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TM 10-1668

R DEPARTMENT TECHNICAL MANUAL

OUTFIT, DELOUSING GASOLINE-ENGINE DRIVEN (DEFIANCE)

UNIVERSITY OF CALIFORNIA, LOS ANGELES
MAR 21 1947
MAR 21 1947

WAR DEPARTMENT 15 SEPTEMBER 1945

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WAR DEPARTMENT
Washington 25, D. C., 15 September 1945

TM 10-1668, OUTFIT, DELOUSING, GASOLINE-ENGINE DRIVEN (DEFIANCE), is published for the information and guidance of all concerned.

[A. G. 300.7 (21 December 44)]

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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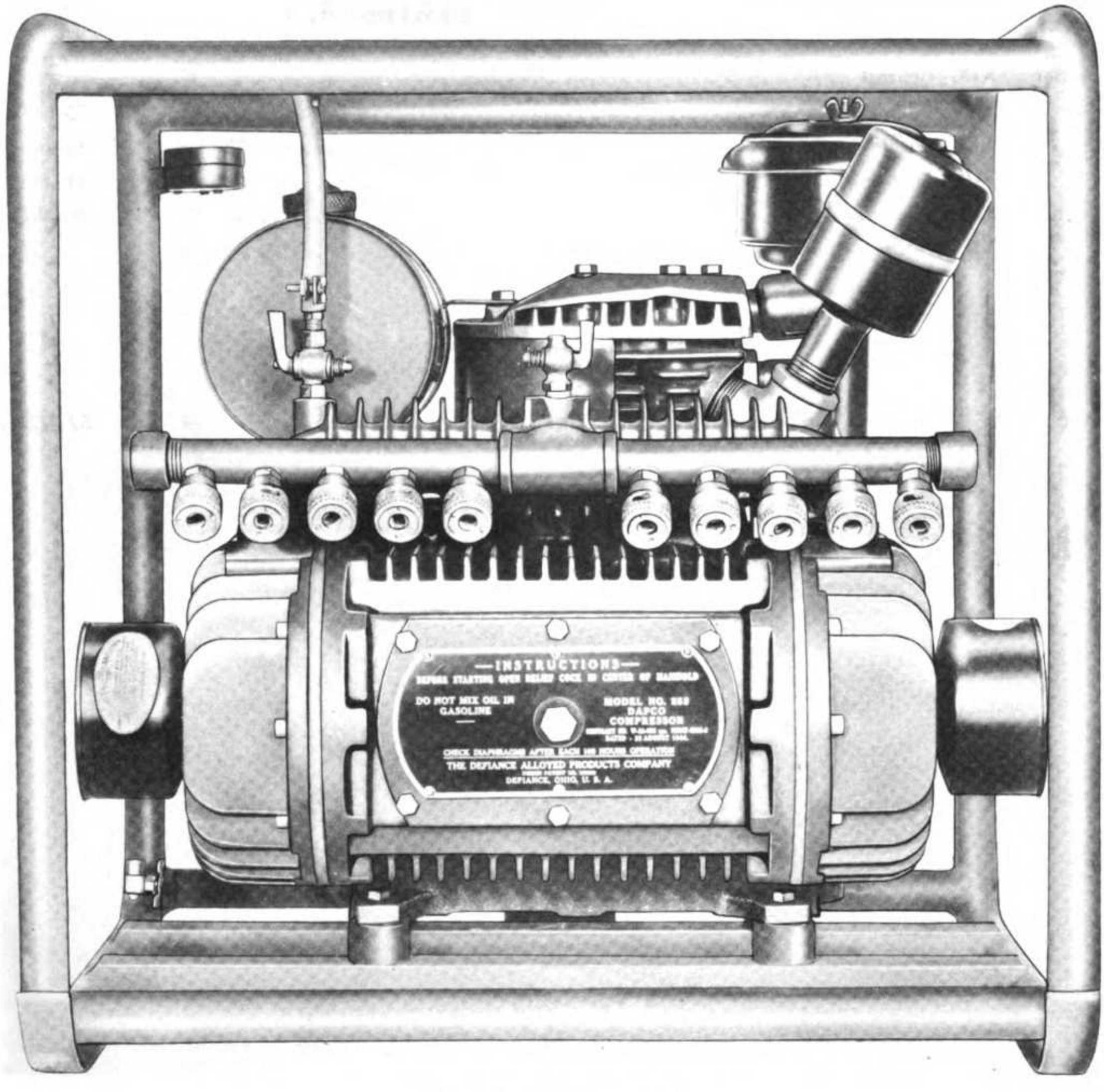

Figure 1—Delousing Outfit

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PART ONE—INTRODUCTION

Section I. General

1. SCOPE

a. These instructions are published for the information and guidance of the personnel to whom this equipment is assigned. They contain information on the operation and maintenance of the equipment as well as descriptions of the major units and their functions in relation to the other components of the equipment. They apply only to the Outfit, Delousing, Gasoline-Engine Driven, and are arranged in four parts: Part One, Introduction; Part Two, Operating Instructions; Part Three, Maintenance Instructions; Part Five, Repair Instructions; plus an illustrated Parts Catalog.

b. Technical Manuals and other publications applicable to the material covered by this manual are listed in the reference section at the end of the book.

Section II. Description and Tabulated Data

2. DESCRIPTION.

a. Type. The Outfit, Delousing, Gasoline-Engine Driven, is a complete portable, gasoline-engine driven compressor designed to provide an ample supply of compressed air for operation of ten dusting guns. Each outfit consists of a gasoline engine with the compressor directly attached. (See figure 1.)

b. Identification. The manufacturer's model number is stamped on a plate mounted on the compressor housing. (See figure 2.) The engine serial number is carried on a plate mounted on the flywheel housing. (See figure 3.)

3. TABULATED DATA.

a. Outfit Specifications.

Engine ..... Briggs & Stratton BP

Air Cleaner ..... United

Figure 2—Delousing Outfit Nameplate

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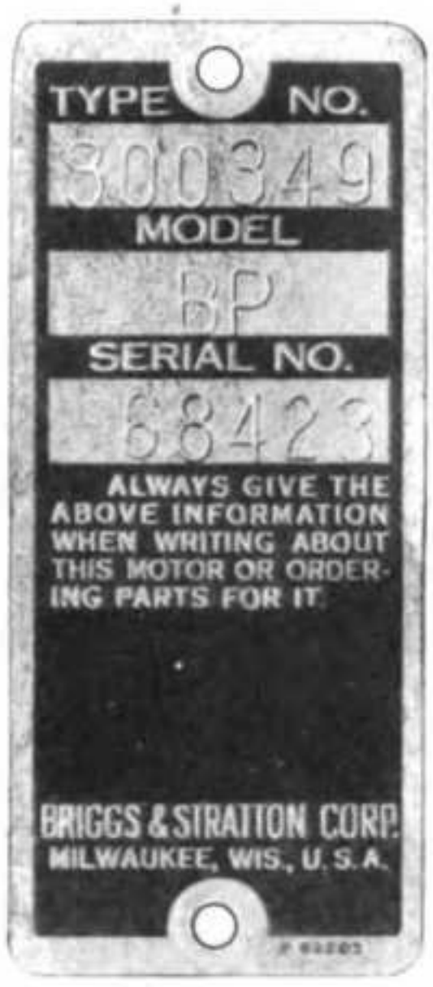

Figure 3—Engine Nameplate

Compressor	Dapco 252
Frame	Tubular steel
Height, over-all	24 inches
Width, over-all, less dusting guns and hose	24 inches
Depth, over-all, less dusting guns and hose	23½ inches
Operators	11
Type and grade of fuel	Gasoline (68 octane)

Weights:

Including fuel, less dusting guns	180 pounds
Including fuel and dusting guns	278 pounds
Less fuel and dusting guns	174 pounds
Less fuel, with dusting guns	272 pounds
Boxed, gross, less dusting guns	320 pounds
Boxed, gross, with dusting guns	418 pounds

Shipping dimensions, uncrated, less hose and guns:

Height	24 inches
Width	24 inches
Depth	23½ inches

Shipping dimensions, crated:

Cubic feet	11
Height	32 inches
Width	26 inches
Depth	27½ inches

b. Performance Data.

Capacity	15 cu. ft. per minute
Engine governed speed	2400 rpm

c. Capacities.

Engine crankcase	1 pint
Fuel tank	1 gallon
Air cleaner	½ pint

Section III. Tools and Equipment

4. TOOLS & EQUIPMENT.

a. Tools supplied with Outfit, Delousing, are illustrated in figure 4.

Federal Stock No.	Nomenclature	Quan. Reqd.
41-B-8-100	Bag, tool, canvas, empty, 5-1/2 x 16-1/2″	1
NSN	Bearing driver—#255303	1
41-S-1076	Screwdriver, comomn, heavy duty, integral handle, 6″ blade	1
41-S-1062	Screwdriver, close quarter, 1 x 1/4″ blade, 2-3/4″ overall	1
41-H-523	Hammer, machinists, ball peen, 1 lb.	1
41-P-1650	Pliers, combination, slip joint, wire cutting, 6″	1
41-P-2912	Puller, gear, universal type, small, reversible jaw, 0 to 6″ capacity, (jaws, screws & nut to be forged from alloy steel)	1
41-W-3005	Wrench, socket, (detachable) 1/2″ sq. drive, 12 point opening, 7/16″	1
41-W-3007	Wrench, socket, (detachable) 1/2″ sq. drive, 12 point opening, 1/2″	1
41-W-3009	Wrench, socket, (detachable) 1/2″ sq. drive, 12 point opening, 9/16″	1
41-W-3017	Wrench, socket, (detachable) 1/2″ sq. drive, 12 point opening, 3/4″	1

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Federal Stock No.	Nomenclature	Quan. Reqd.
NSN	Tool, staking #255304	1
41-W-485	Wrench, adjustable, crescent type, single end, 6" (3/4" jaw opening)	1
41-W-2452	Wrench, set or cap screw, (hollow head), hexagon, plug type, regular short arm series, 3/16", (3/8" set screw, 1/4" cap screw)	1
41-W-2453	Wrench, set or cap screw, (hollow head), hexagon, plug type, regular short arm series, 7/32", (7/16" set screw, 5/16" cap screw)	1
41-W-1474	Wrench, filler cap and oil plug	1
41-W-3297-850	Wrench, spark plug, double end, hexagon opening (with pin handle) 27/32 and 1-1/32", 4" long	1
41-H-1500	Handle, socket wrench, hinged, 1/2" sq. drive, 10-1/2"	1
41-B-155	Bar, cross, socket wrench, round, solid, 1/2" diameter x 10" long	1
NSN	Wrenches, tee handle, #252305	2
41-G-1334	Gun, lubricating, hand operated, push type nozzle, 1-1/2 oz.	1

b. Equipment supplied (see figure 4) consists of:

Starter Rope.

Canvas Cover.

Cover Removing Bolt.

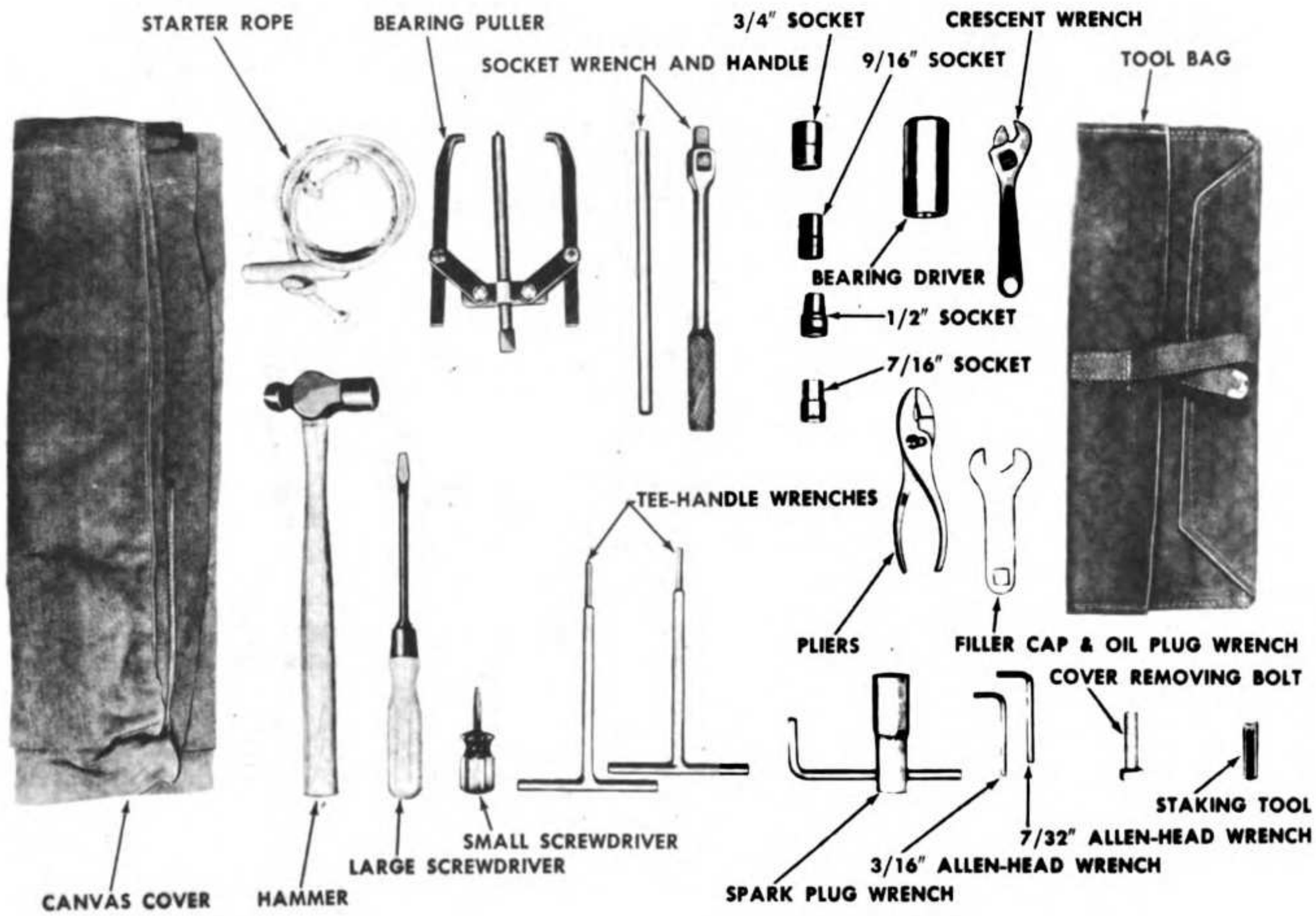

Figure 4—Tools and Equipment

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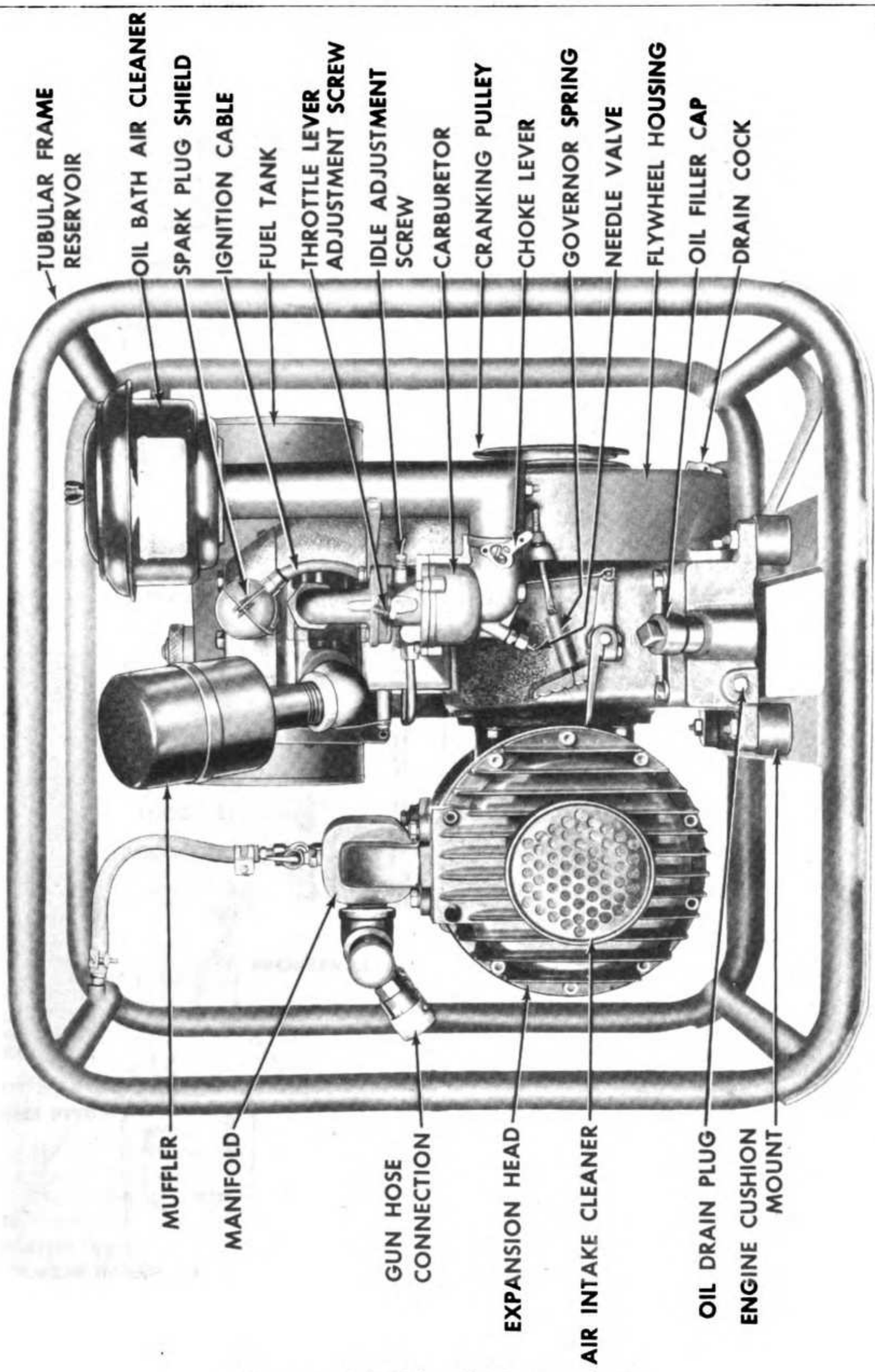

Figure 5—Left Side of Delousing Outfit

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PART TWO—OPERATING INSTRUCTIONS

Section IV. General

5. SCOPE.

Part Two contains information for the guidance of the personnel responsible for the operation of this equipment. It contains information on the operation of the equipment, and description and location of controls and the single instrument.

Section V. Service Upon Receipt of Equipment

6. RUN-IN TEST PROCEDURE.

a. Preliminary Service.

(1) FUEL AND WATER. Fill the fuel tank. Inspect engine crankcase oil level; add oil to bring to correct level. (See figure 5.)

(2) FUEL FILTER. Inspect the fuel filter for leaks, damage, and secure connections. Drain the sediment bowl, and clean the strainer. Drain accumulated dirt and water from the bottom of the fuel tank. Drain until fuel runs clean. Reinstall the filter sediment bowl. (See figure 6.)

(3) AIR CLEANERS. See that the engine air cleaner is in good condition and secure. (See figure 5.) Service in accordance with instructions on Lubrication Order LO 10-1668. Reinstall securely. Be sure the connection to the carburetor is air tight. See that the compressor air intake cleaners are in good condition and secure. (See figure 5.) Service in accordance with instructions on Lubrication Order LO 10-1668.

(4) SUBASSEMBLIES. See that carburetor, blower housing, compressor, compressor manifold, muffler, and spark plug shield are securely mounted. (See figures 5 and 6.)

(5) WIRING. See that the spark plug wire is in good condition and securely connected.

(6) FRAME. See that engine mountings are secure. Inspect frame for good condition, and paint for rust. (See figure 5.)

(7) LUBRICATE. Perform a complete lubrication, covering all points according to instructions on Lubrication Order LO 10-1668.

(8) CHOKE. Be sure choke opens and closes fully. (See figure 5.)

(9) ENGINE WARM-UP. Start the engine and note whether the engine has any tendency toward hard starting. During warm-up, gradually reset the choke lever to operate the engine smoothly and prevent overchoking and oil dilution.

(10) INSTRUMENT. Observe the air pressure gage to determine whether pressure builds up in the tubular frame reservoir. (See figure 8.)

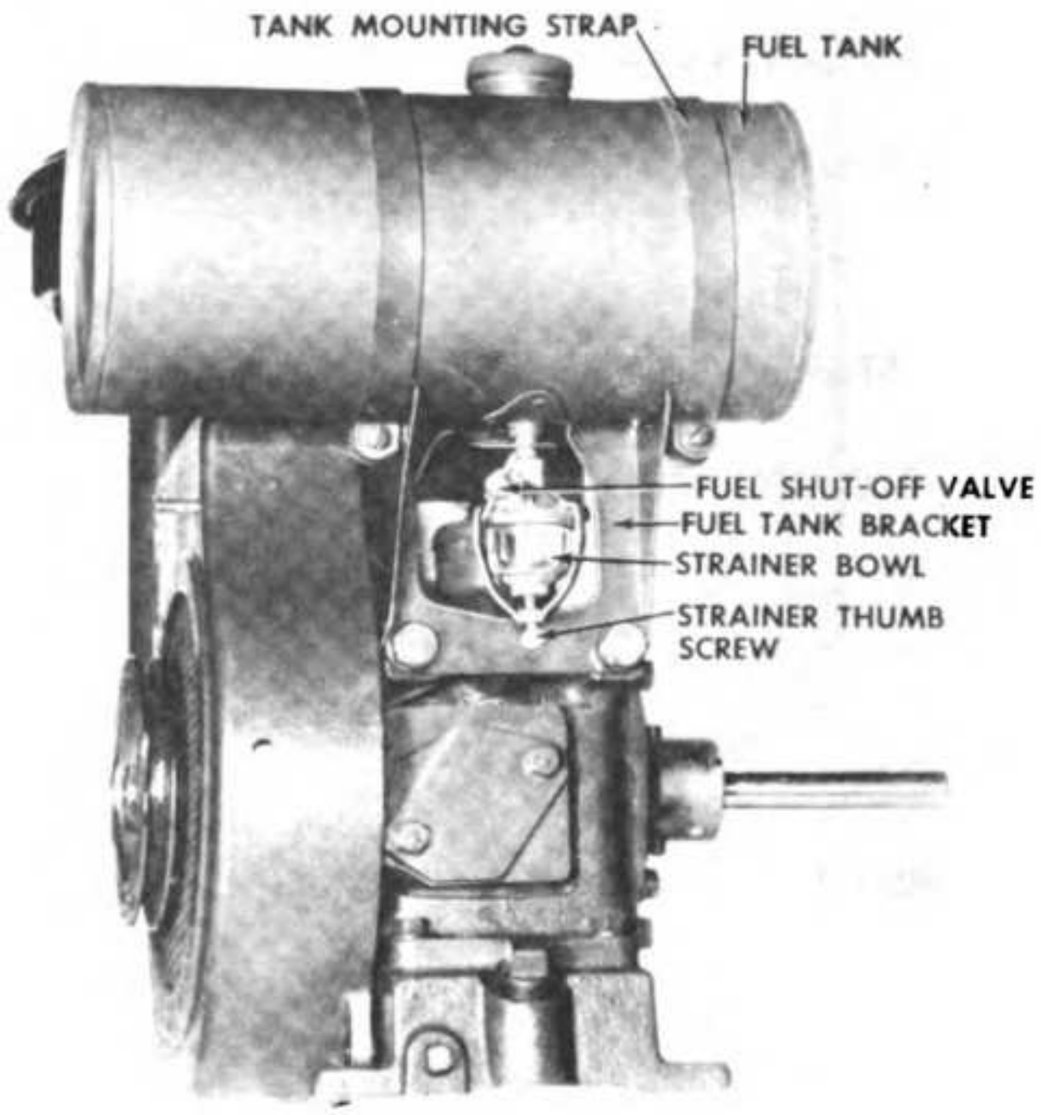

Figure 6—Engine Fuel Strainer

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(11) LEAKS, GENERAL. Inspect the outfit for fuel, oil and air leaks. Trace leaks to source, and correct or report to the designated individual in authority.

(12) TOOLS. Inspect tools to be sure all items are present and serviceable. (See paragraph 4.)

b. Run-In Test. Perform the following procedures, steps (1) to (4) inclusive, during a run-in test of 30 minutes duration. Correct any deficiencies within the scope of the using organization before placing the equipment in service. Refer deficiencies beyond the scope of the using organization to the designated individual in authority.

(1) INSTRUMENT. Observe reading of the air pressure gage to be sure it indicates pressure in the tubular frame reservoir.

(2) ENGINE. Be alert for any unusual engine noise or faulty operation, such as lack of power, backfiring, misfiring, stalling, overheating or excessive exhaust smoke.

(3) COMPRESSOR. Be alert for unusual compressor noise, such as hissing or other sounds indicating air leaks.

(4) DUSTING GUNS. Inspect connections of hoses at the compressor manifold and at the guns. Observe whether dusting guns respond properly to air control valves.

(5) TIGHTEN. Tighten all bolts, screws, and nuts.

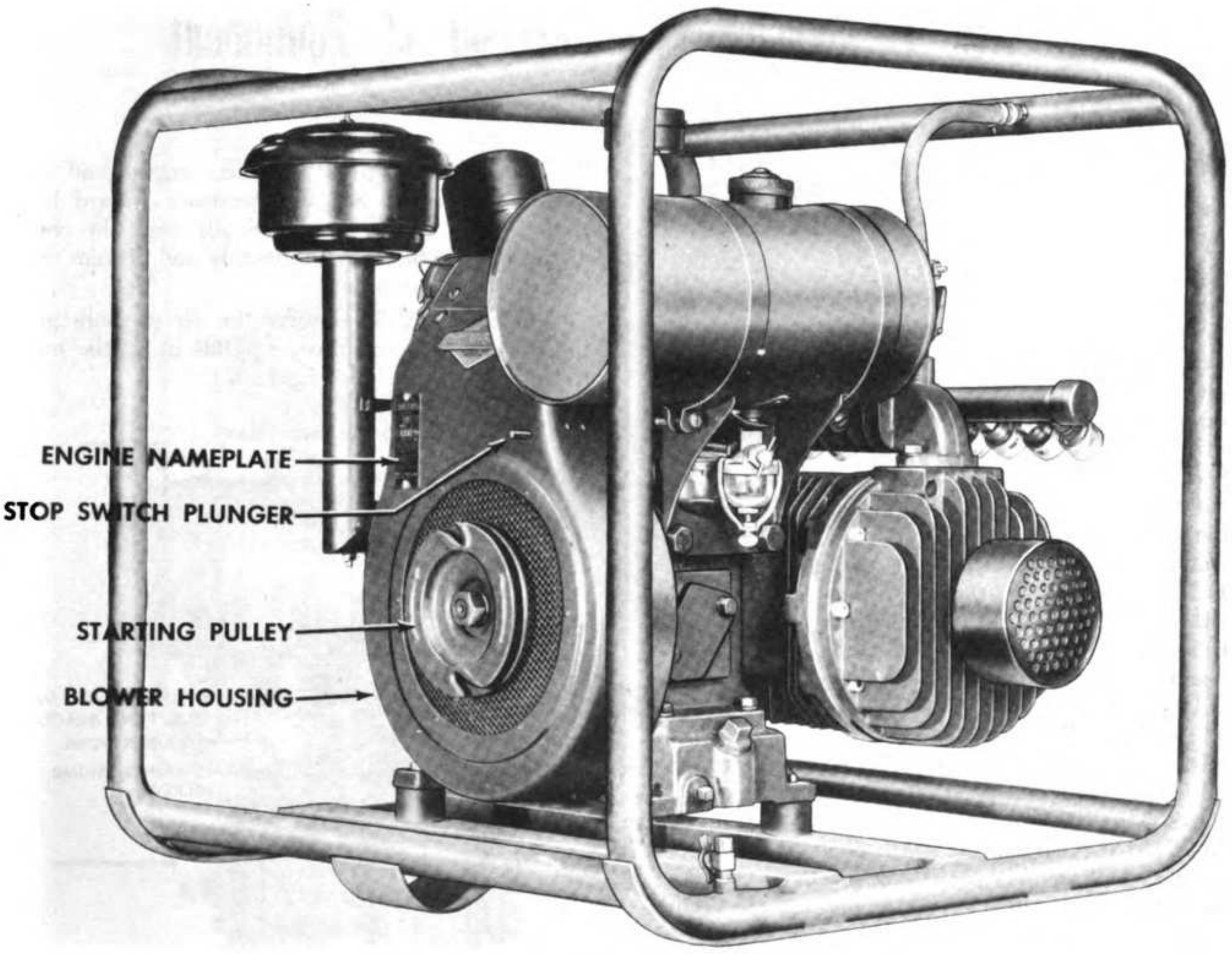

Figure 7—Blower Housing Side of Engine

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Section VI. Controls and Instrument

7. LOCATION OF CONTROLS.

a. Starting.

(1) STARTING PULLEY. The starting pulley is attached to the crankshaft, mounted outside the blower housing. (See figure 7.)

(2) CHOKE LEVER. The choke lever is mounted on the carburetor body. (See figure 5.) Pull the choke lever up, or to the right, for OPEN position.

(3) FUEL SHUT-OFF VALVE. The fuel supply to the carburetor can be shut off at the fuel tank by means of a valve set in the strainer, just below the fuel tank. (See figure 6.)

(4) STOP SWITCH PLUNGER. The stop switch plunger protrudes from the blower housing. (See figure 7.) Pressing in the plunger grounds the spark.

b. Operating.

(1) RELIEF COCK. The relief cock is located at the top center of the manifold. (See figure 8.) When in closed position, and when the air tube valve is open, air passes into the tubular frame reservoir.

(2) AIR CONTROL VALVE. The air control valve on the dusting gun regulates the intensity of dusting compound spray. (See figure 9.)

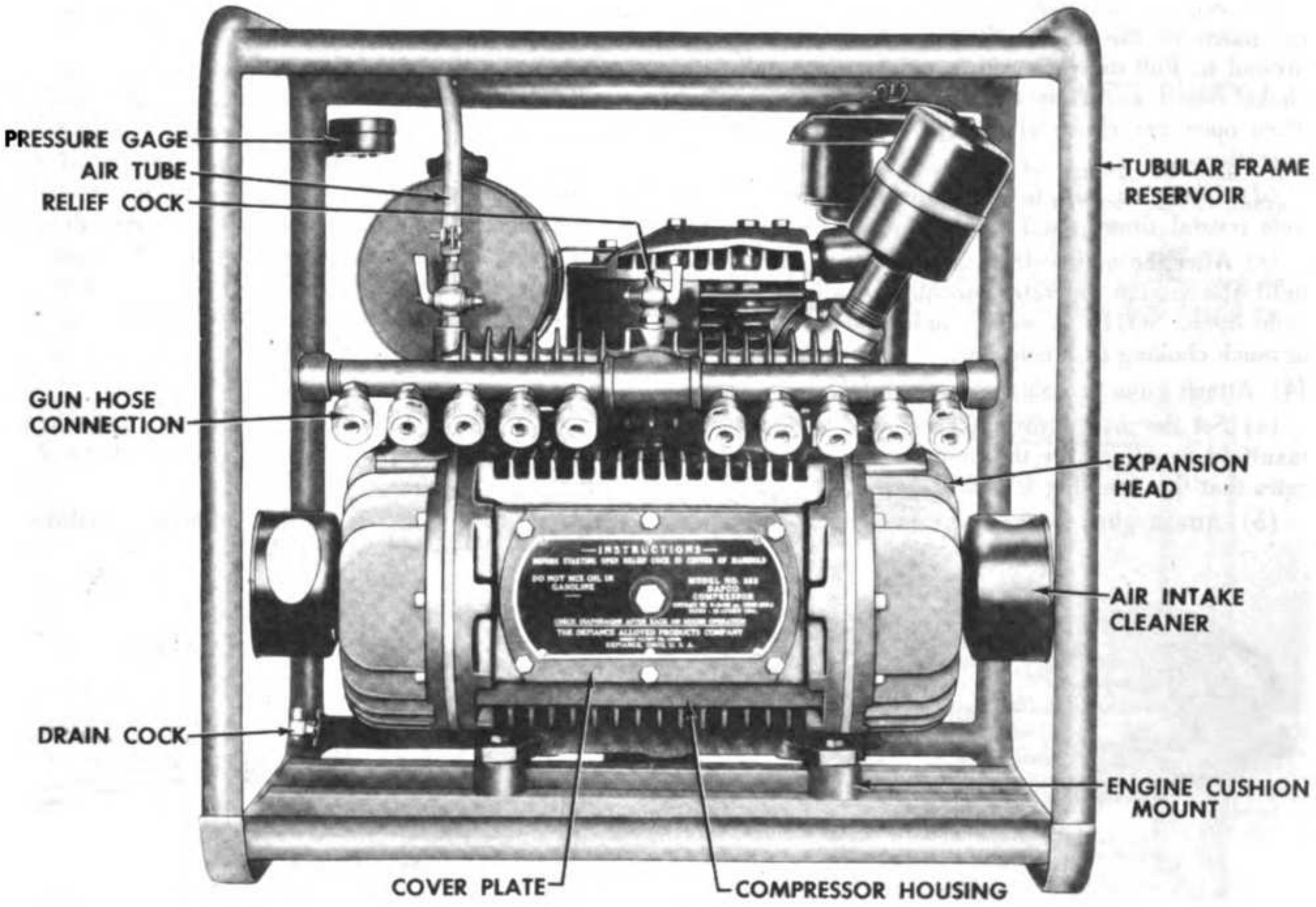

Figure 8—Front of Delousing Outfit

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8. LOCATION OF INSTRUMENT.

a. Air Pressure Gage. The air pressure gage is mounted at the upper left rear corner of the tubular frame reservoir. (See figure 8.)

Section VII. Operation Under Usual Conditions

9. STARTING, OPERATING, AND STOPPING.

a. Starting.

(1) Perform the services outlined in Paragraph 20 before attempting to start the engine.

(2) See that the relief cock on the compressor manifold is in open position. (See figure 8.)

(3) Start the engine.

(*a*) Open the fuel shut-off valve in the strainer. (See figure 6.)

(*b*) Completely close the choke, pulling the lever in a clockwise direction. (See figure 5.)

(*c*) Slip the knotted end of the starter rope into the notch of the starting pulley and wind the rope around it. Pull the rope with a quick steady pull with choke closed to prime the engine. (See figure 10.) Then open the choke about half-way and repeat the operation.

(*d*) If engine fails to start after spinning the engine several times, see Trouble Chart, Paragraph 25.

(*e*) After the engine starts, gradually open the choke until the engine operates smoothly with the choke wide open. NOTE: A warm engine does not require as much choking as a cold one.

(4) Attach guns to compressor manifold.

(*a*) Set the male fitting of each hose in one of the manifold couplings on the compressor. A click indicates that the coupling is locked.

(*b*) Attach guns in the same manner at the other end of the hose. NOTE: Two or more hose sections may be coupled together when longer hose but fewer guns are needed. All couplings are self closing, enabling unit to operate with one or more hose or guns as desired.

(5) Close the relief cock on the compressor manifold.

b. Operating. Press air control valve on gun until desired amount of powder has been ejected.

NOTE: When handling large groups of individuals, keep hose off the ground. Suspend hose over a rope or ropes stretched about eight feet above the ground, but sufficiently far from the compressor to permit the guns to reach the ground easily. Two guns are provided for each hose to make continuous processing possible. The operator using the gun can rapidly uncouple an empty gun and replace it with a full one. The operator of the compressor engine can then fill the dust chamber of the empty gun three-quarters full, making the gun again ready for use. A scoop is provided on the cap. Twenty guns, two for each compressor manifold hose connection, are supplied with the outfit.

c. Stopping.

(1) Press the stop switch plunger on the side of the blower housing as far as it will go, and hold it in until the engine stops.

(2) Open the relief cock on the compressor manifold.

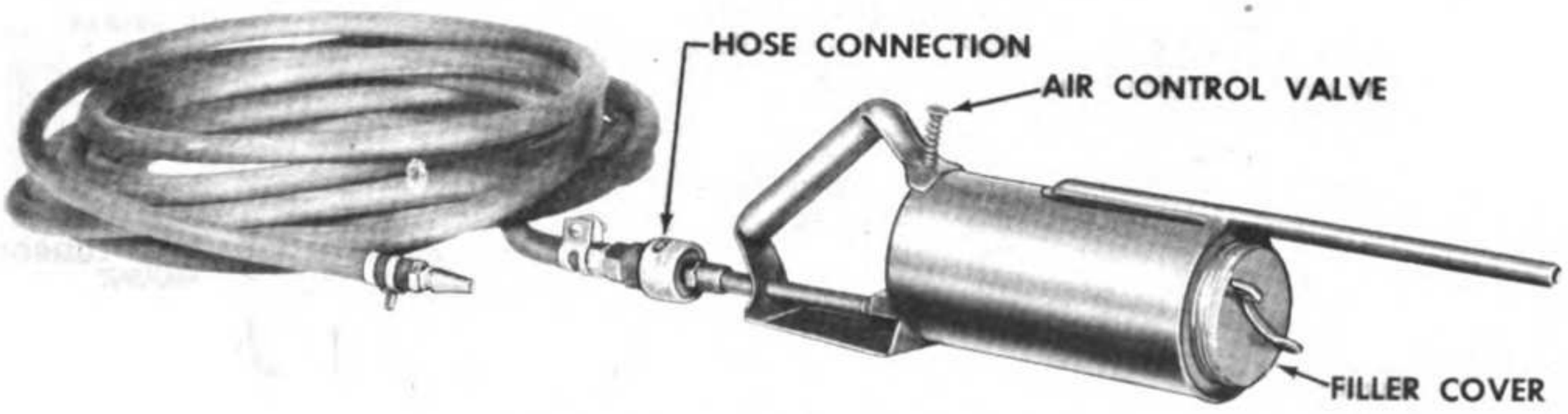

Figure 9—Dusting Gun and Hose

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Section VIII. Operation Under Unusual Conditions

10. OPERATION AND CARE IN EXTREME HEAT.

a. Lubrication. Lubricate in accordance with instructions on Lubrication Order LO 10-1668. (See paragraph 16.)

b. Ignition System. If engine is hard to start, clean and dry the spark plug and the spark plug wire.

c. Fuel System. If carburetor floods in starting, turn choke control lever counterclockwise and turn the starting pulley with the starter rope several times.

11. OPERATION AND CARE IN EXTREME COLD.

a. Storage and Handling of Gasoline. Due to condensation of moisture in the air, water will accumulate and freeze in tanks, drums and other storage containers and clog fuel lines and jets unless the following precautions are taken:

(1) Filter the fuel to prevent the passage of water. CAUTION: Always provide a metallic contact between the container and the tank to assure an effective ground.

(2) Keep tank full, if possible, to reduce the volume of air from which moisture may be condensed.

(3) Be sure that all fuel containers are clean and free of rust.

(4) Keep all closures of containers tight to prevent the entry of snow, ice, dirt, and other foreign matter.

(5) Remove snow or ice from dispensing equipment and from fuel tank filler cap before removing the cap to refuel the outfit.

b. Lubrication. For cold weather lubrication instructions, see paragraph 17.

c. Ignition System.

(1) WIRING. Inspect, clean, and tighten the connection at the spark plug. Be sure no short circuits are present.

(2) SPARK PLUG. Clean, adjust or replace, if necessary. If difficulty is experienced in starting the engine, reduce the gap to .020-inch, .005-inch less than that recommended for normal operation.

d. Starting and Operating Engine.

(1) CHOKE. A full choke is necessary to secure the rich air-fuel mixture required for cold weather starting. See that the choke valve closes and opens completely.

(2) ENGINE AIR CLEANER. Service in accordance with instructions on Lubrication Order LO 10-1668 for temperatures below 0°F. Wash in SOLVENT, dry cleaning; dry, reinstall, and fill.

(3) FUEL SYSTEM. Remove and clean the fuel strainer bowl and screen daily.

