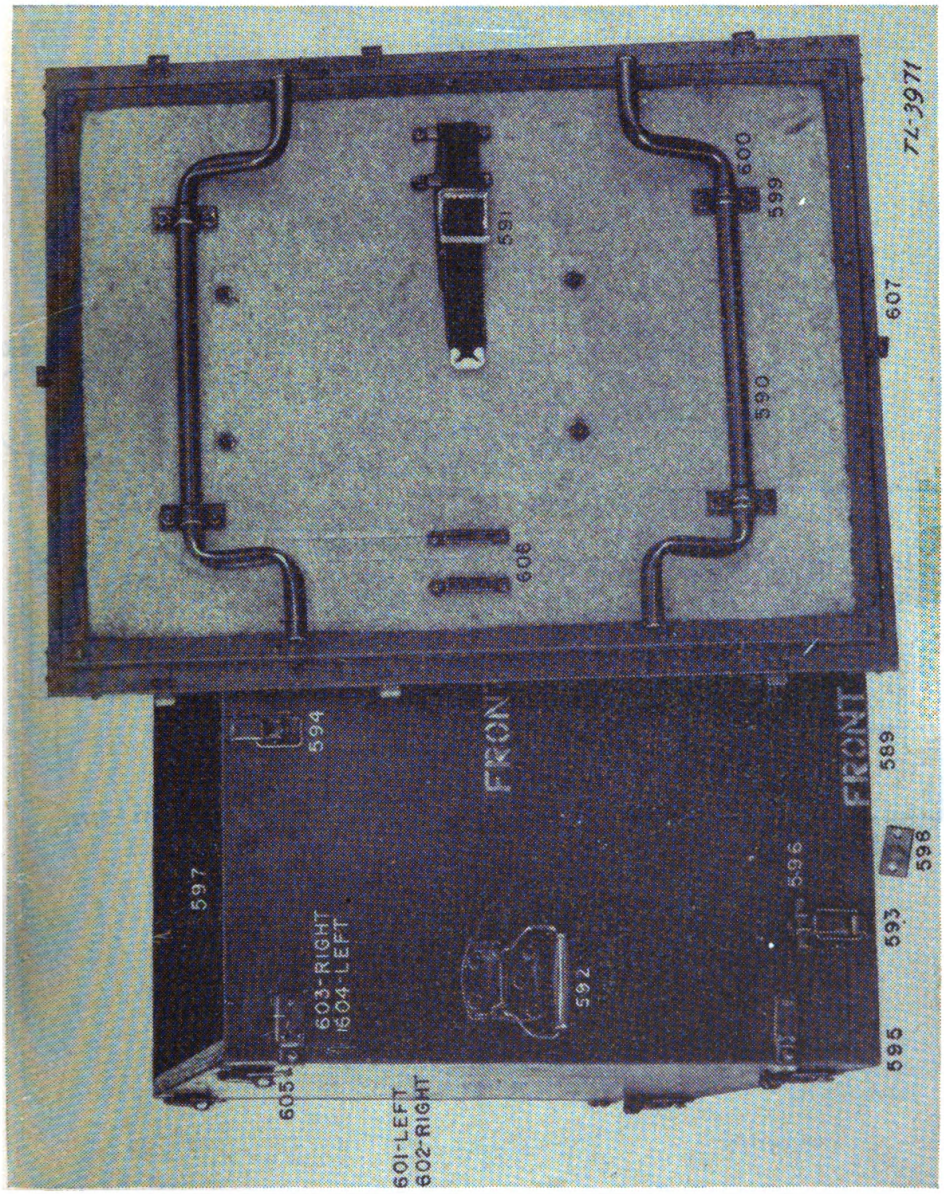

FIGURE 23.—Case parts.

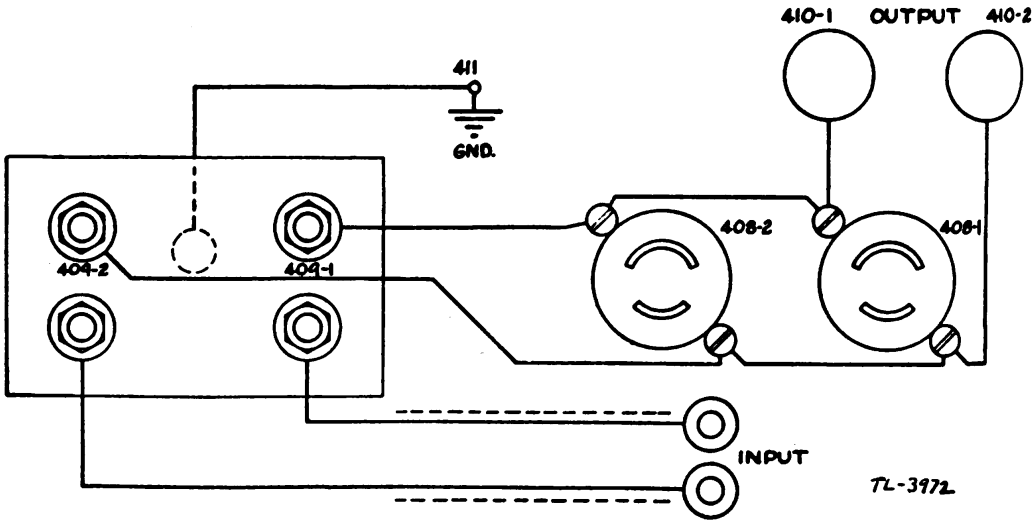

FIGURE 24.—Filter, practical wiring diagram.