12. OPERATION UNDER EXTREMELY DUSTY CONDITIONS.

a. Air Cleaners. Service the engine oil-bath air cleaner and the compressor moss-type air cleaners more frequently than normally required.

b. Cooling System. Keep screen of the engine blower housing free of foreign matter that would restrict air flow.

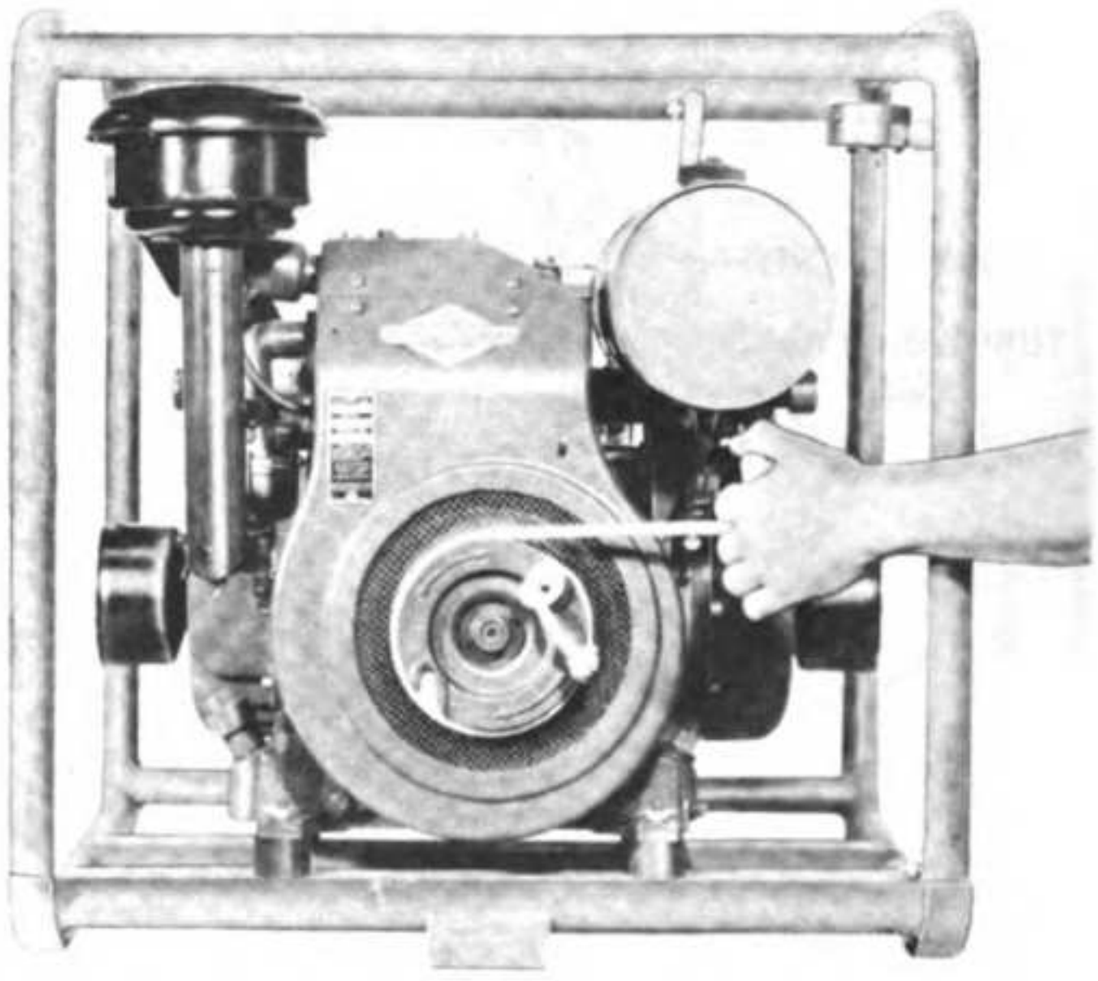

Figure 10—Starting the Engine

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Section IX. Demolition to Prevent Enemy Use

13. ENGINE.

Using a heavy hammer or sledge, smash all engine subassemblies, including the blower housing, carburetor, fuel tank, fuel filter, and air cleaner.

14. COMPRESSOR.

Using a heavy hammer or sledge, smash the manifold, air intake cleaners, expansion heads, air pressure gage, and dusting guns. Cut rubber hose.

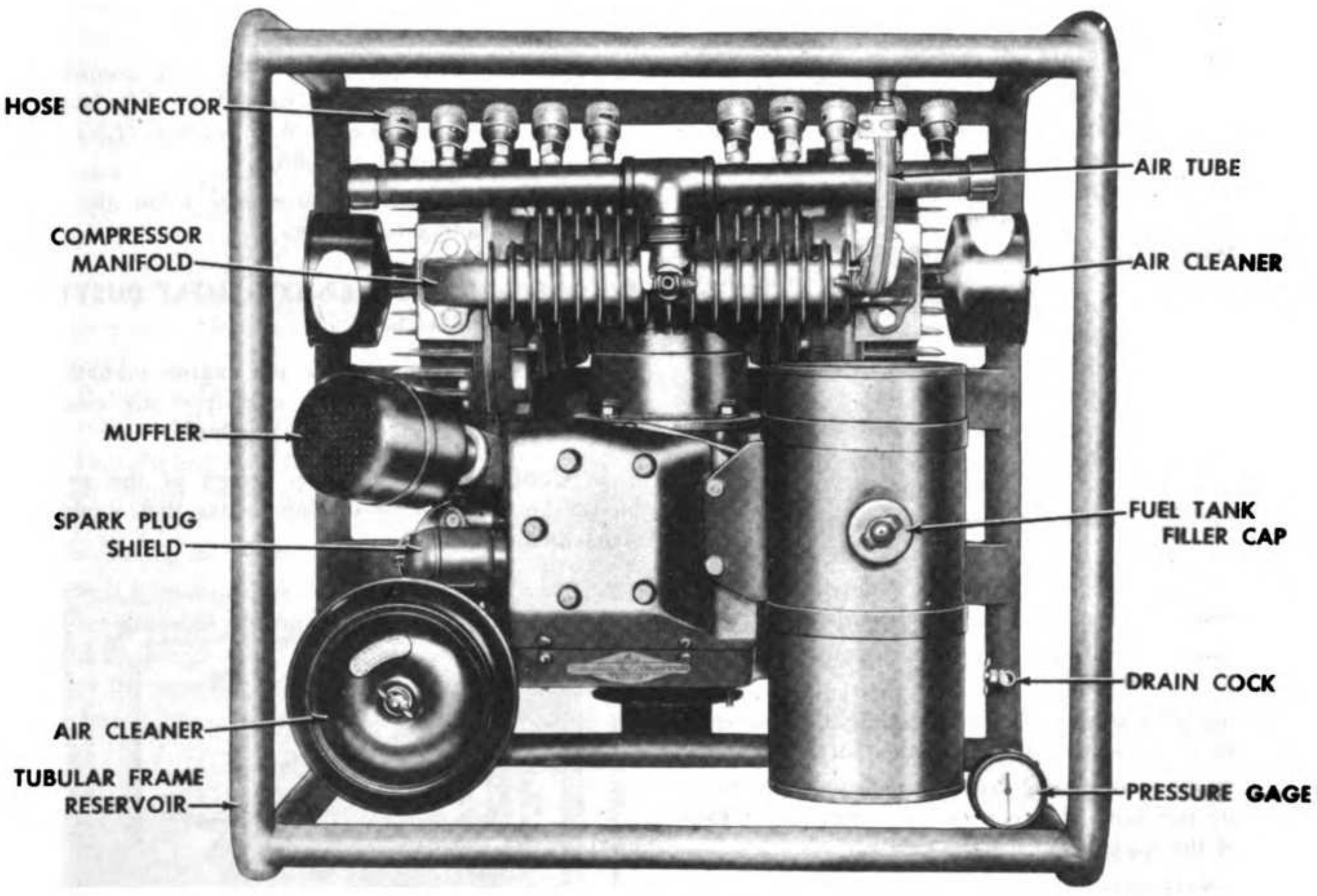

Figure 11—Top of Delousing Outfit

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PART THREE—MAINTENANCE INSTRUCTIONS

Section X. General

15. SCOPE.

Part Three contains information for the guidance of personnel (first and second echelon) of the using organizations responsible for the maintenance of this equipment. It contains information needed for the performance of the scheduled lubrication and preventive maintenance services, as well as descriptions of the major systems and units, and their functions in relation to other components of the equipment.

Section XI. Lubrication

16. LUBRICATION ORDER.

a. War Department Lubrication Order LO 10-1668 prescribes first and second echelon lubrication.

b. A Lubrication Order is to remain with the outfit at all times. If the outfit is received without a Lubrication Order, the using organization shall immediately requisition a copy in conformance with instructions and lists in FM 21-6.

c. Instructions on the Lubrication Order are binding on all echelons of maintenance and there shall be no deviations.

d. Lubrication intervals specified on the Lubrication

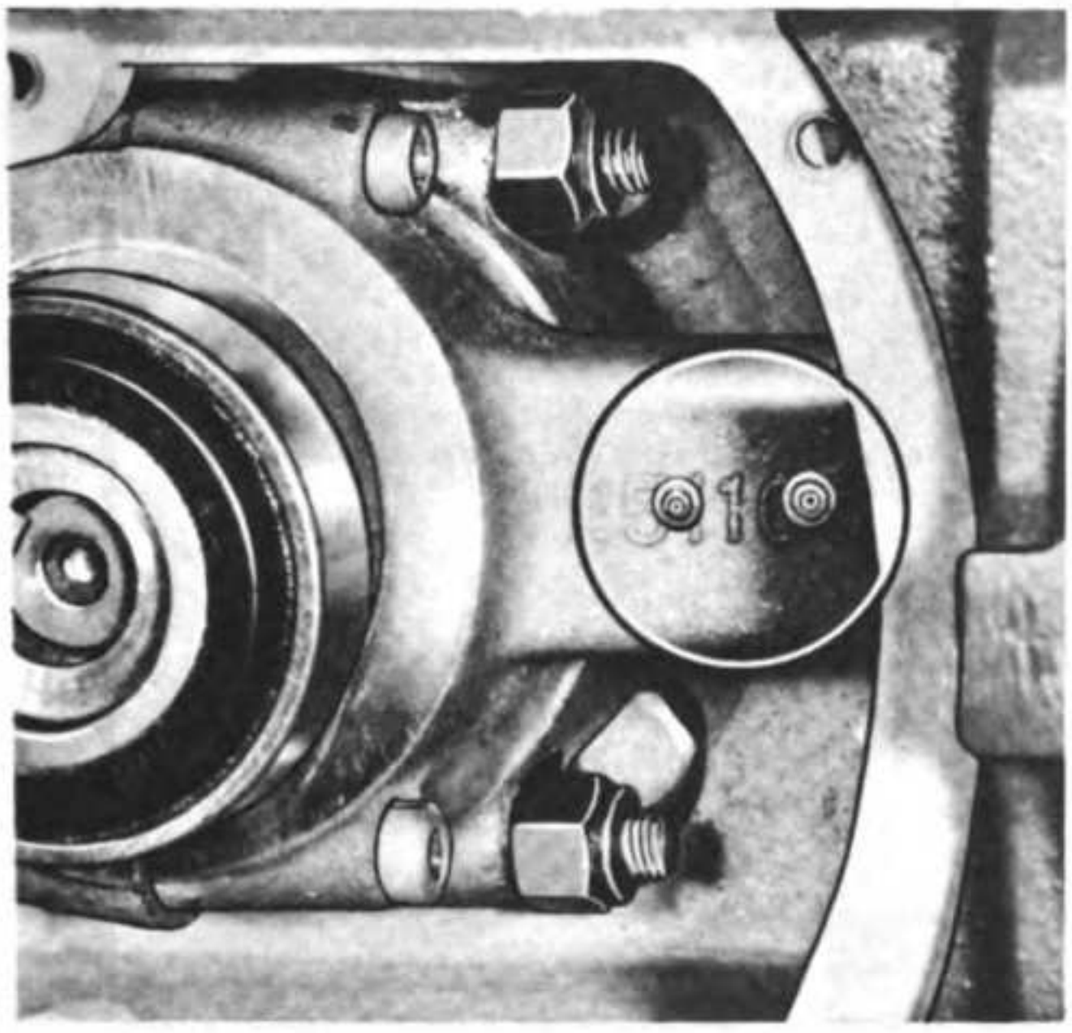

Figure 12—Compressor Bearings

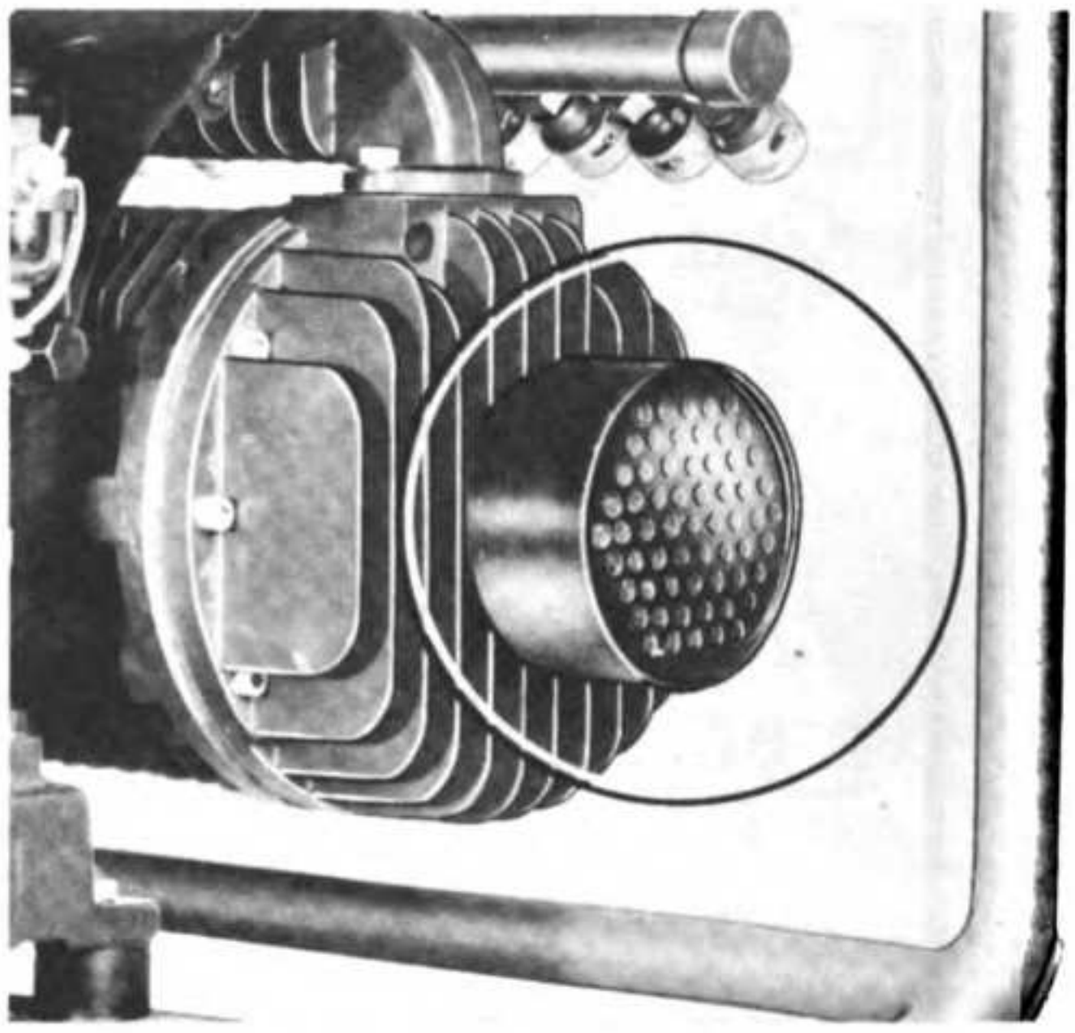

Figure 13—Compressor Air Cleaner

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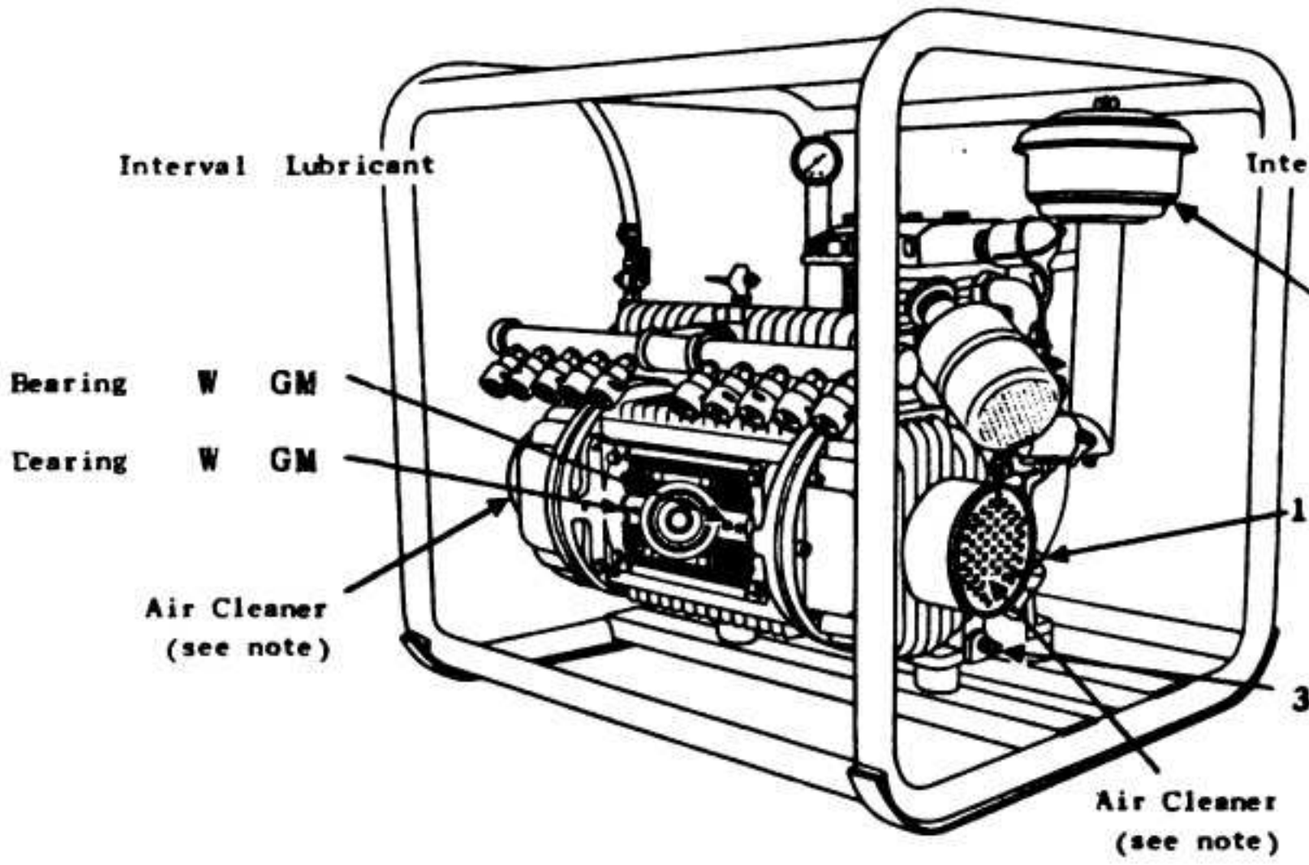
WAR DEPARTMENT LUBRICATION ORDER **LO 10-1668**

28 APRIL 1945

OUTFIT, DELOUSING, GASOLINE-ENGINE DRIVEN (DEFIANCE)

Reference: TM 10-1668



KEY AND NOTES

LUBRICANTS	LOWEST EXPECTED TEMPERATURE		
	above 32° F.	32° F. to 0° F.	below 0° F.
OE - OIL, engine	OE 30	OE 10	see note

ALL TEMPERATURES	INTERVALS
GM - GREASE, special, high temperature	1/2 D - Twice daily D - Daily 3 D - Every 3 days W - Weekly

Clean parts with SOLVENT, dry cleaning. Dry before lubricating.
Reduce intervals under severe operating conditions.

AIR CLEANER - Every week remove the air cleaner from each compressor head and wash in SOLVENT, dry cleaning. Dry thoroughly and replace the cleaner in the heads.

AIR CLEANER (Oil bath type) - Fill to prescribed level with used crankcase oil or OE. Below 0° F. use diluted OE as prescribed for crankcase. Every week remove and wash all parts. Reinstall and fill.

CRANKCASE - Drain when hot. If equipped with magnetic drain plug, wash before reinstalling. Below 0° F. replenish with 2 1/4 pints OE 10. Add 3/4 pint engine fuel to bring to normal level. Operate engine 5 minutes to mix the oil and fuel. Maintain level by adding engine fuel. Drain crankcase at each shut-down period of 5 hours or more and fill as prescribed above.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained herein are mandatory and supersede all conflicting lubrication instructions dated prior to 28 April 1945.

A.G. 300.8 (23 April 1945)

By Order of the Secretary of War:
G. C. MARSHALL,
Chief of Staff.

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

Requisition additional Lubrication Orders in conformance with instructions and lists in FM 21-6.

Figure 14—Lubrication Order

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Order are for normal operating conditions. They should be reduced if the outfit is run during high or low temperatures, at high speed, in sand or dust, immersed in water, or exposed to moisture, any one of which conditions may quickly destroy the protective qualities of the lubricant and require immediate lubrication to prevent damage or failure of the outfit.

e. Lubricants are prescribed in the "Key" on the WDLO in accordance with three temperature ranges: above 32°F., 32°F. to 0°F., and below 0°F. The time to change grades of lubricants is determined by maintaining close observation on the operation of the outfit during the approach to changeover periods. Change should be made *only when air temperatures are constantly in the next higher or lower range.*

17. DETAILED LUBRICATION INSTRUCTIONS.

a. Lubrication Equipment. Each outfit is supplied with lubrication equipment adequate for its lubrication. Clean before and after use. Operate lubricating guns carefully to assure proper application of the lubricant.

b. Points of Application. Lubrication fittings, oil fills and drains, and other points of application are located by reference to the Lubrication Order. Clean them and the surrounding surfaces before applying lubricant.

c. Cleaning and Washing. Use SOLVENT, dry cleaning, or OIL, fuel, Diesel, to clean or wash parts. Use of gasoline for this purpose is prohibited. After cleaning or washing, dry parts thoroughly before applying lubricant.

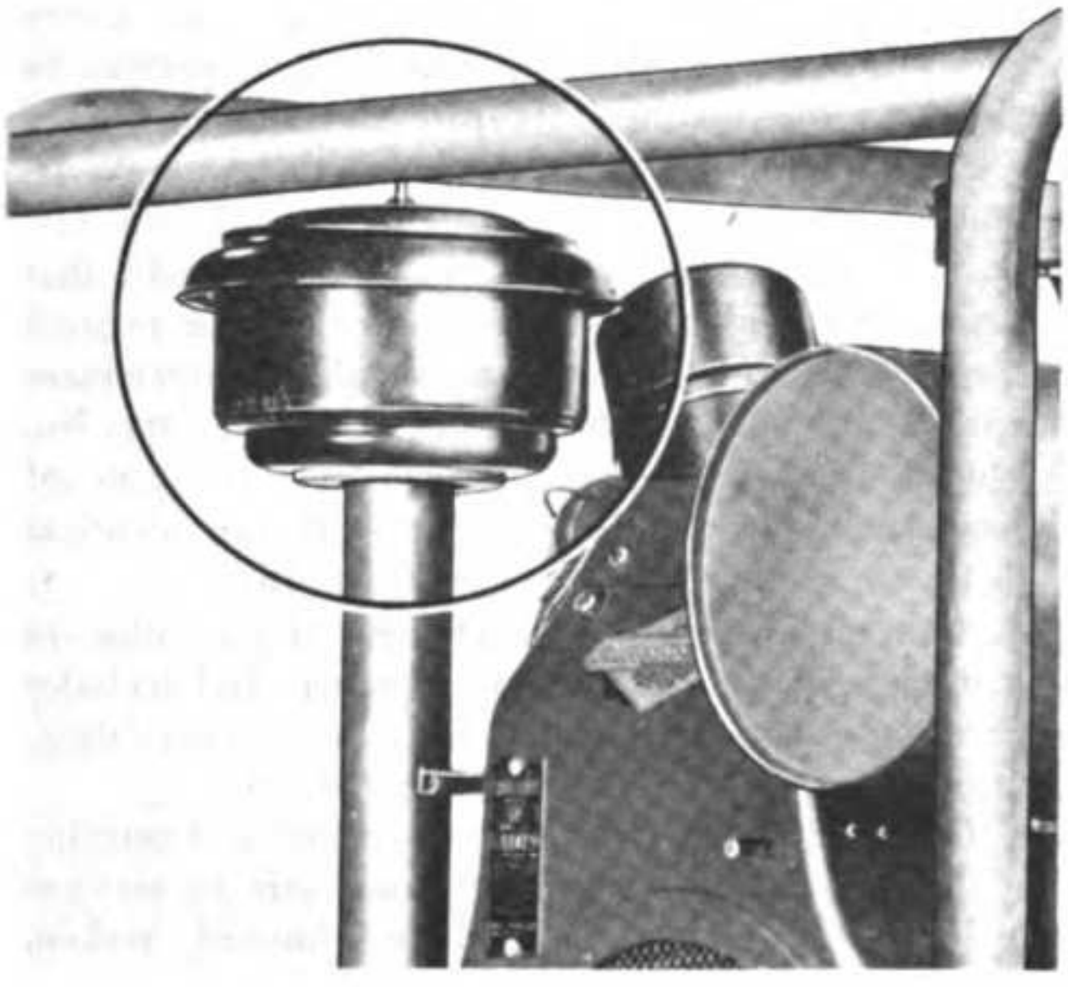

Figure 15—Engine Air Cleaner

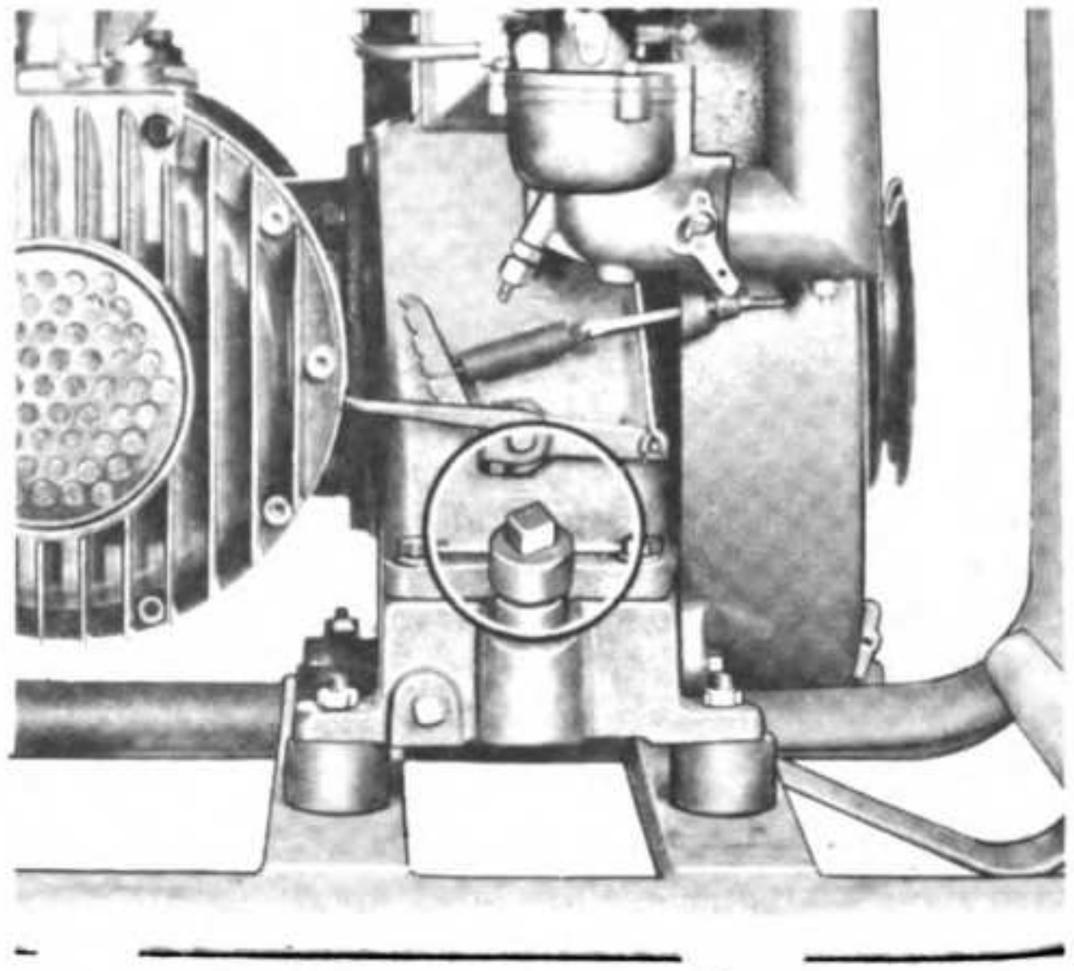

Figure 16—Crankcase Fill

d. Cold Weather Lubrication (0°F. to –65°F.).

(1) GENERAL. Operation of this outfit at subzero temperatures presents problems that require special precautions. Careful lubrication by maintenance personnel is required if damage or failure is to be avoided.

(2) KEEPING CRANKCASE OIL FLUID. Give preference to the following methods in the order listed.

(*a*) Store the outfit in a heated inclosure.

(*b*) When the engine is stopped, drain the oil while hot and store in a warm place until the outfit is to be

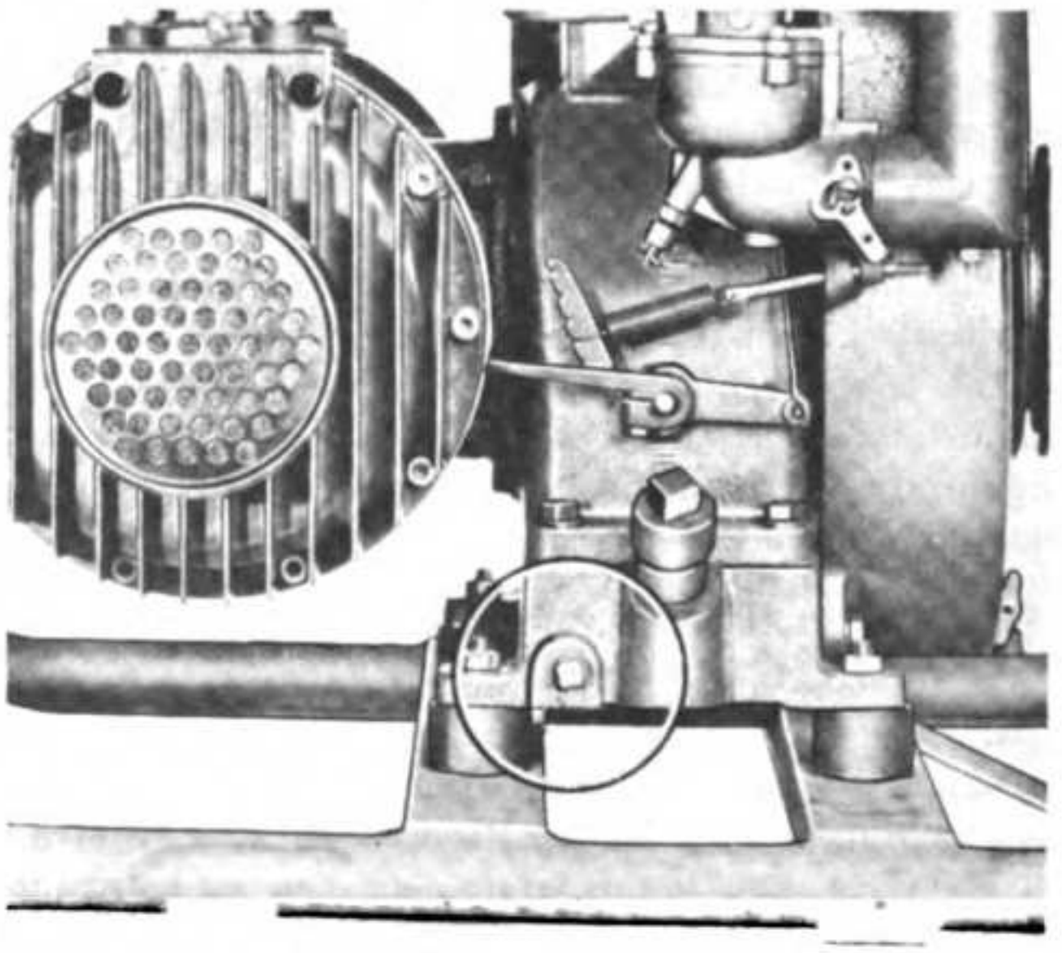

Figure 17—Crankcase Drain

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operated. If warm storage is not available, heat the oil before re-using. Heat only to a temperature at which the bare hand can be immersed without being burned. Attach to the frame of the outfit a tag containing a warning to personnel that the crankcase is empty.

(*c*) Crankcase oil will be diluted with engine fuel. Use the following procedures to provide properly diluted oil for cold startings: Below 0°F. drain and fill with 2¼ pints OE10. Add ¾ pint engine fuel to bring to normal level. Operate engine 5 minutes to mix oil and fuel. Maintain level by adding engine fuel. Drain crankcase at each shut-down period of 5 hours or more and fill as prescribed above.

(*d*) The presence of a large percentage of light diluent will increase oil consumption and, for that reason, the oil level should be inspected frequently.

e. Individual Lubrication Notes. The following instructions supplement the notes on the Lubrication Order.

(1) BEARINGS. Every week the cover plate on the compressor of outfits carrying serial numbers above 3179 should be removed. This will expose the connecting rods with four lubrication fittings. The two outside fittings lubricate needle bearings while the inner two lubricate ball bearings. GREASE should be applied to these fittings and the cover plate reinstalled in its original position. NOTE: Outfits with lower serial numbers do not carry grease fittings on compressor connecting rods.

f. Reports and Records.

(1) Report unsatisfactory performance of outfit and lubricants on Unsatisfactory Equipment Report (WD AGO Form 468) to the Maintenance and Equipment Branch, Service Installations Division, Office of The Quartermaster General, in accordance with instructions on the face of the form.

(2) A record of lubrication will be maintained in the Preventive Maintenance Roster (WD AGO Form 460).

Section XII. Preventive Maintenance Services

18. SCOPE AND DESCRIPTION.

To insure mechanical efficiency, it is necessary that the equipment be systematically inspected at specified intervals to disclose and correct defects before they result in damage or failure. Certain scheduled services will be performed at those designated intervals. The services set forth in this section are those performed by the operator before and during operation, by the maintenance mechanic after operation, and by the organizational maintenance personnel at weekly and monthly intervals.

19. FIRST ECHELON PREVENTIVE MAINTENANCE SERVICES.

a. Operator preventive maintenance services are listed on the back of "Driver's Trip Ticket and Preventive Maintenance Service Record," W. D. Form No. 48. Items peculiar to this equipment, but not listed on W. D. Form 48, are covered in procedures under the items to which they apply. Certain items listed on the form that do not pertain to this equipment are eliminated from the procedures in this manual. Every organization must thoroughly school each operator in performing the maintenance procedures set forth in this manual, whether or not they are listed on W. D. Form No. 48.

b. The items listed on W. D. Form No. 48 that apply to this equipment are expanded in this manual to provide specific procedures. Scheduled procedures are in the numerical order shown on W. D. Form No. 48 to facilitate inspection and conserve the time of the operator. The numbers of the items are identical with those shown on W. D. Form No. 48.

c. General inspection of each item applies, also, to any subassembly or supporting member, and includes an inspection to see that the item is in good condition, correctly assembled, secure, and not worn.

(1) GOOD CONDITION. An inspection to determine that the item is not damaged beyond safe or serviceable limits, not bent, twisted, chafed, burned, broken, cracked, bare, frayed, dented, collapsed, torn, or cut.

(2) CORRECTLY ASSEMBLED. An inspection to

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determine that the unit is in its correctly assembled position on the equipment.
(3) SECURE. A wrench, hand-feel or pry-bar inspection for looseness, including brackets, lockwashers, lock nuts, or cotter pins used in assembly.
(4) WORN. Worn close to or beyond serviceable limits, and likely to result in failure if not replaced.

d. Any defects or unsatisfactory operating characteristics beyond the scope of the first echelon to correct must be reported at the earliest opportunity to the designated individual in authority.

20. BEFORE-OPERATION SERVICE.

a. General. This is primarily an inspection to see that the equipment has not been damaged, tampered with, or sabotaged.

b. Procedures. "Before-Operation Service" consists of inspecting items listed below according to the procedures described, and correcting any deficiencies. Upon completion of the inspection, results should be reported promptly to the designated individual in authority.
(1) ITEM 1, TAMPERING AND DAMAGE. Inspect for any injury to the equipment or its subassemblies caused by tampering or sabotage. Inspect for loosened or damaged engine, subassemblies, loose spark plug wire, fuel line, or disconnected control linkages. Make a finger test of oil to detect the presence of foreign abrasives. Inspect fuel level.
(2) ITEM 3, FUEL AND OIL SUPPLY. Inspect fuel tank and crankcase for leaks or tampering. Add fuel or oil as required.
(3) ITEM 4, SUBASSEMBLIES. Inspect the carburetor, fuel filter, air cleaner, and muffler for looseness, damage, or leaks.
(4) ITEM 6, LEAKS, GENERAL. Observe under the equipment for leaks, particularly at fuel tank, fuel filter, crankcase, and fuel line. Trace leaks to source and report to designated individual in authority.
(5) ITEM 7, ENGINE WARM-UP. NOTE: Be sure the relief cock in the compressor manifold is open. Start the engine; listen for unusual noise and observe the starting speed. Proceed immediately with the following services while engine is warming up:
(6) ITEM 8, CHOKE. As the engine warms up, gradually reset the choke as required to operate engine smoothly and to prevent carburetor flooding and oil dilution.
(7) ITEM 19, FRAME. Inspect the tubular frame reservoir for damage, loose connections, or loose engine mountings.
(8) ITEM 22, ENGINE OPERATION. The engine should operate smoothly under load with the choke fully released.
(9) ITEM 23, LUBRICATION ORDER. See that Lubrication Order LO 10-1668 is present, legible, and properly applied.
(10) ITEM 25, DURING-OPERATION CHECK. Begin the "During-Operation Service" as soon as the equipment is put in operation.

21. DURING-OPERATION SERVICE.

a. General. While the outfit is running, listen for unusual rattles, knocks, squeaks, or hums, escaping air from the compressor system, and smoke from any part of the equipment. Be alert to detect any odor or overheated items such as bearings, fuel (from leak in fuel system), or other such signs of trouble.

b. Procedures. "During-Operation Service" consists of observing the following items according to procedures described below, stopping the engine if trouble develops, and noting minor deficiencies to be reported at the earliest opportunity.
(1) ITEM 31, ENGINE. Be alert for deficiencies in engine performance, such as lack of usual power, misfiring, unusual noise, or stalling, indications of engine overheating, or unusual exhaust smoke.
(2) ITEM 35, FRAME. Inspect engine mountings and connections at the air hose and air pressure gage for looseness.

22. AFTER-OPERATION SERVICE.

a. General. When performing the "After-Operation Service," the maintenance mechanic must consider any irregularities reported during the day in the "Before-Operation Service" and "During-Operation Service."

b. Procedures. "After-Operation Service" consists of inspecting the following items according to the procedures described below and correcting deficiencies. Upon completion of these services, results must be reported promptly to the designated individual in authority.
(1) ITEM 54, FUEL AND OIL. Fill fuel tank, observing safety precautions for grounding static electricity. Inspect oil level; add lubricant as required.
(2) ITEM 55, ENGINE OPERATION. Observe whether the engine runs satisfactorily. Watch for misfiring, backfiring, or unusual noise or vibration indicating worn parts, loose mountings, incorrect fuel mixture, or faulty ignition. Correct or report unsatisfactory engine operating characteristics noted during operation.

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(3) ITEM 63, SUBASSEMBLIES. Inspect the caburetor, fuel filter, and air cleaner for loose connections or mountings.
(4) ITEM 64, ELECTRICAL WIRING. See that spark plug wire is securely connected, clean and not damaged.
(5) ITEM 65, AIR CLEANER. Inspect oil level of engine air cleaner for correct level. If the oil in the cleaner is dirty, clean and fill in accordance with Lubrication Order LO 10-1668.
(6) ITEM 66, FUEL FILTER. Inspect the sediment bowl. If water or dirt is present, remove bowl and drain; clean screen before reinstalling bowl.
(7) ITEM 73, LEAKS, GENERAL. Inspect under the equipment for fuel or oil leaks. Inspect for air leaks at the compressor manifold, relief cock and air hose. Trace leaks to their source, and correct or report them.
(8) ITEM 78, FRAME. Inspect the tubular frame reservoir for damage, loose connections, or loose engine mountings.
(9) ITEM 82, TIGHTEN. Tighten all loose nuts, or other points as required. Replace damaged parts, or missing bolts, lockwashers, or nuts.
(10) ITEM 84, CLEAN. Remove dirt or grease from the exterior of the engine, compressor, frame, hose, and dusting guns. Wash equipment; wipe off thoroughly.

23. SECOND ECHELON PREVENTIVE MAINTENANCE SERVICES.

a. General. Regularly scheduled maintenance inspections and services are a preventive maintenance function of the using organizations, and are the responsibility of the commanders of operating organizations or installations.

b. Frequency. The frequencies of preventive maintenance services specified herein are considered a minimum requirement for normal operation of the equipment. NOTE: Under unusual operating conditions, it may be necessary to perform the maintenance services more frequently.

c. Instructions. If instructions other than those contained in the general procedures in step *d.* below, or the specific procedures in step *e.* below are required for the correct performance of a preventive maintenance service, or the correction of a deficiency, consult other sections of this manual pertaining to the item involved or a designated individual in authority.

d. General Procedure. General procedures are basic instructions which are to be followed when performing the services on the item listed in the specific procedures. NOTE: Second echelon personnel must be so trained in these procedures that they will apply them automatically.

(1) When new or repaired subassemblies are installed, they must be clean, correctly installed, properly lubricated and adjusted.
(2) When installing new lubricant retainer seals, wipe a coating of the lubricant over the sealing surface of the lip of the seal.
(3) The general inspection of each item applies also to any supporting member or connection, and usually includes an inspection to see that the item is in good condition, correctly assembled, secure, and not worn.
(*a*) *Good Condition.* An inspection to determine that the item is not damaged beyond safe or serviceable limits, not bent, twisted, chafed, burned, broken, cracked, bare, frayed, dented, collapsed, torn, or cut.
(*b*) *Correctly Assembled.* An inspection to determine that the unit is in its correctly assembled position on the equipment.
(*c*) *Secure.* A wrench, hand-feel, or pry-bar inspection for looseness, including brackets, lockwashers, or cotter pins used in assembly.
(*d*) *Worn.* Worn close to or beyond serviceable limits, and likely to result in failure if not replaced.
(4) SPECIAL SERVICES. These are indicated by repeating the item numbers in the columns which show the interval when the services are to be performed, and indicate the items to receive certain mandatory services. For example, an item number in one or both columns opposite a "Tighten" procedure means that the item must be tightened. The special services include:
(*a*) *Adjust.* Make all necessary adjustments in accordance with pertinent sections of this manual, special bulletins, or other current directives.
(*b*) *Clean and Wash.* Clean or wash parts and items of the equipment with SOLVENT, dry cleaning, to remove lubricant and dirt. After parts and items are washed or cleaned, dry them thoroughly. Keep cleaning fluid away from rubber or other material which it may damage. Remove protective coating from new parts because it is not a lubricant.
(*c*) *Special Lubrication.* This applies to lubrication operations that appear on the Lubrication Order and to items that do not appear on Lubrication Order but which should be performed in connection with the maintenance operations if parts are disassembled for inspection or maintenance.
(*d*) Serve. Perform operations such as draining and filling items with oil.
(*e*) *Tighten.* Perform with sufficient wrench torque to tighten the unit according to good mechanical practice. Use a torque-indicating wrench where specified. Tightening includes the necessary and correct installation of lockwashers and cotter pins.
(5) CONDITIONS. When conditions make it difficult

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to perform the complete preventive maintenance service at one time, the procedures can sometimes be handled in sections; plan to complete all procedures within the week.

(6) FORM. The numbers of the preventive maintenance procedures are identical with those outlined on W. D., A. G. O. Form No. 461, which is the Preventive Maintenance Service Work Sheet for Wheeled and Half-Track Vehicles. Certain items on this form not applicable to this equipment are not included in the maintenance procedures in this manual. The numerical sequence of items on the work sheet is followed in the manual procedures, but in some instances there is deviation for conservation of the mechanic's time.

e. Specific Procedures. The procedures for performing each item in the weekly and monthly maintenance procedures are described on the following schedule. Each page of the schedule has two columns at the left edge corresponding to the monthly and the weekly maintenance, respectively. Frequently a specific procedure may not apply to both scheduled intervals. To determine which procedure to follow, look down the column corresponding to the maintenance due, and where an item number appears, perform the operations indicated opposite that item number.

MAINTENANCE	
Monthly	*Weekly*
1	1
9	9
10	10
14	14
18	18
19	19
19	
	20
20	
20	

WORK TEST

NOTE: Work test, of not less than 15 *minutes nor more than* 30 *minutes duration, should include the operation of the outfit with dusting guns.*

Before-Operation Service. Perform the Before-Operation Service as outlined in Paragraph 20.

Engine. Observe engine operating characteristics; listen for knocks and rattles.

Unusual Noises. Be continually alert for unusual noises indicating loose parts or damaged units.

Leaks. Inspect the engine and below the engine for oil and fuel leaks.

Cylinder Head and Gasket. Inspect for cracks or indications of oil or compression leaks around capscrews, studs and gasket.

CAUTION: Cylinder heads should not be tightened unless there is a definite indication of looseness or leaks. To tighten, use a torque-indicating wrench and tighten to 200*-inch pounds tension; tighten in the sequence shown in figure* 18. *When a new gasket is installed, tighten two times, as follows: First, upon installation; second, after engine is hot. Adjust the valve lifter clearances to specifications after the final tightening.*

Valve Mechanism. Inspect valve lifter clearances while cold. The exhaust valve clearance should be .008-inch; the intake valve clearance should be .010-inch. Valve lifters, shafts and springs should be in good condition, correctly assembled, and secure. Be sure that the valve cover gasket is in good condition.

ADJUST. Adjust valve lifter clearances—exhaust valves to .008-inch and intake valves to .010-inch.

Spark Plug. Wipe off plug without removing from cylinder head. Inspect spark plug to see that the insulator is in good condition and clean, and that there is no leakage around the insulator or gasket. Replace defective plug.

Remove the spark plug and examine for condition, particularly for broken insulator, carbon deposit, and burned electrodes. Replace unserviceable plug. Report excessive deposit or damaged insulator to designated individual in authority.

CLEAN. Clean deposits from electrodes and insulator, and reinspect for cracks. If a sand blast cleaner is not available, replace plugs.

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MAINTENANCE	
Monthly	*Weekly*
20	
21	
23	23
28	28
28	28
32	32
33	33
33	
34	34
34	34
35	35
36	36
37	37
37	37
40	40
41	41
42	42
42	42
63	63

ADJUST. Adjust gaps to .025-inch for normal operation, or .020-inch for cold-weather operation by bending the grounded electrode. Reinstall the plug, using new gasket. Do not overtighten.

Compression Test. Inspect the engine to determine whether it bounces back freely when pulled up smartly against compression, and then releases.

Crankcase. *NOTE: If an oil change is due, follow instructions in Lubrication Order.*

Compressor. Wipe the compressor clean; inspect for leaks at manifold valves, gaskets, air hose to tubular frame reservoir, and hose couplings. Correct leaks.

SERVE. Remove air intake cleaner from both compressor expansion heads and wash in SOLVENT, dry cleaning. Dry thoroughly and reinstall.

Wire. Inspect wire for good condition, secureness of terminals, and cleanliness of insulation and connections.

Manifold. Inspect intake manifold to see that it is in good condition and secure. Inspect gasket between carburetor and elbow for good condition and leaks.

TIGHTEN. Secure muffler nipple and carburetor connecting flange nuts carefully.

Air Cleaner. Remove the engine air cleaner element. See that the gasket is present and in good condition. Inspect the cleaning element, baffle and body, and reservoir for good condition.

CLEAN AND SERVE. Follow instructions on Lubrication Order. Reinstall the air cleaner securely; be sure the gasket is in good condition and secure.

Breather. Disassemble breather and install new sisal filtering material; wash out old sisal thoroughly in SOLVENT, dry-cleaning, if new sisal is not available.

Carburetor. See that choke, linkage, and governor are in good condition, correctly assembled and securely installed; that the carburetor does not leak; and that the control linkage is not worn.

Fuel Filter, Screen, and Line. See that the fuel filter sediment bowl, fuel line and connections are in good condition, secure, and not leaking.

CLEAN. Close the fuel shut-off valve, and remove fuel strainer sediment bowl; clean the bowl and screen. Reinstall the screen and bowl, using a new gasket. Open the fuel shut-off valve after installing, and reinspect for leaks.

Leaks. Inspect under the unit for engine oil or fuel leaks. Trace all leaks to their source, and report or correct them.

Ignition Timing. Check ignition timing.

Engine Idle Test. Observe whether the engine idles smoothly at normal idle speed.

ADJUST. Adjust the engine to its normal idle speed by means of the throttle stop screw.

Engine Mountings. Inspect engine mountings; tighten if loose.

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MAINTENANCE	
Monthly	*Weekly*
80	80
81	81
82	82
82	
84	84
85	85
103	103
135	135
141	141
142	142

Frame. Inspect tubular frame for good condition; if frame appears to be out of line or otherwise damaged, report to designated individual in authority.

Wiring. Inspect spark plug wire to see that it is in good condition, properly connected and secure.

Fuel Tank, Fittings and Line. Inspect fuel tank to see that it is in good condition and securely mounted. Examine cap for defective gasket. Check fuel line to see that it is in good condition, securely supported, and not leaking.

Remove fuel strainer bowl and drain off accumulated water and sediment from fuel tank. Drain only until fuel starts to run clear.

Exhaust Pipe and Muffler. Examine exhaust nipple to see that it is securely attached to block and to muffler. Examine muffler to see that it is in good condition.

Lubricate. Lubricate in accordance with Lubrication Order LO 10-1668.

Paint and Markings. Inspect paint for good condition, and equipment markings and identification for legibility.

Publications. The Lubrication Order must be present, legible and properly applied.

Modifications (completed). Be sure all Modification Work Orders have been completed; enter modifications or major unit replacements made at time of this service on W.D., A.G.O. Form No. 478.

Final Work Test. Perform final work test, reinspecting items 9, 10, and 14. Confine test to minimum time necessary for satisfactory observations. Correct or report all defects found during final work test to designated individual in authority.

Section XIII. Trouble Shooting

24. DESCRIPTION OF SCHEDULE.

a. The following schedule of trouble shooting and remedies will aid in determining the cause of unsatisfactory operation. A separate list is provided for each unit. If the remedy is not given, reference is made to a paragraph where complete information will be found.

b. The information in this section applies to operation of the equipment under usual conditions. Unusual conditions require precautions outlined in Section VIII.

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25. TROUBLE SHOOTING SCHEDULE.

Symptom	*Possible Cause*	*Remedy*
(1) ENGINE DIFFICULT TO START.	No fuel in tank.	Replenish fuel supply.
	Fuel flow obstructed.	Clean fuel filter and line. (See paragpragh 32.)
	Loose or defective wiring.	Repair or replace.
	Spark plug cracked.	Replace. (See paragraph 30.)
	Spark plug fouled.	Clean or replace. (See paragraph 30.)
	Improper fuel mixture.	Adjust carburetor. (See paragraph 32.)
	Throttle valve stuck or out of adjustment.	Free or adjust.
	Throttle valve loose.	Tighten.
	Valvė seats bad.	Grind valves.
	Valves sticking.	Free and clean. (See paragraph 29.)
	Improper timing.	Retime. (See paragraph 30.)
	Magneto breaker points worn or pitted.	Repair or replace. (See paragraph 30.)
	Magneto breaker points out of adjustment.	Adjust. (See paragraph 30.)
	High tension wire shorted.	Repair or replace. (See paragraph 30.)
(2) ENGINE MISFIRING.	Spark plug fouled.	Clean or replace. (See paragraph 30.)
	Spark plug cracked.	Replace. (See paragraph 30.)
	Incorrect spark plug gap.	Adjust. (See paragraph 30.)
	Defective wiring.	Repair or replace. (See paragraph 30.)
	Ignition breaker points sticking.	Free and adjust. (See paragraph 30.)
	Valves warped or broken.	Replace. (See paragraph 29.)
(3) ENGINE LOSING POWER.	Carburetor choke valve partly closed.	Open.
	Improper fuel mixture.	Adjust carburetor. (See paragraph 32.)
	Piston rings sticking.	Report to designated individual in authority. (See paragraph 52.)
	Improper timing.	Retime. (See paragraph 30.)
	Muffler clogged.	Clean muffler.
	Governor or throttle loose.	Tighten.
	Air cleaner requires cleaning.	Clean. (See paragraph 31.)
	Cooling air stream obstructed or restricted.	Remove obstruction.

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Symptom	*Possible Cause*	*Remedy*
(4) ENGINE KNOCKS.	Carbon in cylinder.	Report to designated individual in authority. (See paragraph 52.)
	Loose main bearings.	Report to designated individual in authority. (See paragraph 52.)
	Loose rod bearings.	Report to designated individual in authority. (See paragraph 52.)
	Worn piston and cylinder.	Report to designated individual in authority. (See paragraph 52.)
	Engine overheated.	Inspect oil level. (See Lubrication Order.)
	Tight pistons.	Report to designated individual in authority. (See paragraph 52.)
	Loose flywheel.	Tighten. (See paragraph 30.)
	Lack of oil.	Inspect oil level. (See Lubrication Order.)
(5) FAULTY CARBURETOR.	Carburetor improperly adjusted.	Adjust. (See paragraph 32.)
	Valve leaking.	Grind valves. (See paragraph 29.)
	Shut-off valve closed.	Open.
	Sediment or water in fuel tank.	Clean. (See paragraph 32.)
(6) EXCESSIVE SMOKE.	Carburetor needle valve open too far.	Adjust. (See paragraph 32.)
	Carburetor float sticking or leaking.	Replace carburetor. (See paragraph 32.)
	Worn piston or piston rings.	Report to designated individual in authority. (See paragraph 52.)
(7) BACKFIRING.	Gas mixture too lean.	Adjust carburetor. (See paragraph 32.)
	Intake valve sticking.	Free valve. (See paragraph 29.)
	Intake lifter sticking.	Free. (See paragraph 29.)
	Intake valve warped or broken.	Replace. (See paragraph 29.)
	Intake lifter set too close.	Adjust. (See paragraph 29.)
(8) POOR COMPRESSION.	Valves not seating.	Grind valves.
	Valves sticking.	Free valves. (See paragraph 29.)
	Piston rings worn or weak.	Report to designated individual in authority. (See paragraph 52.)
	Piston rings broken.	Report to designated individual in authority. (See paragraph 52.)
	Piston rings sticking.	Report to designated individual in authority. (See paragraph 52.)
	Loose spark plug.	Tighten.
	Cylinder head loose.	Tighten. (See paragraph 27.)
	Scored cylinder.	Report to designated individual in authority. (See paragraph 52.)
	Worn piston and cylinder.	Report to designated individual in authority. (See paragraph 52.)
(9) COMPRESSOR BUILDS UP RESERVOIR PRESSURE SLOWLY.	Leaking lines or connections.	Repair or replace.
	Leaking compressor manifold gaskets.	Replace. (See paragraph 36.)
	Clogged air intake strainer.	Clean. (See paragraph 35.)
	Worn diaphragms.	Replace. (See paragraph 39.)
	Intake and check valves not seating properly.	Replace. (See paragraph 38.)

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Section XIV. Engine—Description, Data, Maintenance and Adjustment

26. DESCRIPTION AND TABULATED DATA.

a. Description. The single-cylinder, four-cycle, L-head internal combustion engine is secured to four rubber cushion mounts attached to the tubular reservoir frame. (See figure 8.)

b. Tabulated Data.

Model	Briggs & Stratton BP
Type	L-head
Number of cylinders	1
Bore	2⅝ in.
Stroke	2⅝ in.
Piston displacement, cubic inches	14.21
Cooling	Air
Lubrication	Pump and splash
Rotation (viewed from power take-off side)	Counterclockwise
Valve lifter clearance, cold:	
Intake valve	.010 in.
Exhaust valve	.008 in.

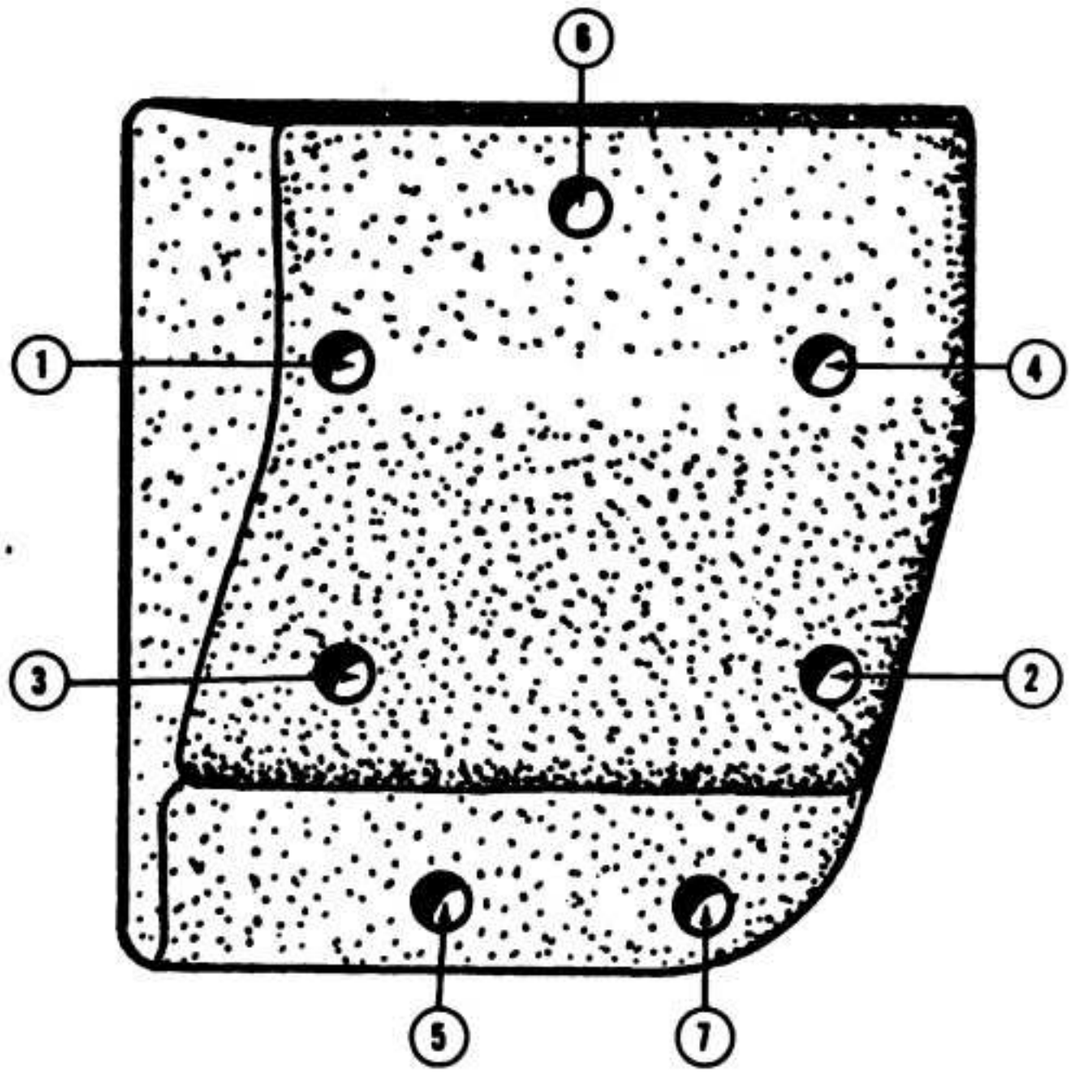

Figure 18—Cylinder Heat Tightening Chart

27. CYLINDER HEAD GASKET.

a. Removal.

(1) Remove the spark plug shield (see figure 11) and the spark plug. (See paragraph 30.)
(2) Remove the seven capscrews securing cylinder head; lift off the head and remove the gasket.

b. Inspection.

(1) Scrape off accumulated dirt, grease and oil; blow out air passages to permit free circulation of air and prevent engine overheating.
(2) Inspect spark plug hole to see that threads are not stripped.

c. Installation.

(1) Position a new gasket on the cylinder block. NOTE: If a new gasket is not available, clean the old one and coat both sides with grease; do not use shellac.
(2) Position the cylinder head and fuel tank mounting bracket; install the cylinder head capscrews, using spacers under the five that pass through the heavy portion of the head. Tighten capscrews a little at a time, in rotation as shown in figure 18, until secure; do not exert more than 200 inch pounds of pressure.
(3) Install the spark plug and spark plug shield. (See paragraph 30.)

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28. VALVE COVER GASKET.

a. Removal.

(1) Remove the carburetor and air cleaner as an assembly. (See paragraph 32.)
(2) Remove the valve cover plate screw; lift off the plate and gasket.

b. Installation.

(1) Position a new gasket and the valve cover plate on the crankcase; install the valve cover screw with a washer and secure.
(2) Install the carburetor and air cleaner. (See paragraph 32.)

29. VALVE LIFTER ADJUSTMENT.

a. Inspecting Adjustment.

(1) Remove the carburetor and air cleaner as an assembly. (See paragraph 32.)
(2) Remove the valve cover plate screw; lift off the plate and gasket.
(3) Inspect valve lifter clearance by inserting a feeler gage between the valve stem and lifter. (See figure 19.) Clearances, with engine cold, should be .010-inch for the intake valve; .008-inch for the exhaust valve.

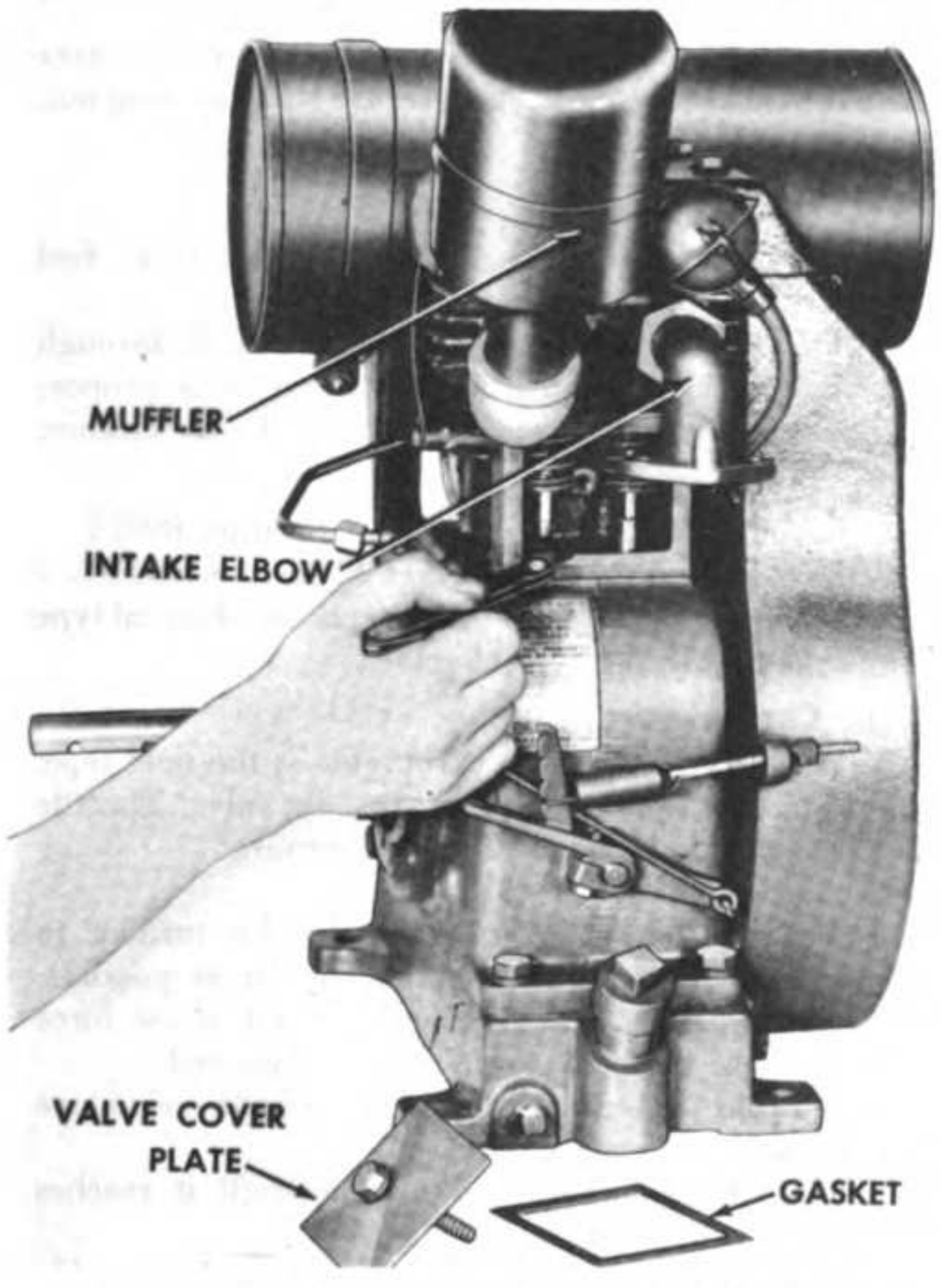

Figure 19—Inspecting Valve Lifter Clearance

b. Adjusting Valves.

(1) Remove the muffler and intake elbow. (See figure 19.)
(2) Remove the cylinder head. (See paragraph 27.)
(3) Use a valve spring compressor to compress the valve spring; pry out the split retainer collars and lift the valve from the crankcase.
(4) Grind the end of the valve stem to obtain the proper clearance. Be sure the end of the stem is square with the stem proper.
(5) Install the valve, as follows:
(*a*) Drain the oil and invert the crankcase.
(*b*) Position the valve spring and retainer in the compressor and compress as much as possible. Place the tool into valve chamber, and slip valve into place. Slip one-half of the retainer collar into its groove in valve stem and move toward the rear of the valve chamber; then insert the other half. Release the spring compressor.
(6) Install the muffler and intake elbow.
(7) Install the cylinder head. (See paragraph 27.)
(8) Position a new gasket and the valve cover plate on the crankcase; install the valve cover screw with a washer and secure.
(9) Install the carburetor and air cleaner. (See paragraph 32.)

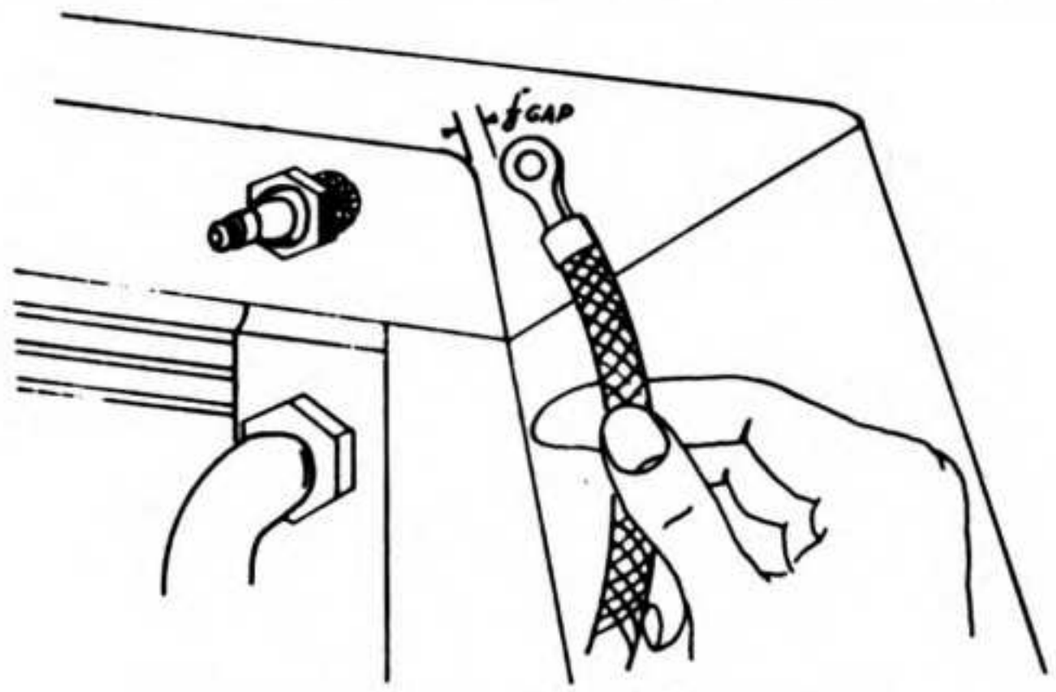

Figure 20—Inspecting Ignition Spark

30. IGNITION SYSTEM.

a. Description. Ignition spark is produced by a high-tension magneto consisting of an armature, condenser, contact points, and rotating magnets cast in a flywheel. The ignition current reaches the engine cylinder through the ignition cable and spark plug.

b. Inspecting for Spark.

(1) Remove the spark plug shield, and the ignition cable from the spark plug. (See figure 5.)

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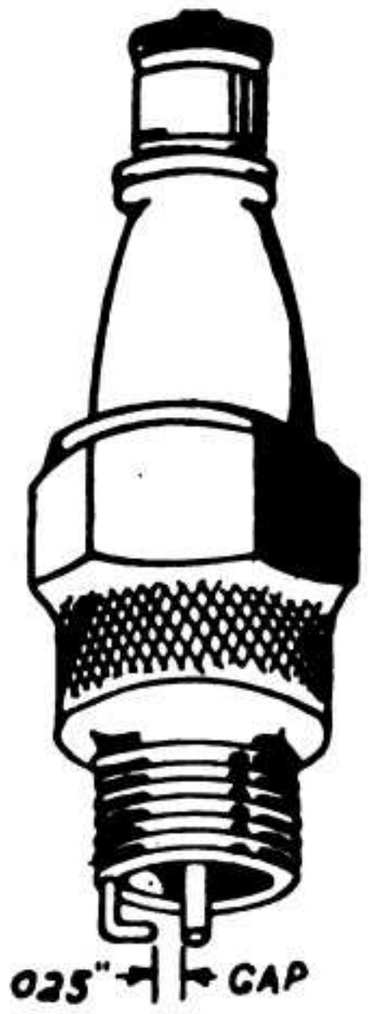

Figure 21—Spark Plug Gap

(2) Hold the ignition cable about ⅛-inch from any metal part of the cylinder head. (See figure 20.)
(3) Rotate the engine. If a spark jumps this gap, the entire ignition system is functioning properly with the possible exception of the spark plug. If no spark develops, inspect the spark plug cable. If cable is not defective, report to individual in authority for magneto repair. (See paragraphs 64-66.)

c. Spark Plug.

(1) DESCRIPTION. The spark plug is located in the side of the cylinder head. A copper-silver alloy gasket transfers heat to the cylinder head and prevents leakage of compression. A screw-on type terminal is used.

(2) DATA.

Make and model	Champion 6M
Thread size	.18 MM
Gap	.025-inch

(3) MAINTENANCE.

(*a*) Spark plug gap should be .025-inch (see figure 21.) To adjust, bend the side electrode only and gage the plug with a round thickness gage to a gap of .025-inch.

(*b*) To clean plug, scrape and clean with SOLVENT, dry cleaning. Do not use emery or sandpaper to clean the porcelain. Replace plug if porcelain is broken or cracked.

(4) REMOVAL. Remove the spark plug shield and ignition cable. To avoid breaking the porcelain, use a socket wrench to remove plug.

(5) INSTALLATION. If available, use new plug gaskets. Tighten the plug so that the gasket will compress. Do not overtighten. Connect the ignition cable and install spark plug shield.

31. AIR CLEANER.

a. Description. An oil-bath type air cleaner is mounted on the carburetor side of the engine. (See figure 5.)

b. Maintenance. Unscrew the wing nut at the top of the cleaner and remove the cover. Service in accordance with instructions on Lubrication Order LO 10-1668.

c. Removal.

(1) Unscrew the wing nut at the top of the cleaner; lift the cleaner from the air cleaner pipe.
(2) Remove the air cleaner filter from the bowl. (See figure 22.)

d. Installation.

(1) Position the air cleaner filter in the bowl; be sure the air cleaner gasket will effectively seal off leakage between the bowl and the air cleaner pipe. Place the bowl and filter on the pipe.
(2) Fill oil reservoir to prescribed level.
(3) Inspect air cleaner cover gasket. Install the cover with a satisfactory gasket and secure with the wing nut.

32. FUEL SYSTEM.

a. Description.

(1) The fuel system consists of the fuel tank, fuel strainer, fuel line, carburetor and governor.
(2) Fuel flows by gravity from the fuel tank, through the fuel filter, to the carburetor where it is proportioned and mixed with air drawn from the air cleaner.

b. Data.

Carburetor	Briggs & Stratton 89914
Fuel filter	Briggs & Stratton 99910
Governor	Adjustable, mechanical type
Fuel tank capacity	5 quarts

c. Carburetor.

(1) DESCRIPTION. The carburetor is the float type. Gasoline flow is regulated by a needle valve. Throttle is automatically controlled by a governor.
(2) ADJUSTMENT.

(*a*) Completely close needle valve by turning to right, or in a clockwise direction, as far as possible. (See figure 5.) Do not screw up too tight or use force when closing as needle valve may be damaged.

(*b*) From closed position, open needle valve one to one and one-quarter turns.

(*c*) Start the engine and operate until it reaches operating temperature.

(*d*) Make final adjustment with the choke wide open by turning the needle valve to the point at which

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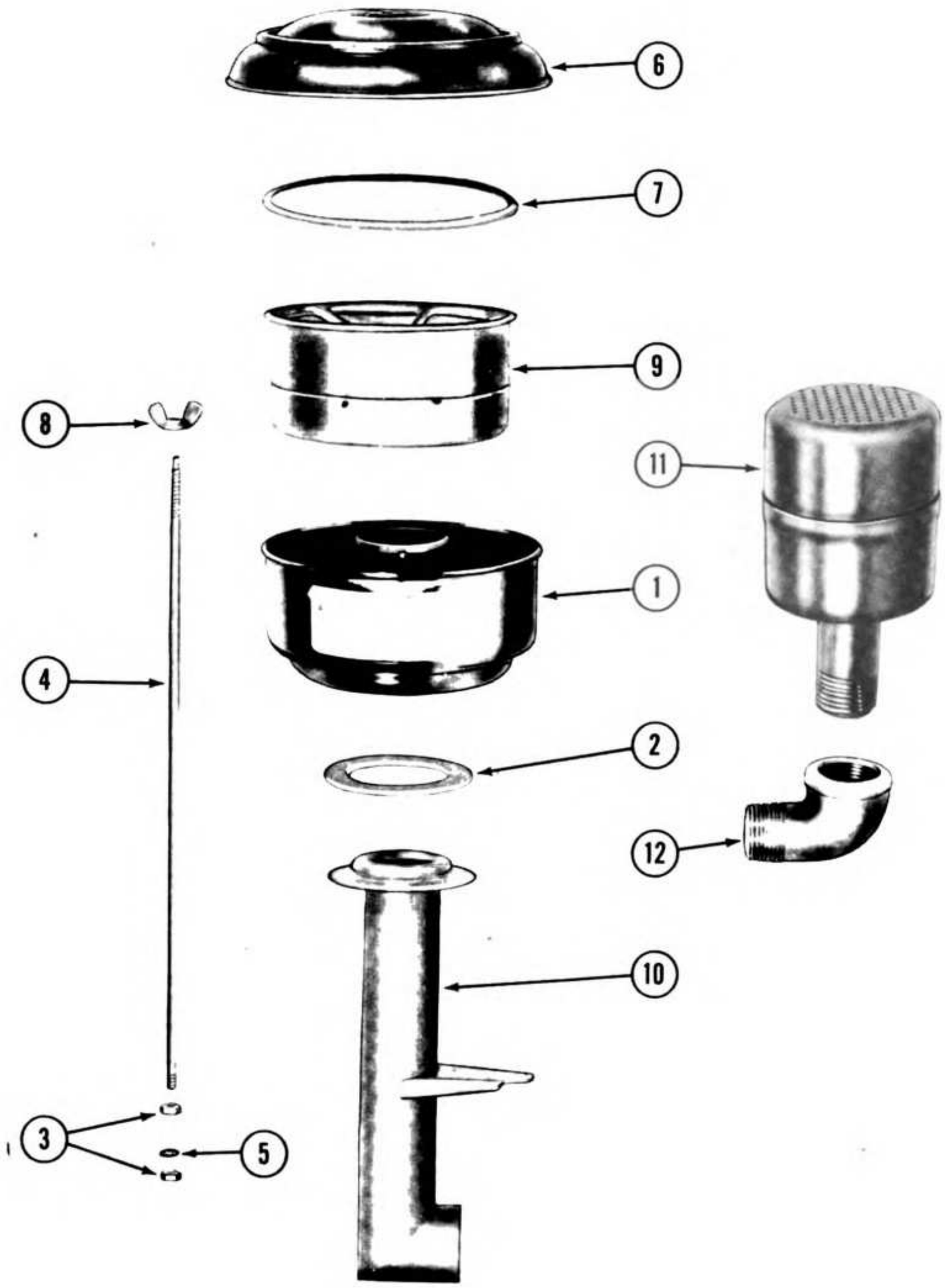

1. Bowl
2. Gasket
3. Stem nut
4. Mounting stud
5. Lockwasher
6. Cover
7. Cover gasket
8. Wing nut
9. Filter
10. Pipe
11. Muffler
12. Elbow

Figure 22—Exploded View of Air Cleaner and Muffler

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the engine operates most smoothly at full load. This setting also will take care of starting with use of the choke. NOTE: If choke must be kept partially closed several minutes before engine operates smoothly, carburetor setting is too lean; open needle valve a notch or two (turn left).

(*e*) Proper idle adjustment screw setting is about one-half to three-quarters of a turn open. Do not force the screw against its seat.

(*f*) Throttle lever adjustment screw is set to permit an idling speed of about 1200 RPM. To increase idling speed, turn throttle lever adjustment screw clockwise; to decrease idling speed, turn screw counterclockwise.

(3) REMOVAL.

(*a*) Close shut-off valve in fuel strainer. (See figure 6.)

(*b*) Disconnect fuel line at the carburetor.

(*c*) Remove the cotter pin from the throttle shaft lever and slip the throttle link off.

(*d*) Remove the two capscrews and lockwashers securing the carburetor and air cleaner pipe to the air intake elbow.

(*e*) Separate the carburetor from the air cleaner pipe.

(4) INSTALLATION.