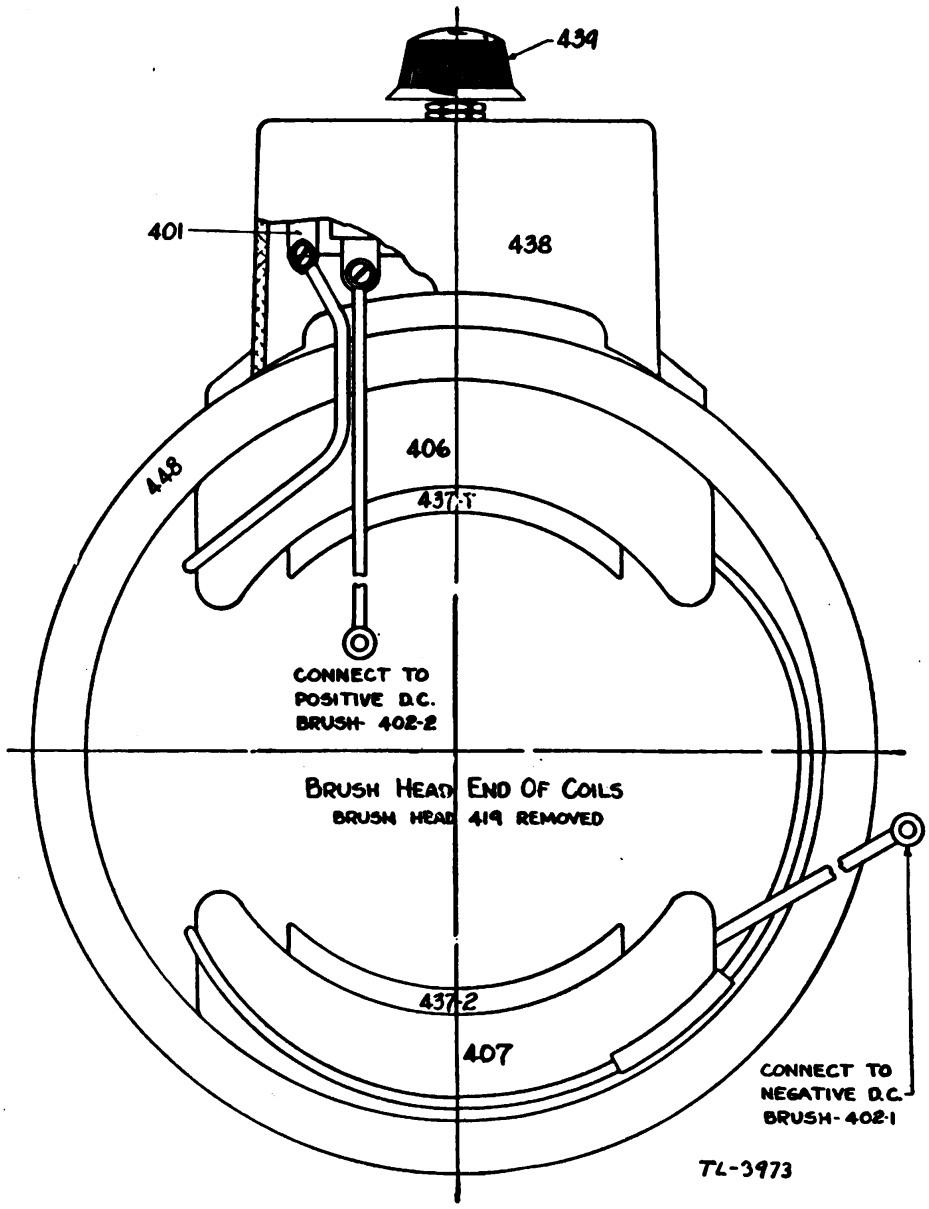

FIGURE 25.—Generator, practical wiring diagram.