(*a*) Using a new gasket, position the carburetor

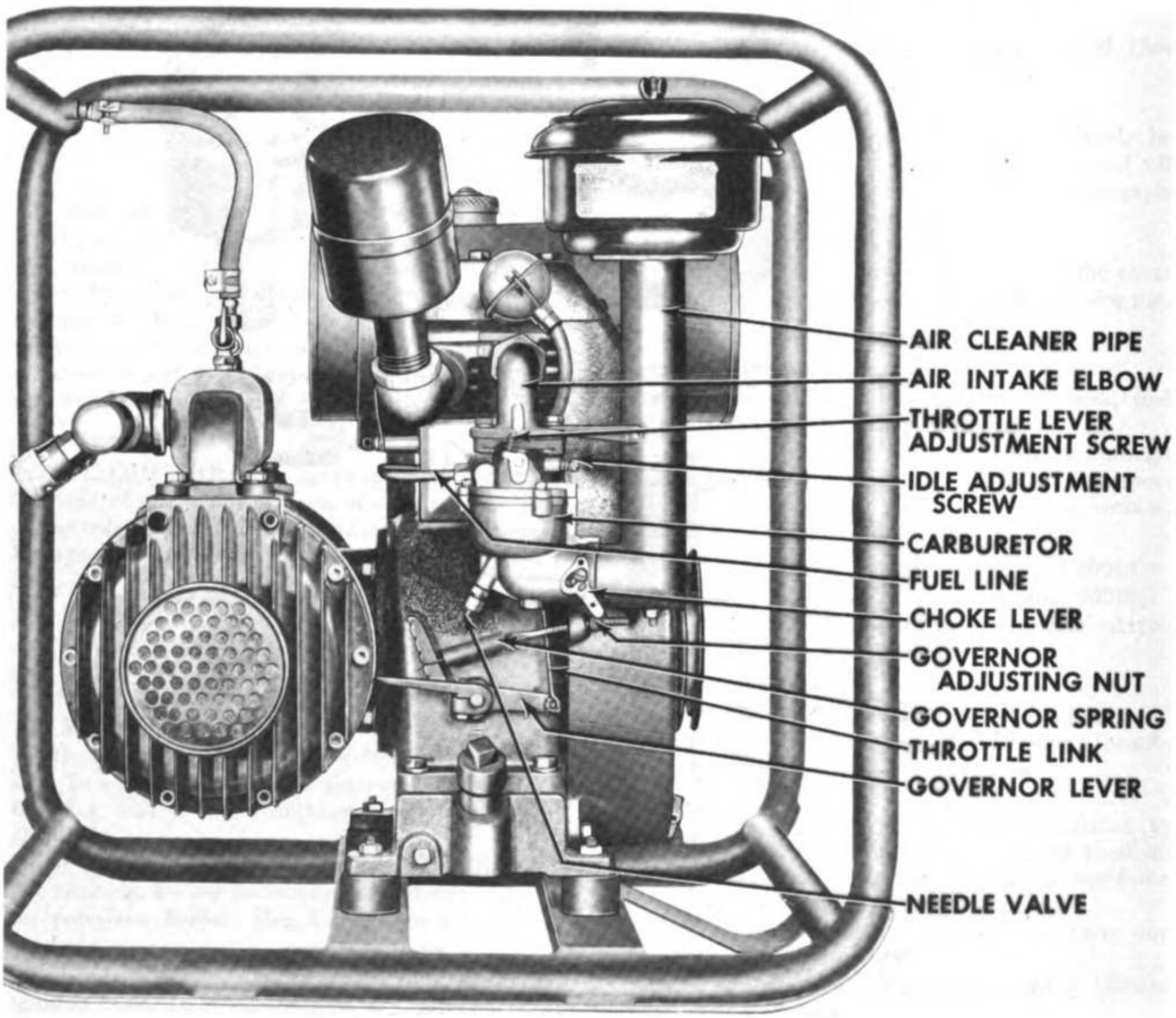

Figure 23—Carburetor and Governor Detail

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and air cleaner pipe at the air intake elbow; secure with capscrews and lockwashers.

(*b*) Connect the throttle link to the throttle shaft, and secure with a cotter pin.

(*c*) Connect the fuel line at the carburetor.

(*d*) Open the shut-off valve in fuel strainer.

d. Governor.

(1) DESCRIPTION. Engine speed is automatically maintained under varying loads by a centrifugal governor, built into the engine, which operates from the cam gear. Correct governor adjustment is set at 2400 RPM; do not readjust unless necessary.

(2) ADJUSTMENT.

(*a*) To increase engine speed, turn governor adjusting nut to the right or in a clockwise direction; to reduce speed, turn nut to left or in a counterclockwise direction.

(*b*) If governor lever has become loosened or removed from the governor shaft, report to individual in authoitry. (See paragraph 53.)

e. Fuel Strainer.

(1) DESCRIPTION. The fuel strainer, located below the fuel tank, has a sediment bowl for dirt and water and a shut-off valve built into its top housing. (See figure 6.)

(2) MAINTENANCE.

(*a*) To clean the fuel strainer, turn the valve handle to a horizontal position to shut off the fuel.

(*b*) Unscrew the thumb screw on the fuel strainer yoke, and swing the yoke out to release the bowl.

(*c*) Remove the screen from the bowl. Empty dirt or water from the bowl; clean the screen thoroughly.

(*d*) Reinstall the screen and the bowl, using a new gasket as required. Secure with thumb screw of the strainer yoke.

(*e*) Open the fuel shut-off valve.

(3) REMOVAL.

(*a*) Turn the valve handle to a horizontal position to shut off the fuel.

(*b*) Remove the strainer glass bowl.

(*c*) Place a suitable container under the strainer and open the shut-off valve to drain the fuel tank.

(*d*) Disconnect the fuel line from the strainer to the carburetor, at the strainer.

(*e*) Unscrew the strainer from the pipe connector in the bottom of the fuel tank.

(4) INSTALLATION.

(*a*) Screw the strainer onto the pipe connector in the bottom of the fuel tank, positioning it so that its outlet elbow is toward the carburetor side of the engine as shown in figure 6.

(*b*) Connect the fuel line to the strainer.

(*c*) Install the strainer glass bowl.

(*d*) Fill the fuel tank.

(*e*) Open the strainer shut-off valve and inspect for leaks.

f. Fuel Tank.

(1) DESCRIPTION. The fuel tank is mounted on the engine, on the side opposite the carburetor. (See figure 6.) Fuel feeds by gravity through a fuel strainer to the carburetor.

(2) REMOVAL.

(*a*) Drain the fuel tank and remove the fuel strainer. (See paragraph 32.*e*.(3).)

(*b*) Remove the nuts and screws that secure the two tank mounting straps, freeing the straps and the tank.

(3) INSTALLATION.

(*a*) Position the fuel tank and mounting straps, and secure to the fuel tank bracket with screws and nuts.

(*b*) Install the fuel strainer. (See par. 32.*e*.(4).)

(*c*) Fill the fuel tank.

g. Fuel Line.

(1) DESCRIPTION. The single fuel line runs from the fuel strainer to the carburetor.

(2) REMOVAL. Loosen the tubing nuts at the carburetor and at the fuel strainer; remove the fuel line.

(3) INSTALLATION. Blow out the line to remove obstructions. Position it, and tighten the tubing nuts to secure the line to the fuel strainer and the carburetor.

33. EXHAUST SYSTEM.

a. Description. Engine exhaust gasses pass from the combustion chamber through a street-ell pipe fitting and muffler. (See figure 5.)

b. Removal. Unscrew the muffler from the pipe fitting.

c. Inspection. After long periods of service, the muffler may become so clogged that it will affect engine performance. To inspect muffler, run water into its open or pipe end. If full streams of water come out of the small holes at the end, it is in serviceable condition. If water runs through very slowly, the muffler is clogged and should be replaced.

d. Installation. Screw the muffler into the street-ell pipe fitting.

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Section XV. Compressor

34. DESCRIPTION AND TABULATED DATA.

a. Description.

(1) The compressor is a direct-driven twin, semi-diaphragm air seal type, designed to deliver oil-free air at steady pressure in ample volume for operating ten dusting guns at one time. (See figure 8.)

(2) The two pistons of the compressor are opposed, pulling inward together for the intake stroke, and pushing outward for the discharge stroke. (See figures 24 and 25.)

(*a*) On the inward, or intake stroke, a partial vacuum is created between the compression plate and the diaphragm.

(*b*) On the outward, or compression stroke, the inlet valves close and the air trapped between the compression plate and the diaphragm is compressed and then forced through the check valves in the compression plate into the expansion head, and on into the manifold for delivery to the guns.

(3) Attached to the compressor manifold is an outlet adaptor carrying ten female hose couplings for gun air hose connections.

b. Tabulated Data.

Make ..... Dapco
Model 252
Type ..... Semi-diaphragm, air seal

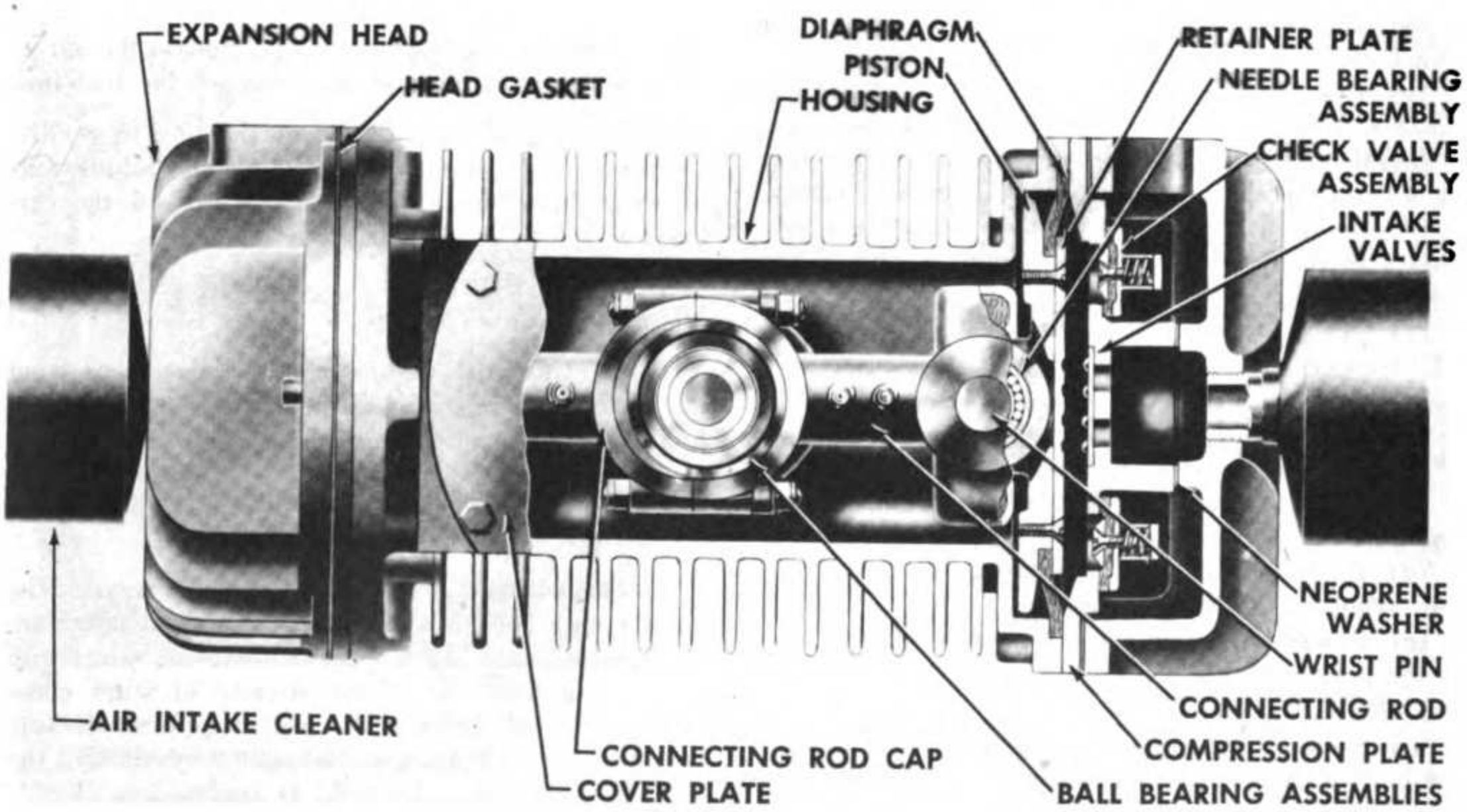

Figure 24—Cross Section of Compressor—Front View

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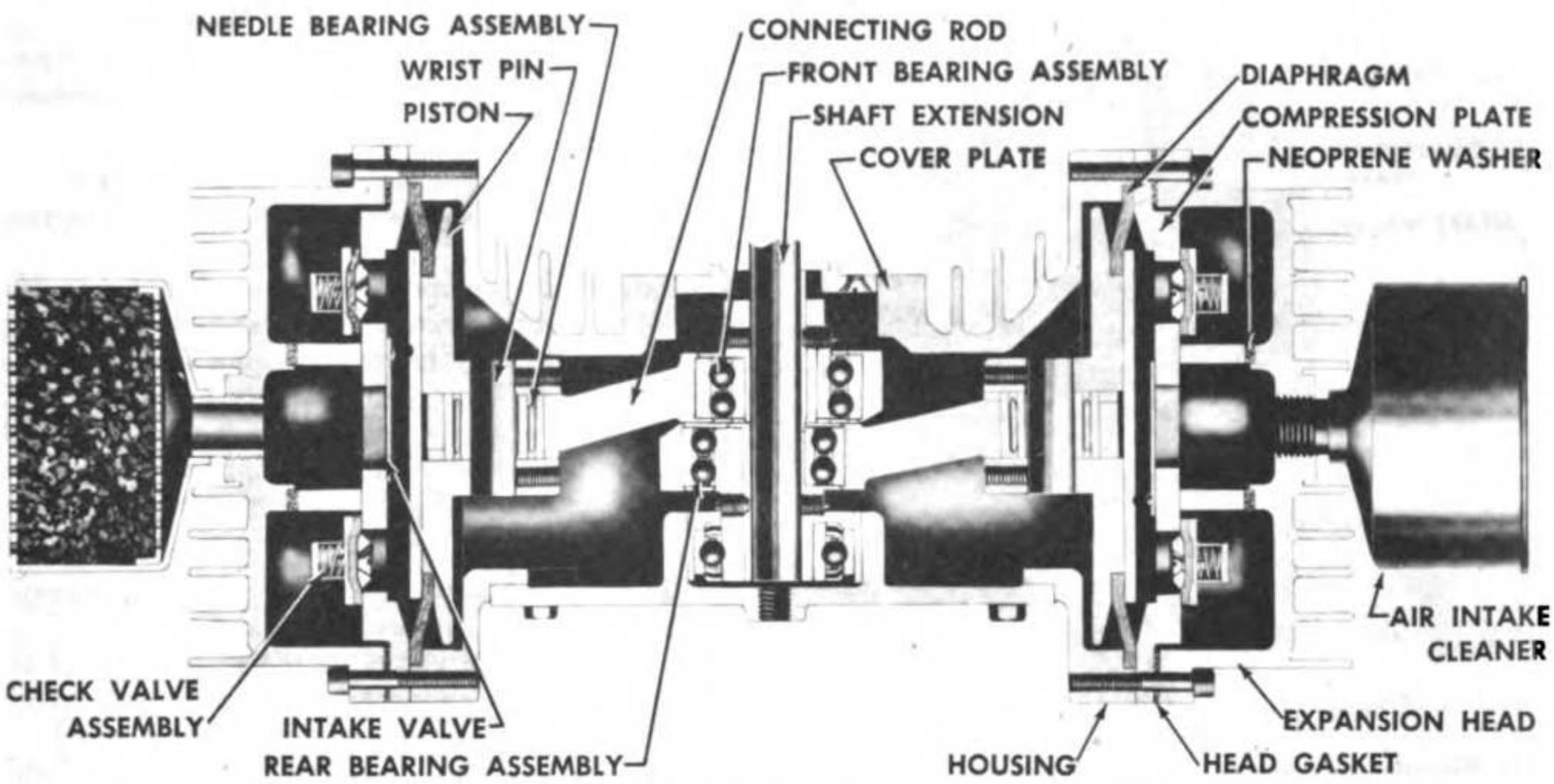

Figure 25—Cross Section of Compressor—Top View

Diaphragm diameter .. 7 inches
Stroke 9/64-inch
Displacement (cu. ft. per min.) 15
Cooling ..... Air

35. AIR CLEANERS.

a. Description. A moss-type air intake cleaner is mounted in each expansion head. (See figure 8.)

b. Service. At specified interval, service in accordance with instructions on Lubrication Order LO 10-1668.

36. MANIFOLD GASKETS.

a. Description. The manifold is attached to expansion heads on both ends of the compressor housing by capscrews and lockwashers.

b. Removal. Remove the two capscrews and lockwashers attaching the manifold to each expansion head; lift off the manifold.

c. Installation.

(1) Thoroughly clean gasket surfaces of the manifold and expansion heads.

(2) Using new gaskets, position the manifold on the expansion heads and secure with capscrews and lockwashers.

37. EXPANSION HEAD GASKETS.

a. Description. Expansion heads are attached to both ends of the compressor housing by ten socket-head capscrews.

b. Removal.

(1) Remove the manifold. (See paragraph 36.*b*.)

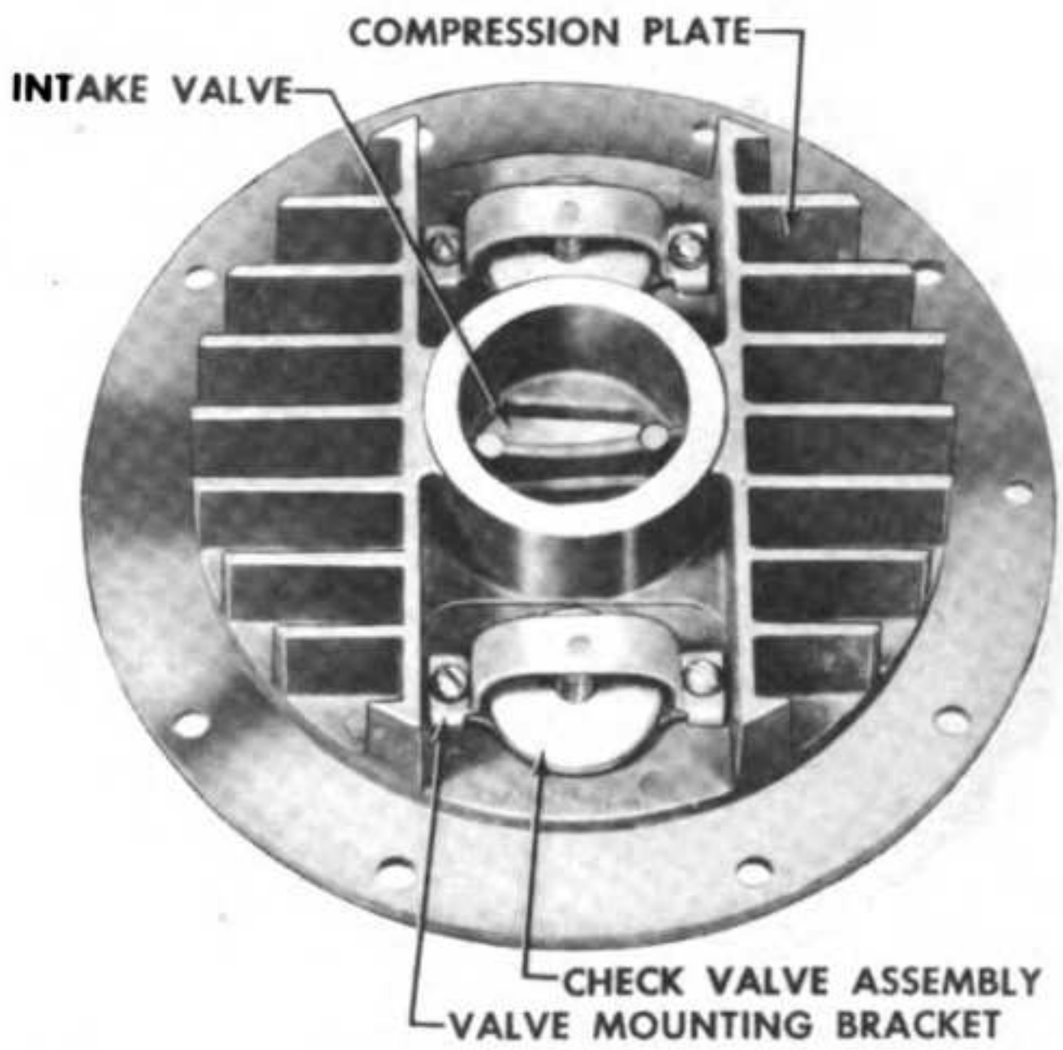

Figure 26—Check Valve Side of Compression Plate

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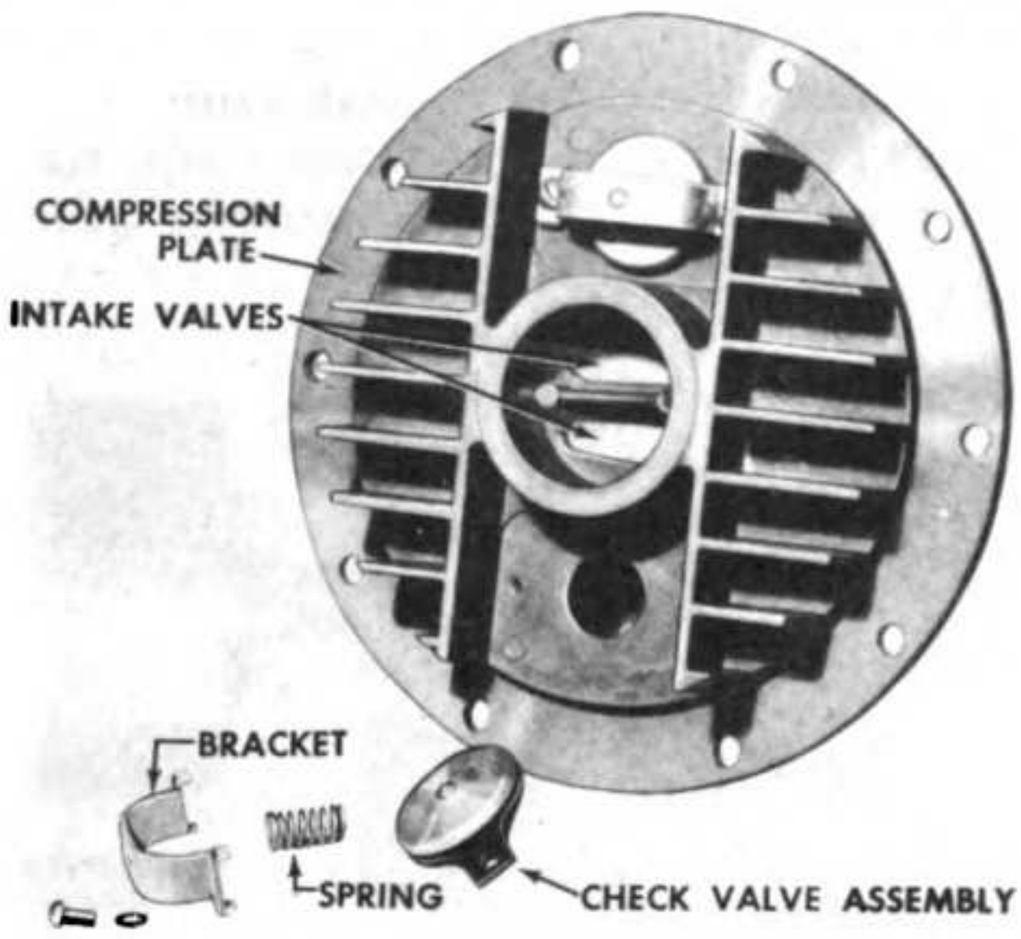

Figure 27—Check Valve Removed

(2) Remove the socket-head capscrews attaching the expansion heads; remove the expansion heads.

c. Installation.

(1) Thoroughly clean gasket surfaces of the expansion heads and the compression plate.
(2) Using new gaskets, position the expansion heads and secure each with ten socket-head capscrews.
(3) Install the manifold. (See paragraph 36.*c.*)

38. VALVES.

a. Description. Two check valves and two intake valves are mounted on compression plates at each end of the compressor housing. After long continuous service, check and intake valves may require replacement.

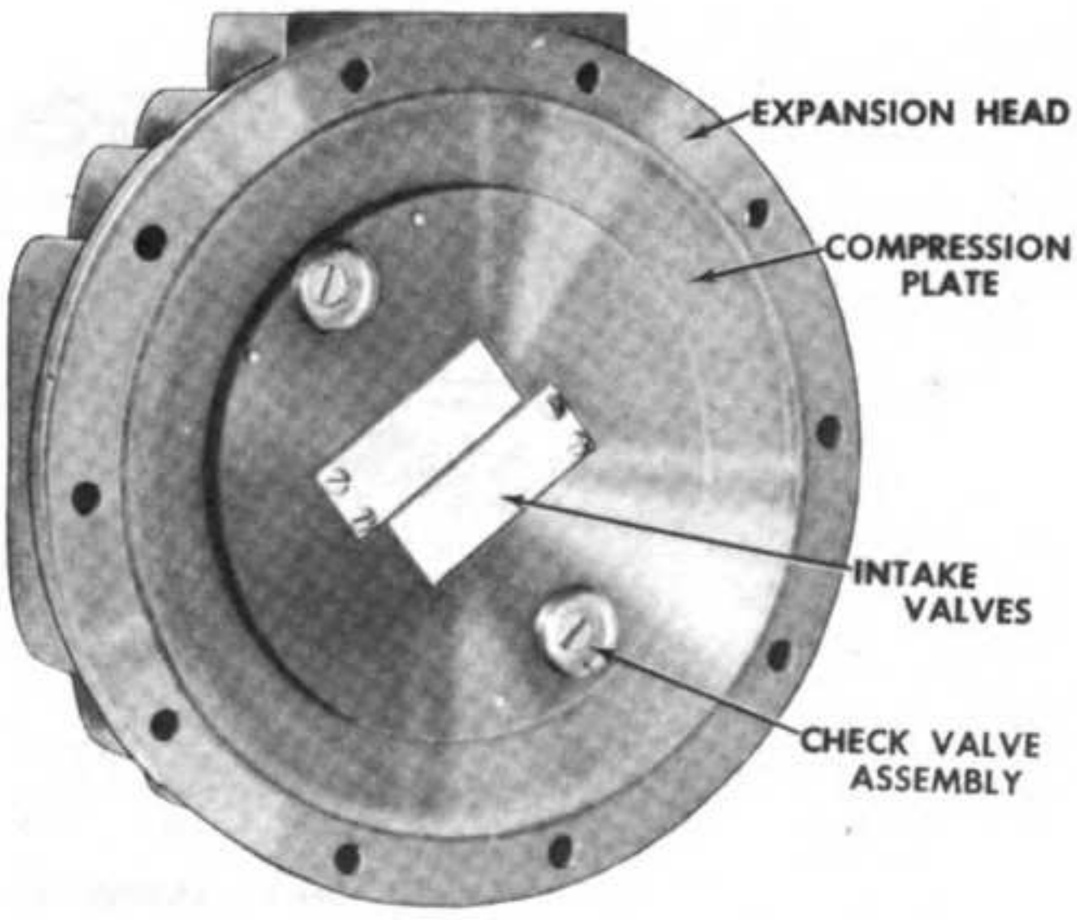

Figure 28—Compression Plate Positioned in Expansion Head

b. Removal.

(1) Remove the manifold. (See paragraph 36.*b.*)
(2) Remove the expansion heads. (See paragraph 37.*b.*)
(3) Lift off the compression plate. (See figure 26.)
(4) Remove the screws and lockwashers attaching check valve assembly brackets, freeing check valve assemblies and springs. (See figure 27.)
(5) To remove intake valves, remove the two round-head screws securing each to the opposite side of the compression plate. (See figure 28.)

c. Installation.

(1) Wash metal parts in SOLVENT, dry cleaning; dry thoroughly and inspect for wear.
(2) Position intake valves on the piston side of the compression plate and secure each with two round-head screws. NOTE: No lockwashers are required.
(3) Position check valves on the expansion head side of the compression plate, position springs and brackets, and secure with screws and lockwashers through brackets.
(4) With expansion head gasket in place, position the compression plate in the expansion head. (See figure 29.) Secure expansion head and compression plate with ten socket-head capscrews.
(5) Install the manifold and connect the manifold air tube. (See paragraph 36.*c.*)

39. DIAPHRAGMS.

a. Description. Diaphragms are attached to the top of each compressor piston. Inspect for wear every two weeks; replace if rubber is checked, cracked, or separated from the fabric at any point.

b. Removal.

(1) Disconnect the manifold air tube and remove the manifold. (See paragraph 36.*b.*)
(2) Remove the expansion heads. (See paragraph 37.*b.*)
(3) Lift off the compression plates.
(4) Remove the six flat-head screws securing each diaphragm to its piston; lift off the diaphragm retaining plates and the diaphragms.

c. Installation.

(1) Position the diaphragms and diaphragm retaining plates on the end of each piston; secure each with six flat-head screws. (See figure 29.) Stake all screws after tightening, using staking tool packed with new diaphragms. Position the tool with the sharp point in the groove around the screw slot and strike with a hammer. (See figure 30.)

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(2) With expansion head gaskets in place, position the compression plates and expansion heads. (See figure 29.) Secure each expansion head and compression plate with ten socket-head capscrews.

(3) Install the manifold. (See paragraph 36.*c*.)

Section XVI. Frame

40. DESCRIPTION.

The tubular steel frame serves as a compressed air reservoir. Reinforcement plates are welded to the frame bottom.

41. FRAME REMOVAL.

a. Disconnect the manifold air tube at the frame. (See figure 8.)

b. Remove the air pressure gage from the frame.

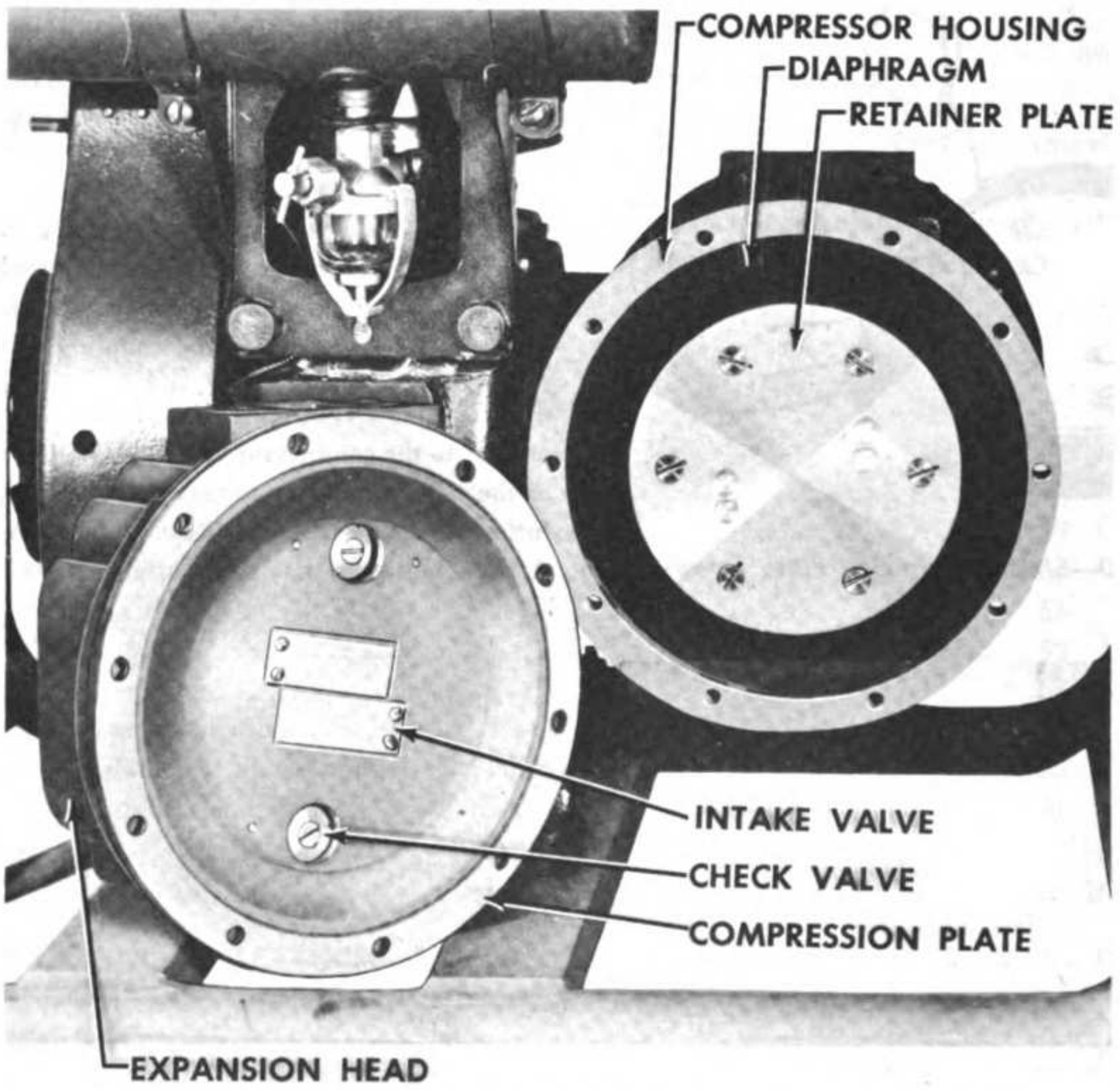

Figure 29—Expansion Head and Compression Plate Removed from Compressor Housing

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c. Remove the nuts and lockwashers from the four engine cushion mounts, and lift the engine and compressor from the frame.

42. FRAME INSTALLATION.

a. Inspect frame and engine cushion mounts for good condition; paint frame if required.

b. Position engine and compressor on the four engine cushion mounts; secure with lockwashers and nuts.

c. Install the air pressure gage.

Section XVII. Dusting Guns

43. DESCRIPTION. Dusting guns are cylindrical metal containers equipped with male hose adapters and spring air control valves. (See figure 9.) The male hose adapters snap into the hose couplings on the end of each hose to provide instant, air-tight connection of hose to gun. The spring air control valve on the gun is opened by pressing down with the thumb, and closed by the spring when the thumb is lifted.

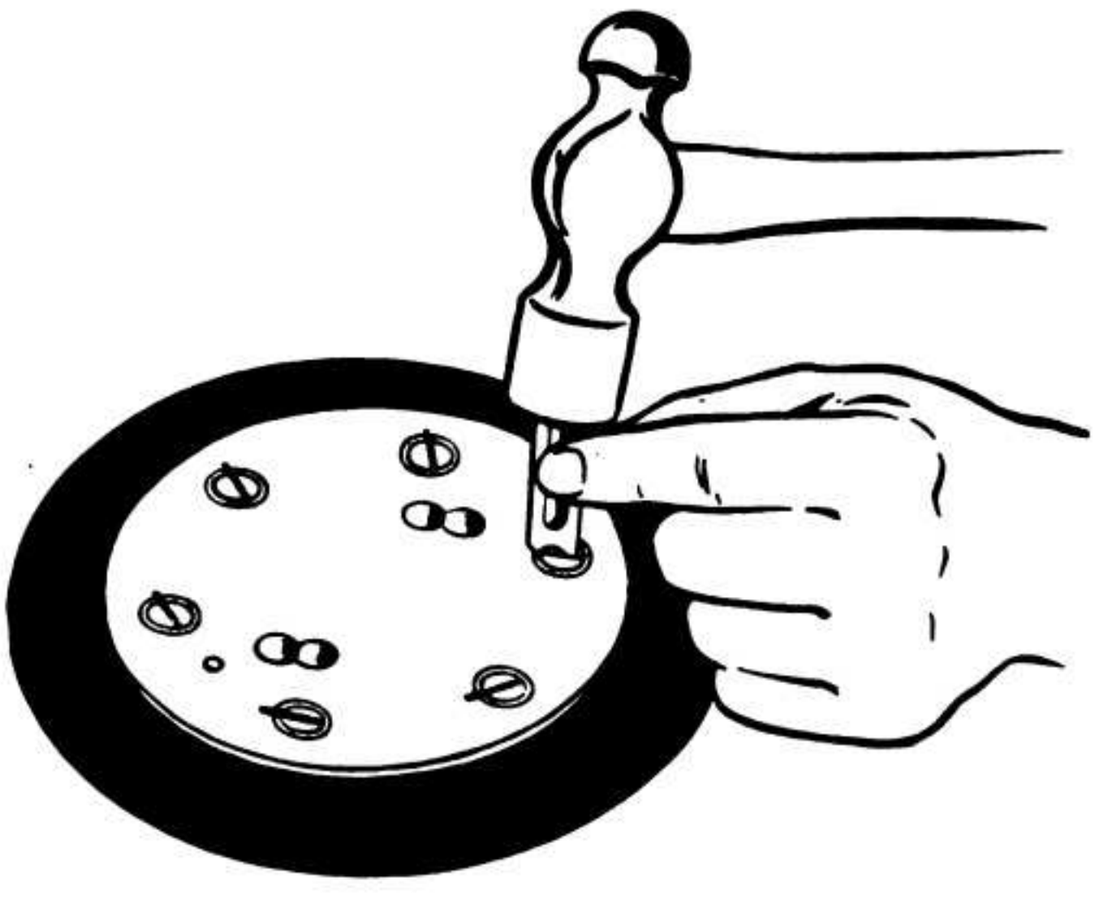

Figure 30—Staking Retaining Plate Screws

44. REMOVAL. To disconnect dusting gun from hose, or a hose from the compressor manifold, turn the knurled slotted collar of the coupling in the direction indicated by an arrow on the coupling; pull free.

45. INSTALLATION. To attach dusting gun to hose, or hose to the compressor manifold, set the male fitting of the gun into the coupling of the hose, or the male fitting of the hose into the coupling of the manifold. A click indicates that the coupling is locked.

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PART FOUR—AUXILIARY EQUIPMENT

Section XVIII. General

46. AUXILIARY EQUIPMENT (NOT APPLICABLE).

PART FIVE—REPAIR INSTRUCTIONS

Section XIX. General

47. SCOPE.

These instructions are for the information and guidance of the maintenance personnel responsible for the third and higher echelons of maintenance of this equipment. They contain information on the maintenance of the equipment which is beyond the scope of the tools, equipment, or supplies normally available to using organizations.

Section XX. Engine

48. DESCRIPTION.

Refer to paragraph 26.*a*.

49. SPECIFICATIONS, TOLERANCES, AND CLEARANCES.

a. Specifications. Refer to paragraph 26.*b*.

b. Tolerances and Clearances.

Spark plug gap ..... .025 in.
Magneto point gap ..... .020 in.
Crankshaft end play ..... .002-.008 in.
Magneto armature shoes and flywheel poles—gap ..... .002-.010 in.
Valve clearances:
Intake valve ..... .010 in.
Exhaust valve ..... .008 in.
Camshaft diameter ..... .49825 (max.)-.49775 (min.)

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Piston and cylinders:
Skirt clearance ..... .007-.009 in.
Piston ring gap ..... .007-.017 in.
Piston ring groove clearance ... .005 in.
Piston pin, fit in piston ..... Slip fit
Piston pin, fit in rod
(maximum clearance) ..... .0015 in.

50. REMOVAL OF SUBASSEMBLIES.

a. Remove the carburetor and air cleaner. Refer to paragraph 32.*c.*(3)(*a*) through (*d*).

b. Remove the muffler and muffler street-ell pipe fitting.

c. Remove the fuel strainer. (Refer to paragraph 32.*e.*(3).)

d. Remove the fuel tank. (Refer to par. 32.*f.*(2).)

e. Remove the fuel tank bracket. (See figure 6.)

51. ENGINE REMOVAL.

a. Remove the compressor assembly from the engine. (See paragraph 68.)

b. Remove nuts and lockwashers from studs of four engine cushion mounts; lift off the engine. (See figure 5.)

52. DISASSEMBLY.

a. Drain the oil. (See figure 5.)

b. Remove the spark plug shield and spark plug. (Refer to paragraph 30.*c.*(4).)

c. Remove the cylinder head. (Refer to paragraph 27.*a.*)

d. Remove valve cover plate and gasket. (Refer to paragraph 28.*a.*)

e. Remove valves, springs, and retainers. (Refer to paragraph 29.*b.*(2) and (3).)

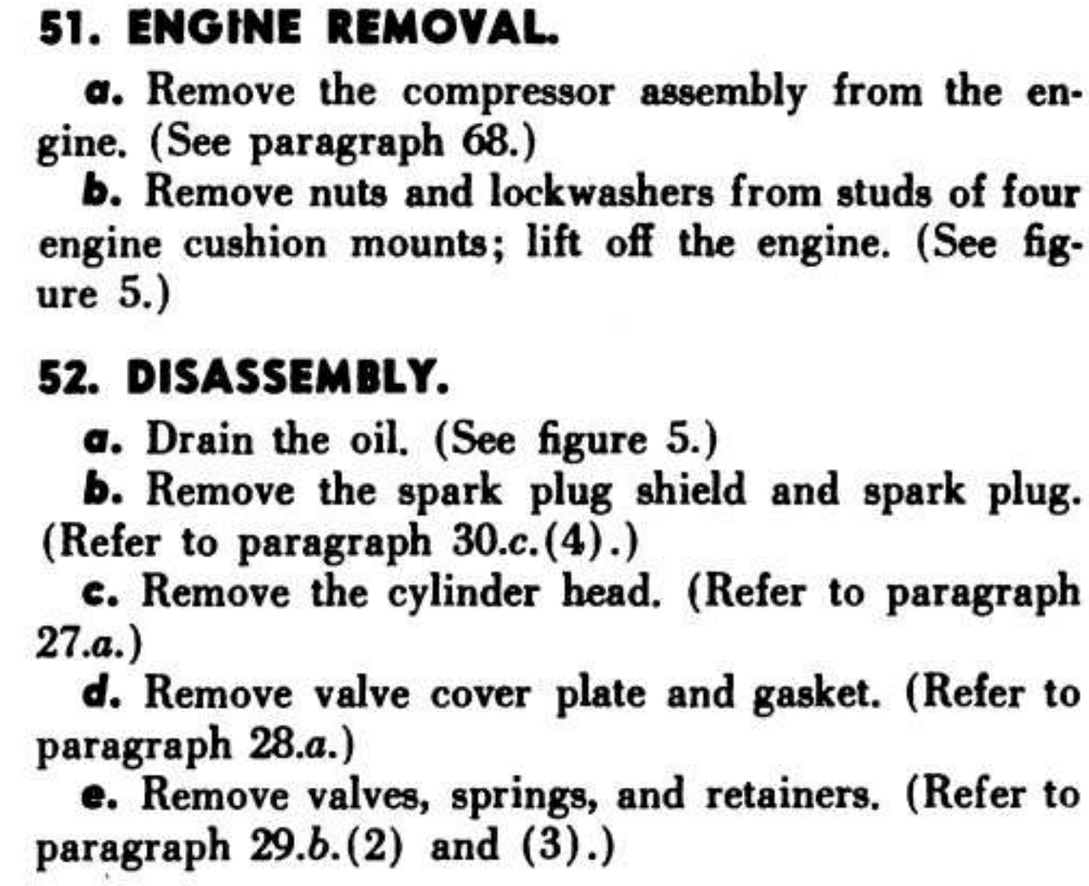

Figure 31—Removing Pulley Nut

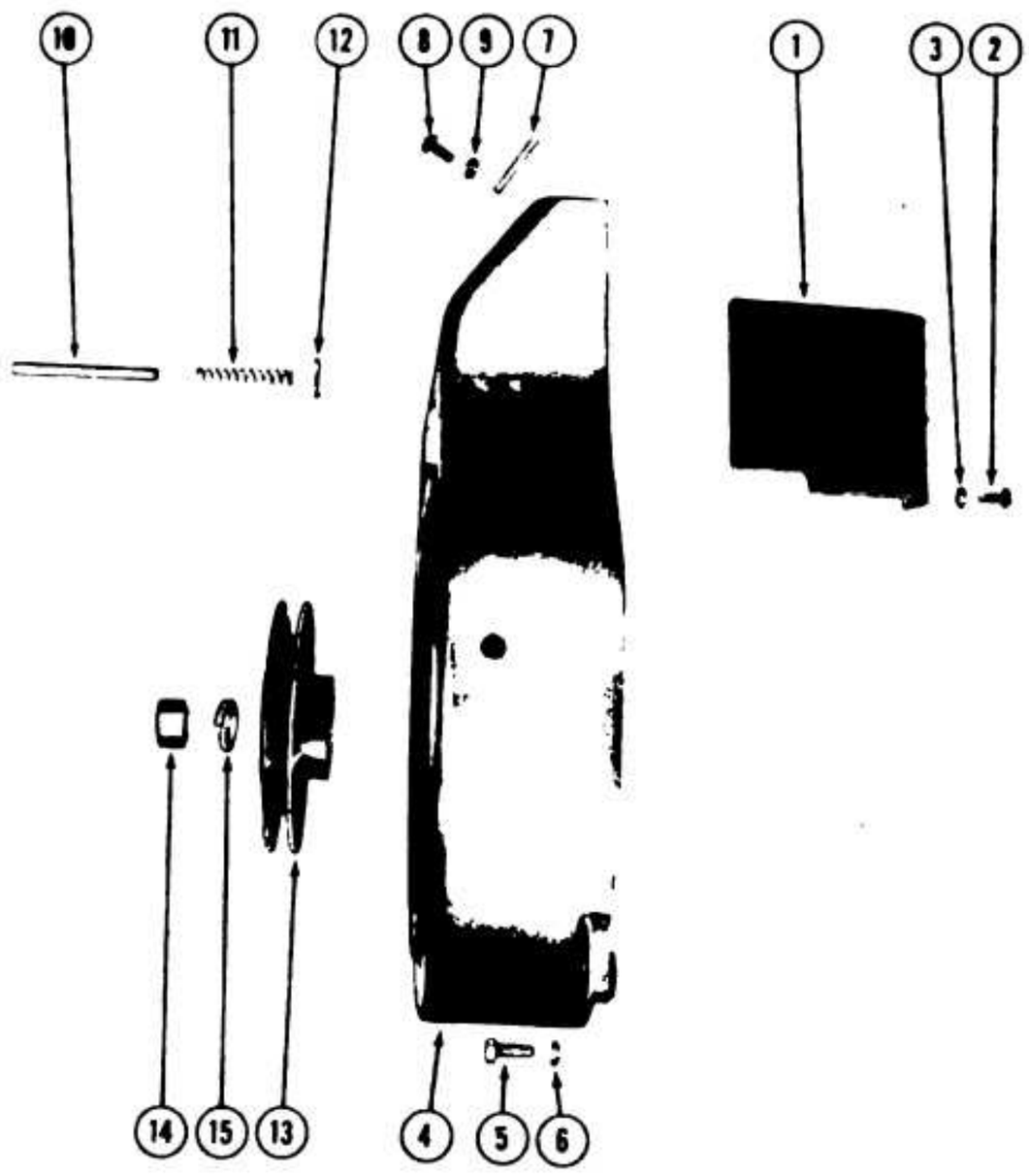

Figure 32—Exploded View of Blower Housing

1. Shield
2. Screw
3. Lockwasher
4. Blower housing
5. Blower housing mounting screw
6. Lockwasher
7. Blower housing bracket
8. Screw
9. Lockwasher
10. Stop switch push rod
11. Stop switch spring
12. Cotter pin
13. Starting pulley
14. Nut
15. Lockwasher

f. Unhook the governor spring from the governor lever. (See figure 23.)

g. Remove the cylinder shield.

h. Remove the starting pulley, blower housing, and flywheel. NOTE: The flywheel is secured to the crankshaft by a taper fit, soft key, and right-hand threaded nut.

(1) Place a rod or punch through the hole in the blower housing at fuel tank side so that it passes between fins of the flywheel to hold the flywheel and prevent its turning when pulley nut is loosened. (See figure 31.)

(2) Use a 1-inch socket wrench with a T- or L-handle and tap handle to loosen nut; remove the nut and lockwasher.

(3) Remove the blower housing. (See figures 32 and 33.)

(4) Remove the two screws in the flywheel, and use a puller to remove the flywheel.

i. Remove the four capscrews and lockwashers securing the cylinder assembly to the base; lift off the

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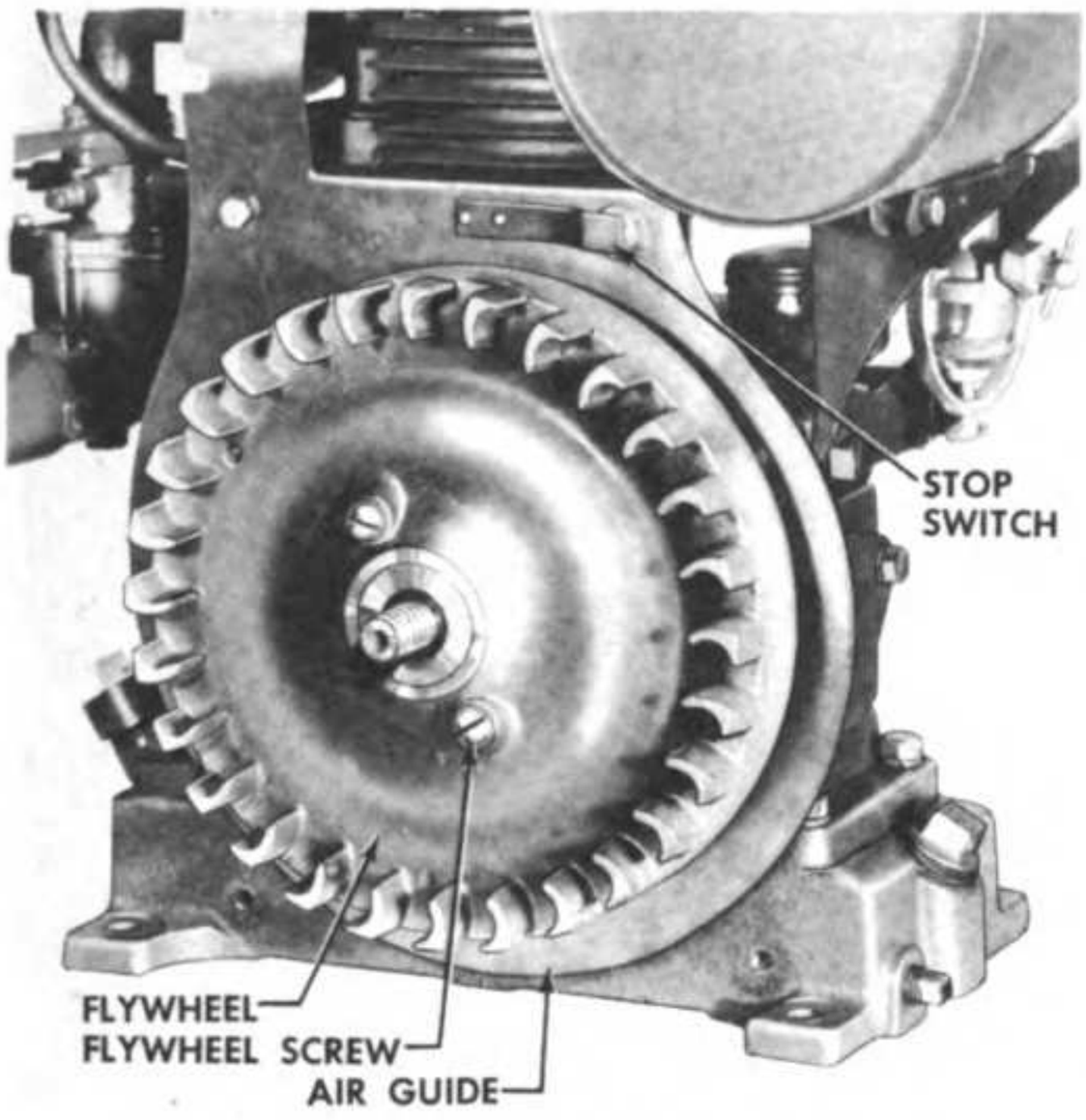

Figure 33—Blower Housing Removed

cylinder assembly. (See figure 34.)

j. Remove the oil pump. NOTE: The oil pump is a plunger type, operating from an eccentric on the cam gear. It forces a stream of oil over all moving parts when the engine is in operation. (See figure 35.)

(1) Remove the two capscrews and lockwashers that secure the oil pump to the cylinder assembly.

(2) Inspect pump operation, as follows:

(*a*) Place pump in a pan of oil about ½-inch deep and work plunger up and down. A stream of oil should be forced out of the hole in the pump plunger. If pump is clogged, remove plunger and plunger spring and submerge parts in SOLVENT, dry cleaning, for 3 or 4 hours to loosen accumulated sludge or gum.

(*b*) If pump is still inoperative, replace.

k. Remove the piston and connecting rod.

(1) Bend down the connecting rod screw locks and remove the connecting rod capscrews. (See figure 37.) Lift off the connecting rod cap.

(2) Push the connecting rod and piston assembly out the top of the cylinder assembly.

(3) Use a piston ring spreader to remove piston rings.

(4) Remove the piston pin locks, freeing the piston pin, piston, and connecting rod.

l. Remove the magneto assembly, as follows:

(1) Remove the air guide, flywheel key, contact point dust cover, and four magneto mounting screws. (See figure 40.)

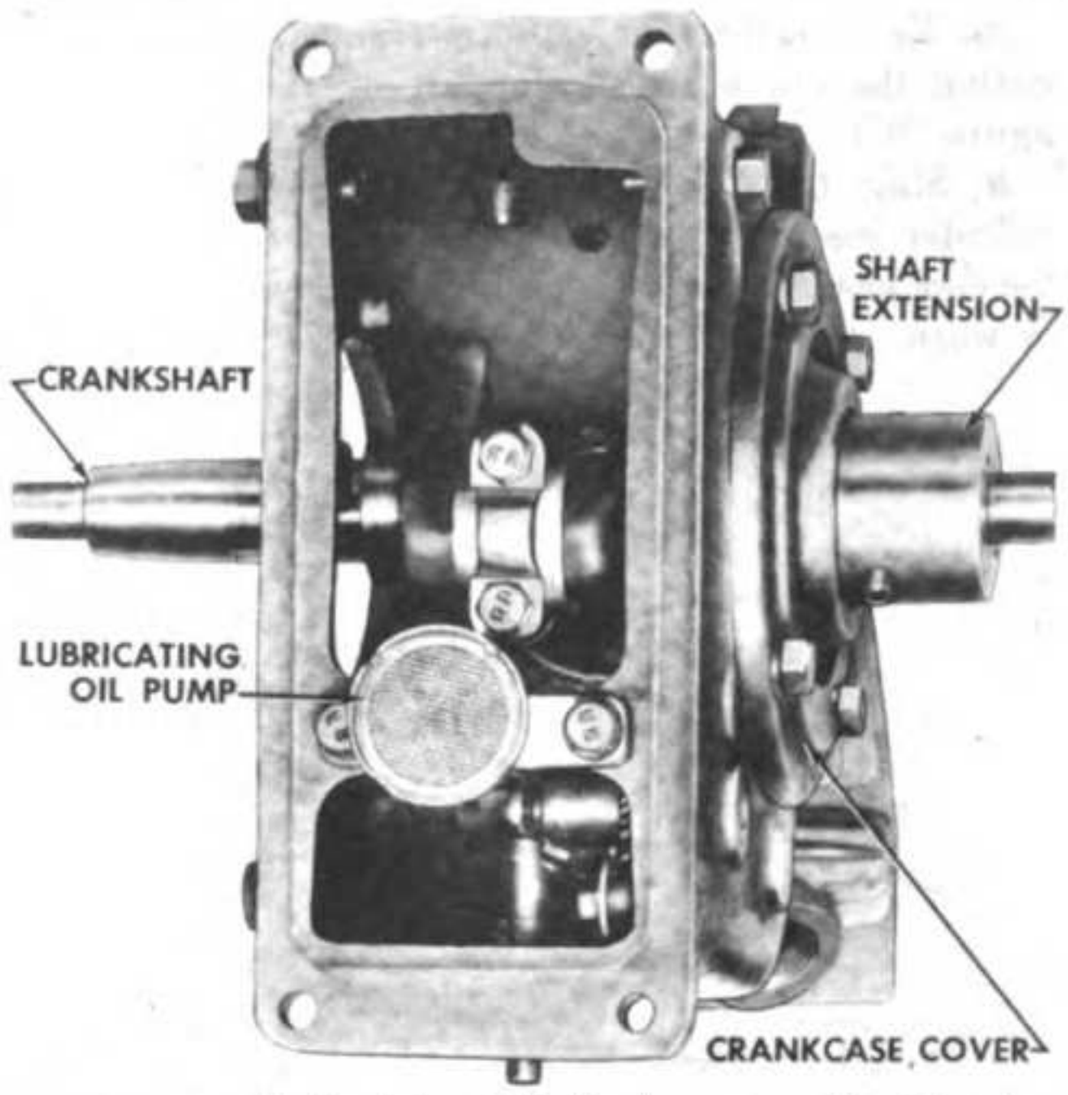

Figure 34—Underside of Cylinder Assembly, Showing Oil Pump

(2) Turn the crankshaft so that the contact plunger holds the contact points open; remove the magneto assembly.

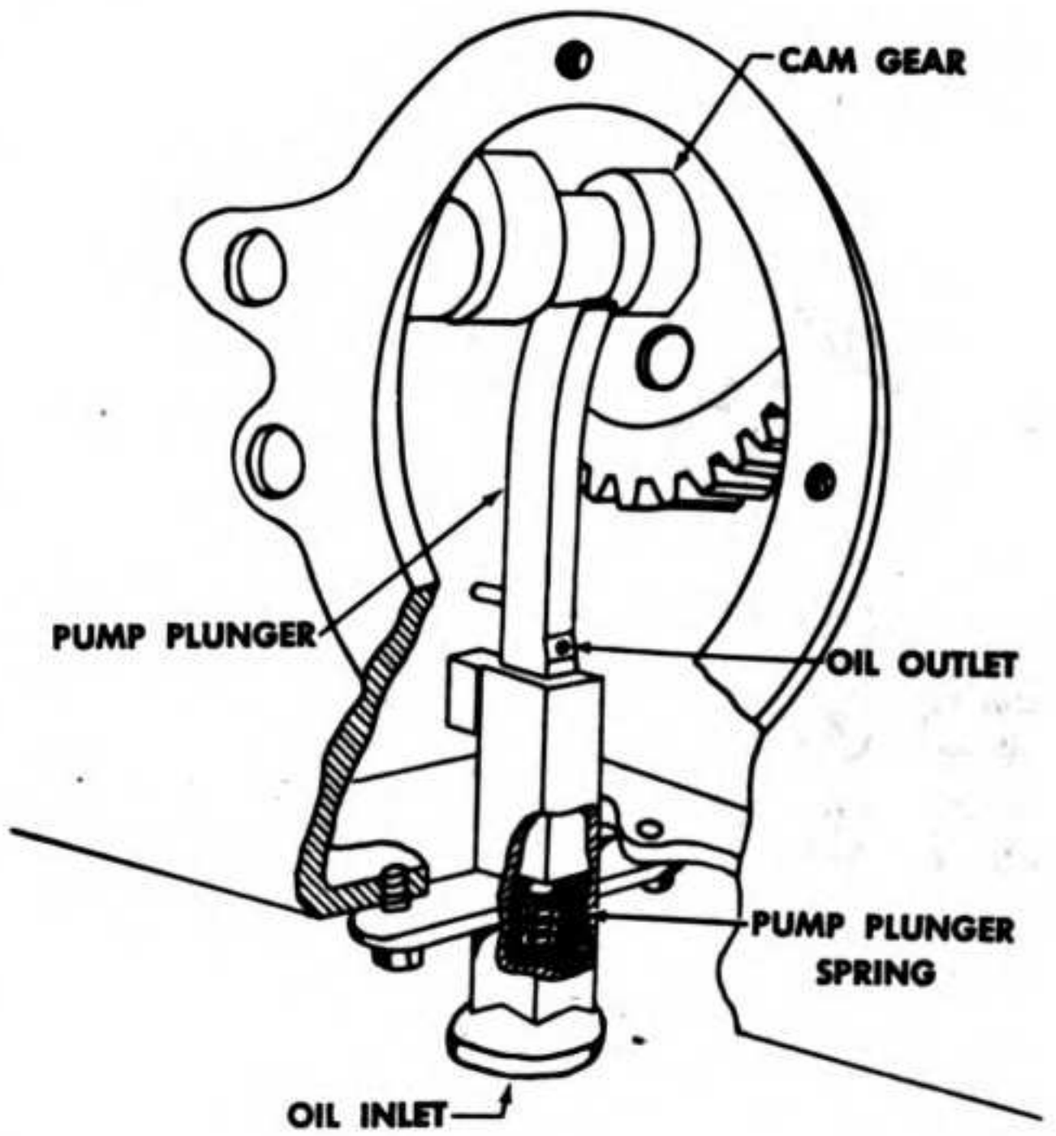

Figure 35—Oil Pump Installation

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m. Remove the four capscrews and lockwashers securing the crankcase cover; lift off the cover. (See figure 34.)

n. Slide the crankshaft from the drive side of the cylinder assembly; see that the counterweights clear the cam gear. Replace crankshaft ball bearing if rough or worn.

(1) Loosen the setscrews locking the shaft extension to the crankshaft. (See figure 38.)

(2) Pull the shaft extension from the crankshaft, freeing two dowel pins.

(3) Slip off the oil seal.

(4) Support both sides of the bearing in an arbor

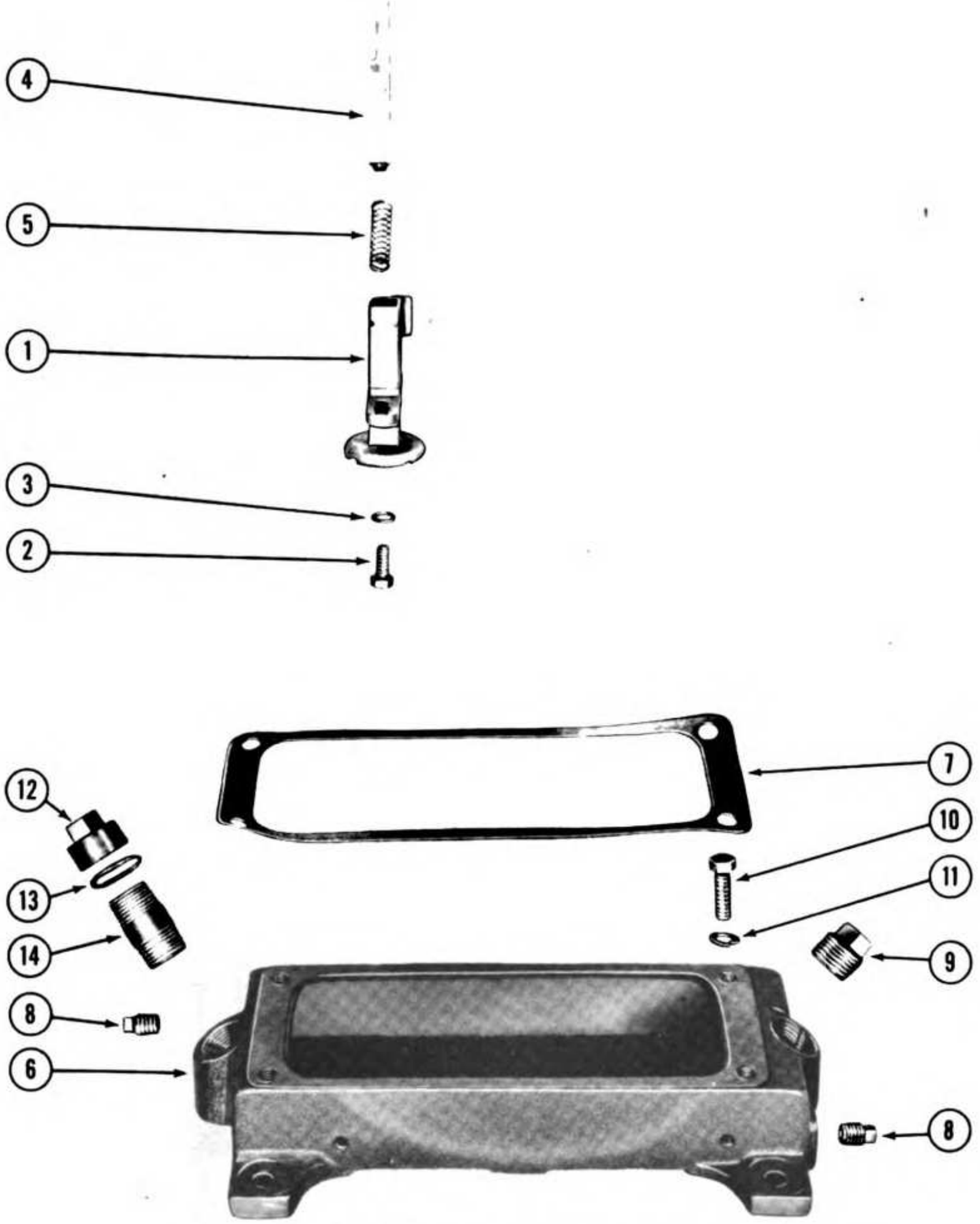

Figure 36—Exploded View of Engine Base and Oil Pump

1. Oil pump body
2. Pump mounting screw
3. Lockwasher
4. Oil pump plunger
5. Oil pump spring
6. Engine base
7. Base gasket
8. Oil drain plug
9. Pipe plug
10. Cylinder mounting screw
11. Lockwasher
12. Oil filler cap
13. Oil filler cap gasket
14. Pipe nipple

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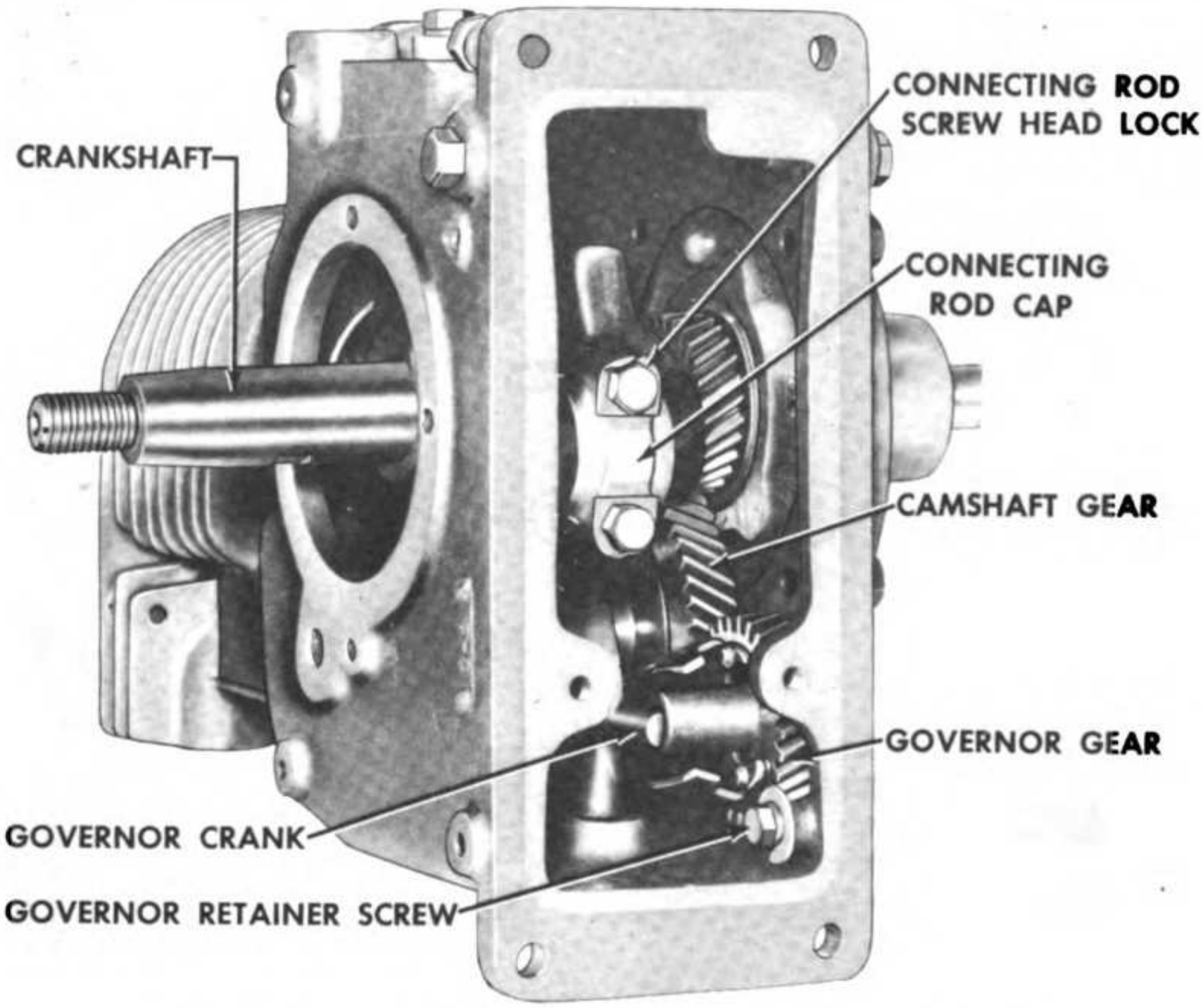

Figure 37—Underside of Cylinder Assembly, Oil Pump Removed

press, and press the shaft through the bearing. (See figure 39.)
(5) Heat a new bearing in hot oil and slip it on the crankshaft with the sealed end of the bearing down. Allow bearing to cool slowly.
(6) Install the oil seal over the bearing.
(7) Install the shaft extension and secure with two dowel pins and two socket-head setscrews.

o. Remove the camshaft.
(1) Using a blunt punch, force the camshaft out from the drive side of the engine, freeing the cam gear.
(2) Inspect camshaft for wear; standard camshaft diameters are .49825-inch maximum, .49775-inch minimum. If worn more than .001-inch undersize, replace camshaft.

p. Remove the governor.
(1) Loosen the governor retainer screw, lockwasher and flat washer. (See figure 37.)
(2) Slide out the governor gear assembly; remove the governor crank and the governor plunger. (See figure 41.)

q. Inspect the cylinder.
(1) Using an inside micrometer, take several readings from top to the bottom of the cylinder area in which the piston operates. (See figure 42.) NOTE: Standard cylinder bore is 2.6240- to 2.6250-inch.
(2) If micrometer readings show standard bore is exceeded by .003-inch, or is more than .0015-inch out-of-round, replace cylinder assembly and piston assembly. NOTE: Allow .007- to .009-inch for piston and cylinder clearance.

53. REASSEMBLY.

a. Install the governor.
(1) Position the governor gear, governor plunger and governor crank in the cylinder assembly; secure the gear with a flat washer, lockwasher and capscrew.
(2) Install the governor lever on the shaft of the governor crank, outside the cylinder block.

b. Install the camshaft.
(1) Insert camshaft through hole on the magneto side of the engine sufficiently to permit sliding the cam gear into position.
(2) Slide camshaft through cam gear and press in flush with outside of cylinder assembly on opposite side.

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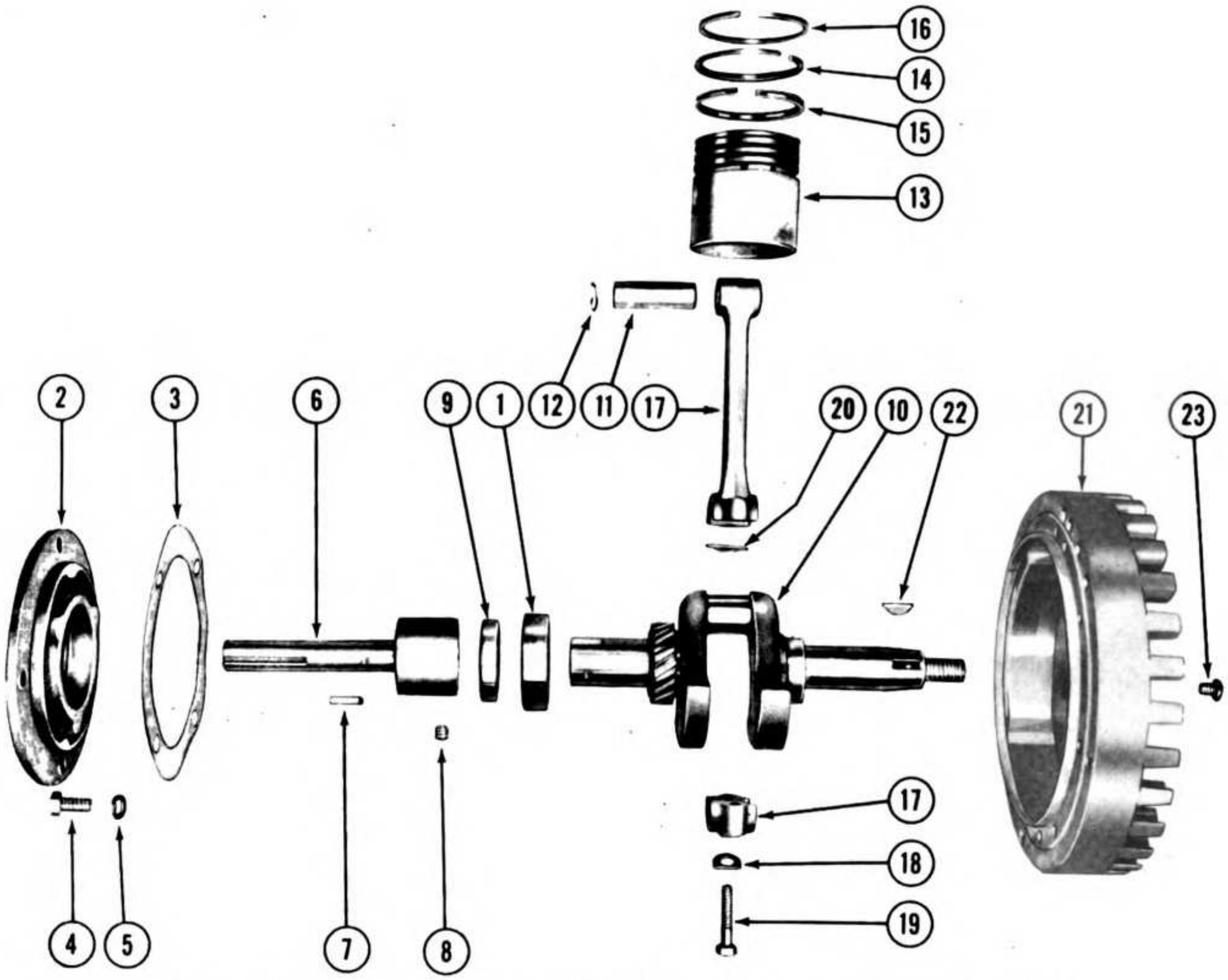

Figure 38—Exploded View of Crankshaft, Piston, Connecting Rod, and Flywheel

1. Ball bearing
2. Crankcase cover
3. Cover gasket
4. Cover screw
5. Lockwasher
6. Shaft extension
7. Dowel pin
8. Setscrew
9. Oil seal
10. Crankshaft
11. Piston pin
12. Piston pin lock
13. Piston
14. Center compression ring
15. Oil ring
16. Top compression ring
17. Connecting rod assembly
18. Screw lock
19. Connecting rod screw
20. Shim
21. Flywheel
22. Woodruff key
23. Flywheel screw

(3) Install an expansion plug in the hole on the magneto side with its open end out. Seal with liquid gasket material to prevent oil leaks.

c. Install the crankshaft.

(1) Position crankshaft in cylinder assembly, making sure timing marks on the camshaft and crankshaft are alined as shown in figure 43.

(2) Install crankcase cover, using a new gasket; secure with capscrews and lockwashers.

d. Install the magneto assembly.

(1) Position the magneto on the crankshaft, using the old gasket or a new gasket that will provide end play of between .002- and .008-inch. (See figure 44); secure the magneto assembly with four screws and lockwashers.

(2) Install the contact point dust cover and the air guide. (See figure 40.) NOTE: The magneto assembly is correctly timed with the engine when the flywheel is assembled to the tapered crankshaft with a key and secured with a right-hand threaded nut. Do not attempt to change the timing by relocating any parts or filing the crankshaft timing flat. Always use a soft key; if a steel key is used and the flywheel becomes loose it will damage the keyway in crankshaft.

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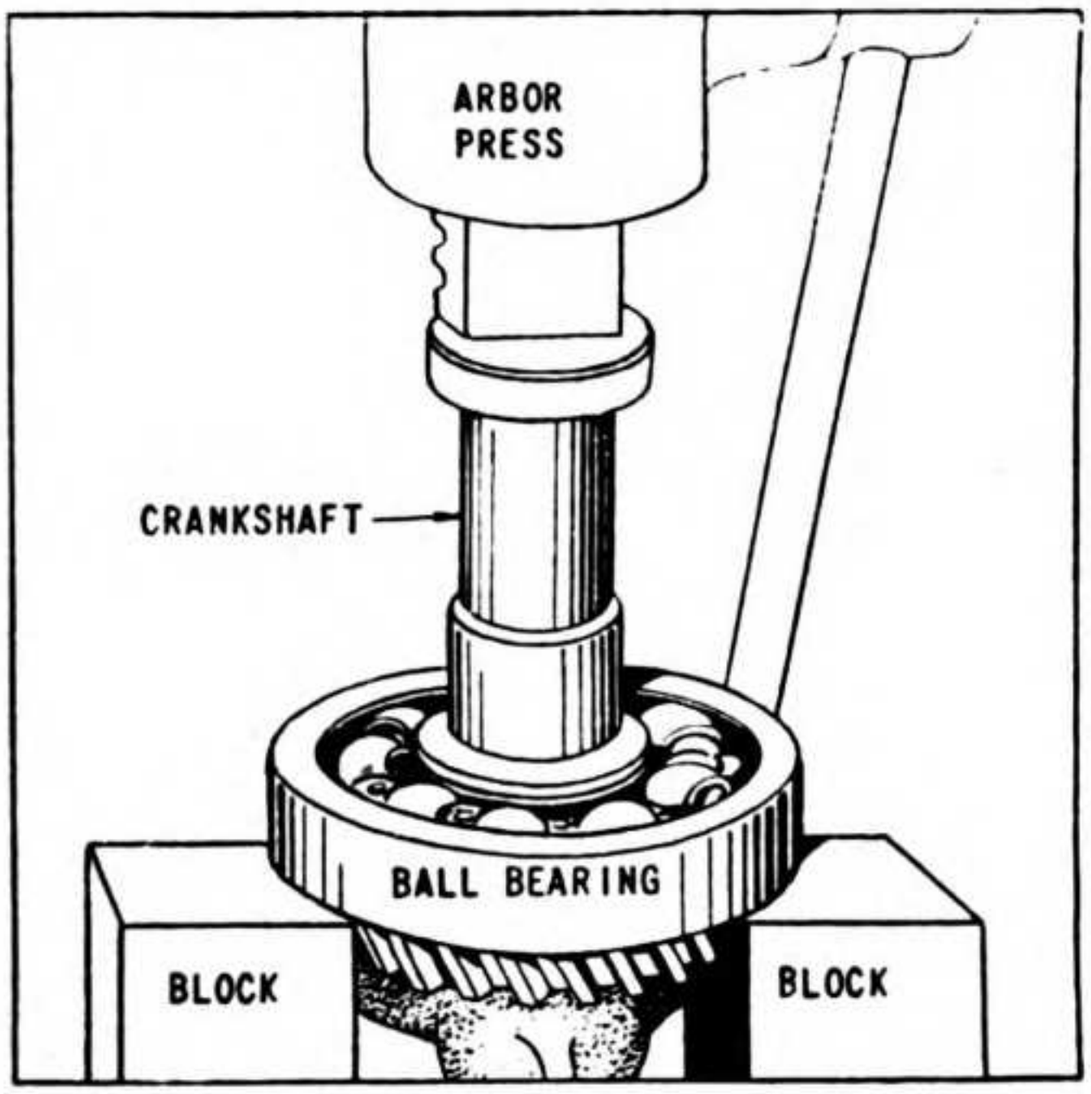

Figure 39—Removing Crankshaft Bearing

e. Install the piston and connecting rod.

(1) Thoroughly clean grooves in piston so rings move freely.

(2) Position new rings on the piston and inspect side clearance between ring and ring land with a feeler gage. Clearance should not exceed .003-inch.

(3) Assemble the piston and the connecting rod with the piston pin; secure pin with pin locks. NOTE: Standard piston pin diameters are .67250-inch maximum, .67225-inch minimum. Maximum clearance, including wear, between the piston pin and the pin hole in the conencting rod is .0015-inch. If clearance exceeds this figure, replace piston assembly.