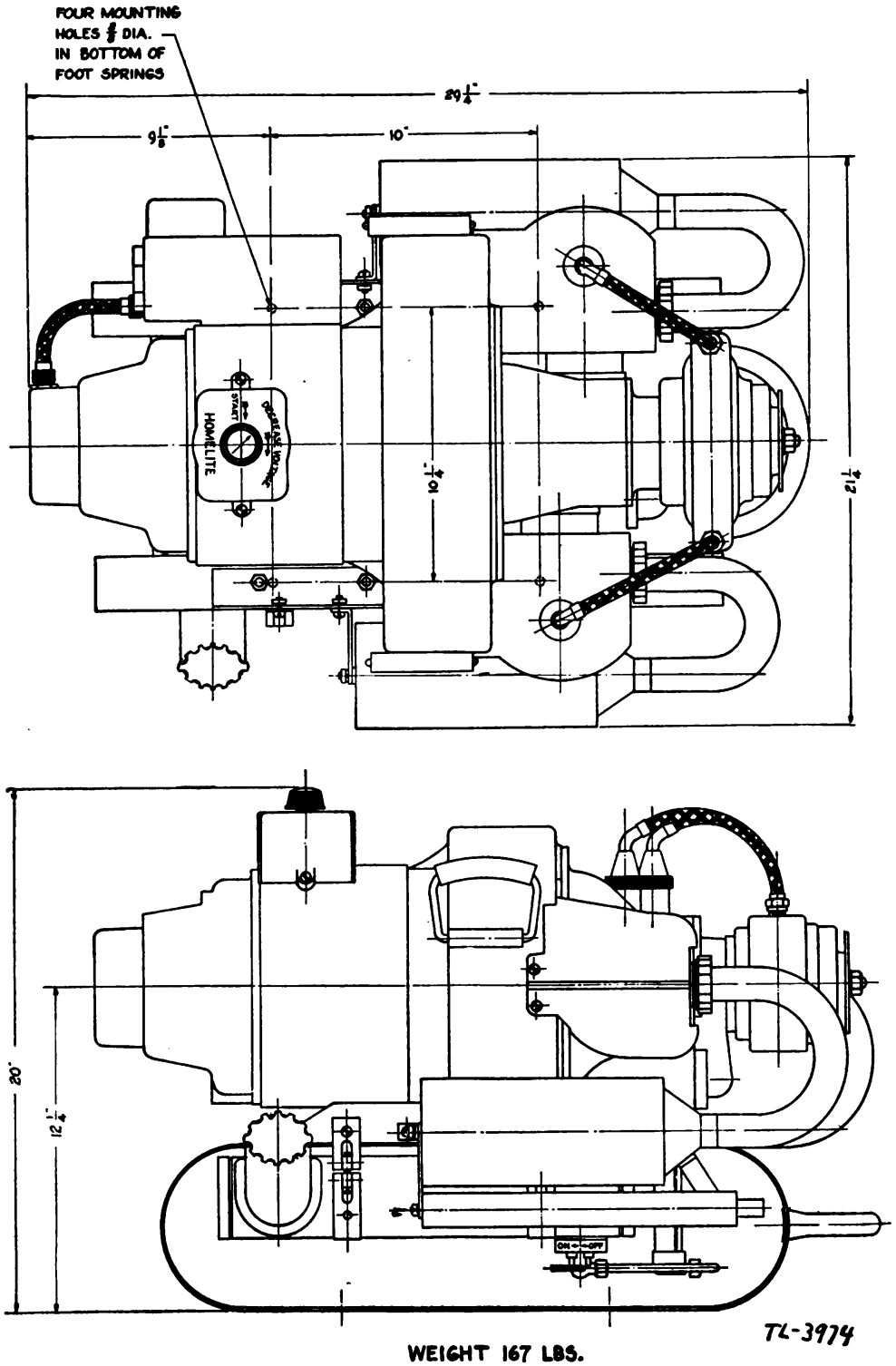

FIGURE 26.—Dimensional drawing.

20. Names and addresses of manufacturers.

No.	Name	Address
1	APCO Mossberg Company	Attleboro, Mass.
2	Billing and Spencer Company	Hartford, Conn.
3	Cornell Dubilier Electrical Corporation.	South Plainfield, N. J.
4	Champion Spark Plug Company	Toledo, Ohio.
5	Electric Specialty Company	Stamford, Conn.
6	Harvey Hubbell, Incorporated	Bridgeport, Conn.
7	Homelite Corporation	Port Chester, N. Y.
8	Indestro Manufacturing Corporation	2649 North Kildare Avenue, Chicago, Ill.
9	McGill Manufacturing Company	Valparaiso, Ind.
10	Mac Tool Company	Norwalk, Conn.
11	New Departure	Bristol, Conn.
12	Ohmite Manufacturing Company	4835 Flournoy Street, Chicago, Ill.
13	Scintilla Magneto Division	Bendix Aviation Corporation, Sidney, N. Y.
14	Solar Manufacturing Corporation	Bayonne, N. J.
15	Stanley Works	New Britain, Conn.
16	Titeflex Metal Hose Company	500 Frelinghuysen Avenue, Newark, N. J.
17	Tobe Deutschmann Corporation	Canton, Mass.

[A.G. 062.11 (4–15–42).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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

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(For explanation of symbols see FM 21–6.)

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