(4) Position the piston and connecting rod in the cylinder assembly. NOTE: Standard clearance between the piston skirt and cylinder wall is .007- to .009-inch, sufficient to compensate for considerable expansion of the aluminum piston when hot. Top and second lands of the piston are smaller than the skirt to allow for greater expansion at the piston head.

(5) Assemble the connecting rod to the crankshaft, positioning it so that the cam gear clearance flat and oil hole in lower bearing faces the magneto side. (See figure 45.) Assembly marks on the cap and rod must be on the same side. Secure the connecting rod cap with locking plates and capscrews; bend up the locks.

f. Install the oil pump, making sure that the plunger is positioned as shown in figure 35. Secure pump to cylinder assembly with two capscrews and lockwashers. (See figure 34.)

g. Using a new base gasket, install the cylinder assembly on the base. Secure with four capscrews and lockwashers.

h. Be sure the flywheel key is in place; coat the crankshaft with a thin coat of grease, and position the flywheel on the crankshaft. Install the two flywheel screws. (See figure 33.)

i. Install the blower housing.

j. Position the starting pulley on the crankshaft, and secure with a lockwasher and nut. Use a bar through the hole in the blower housing to hold the flywheel when tightening the nut.

k. Install the cylinder shield.

l. Hook the governor spring to the governor lever. (See figure 23.)

m. Install the valves, springs and retainers. (Refer to paragraph 29.*b.*(5)(*b*).)

n. Install valve cover plate and gasket. (Refer to paragraph 28.*b.*)

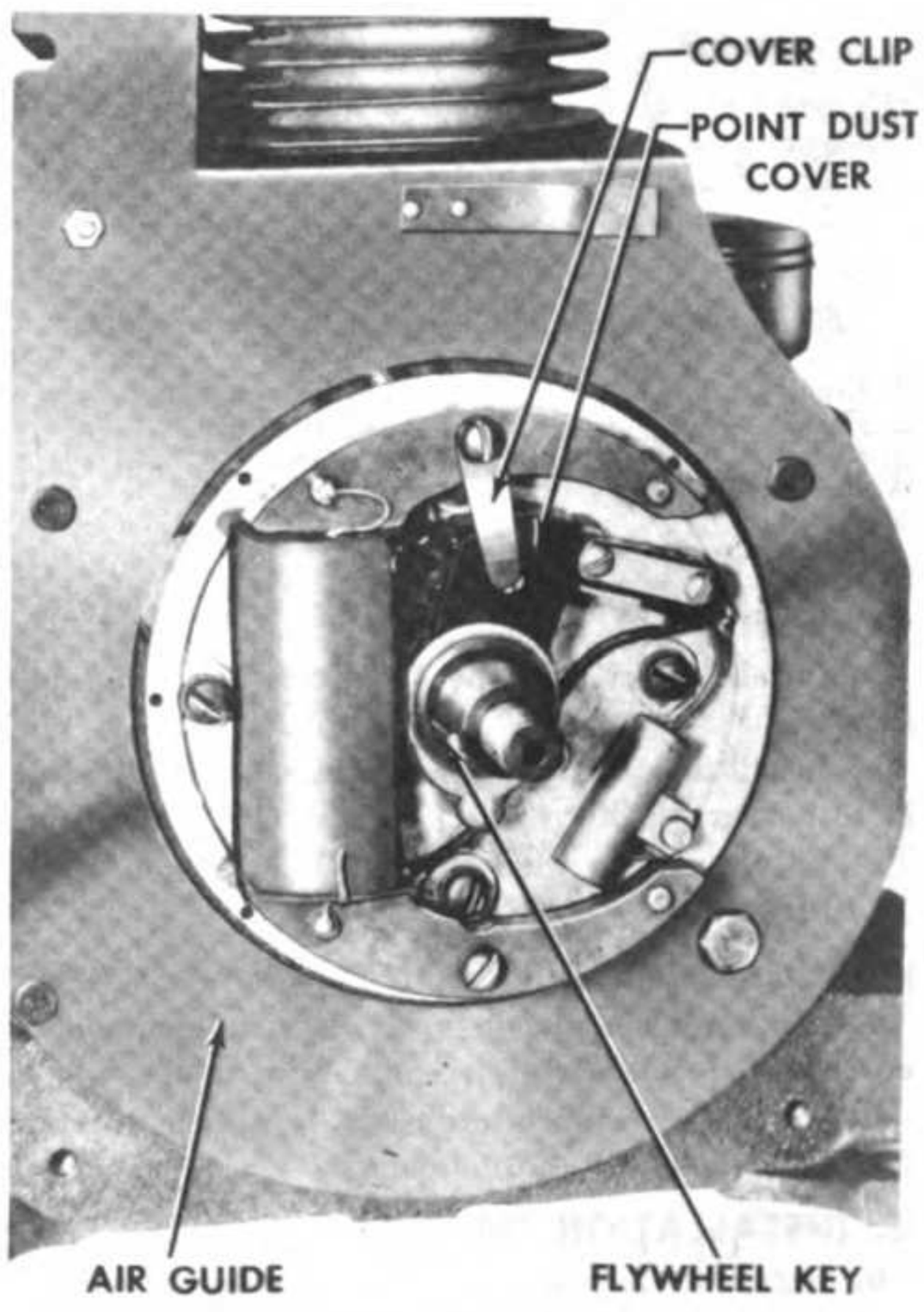

Figure 40—Flywheel Removed from Engine

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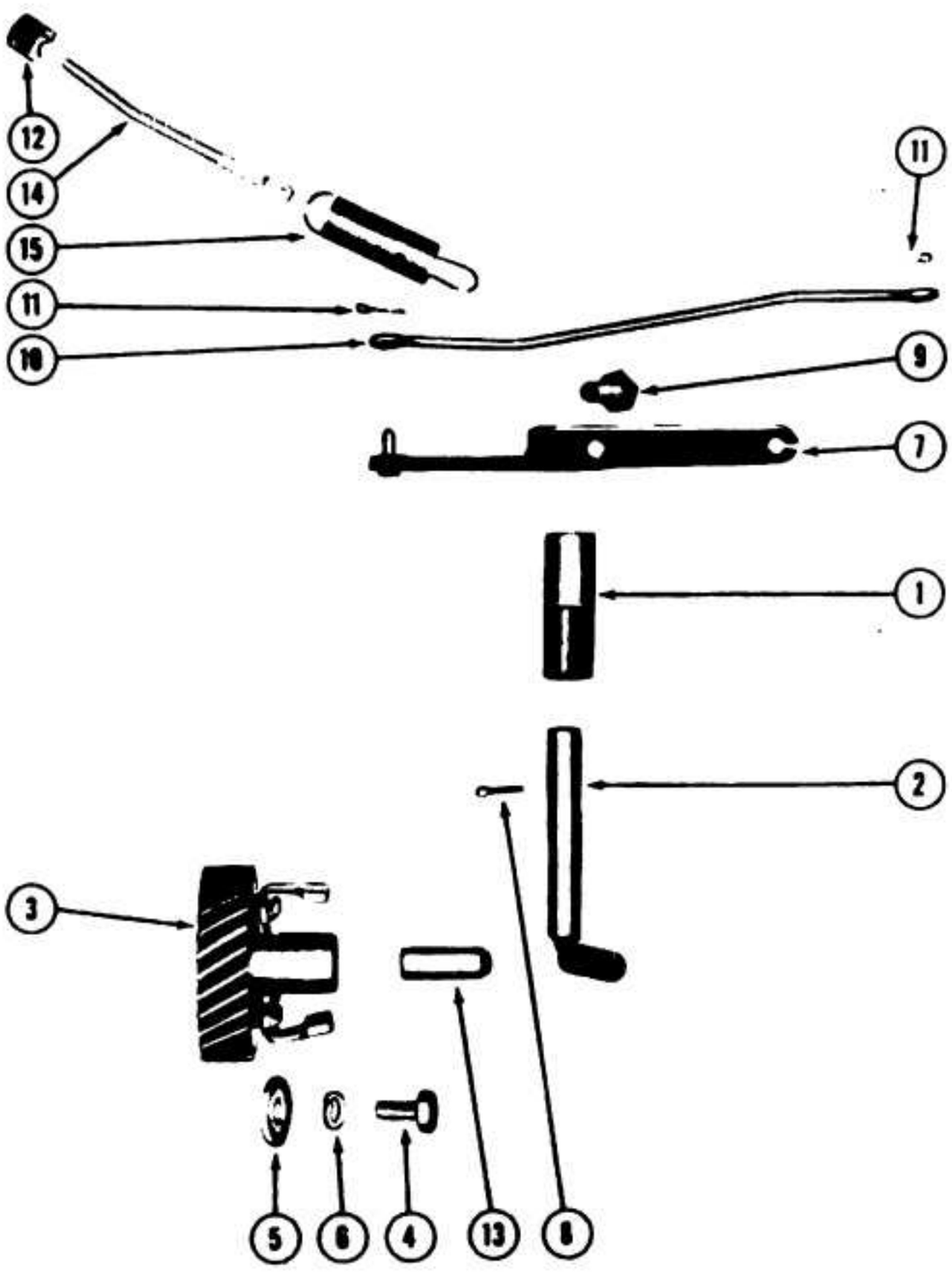

Figure 41—Exploded View of Governor Parts

1. Crank bushing
2. Crank
3. Gear
4. Retainer screw
5. Washer
6. Lockwasher
7. Lever
8. Cotter pin
9. Lever screw
10. Throttle link
11. Cotter pin
12. Adjusting nut
13. Plunger
14. Spring rod
15. Spring

o. Install the cylinder head. (Refer to paragraph 27.*c.*)

p. Install the spark plug and spark plug shield. (Refer to paragraph 30.*c.*(5).)

q. Fill the engine with oil. (See Lubrication Order LO 10-1668.)

54. ENGINE INSTALLATION.

a. Position the engine on the engine cushion mounts; secure with lockwashers and nuts. (See figure 5.)

b. Install the compressor assembly on the engine. (See paragraph 72.)

55. INSTALLATION OF SUBASSEMBLIES.

a. Install the fuel tank bracket. (See figure 6.)

b. Install the fuel tank. (Refer to par. 32.*f.*(3).)

c. Install the fuel strainer. (Refer to par. 32.*e.*(4).)

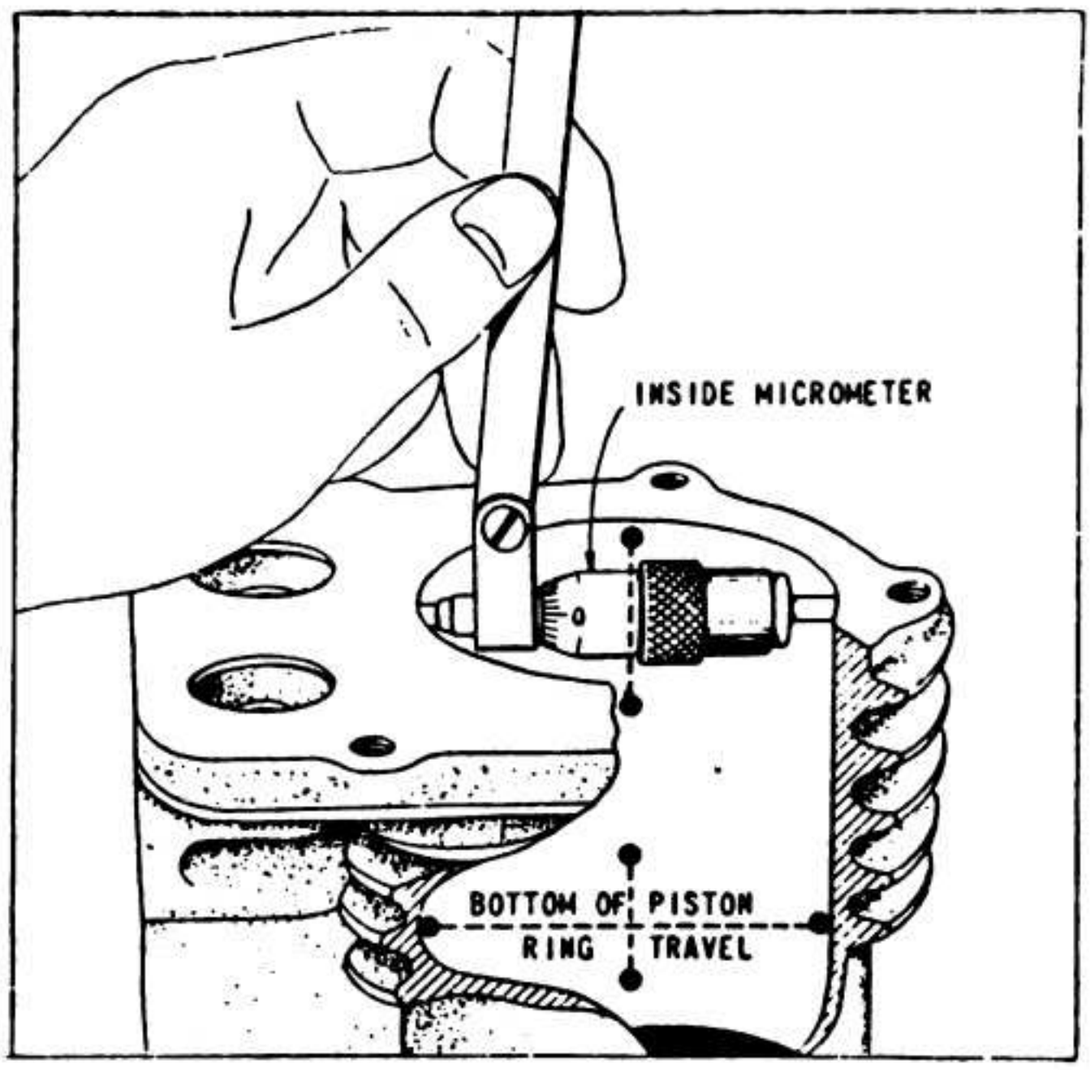

Figure 42—Inspecting Cylinder Bore

d. Install the muffler and muffler street-ell pipe fitting.

e. Install the carburetor and air cleaner. (Refer to paragraph 32.*c.*(4).)

f. Reset governor lever, as follows:

(1) Loosen the screw holding the governor lever on the governor crank shaft.

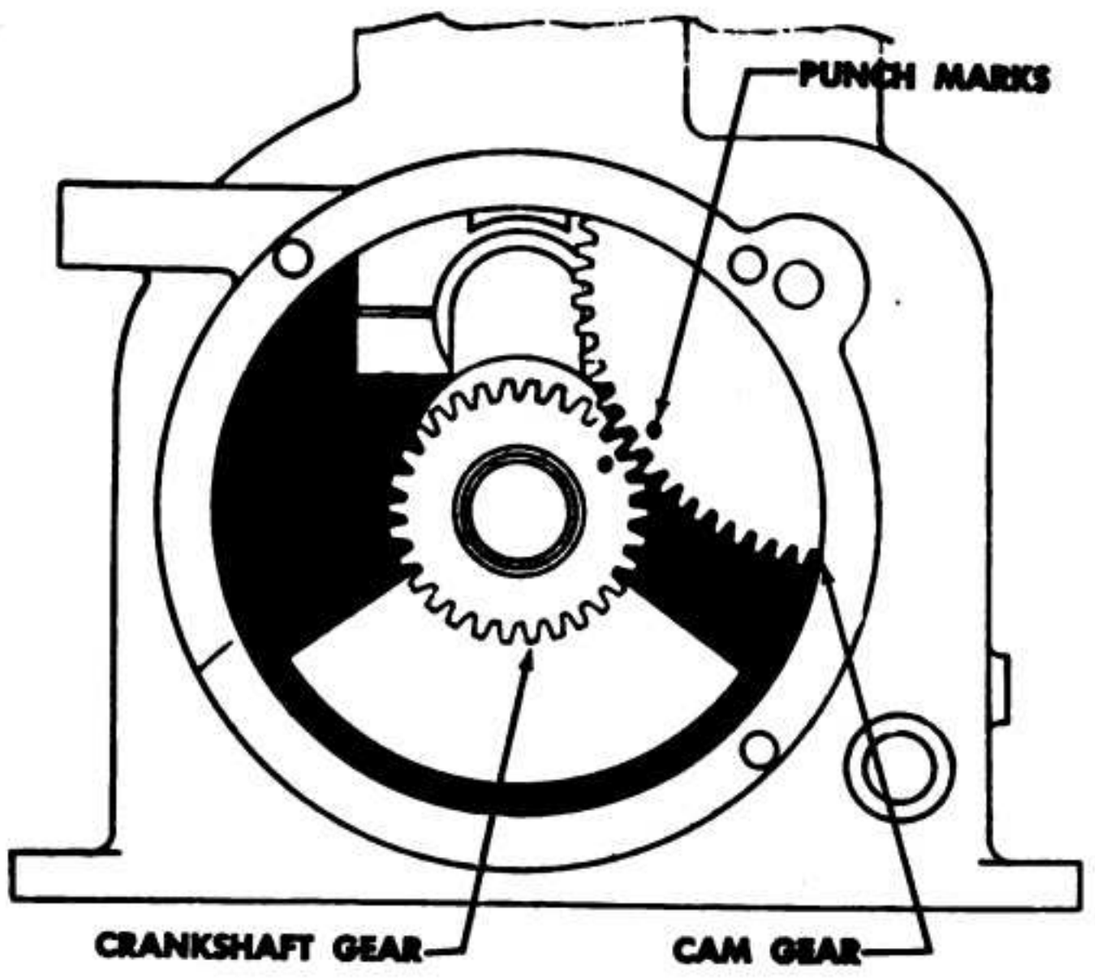

Figure 43—Timing Marks

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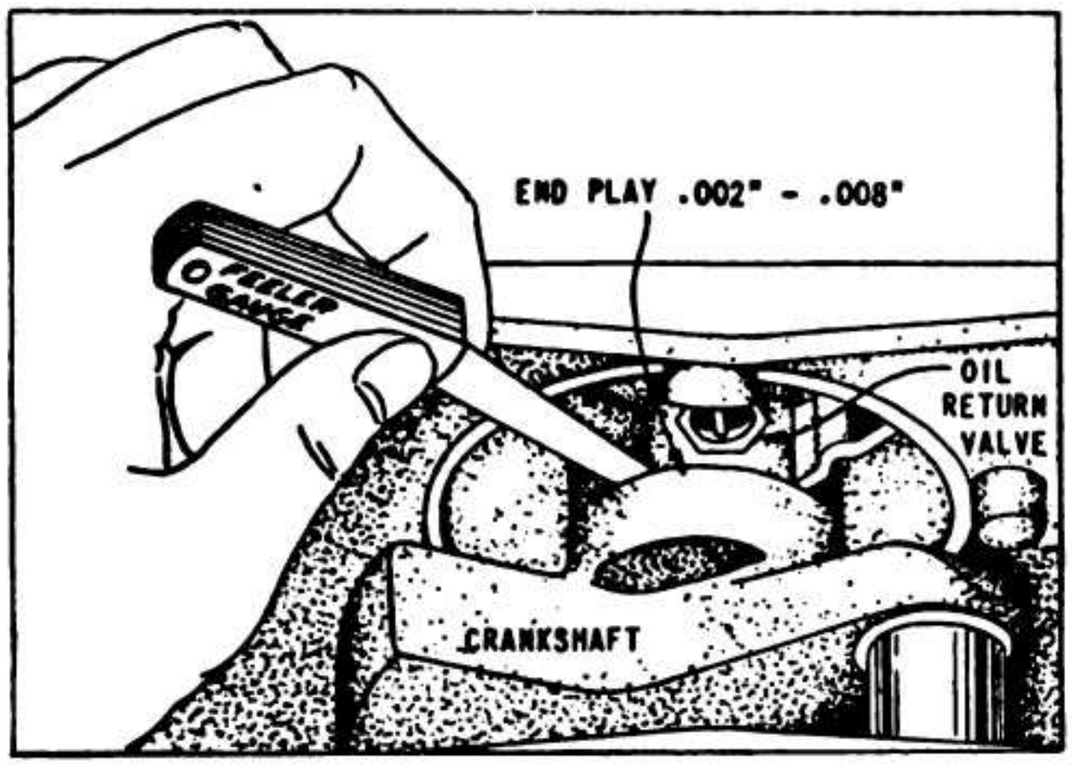

Figure 44—Inspecting Crankshaft End Play

(2) Push the governor lever toward the left as far as it will go. Hold it in this position and turn the governor crank shaft to the right until it strikes a "stop" in the cylinder assembly.
(3) Tighten the clamp screw holding the governor lever to the governor crank shaft until it is snug.
(4) Push the governor lever to the right as far as it will go and tighten the clamp screw securely.
(5) Adjust the governor speed. (Refer to paragraph 32.*d*.(2).)

56. ADJUSTMENTS AND TESTS.

a. Valves and Valve Springs. Rotate the engine slowly; if hissing sound is heard on any compression stroke, valves are leaking or burned, or the valve is not seated uniformly on the valve seat. Regrind leaky valves. To grind, proceed as follows:
(1) Remove the valves from the engine, following the procedure outlined in Paragraph 29.*b*.(2) and (3).
(2) If a valve grinding machine is used, be sure that the valve guide is in good condition and that the pilot mandrel fits properly in the guide and in the hub of the grinder stone. Worn grinders will not give the mandrel solid support and should be replaced before the grinding operation. Set the grinding machine at 45 degrees.
(3) Hand grinding:
(*a*) Be sure the valve stems are clean and fit snugly to insure a tight fitting valve and seat after grinding.
(*b*) Apply correct grinding compound sparingly around the entire valve seat, place a light lifting coiled spring on the stem, lubricate the valve stem, and drop it into its original place in the block. NOTE: The spring should barely hold the valve off its seat.
(*c*) Place the grinding tool in the holes in the valve head.
(*d*) Press down until the valve head is seated. Rotate the valve a quarter-turn, first in one direction and then in the other, three or four times.
(*e*) Release the pressure on the valve; the coiled spring will lift it off its seat.
(*f*) Rotate the valve about 10 or 15 degrees in an alternate position and repeat the grinding.
(*g*) Repeat the operations until all the grinding compound is rubbed off the valve seat; withdraw the valve and apply fresh grinding compound. Repeat the grinding operation.
(*h*) Do not overgrind. Clean the valve and seat occasionally to inspect results of the grinding. When all pits and grooves have been ground over, clean the valve and valve seat, and place eight or ten equally spaced marks on the seat with a soft lead pencil. Drop the valve in place, give it a quarter-turn, and remove it. A perfect seat will be indicated if every pencil mark shows where the valve has rubbed it. If any pencil marks are untouched, continue the grinding until a perfect valve closure is obtained.
(4) When grinding is completed, inspect the valve seat for concentricity with a dial indicator.
(5) Oil the valve stem and reassemble. Place the valve spring and retainer into the compressor and compress as much as possible. Place the tool into valve chamber, and slip valve into place. Slip one-half of the retainer collar into its groove in valve stem and move toward the rear of the valve chamber; then insert the other half. Release the spring compressor.

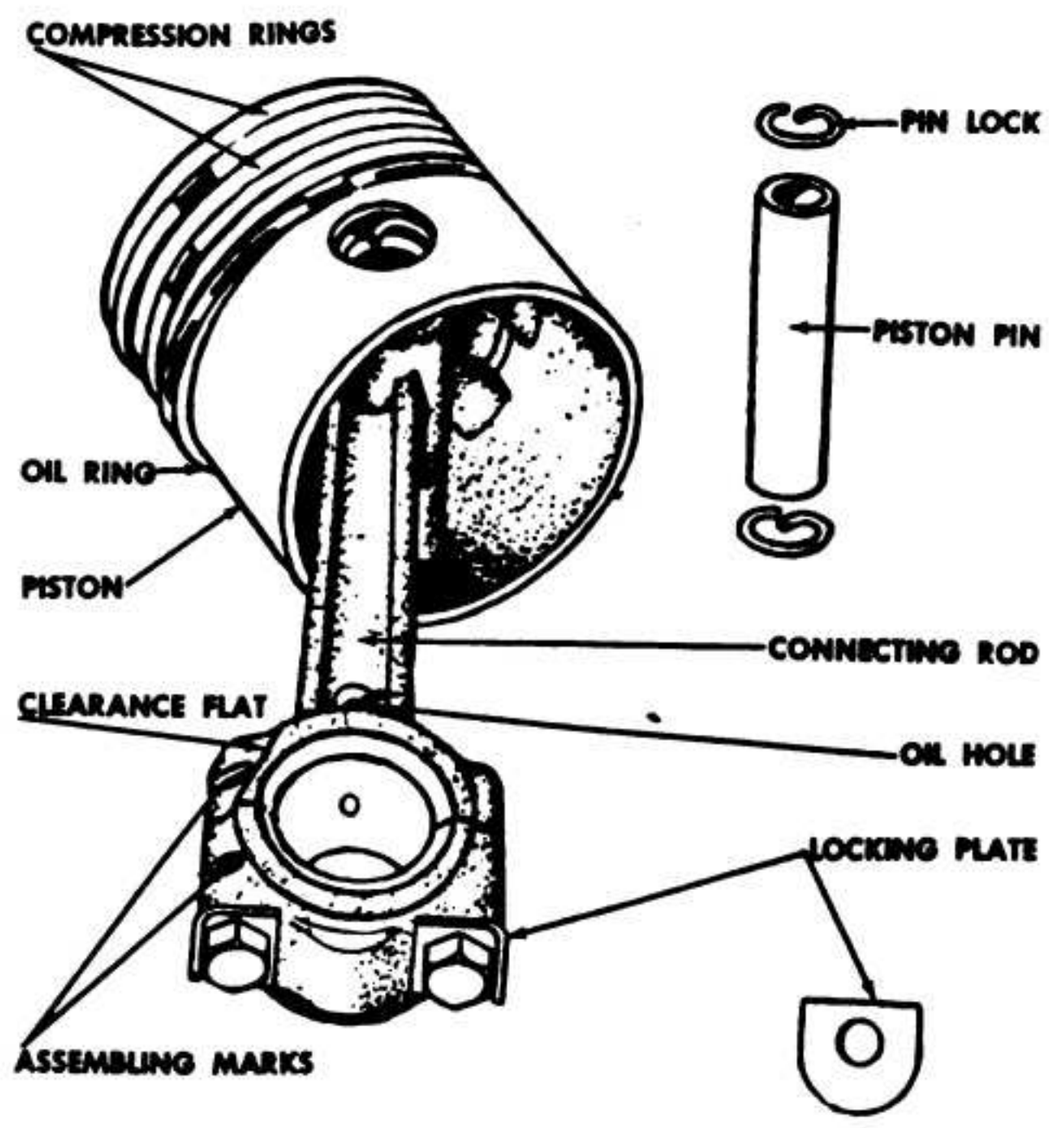

Figure 45—Piston Assembly

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Section XXI. Carburetor

57. DESCRIPTION.

Refer to paragraph 32.*c.*(1).

58. REMOVAL.

Refer to paragraph 32.*c.*(3).

59. DISASSEMBLY.

a. Remove the needle valve, needle valve packing nut, needle valve retainer, seat and nozzle gasket, and carburetor nozzle. (See figure 47.)

b. Remove the three fillister head screws and lockwashers attaching the lower and upper carburetor bodies. CAUTION: The upper and lower bodies are interlocked by the nozzle; remove the nozzle first to avoid damaging parts.

c. Remove the idling valve and its spring.

d. Remove the carburetor throttle valve from the throttle shaft assembly; remove the valve shaft assembly.

e. Remove the hinge pin securing the float to the upper body; remove the float.

f. Remove the carburetor choke valve from the choke shaft and lever; remove the shaft and lever.

g. Remove the inlet valve and seat, with the seat gasket.

60. INSPECTION AND REPAIR.

a. Wash metal parts in SOLVENT, dry cleaning, to remove gum deposits and dirt.

b. Blow through all passages and openings. CAUTION: Do not use wire to clean holes or passages.

c. Inspect all parts; replace worn or damaged parts.

61. ASSEMBLY.

a. Install the inlet valve and seat, with the seat gasket. NOTE: These are matched parts; if one is damaged, replace all three. (See figure 47.)

b. Install the choke shaft and lever in the lower body; secure the choke valve to the shaft with two screws and lockwashers.

c. Install the carburetor float on the upper body. NOTE: The float should be in a horizontal position when it closes inlet valve and seat. Inspect the float by inverting the upper body and placing a scale or flat, straight piece of steel across carburetor float. See that the distance from the top of the float to carburetor body flange is equal on both sides. (See figure 46.) Bend float hinge tang to attain proper float position.

d. Install the throttle valve shaft assembly in the upper body; secure the throttle valve to the shaft with two screws and lockwashers.

e. Install the idling valve and spring.

f. Assemble the upper and lower carburetor bodies; secure with three fillister head screws and lockwashers, after installing gasket to upper body assembly.

g. Install, in order, the carburetor nozzle, nozzle gasket, needle valve retainer, needle valve packing nut, and needle adjusting valve in the lower body. Use packing between the packing nut and valve retainer.

62. INSTALLATION.

a. Refer to paragraph 32.*c.*(4).

b. Adjust the carburetor. (See paragraph 32.*c.*(2).)

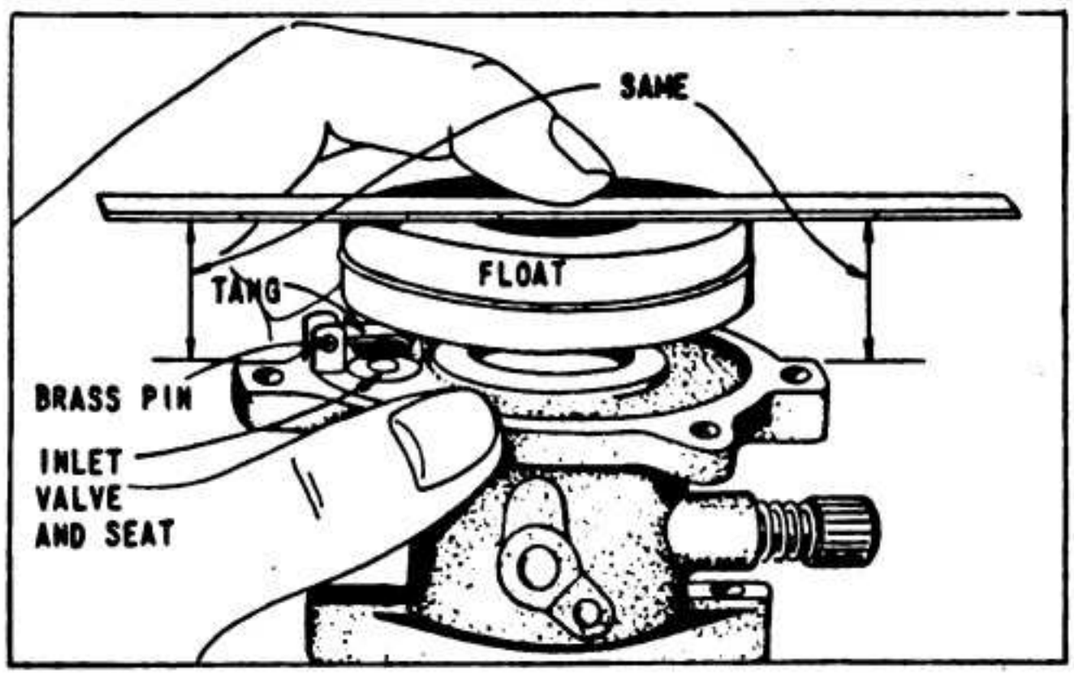

Figure 46—Inspecting Carburetor Float Position

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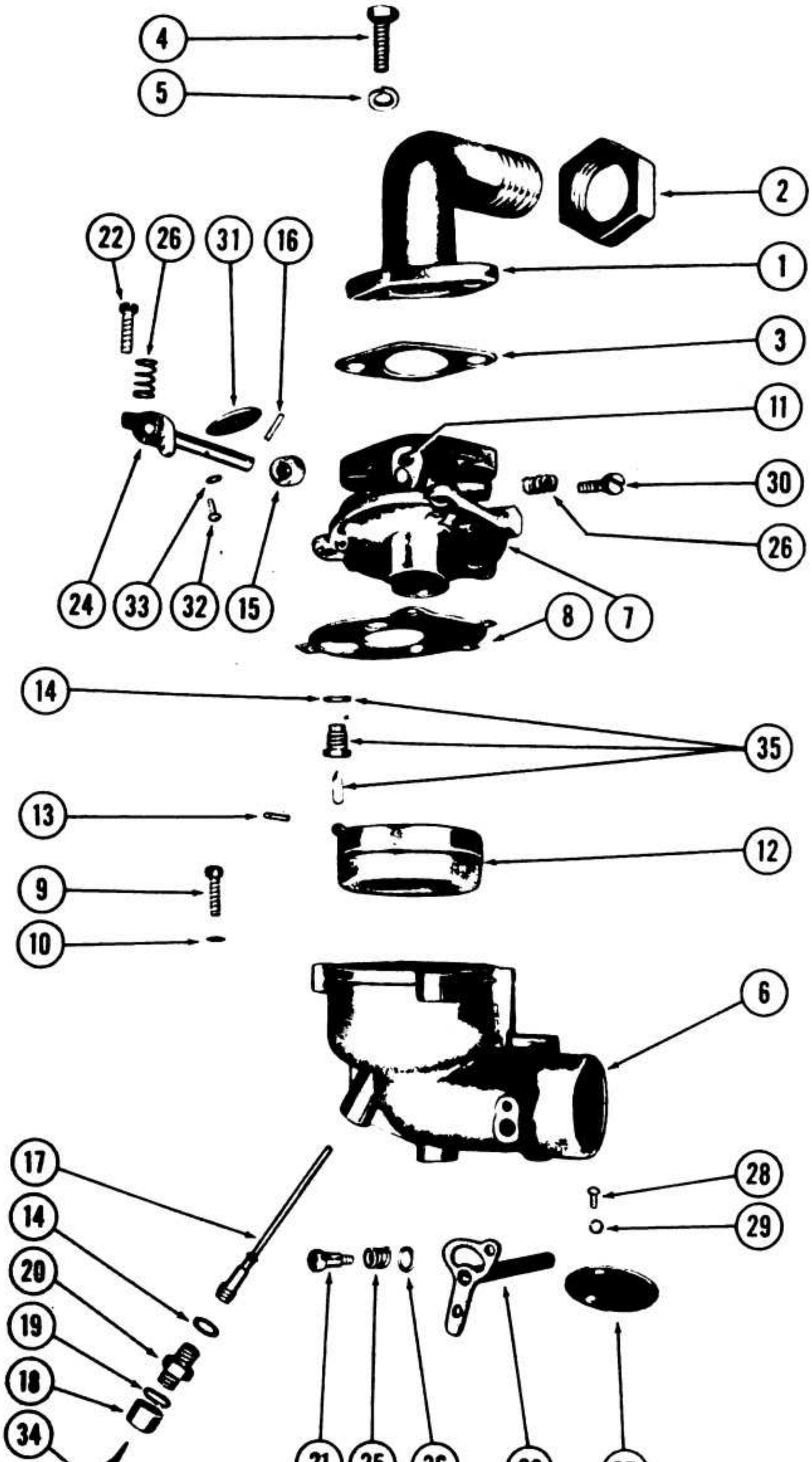

LEGEND FOR FIGURE 47

1. Intake elbow
2. Intake elbow nut
3. Mounting gasket
4. Mounting screw
5. Lockwasher
6. Lower body assembly
7. Upper body assembly
8. Body gasket
9. Screw
10. Lockwasher
11. Throttle shaft bushing
12. Carburetor float
13. Float hinge pin
14. Seat and nozzle gasket
15. Throttle lever
16. Throttle lever pin
17. Nozzle
18. Needle valve packing nut
19. Needle valve packing
20. Needle valve retainer
21. Choke lever screw
22. Screw
23. Choke shaft and lever
24. Throttle shaft assembly
25. Choke lever spring
26. Idle valve and throttle adjusting springs
27. Choke valve
28. Choke valve attaching screw
29. Lockwasher
30. Idling valve
31. Throttle valve
32. Throttle valve attaching screw
33. Lockwasher
34. Needle adjusting valve
35. Inlet valve, seat, and gasket
36. Choke lever washer

Figure 47—Exploded View of Carburetor and Intake Elbow

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Section XXII. Magneto

63. DESCRIPTION.

Refer to paragraph 30.*a*.

64. MAINTENANCE.

a. Remove the flywheel, following procedure outlined in paragraph 52.*h*. (See figure 48.)

b. Magneto Timing. The magneto is correctly timed with the engine when the flywheel is assembled to the tapered crankshaft with a key and secured with a right-hand threaded nut. Do not attempt to change the timing by relocating any parts or filing crankshaft timing flat. Always use a soft flywheel key. If steel key is used and flywheel becomes loose, keyway in crankshaft will be damaged.

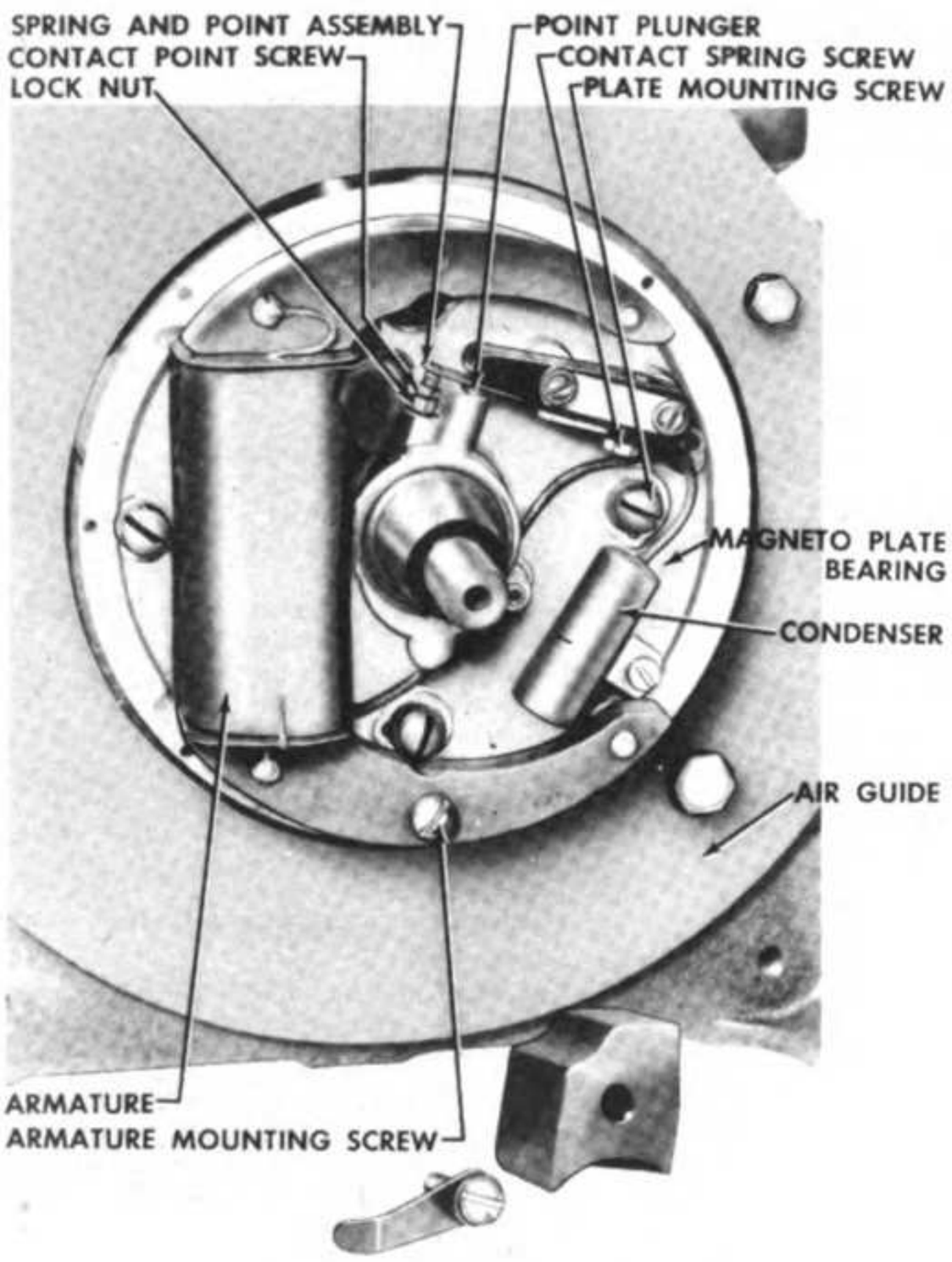

Figure 48—Magneto Detail

c. Contact Points.

(1) Remove contact points dust cover. (See figure 40.)

(2) Turn crankshaft by hand to see whether magneto contact points open and close properly. Points must be clean and squarely alined to make good electrical contact. Use a carborundum contact-point file to square up points. CAUTION: Do not use a steel file.

(3) If either point is badly pitted or burned, replace both points.

(4) To aline contact points, proceed as follows:

(*a*) Loosen contact spring screw. (See figure 50.)

(*b*) Move contact block assembly so that it is alined with contact screw point.

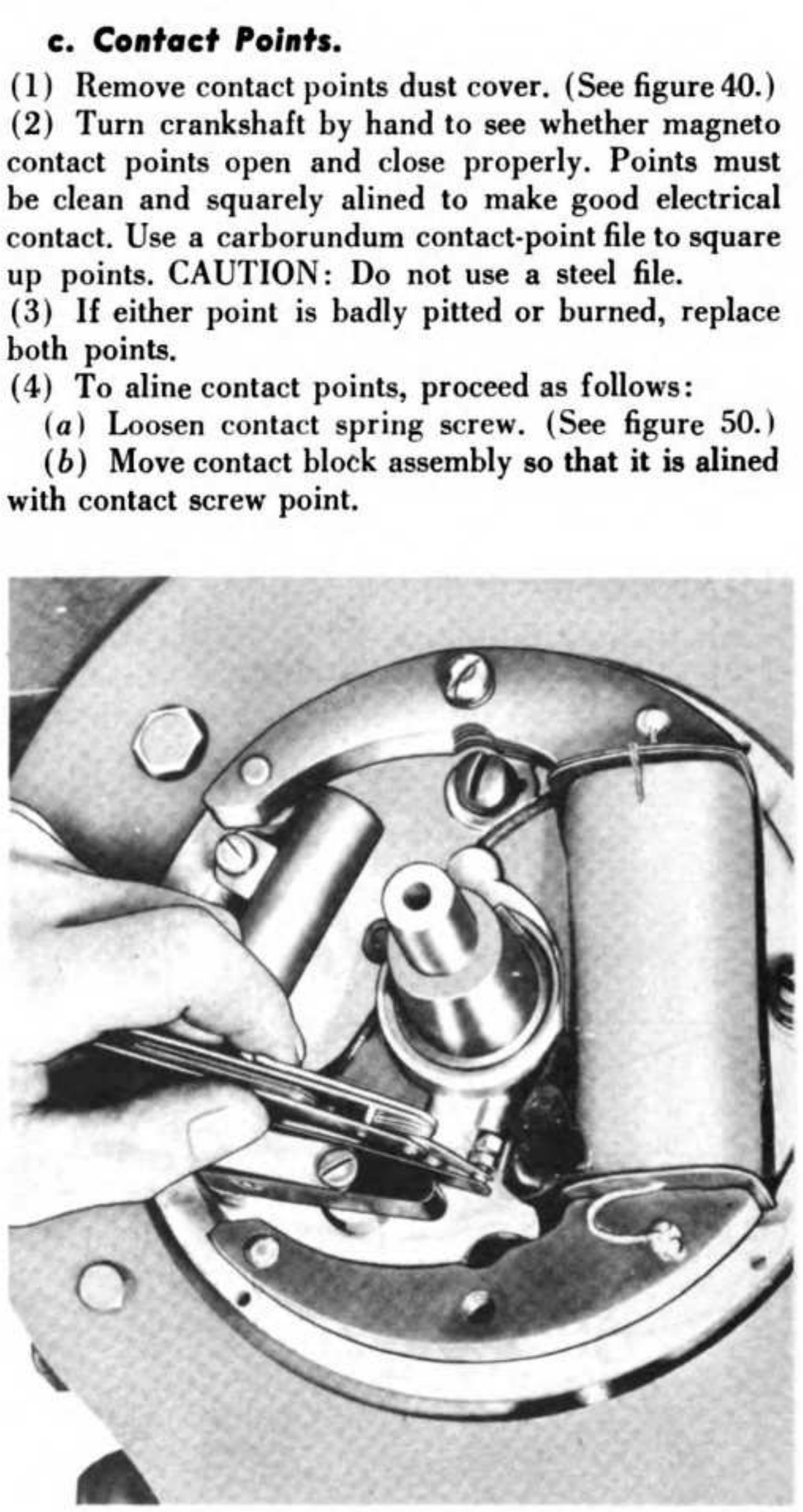

Figure 49—Inspecting Contact Point Gap

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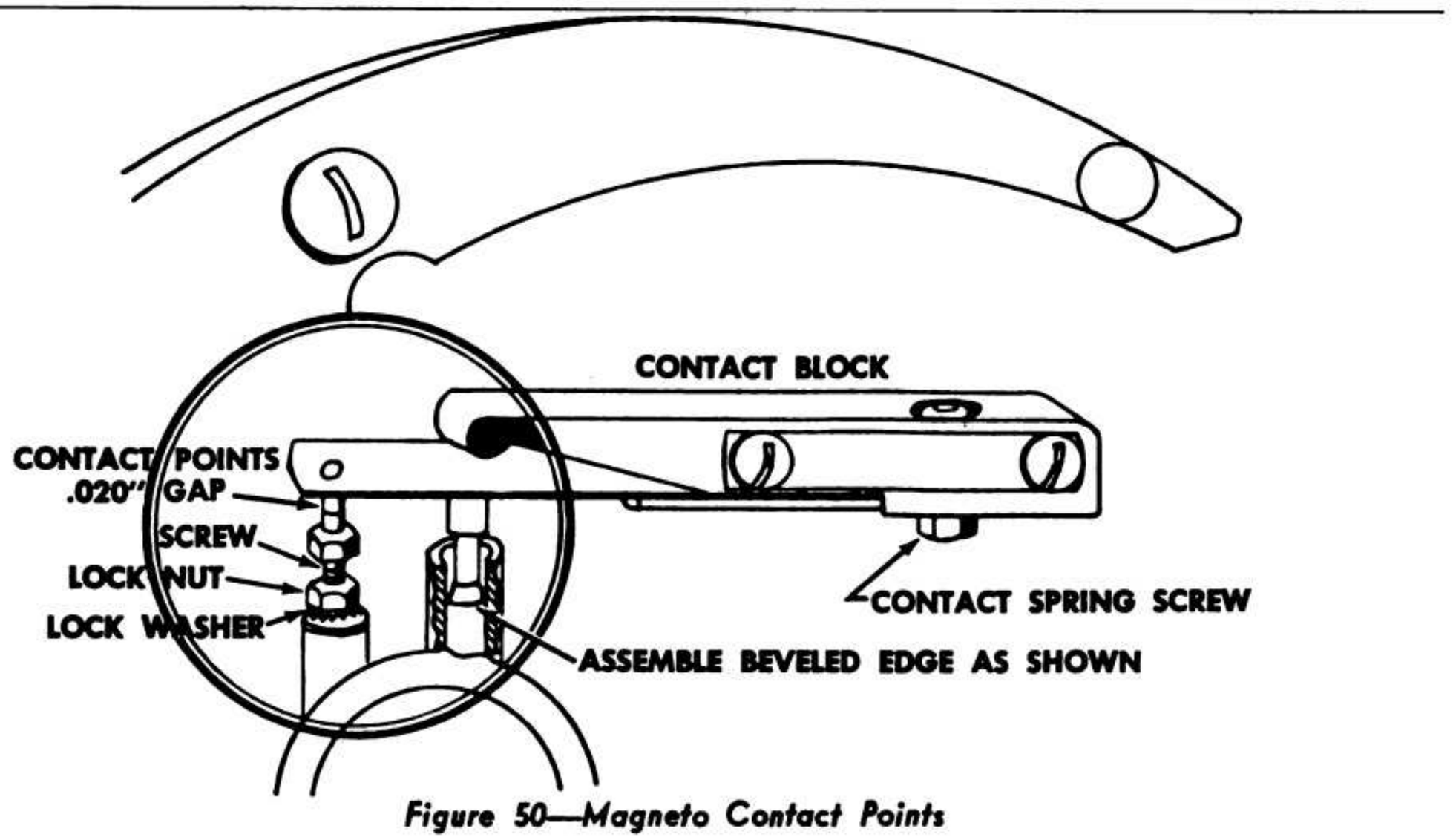

Figure 50—Magneto Contact Points

(*c*) Tighten contact spring screw.

(5) To adjust contact tension, proceed as follows:

(*a*) Turn the crankshaft until points are in open position.

(*b*) Place a 1/16-inch gage between the contact spring and the round end of the contact block; tighten contact block round-head screws.

(*c*) Turn the contact screw to secure .020-inch gap between points; tighten the lock nut against the lockwasher. (See figures 49 and 50.)

d. Condenser. A leaky or weak condenser may cause hard starting, sputtering, or misfiring under load. If inspection of fuel line, carburetor, spark plug, cable, and magneto contact points does not reveal trouble, replace condenser. Solder the end of the condenser wire and primary wire to the contact spring, as shown in figure 51.

e. Armature.

(1) Removal.

(*a*) Remove armature lead wire from contact spring, and high ignition cable from secondary terminal loop in the armature. Both wires are soldered. Save as much of the hydrolene as possible for insulation of high tension terminal when new armature is assembled.

(*b*) Unscrew two armature mounting screws and pry armature loose. (See figure 48.)

(2) Installation.

(*a*) Position armature on magneto backing plate; install upper and lower mounting screws. Tighten only lower screw; upper screw must be removed for installation of dust cover and dust cover clip.

(*b*) Solder ignition cable to the terminal; fill pocket formed with flap with hydrolene.

(*c*) Solder armature lead wire to contact spring.

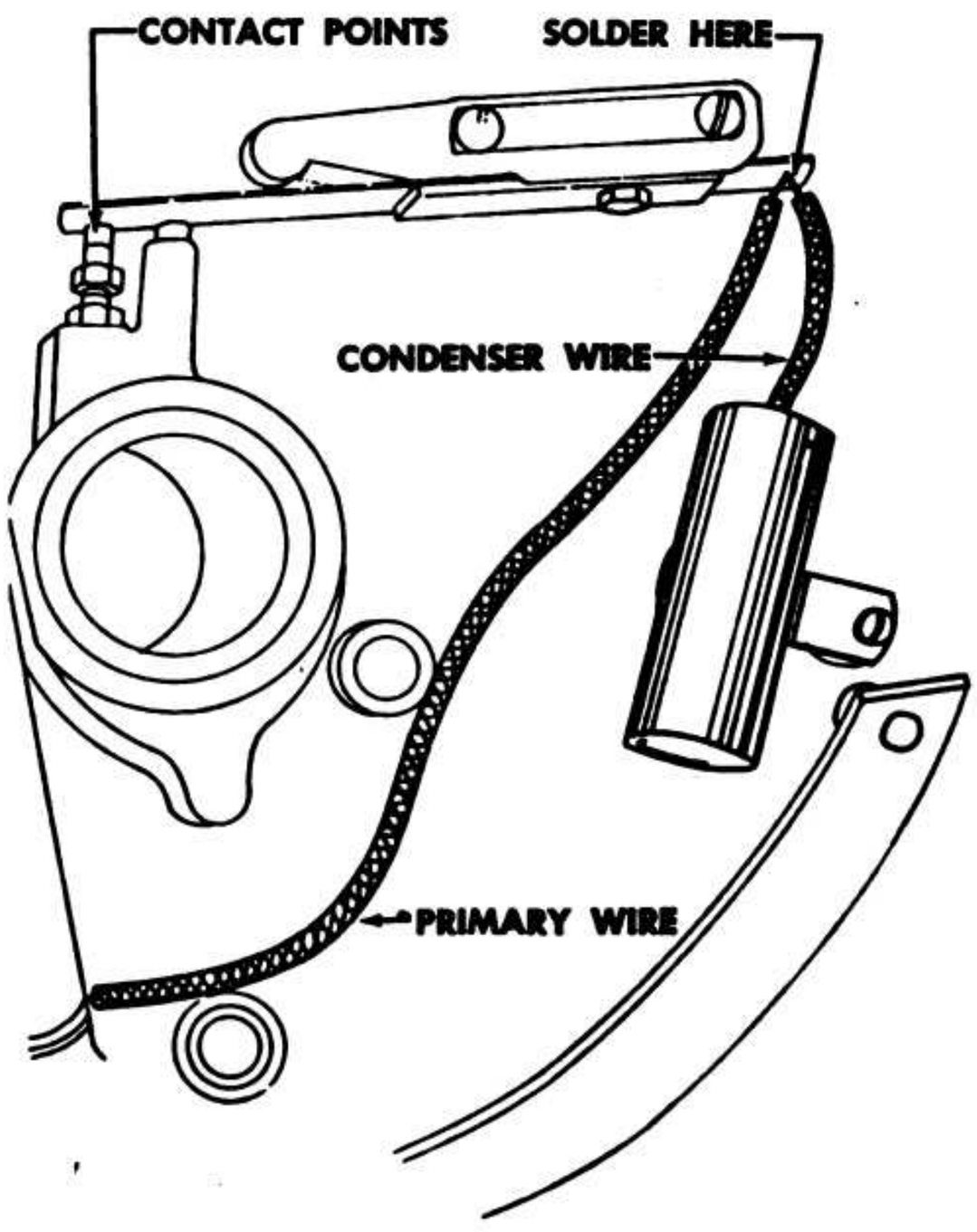

Figure 51—Condenser Installation

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(*d*) Install dust cover and dust cover clip; tighten upper armature mounting screws.

NOTE: An air gap of .002- to .010-inch must be maintained between armature shoes and flywheel poles. Gap must be sufficient only to preven rubbing; if gap exceeds .010-inch, poor ignition will result. To inspect armature shoe for rubbing, chalk edges and mount flywheel in place. (See paragraph 53.*h*.) Remove spark plug to release compression. Turn flywheel several times by hand. Remove flywheel and inspect edges of armature shoes. Chalk will be rubbed off high spots. File high spots carefully with a fine file; be careful not to remove more metal than necessary.

65. REMOVAL.

Refer to paragraph 52.*l*.

66. INSTALLATION.

Refer to paragraph 53.*d*.

Section XXIII. Compressor

67. DESCRIPTION.

Refer to paragraph 34.*a*.

68. COMPRESSOR REMOVAL.

a. Disconnect the manifold air tube and remove the manifold. (See paragraph 37.*b*.)

b. Remove the expansion heads. (See paragraph 37.*b*.)

c. Lift off the compression plates.

d. Remove the six cover plate attaching screws and lockwashers.

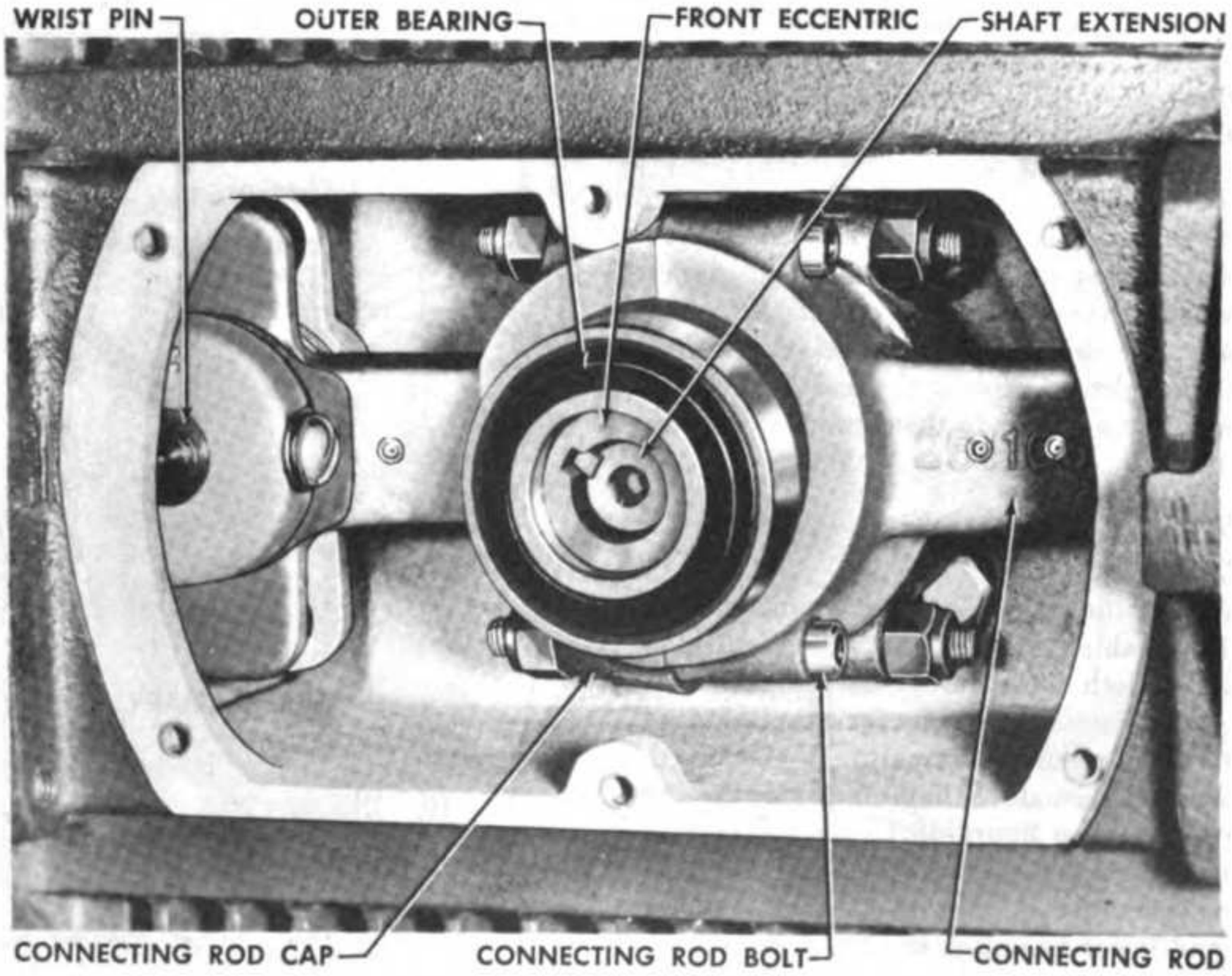

Figure 52—Compressor Cover Removed

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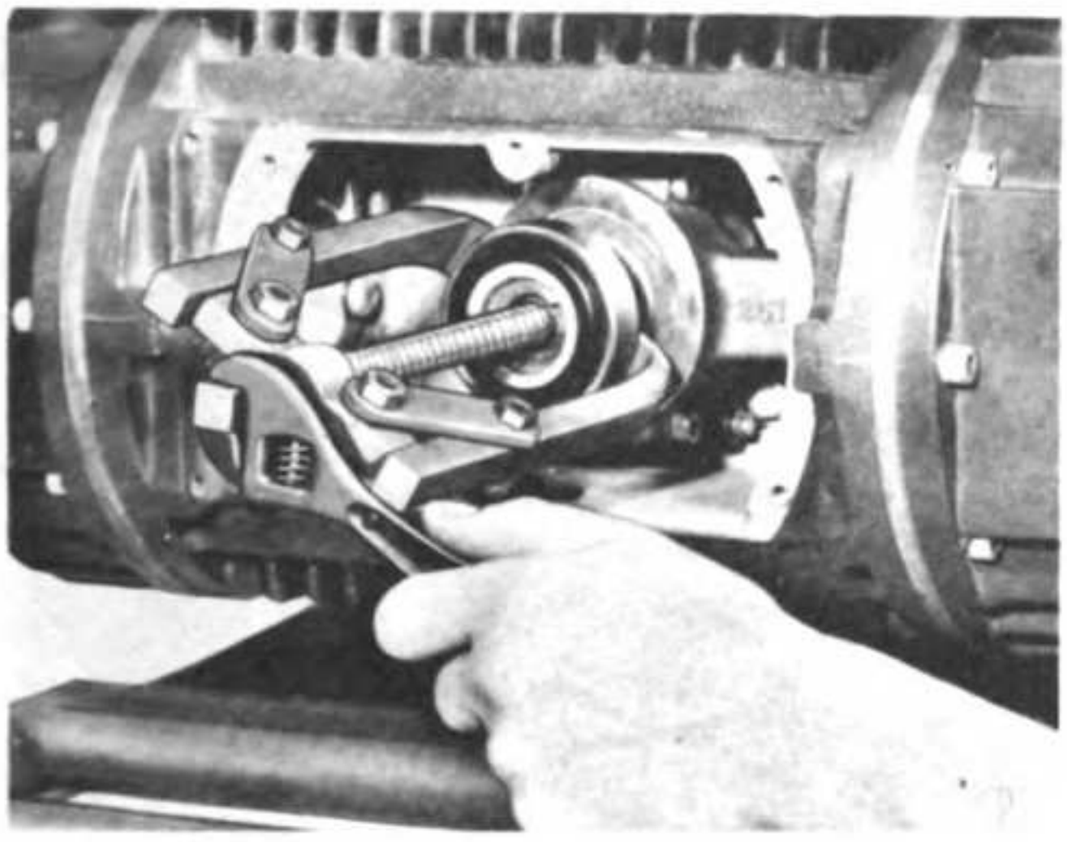

Figure 53—Removing Outer Bearing

e. Remove the cover plate plug screw from the center of the cover plate and insert a cover removing screw; tighten the screw until the cover is free. (See figure 52.)

f. Use a gear puller to remove the outer bearing from the engine shaft extension. (See figure 53.)

g. Remove nuts and bolts securing connecting rod caps to the connecting rods, freeing the caps. (See figure 54.)

h. Pull the connecting rod and piston assemblies, with the diaphragms, from the compressor housing.

i. Remove the four mounting capscrews and lockwashers securing the compressor housing to the compressor housing extension, freeing the housing. (See figure 55.)

j. Loosen the setscrews in the front eccentric and, using a gear puller, remove the eccentric with its bearing from the engine shaft extension.

k. Loosen setscrew and use a gear puller to remove the rear eccentric and its bearing from the engine shaft extension.

l. Remove the six slotted-head capscrews securing the compressor housing extension, freeing the extension.

69. DISASSEMBLY.

NOTE: Removal of the compressor from the engine necessitates partial disassembly. To complete disassembly, proceed as follows:

a. Disassemble the piston and diaphragm assembly. (1) Remove the six flat-head screws securing the dia-

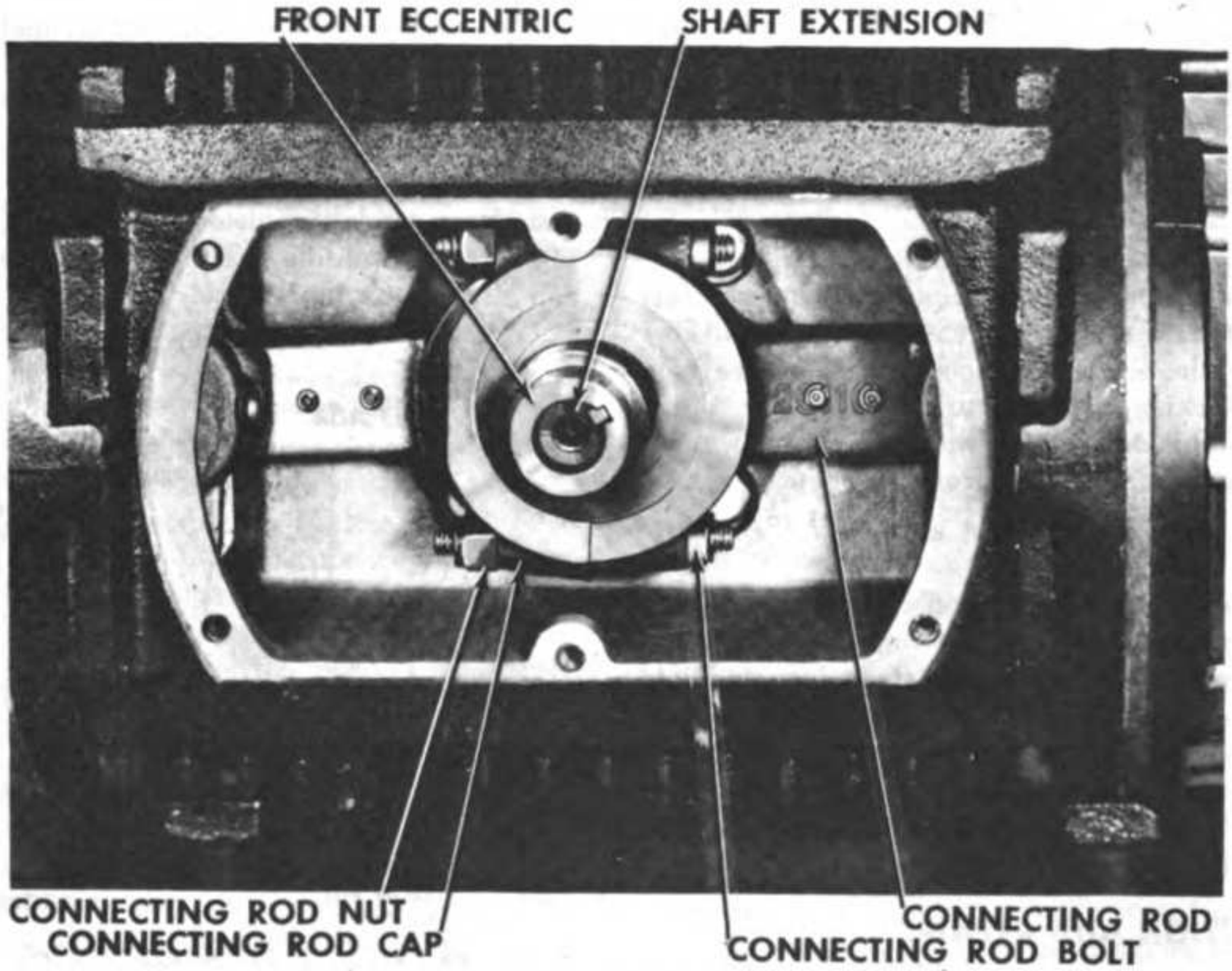

Figure 54—Outer Bearing Removed

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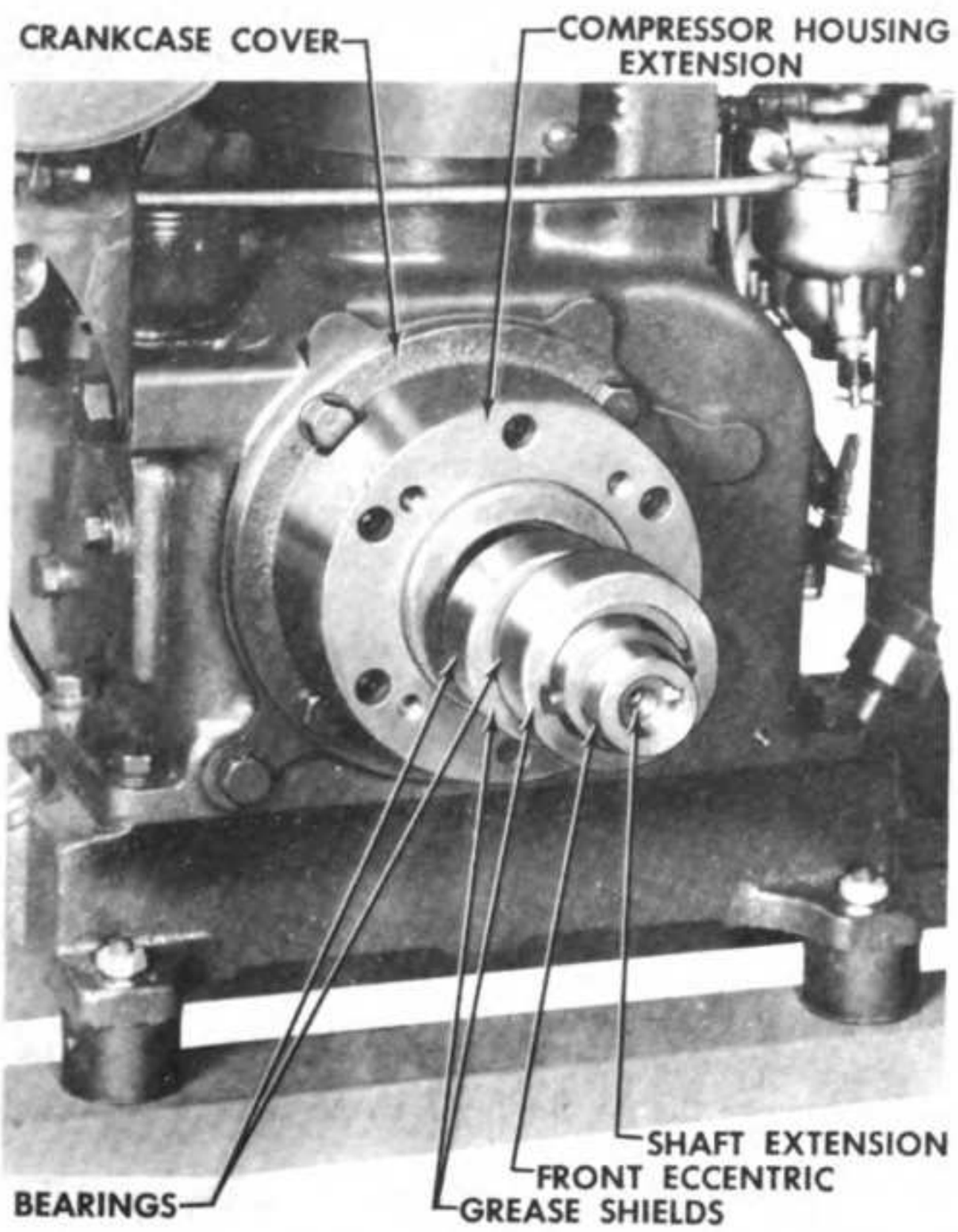

Figure 55—Compressor Housing Removed from Engine

phragm and diaphragm retainer plate to the piston. (See figure 58.)

(2) Remove the setscrews securing the piston pin; drive out the piston pin and remove the inner thrust washer and the thrust bearing. (See figures 56 and 58.)

(3) Remove the screw and lockwasher, or the capscrew and locking plate, securing the outer thrust washer to the piston; remove the outer thrust washer.

(4) Press the needle bearing from the connecting rod.

b. Disassemble the manifold assembly. (See figure 59.)

(1) Unscrew the air tube shut-off valve and the relief cock from the manifold.

(2) Unscrew the hose connectors from the manifold pipes.

(3) If connectors require service, unscrew the brass hexagon washer holder and install a new rubber washer. CAUTION: The deflator is loose under the washer; take care not to lose this part.

70. INSPECTION AND REPAIR.

a. Wash metal parts in SOLVENT, dry cleaning; dry thoroughly.

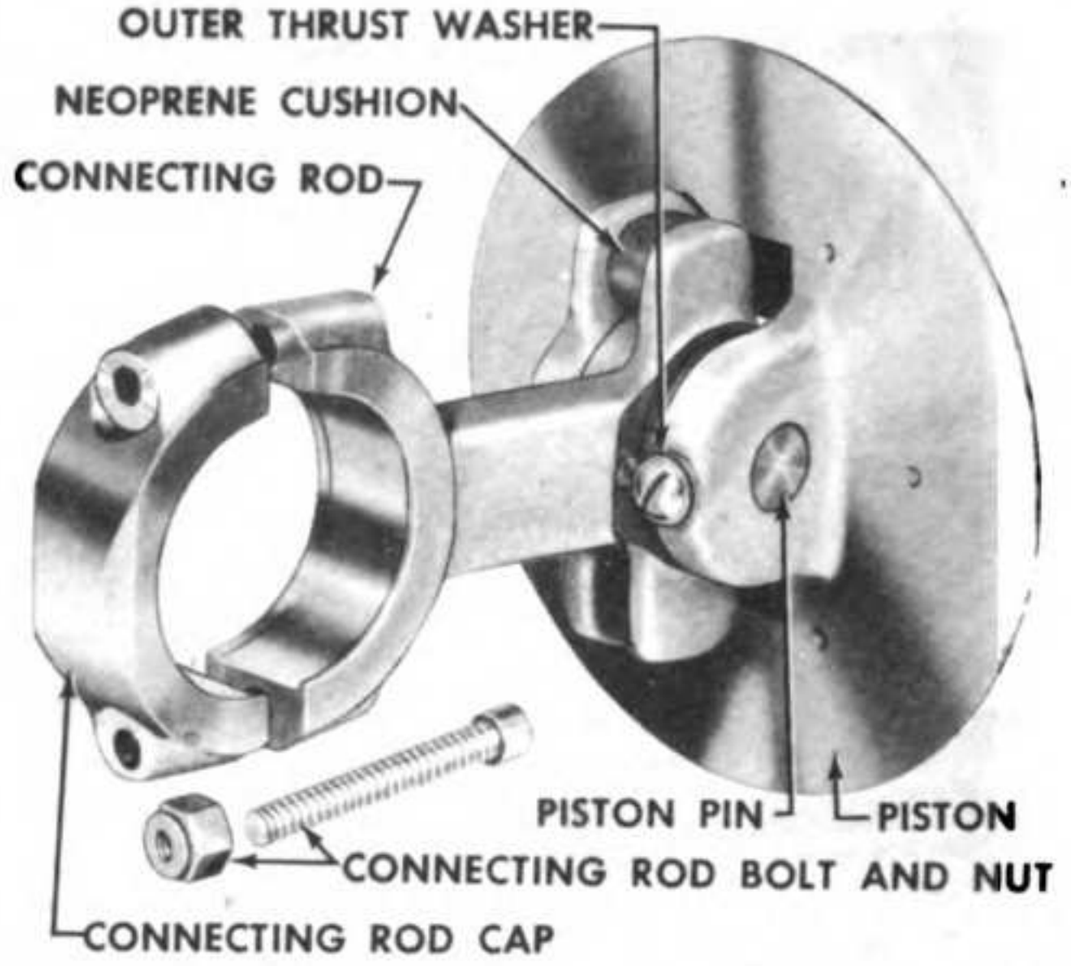

Figure 56—Compressor Piston and Connecting Rod, Assembled

b. Inspect all parts; replace worn parts.

c. Replace all gaskets.

71. REASSEMBLY.

a. Reassemble the manifold.

(1) Assemble the hose connectors, making sure the van end of the deflator points into the hose connector.

(2) Screw hose connectors into manifold pipes.

(3) Install the air tube shut-off valve and the relief cock. (See figure 59.)

b. Reassemble the piston and diaphragm assembly.

(1) Press the needle bearing into the connecting rod, and slip in the inner race.

(2) Position the connecting rod in the piston, with

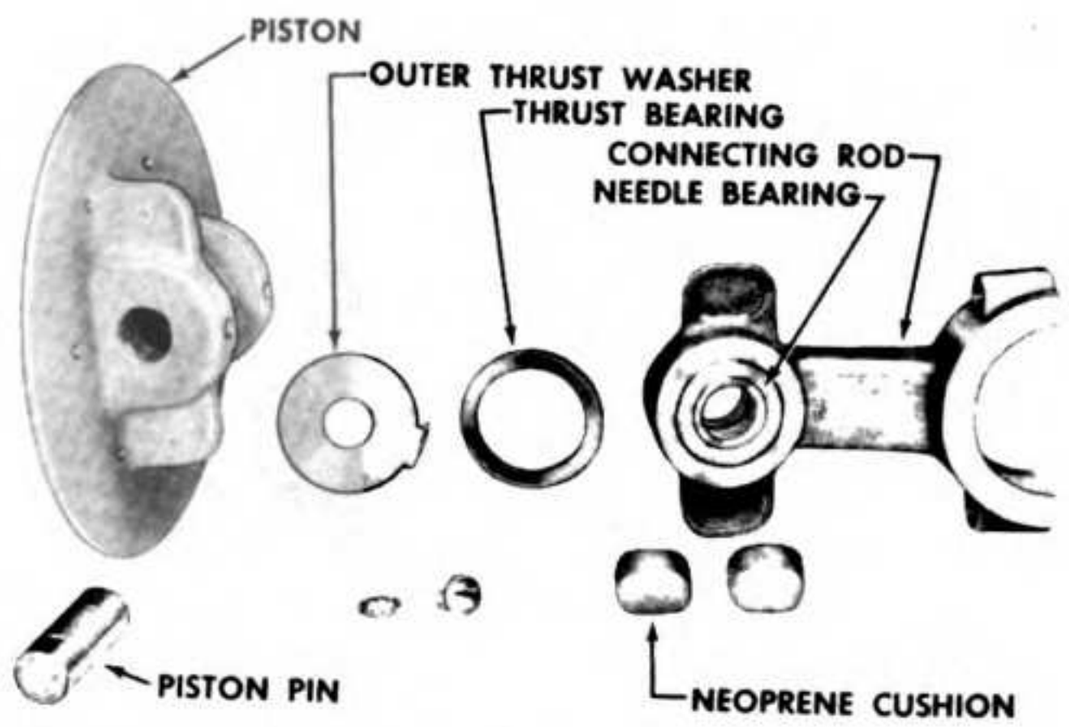

Figure 57—Compressor Piston and Connecting Rod, Disassembled

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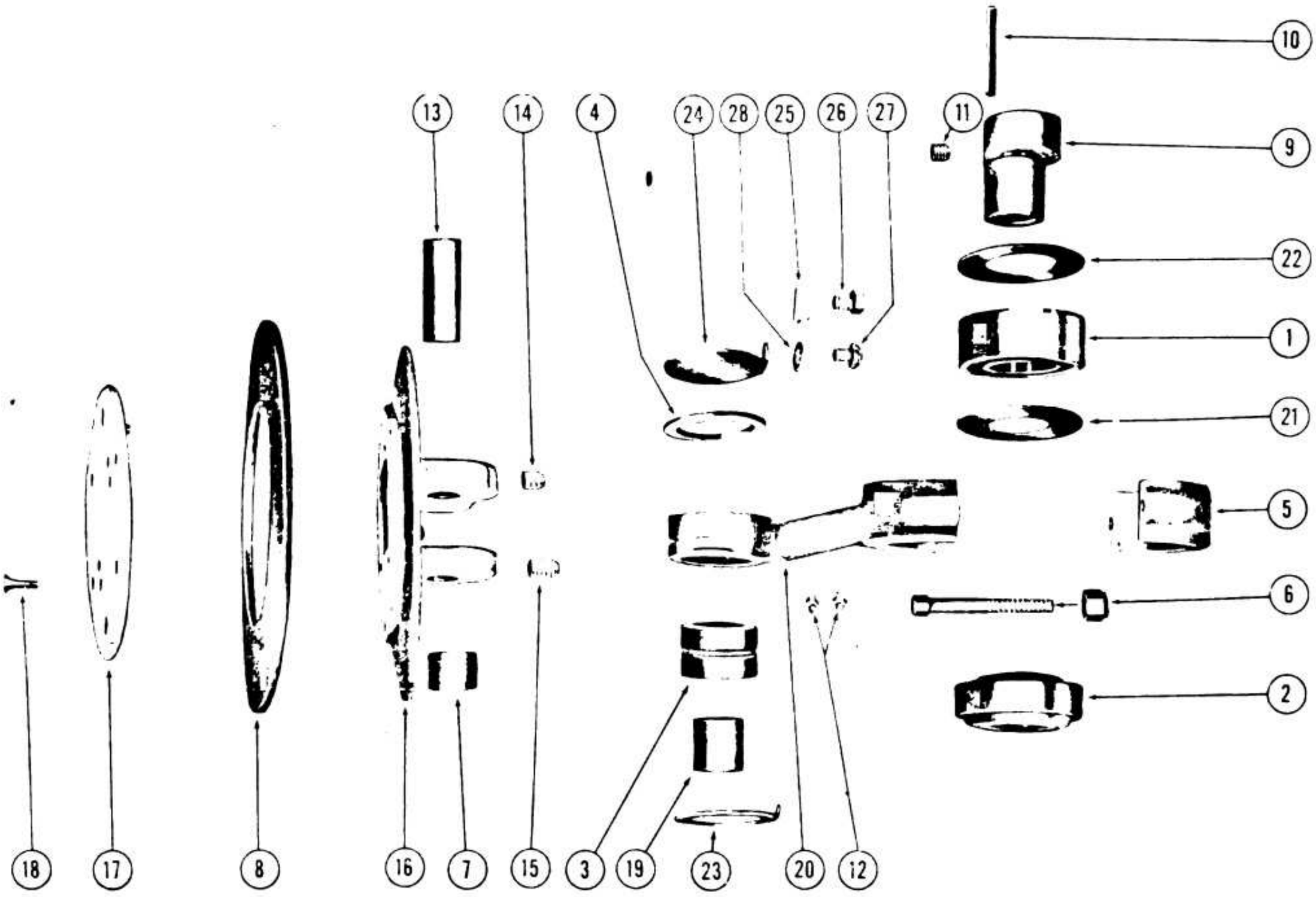

Figure 58—Exploded View of Compressor Piston and Diaphragm Assembly

1. Connecting rod ball bearing
2. Front cover ball bearing
3. Needle bearing
4. Thrust bearing
5. Connecting rod cap
6. Bolt and nut
7. Neoprene cushion
8. Compressor diaphragm
9. Back eccentric
10. Back eccentric key
11. Setscrew
12. Lubrication fitting
13. Piston pin
14. Setscrew
15. Setscrew
16. Compressor piston
17. Retainer plate
18. Retainer plate screw
19. Inner bearing race
20. Connecting rod
21. Inner grease shield
22. Outer grease shield
23. Inner thrust washer
24. Outer thrust washer
25. Locking plate
26. Capscrew
27. Roundhead screw
28. Lockwasher

inner and outer thrust washers, thrust bearing, and neoprene cushions in place. (See figures 57 and 58.)

(3) Drive in the piston pin, and secure with setscrews. Secure the outer thrust washer with a round-head screw and lockwasher, or with a capscrew and locking plate.

(4) Install the diaphragm on the piston. (See paragraph 39.*c.*)

NOTE: Further assembly of the compressor takes place during installation on the engine.

72. COMPRESSOR INSTALLATION.

a. Secure the compressor housing extension to the engine crankcase cover with six slotted-head capscrews.

b. Drive rear eccentric and bearing on the shaft extension, locating the eccentric on the shaft by seating setscrew in the locating hole on the shaft. (See figure 60.) Be sure bearing grease seals are in proper position.

c. With grease seals and bearing in position, drive front eccentric on the engine shaft extension up against back eccentric. Tighten front eccentric setscrews.

d. Secure the compressor housing to the compressor housing extension, using four capscrews and lockwashers.

e. Position the connecting rod and piston assemblies, with diaphragms in place, in the compressor housing. Place the left connecting rod and piston assembly over the bearing on the rear eccentric, and the right assembly over the bearing on the front eccentric. Secure with connecting rod caps, bolts, and nuts.

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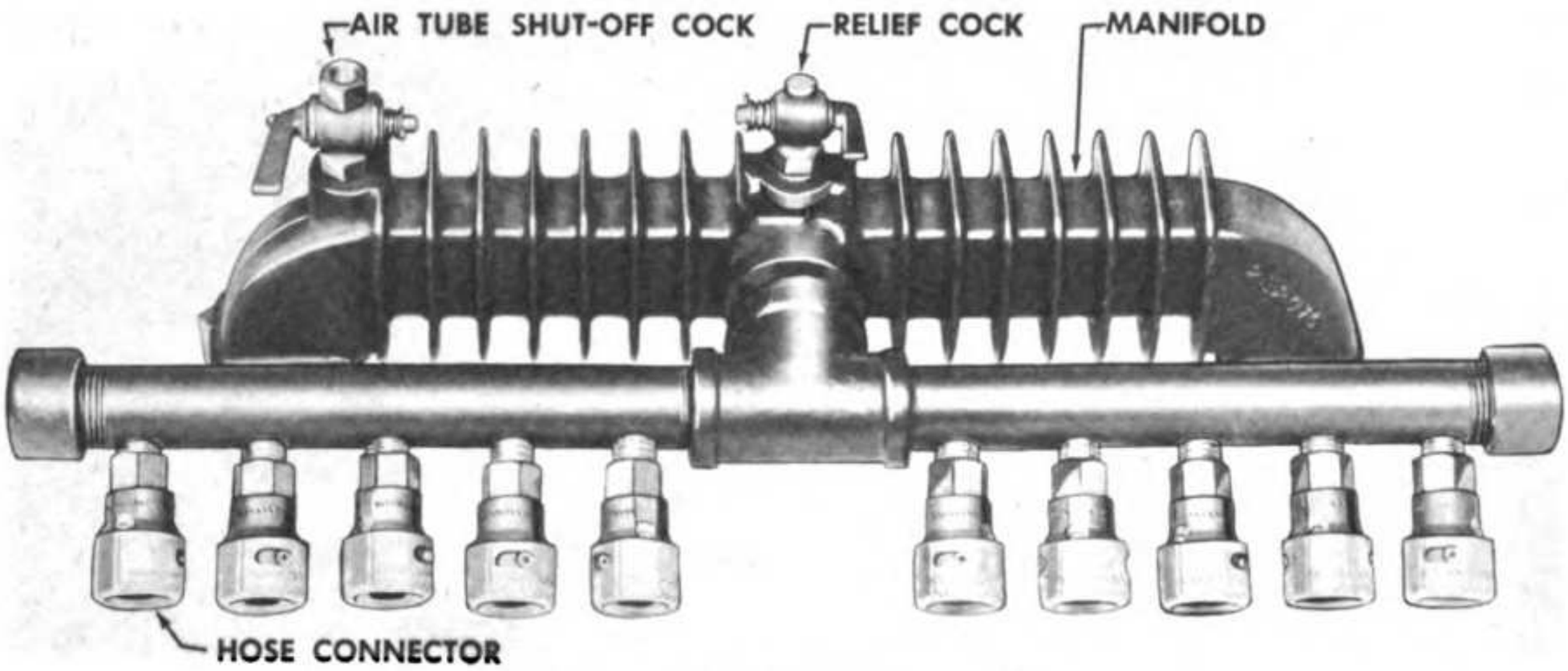

Figure 59—Manifold Assembly

f. Press the outer bearing on the engine shaft extension.

g. Position the cover plate on the compressor housing, and secure with six capscrews and lockwashers. Place the cover plate plug screw in the cover plate to seal against entry of dirt.

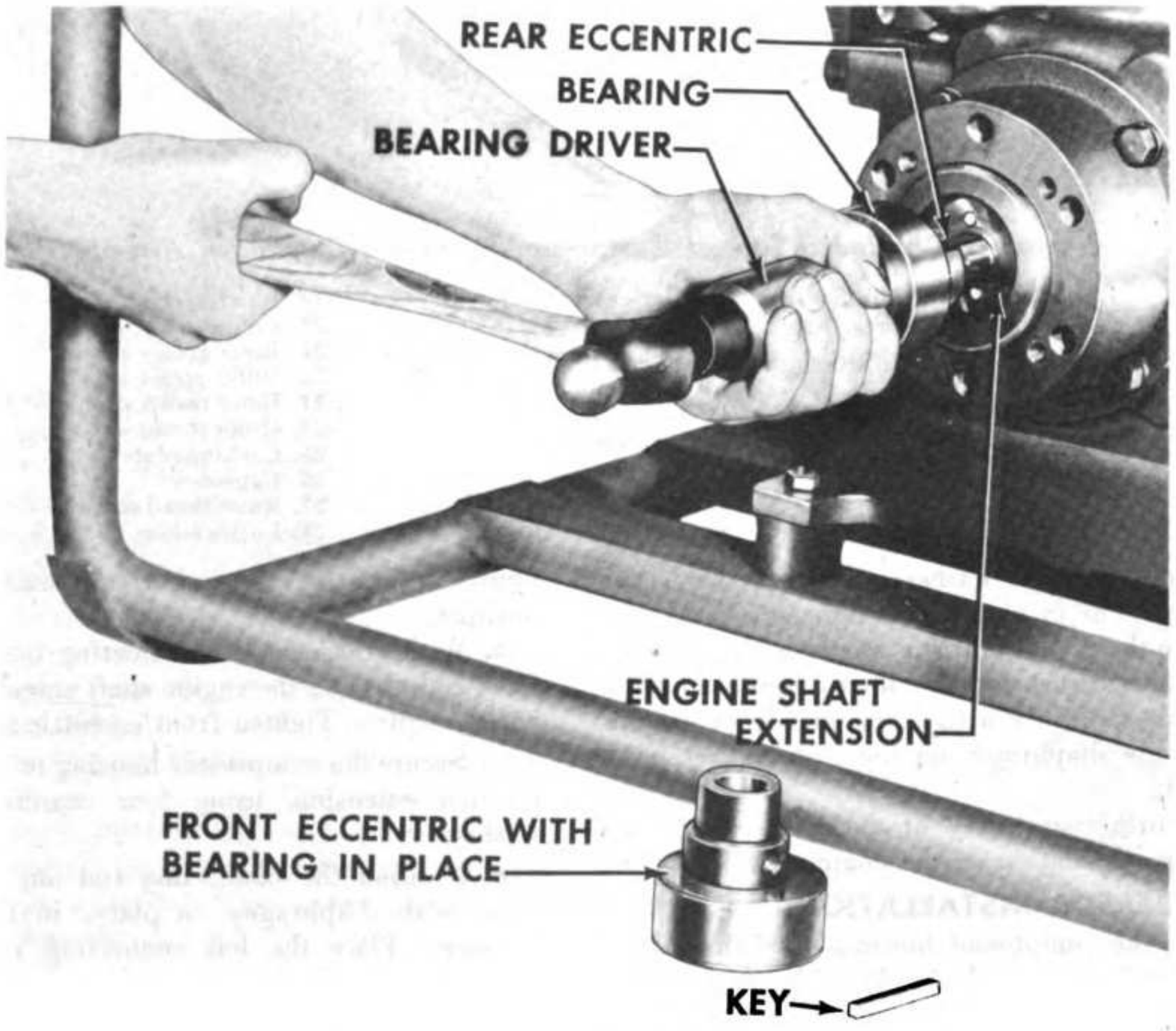

Figure 60—Installing Rear Eccentric

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h. With expansion gaskets in place, position the compression plates and expansion heads. (See figure 29.) Secure each expansion head and compression plate with ten socket-head capscrews.

i. Install the manifold and connect the manifold air tube. (See paragraph 36.*c*.)

Section XXIV. Dusting Guns

73. DESCRIPTION.

Refer to paragraph 43.

74. REMOVAL.

Refer to paragraph 44.

75. DISASSEMBLY.

a. Unscrew the cover assembly.

b. Remove the cotter pin in valve push pin, releasing the push pin spring and coupling. (See figure 62.)

c. Unscrew the connecting nipple assembly, releasing the three parts comprising the spring seat assembly.

76. INSPECTION AND REPAIR.

a. Wash metal parts in SOLVENT, dry cleaning; dry thoroughly.

b. Inspect all parts for good condition; replace defective parts.

77. ASSEMBLY.

a. Insert the ball, seat and spring of the spring seat assembly, in the order named, in the dusting gun; install the connecting nipple assembly.

b. Install the coupling, valve push pin spring and valve push pin, positioning the spring below the head of the pin and outside of the gun handle. (See figure 9.) Secure with a cotter pin.

c. Install the cover assembly.

78. INSTALLATION.

Refer to paragraph 45.

LEGEND FOR FIGURE 61

1. Pipe cap
2. Hose clamp
3. Relief cock
4. Shut-off cock
5. Connector
6. Deflator
7. Washer holder
8. Manifold
9. Manifold mounting bolt
10. Manifold gasket
11. Lockwasher
12. Pipe nipple
13. Pipe nipple
14. Pipe nipple
15. Pipe tee
16. Air tube
17. Hose connector
18. Rubber washer

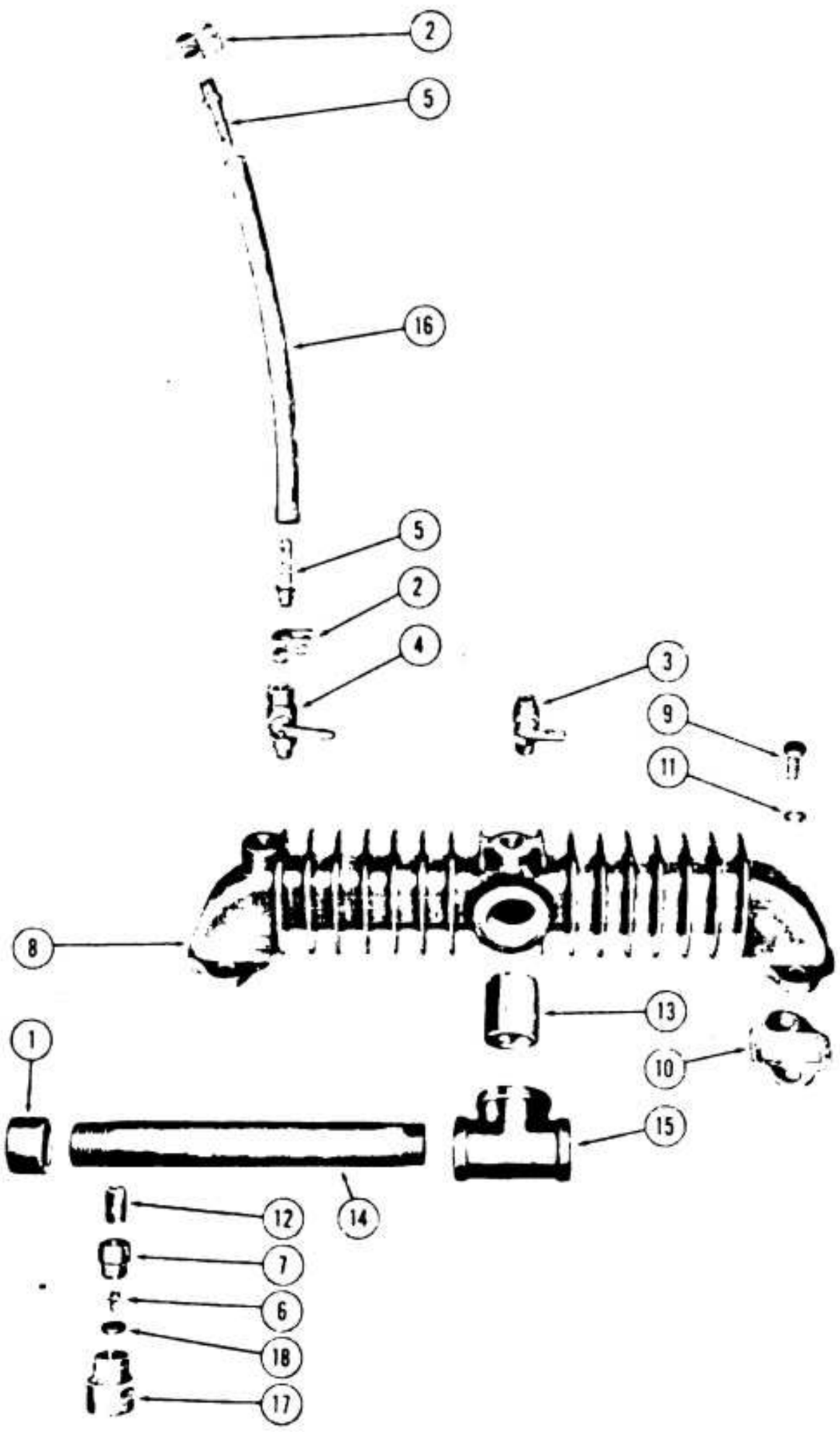

Figure 61—Exploded View of Manifold Assembly

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APPENDIX

Section XXV. Shipment and Storage

79. PREPARATION FOR SHIPMENT OR STORAGE.

Perform the following operations to prepare the Outfit, Delousing, for shipment or storage.

a. Inspection. A thorough inspection shall be made of the Outfit and component parts thereof, including major unit assemblies, subassemblies, or parts, to determine correctness of operation, and absence of all defects, or deficiencies. Make adjustments, repairs and reinspect as required.

b. Cleaning and Painting. Thoroughly clean the entire outfit, including engine and compressor. Remove rust and spray paint over exposed metal surfaces.

c. Lubrication. Lubricate the entire outfit covering all items specified on the Lubrication Order.

d. Engine and Compressor. Prepare engine and compressor in accordance with specification JQD 1021B.

e. Fuel Tank. Fog fuel tank with preservative oil (USA 2-122) and seal openings.

f. Exhaust Openings. Seal muffler with tape (JAN-P-127). Coat tape with compound USA 3-182.

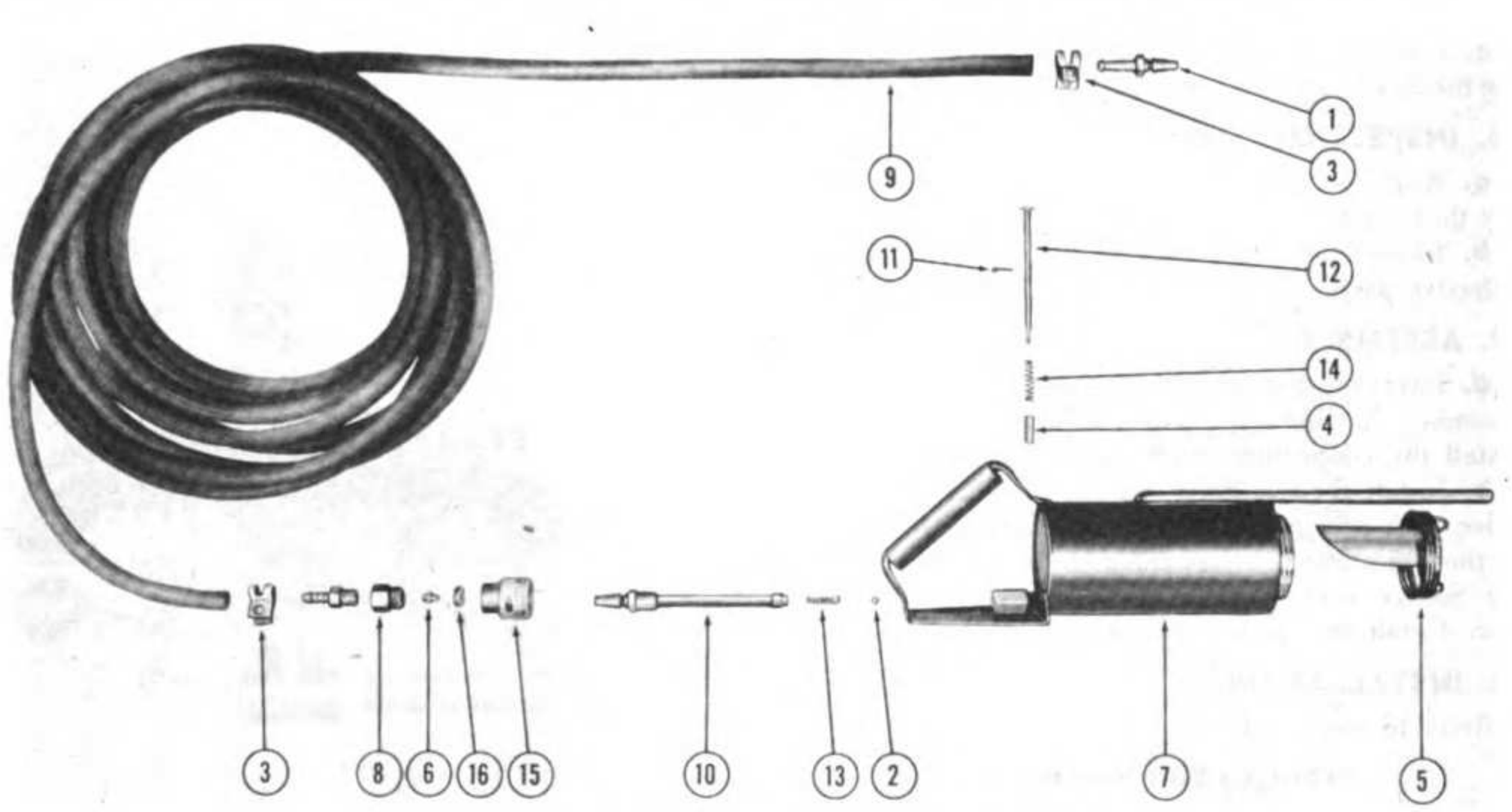

Figure 62—Exploded View of Dusting Gun and Hose

1. Adapter
2. Steel ball
3. Hose clamp
4. Coupling
5. Cover assembly
6. Deflator
7. Dusting gun
8. Washer holder
9. Hose
10. Barbed insert
11. Connecting nipple assembly
12. Cotter pin
13. Valve push pin
14. Spring seat assembly
15. Push pin spring
16. Hose connector
17. Rubber washer

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g. Instrument and Switches. Tape or mask and spray front and rear with compound (USA 3-182). Spray all bare metal surfaces with Kendall No. 5 or approved equal.

h. Gun Hose Connections. Seal with tape (JAN-P-127) and coat with compound USA 3-182.

i. Tools. Clean with petroleum solvent; spray with Kendall No. 5 or approved equal, and wrap and cushion to prevent abrasive action and damage through contact. Pack in a nailed wood box and securely brace and block the box within the shipping container.

j. Preparation for Shipment. Prepare in accordance with Quartermaster Packing Specification GS No. 20.

k. Removal from Storage. Before an outfit which has been processed for shipment or storage is placed in service, perform operations contained in Section V — Service Upon Receipt of Equipment.

Section XXVI. References

80. PUBLICATIONS INDEXES.

The following publications indexes should be consulted frequently for latest changes to, or revision of, the publications given in this list of references and for new publications relating to materiel covered in this manual:

FM 21-6. *List of Publications for Training.* (Lists MR's, MTP's, T/BA's, T/A's, FM's, TM's, and TR's, concerning training.)

FM 21-7. *List of Training Films, Filmstrips, and Film Bulletins.* (Lists TR's, FS's, and FB's by serial number and subject.)

FM 21-8. *Military Training Aids.* (Lists graphic training aids, models, devices, and displays.)

81. EXPLANATORY PUBLICATIONS.

a. Fundamental Principles.

TM 1-455. *Electrical Fundamentals.*
TM 9-2852. *Welding.*
TM 10-580. *Automotive Electricity.*
TM 37-250. *Basic Maintenance Manual.*
AR 850-20. *Precautions in Handling Gasoline.*

b. Maintenance and Repair.

TM 9-850. *Cleaning, Preserving, Lubricating, and Welding Materials and Similar Items Issued by the Ordnance Department.*

c. Storage and Shipment.

JQD 1021. *Preparation of Engines and Unit Spares for Storage or Shipment.*
JQD 1012A. *Preparation of Spare Parts for Storage or Shipment (Minimum).*

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INDEX

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PARTS LIST

FOR

OUTFIT, DELOUSING GASOLINE (DEFIANCE)

BUILT FOR

QUARTERMASTER CORPS

Each section has a black tab which lines up with the corresponding section name and number shown at the right.

The black tabs are located quickly by bending this book back.

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PARTS LIST

General Information

The Parts List section of this book is arranged as follows:

1. QUICK REFERENCE INDEX.

For rapid location of major group listings, a quick-reference index, with black tabs numbered according to the Standardized Government Grouping, is provided on the right side of the first page of this section of the book. Similarly numbered tabs are placed in line with these on the first page of each major group listing. To locate the tab opposite the desired index number, bend the book back until the black tabs line up.

2. PARTS LIST GENERAL INFORMATION.

These pages explain the arrangement and use of the Parts List and contain all necessary information for locating part numbers, descriptions, and illustrations of serviceable parts. It also includes explanation and listing of the Standard Government Grouping as adapted to this equipment.

3. STANDARDIZED GOVERNMENT GROUPING.

Parts are listed according to functional groups and subgroups to conform with Standardized Government Grouping. The group and subgroup numbers applicable to this equipment are listed on page 60. Major groups are identified by numbers containing two major digits. Subgroups are identified by numbers containing four digits, of which the first two are the major group numbers. For example, subgroup 0108 — Manifold, is immediately identified by its first two digits as belonging in major group 01 — Engine Group. The groups and subgroups are shown in numerical sequence in this Parts List. The group number and name appear at the top of right-hand pages. The subgroup and name appear immediately below the column headings in the main listing.

4. PARTS LIST.

This is the main body of this section of the book. It lists, according to the Standard Government Grouping, all parts which are available for service replacement.

a. Part Numbers. Two columns of part numbers are provided, the Defiance Part Number and the Unit Manufacturer's Part Number. Parts manufactured particularly for this equipment are listed only in the Defiance Part Number column, while parts purchased for use on this unit from other manufacturers are listed in the Unit Manufacturer's Part Number column. Where the manufacturer of this unit has adapted the part number of another manufacturer or vendor as his own number, or assigned his own number for the part, numbers will be found in both part number columns. Parts may be ordered by either the Defiance Part Number or the Unit Manufacturer's Part Number.

b. Listing of Parts. The main listing of serviceable parts contains the following information:

(1) FIGURE NUMBER. The number of the figure where the part is illustrated is shown in the first column. Turn to that figure if you wish to see what the part looks like or its exact location.

(2) REFERENCE NUMBER. A reference or "key" number by which the part is marked on the figure is given in the second column.

(3) DEFIANCE PART NUMBER. This is the number assigned to the part by the outfit manufacturer.

(4) NOMENCLATURE. Parts are listed in their respective subgroups in alphabetical order by noun name in capital letters, followed by descriptive words or phrases, dimensions, or application as needed to identify each part fully.

(5) UNIT MANUFACTURER'S SYMBOL. In the case of parts purchased by the manufacturer of this equipment the name of the supplier is indicated in fifth column. A list of suppliers of parts for this equipment, with the abbreviations used in column five of the main listing, is given on page 60.

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(6) UNIT MANUFACTURER'S PART NUMBER. The number assigned to purchased parts by the supplier of that part is shown in the sixth column.

(7) NUMBER REQUIRED. Many parts are used only once in the equipment to accomplish a given purpose. In other cases, a given part is used two or more times for exactly the same purpose. For example, many compressor expansion head parts are exact duplicates for the right and left sides of the compressor, and several identical screws and washers are often used for holding an assembly together or mounting it to the equipment. Such parts are listed only once, but the quantity used is shown in the right-hand column. Where the quantity may vary, as in the case of shims, the designation "As Req." appears in this column.

c. Standard Parts. Common screws, washers, nuts, cotter pins, keys, etc., that are merely attaching parts have no part number and are not listed alphabetically in the main listing, but are indented and listed alphabetically immediately below the specific part with which they are used. They are not however, components of the part they attach and must be ordered individually by size and description. A complete list of standard parts will be found in Group 23.

d. Illustrations. Serviceable parts are illustrated by means of "exploded" or disassembled views which show each part in its proper relation to the other parts of the assembly. Each illustration is identified by a figure number (01-1, 01-2, 01-3, etc.) and a title. The figure number is made up of the two-digit number of the major group to which the illustrated parts apply, followed by a dash and the sequence number indicating the illustration within that group. All serviceable parts are illustrated by a key number, except in the case of two or more easily recognizable, identical parts where one key number provides sufficient identification.

5. INDEXES.

There are two indexes at the back of the book to aid in locating desired parts:

a. Alphabetical Index. This lists all parts in alphabetical sequence by noun name set out in capital letters, followed by descriptive adjectives, sizes and location as needed for complete identification, and gives the number of the Standardized Government Grouping subgroup in which the main listing will be found.

b. Part Number Index. This lists all parts by part number. Parts are listed in numerical sequence regardless of prefix, suffix or intermediate letters. Each part number listing gives the number of the Standardized Government Grouping subgroup in which the main listing will be found.

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Standardized Government Grouping

01 Engine Group

0100 Engine Assembly
0101 Block, Crankcase, and Cylinder Head
0102 Crankshaft, Bearings, Caps, and Seals
0103 Pistons, Rings and Pin
0104 Connecting Rod and Bearing
0105 Valves, Springs, and Lifters
0106 Camshaft
0107 Oil Pump, Oil Pan, Oil Filler
0108 Manifold
0109 Flywheel
0110 Engine Mountings
0111 Engine Starting Parts

03 Fuel Group

0301 Carburetor and Air Cleaner
0302 Fuel Filter
0304 Tank, Fuel, and Line
0305 Governor

04 Exhaust System

0401 Muffler
0402 Exhaust Pipe

06 Electrical System

0604 Switch, Stop; Plug, Spark
0605 Instrument
0611 Magneto

12 Compressor

1213 Compressor

15 Frame

1506 Frame

22 Miscellaneous Body and Accessories

2202 Plates, Identification

23 General Use, Standardized Parts

2304 Parts Common -
2306 Tools and Equipment

25 Bearing Chart

LIST OF ABBREVIATIONS

BCA	Bearings Company of America 501 Harrisburg Ave. Lancaster, Pa.
BR	Briggs & Stratton Corp. Milwaukee 1, Wis.
DN	Donaldson Company, Inc. 666 Palham St. St. Paul 4, Minn.
FAF	Fafnir Bearing Company Booth St. New Britain, Conn.
MG	McGill Manufacturing Co., Inc. 259 Indiana Ave. Valparaiso, Ind.
MRC	Marlin-Rockwell Corp. 402 Chandler St. Jamestown 55, N. Y.
ND	New Departure Division General Motors Corporation Bristol, Connecticut
SV	A. Schrader's Son 470 Vanderbilt Ave. Brooklyn 17, N. Y.
SW	Stewart-Warner Corporation Chicago 14, Illinois
TR	Torrington Company 59 Field St. Torrington, Conn.

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			01 — ENGINE			
			0100 — ENGINE ASSEMBLY			
			0101 — BLOCK, CRANKCASE, AND CYLINDER HEAD			
01-1	1		CYLINDER ASSEMBLY	BR	89983	1
01-2	1		HEAD, Cylinder	BR	61889	1
01-2	2		GASKET, Cylinder head	BR	29290	1
01-2	3		SCREW, Cylinder head	BR	91203	2
01-2	4		SCREW, Cylinder head, 5/16—18 x 2-1/2"			5
01-2	5		SPACER, Cylinder head	BR	67253	5
01-1	2	255235	PLATE, Engine side			1
01-1	3		GASKET, Engine side plate	BR	67997	1
01-1	4		SCREW, Cap	BR	92421	2
01-1	5		WASHER, Lock	BR	92369	2
01-6	1		SHIELD, Cylinder	BR	22085	1
01-6	2		SCREW, Round head, 1/4—20 x 1/2"			1
01-6	3		WASHER, Lock, 1/4"			1
			0102 — CRANKSHAFT, BEARINGS, CAPS AND SEALS			
01-3	1		BEARING, Ball	BR	29530	1
01-3	2		COVER, Crankcase; includes oil seal	BR	29529	1
01-3	3		GASKET, Crankcase cover	BR	67137	1
01-3	4		SCREW, Crankcase cover	BR	91471	4
01-3	5		WASHER, Lock, 1/8"			4

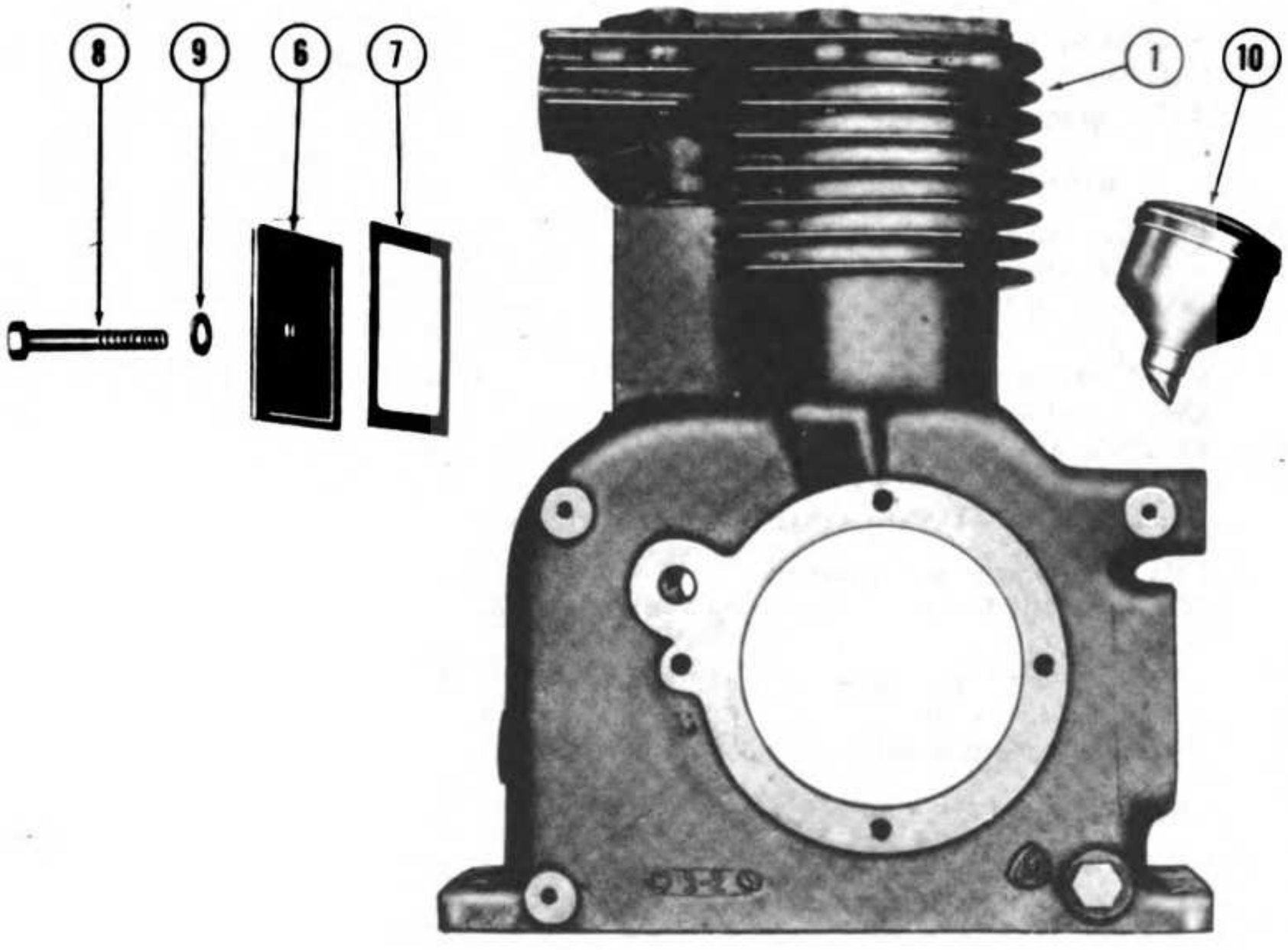

Figure 01-1—Engine Cylinder

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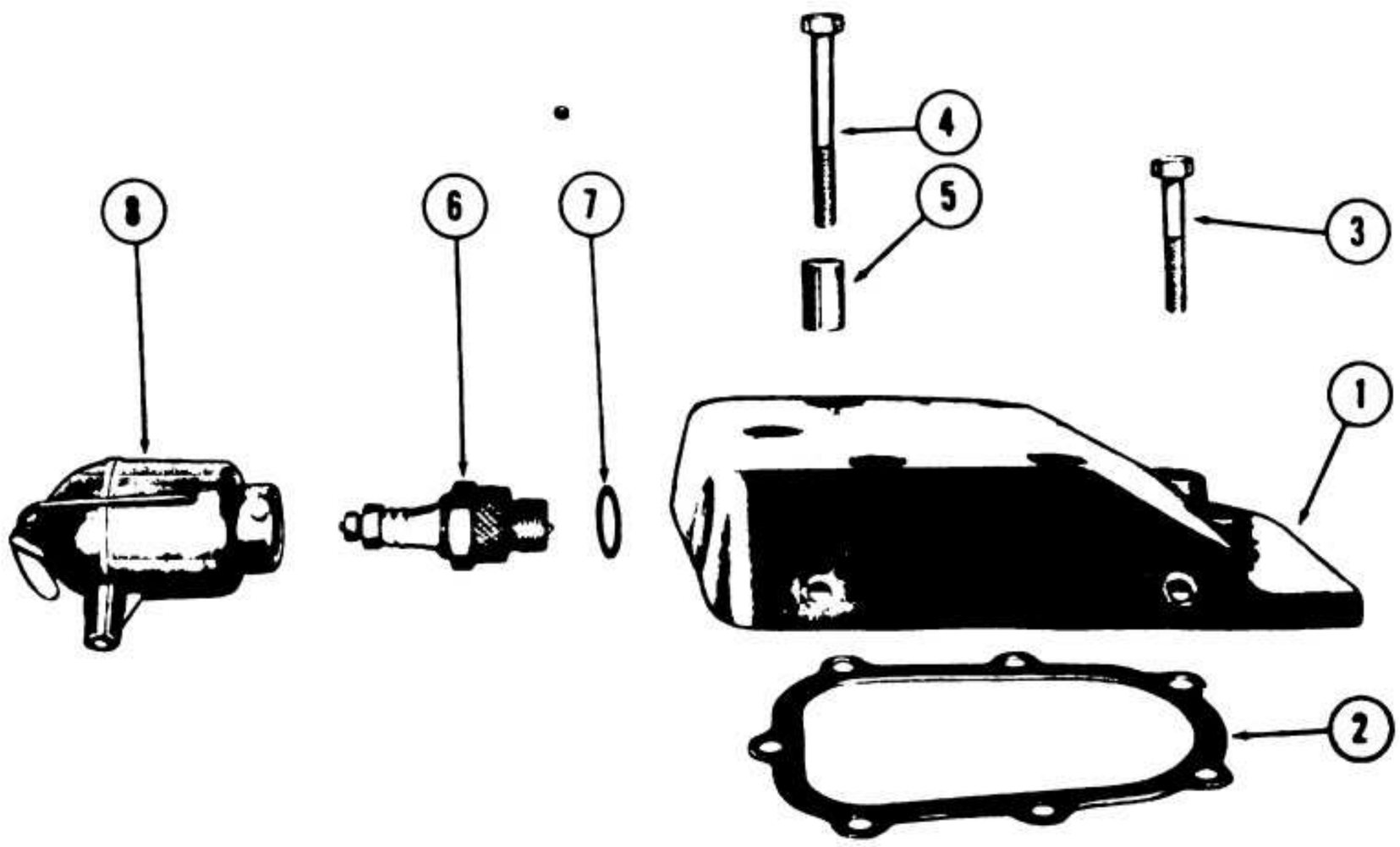

Figure 01-2—Cylinder Head, Spark Plug and Shield

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			0102 — CRANKSHAFT, BEARINGS, CAPS AND SEALS, Continued			
01-3	6	255270	EXTENSION, Shaft			1
01-3	7		PIN, Dowel, 1/4 x 1-1/4"			2
01-3	8		SCREW, Socket head set, 3/8—24 x 3/8"			2
01-3	9		SEAL, Oil	BR	29531	1
01-3	10		SHAFT, Crank	BR	89985	1
			0103 — PISTON, RINGS AND PIN			
01-3	11		PIN, Piston standard, includes pin locks	BR	63615	1
01-3	12		LOCK, Piston pin	BR	68546	2
			PISTON ASSEMBLY, Standard; includes rings and pin locks	BR	99153	1
01-3	13		PISTON, Standard	BR	29407	1
01-3	14		RING, Center compression, standard	BR	61907	1
01-3	15		RING, Oil, standard	BR	61908	1
			0104 — ROD, CONNECTING, AND BEARING			
01-3	16		RING, Top compression, standard	BR	61906	1
01-3	17		ROD ASSEMBLY, Connecting; includes lock, screw and shim	BR	29269	1
01-3	18		LOCK, Connecting rod screw head	BR	22073	2
01-3	19		SCREW, Connecting rod	BR	91162	2
01-3	20		SHIM, Connecting rod	BR	22246	2
			0105 — VALVES, SPRINGS AND LIFTERS			
01-4	1		CUP, Valve spring	BR	62222	1
01-1	6		PLATE, Valve cover	BR	65942	1
01-1	7		GASKET, Valve cover	BR	65237	1
01-1	8		SCREW, Valve cover, hex head, 5/16—18 x 2"			1
01-1	9		WASHER, Valve cover, 5/16"			1

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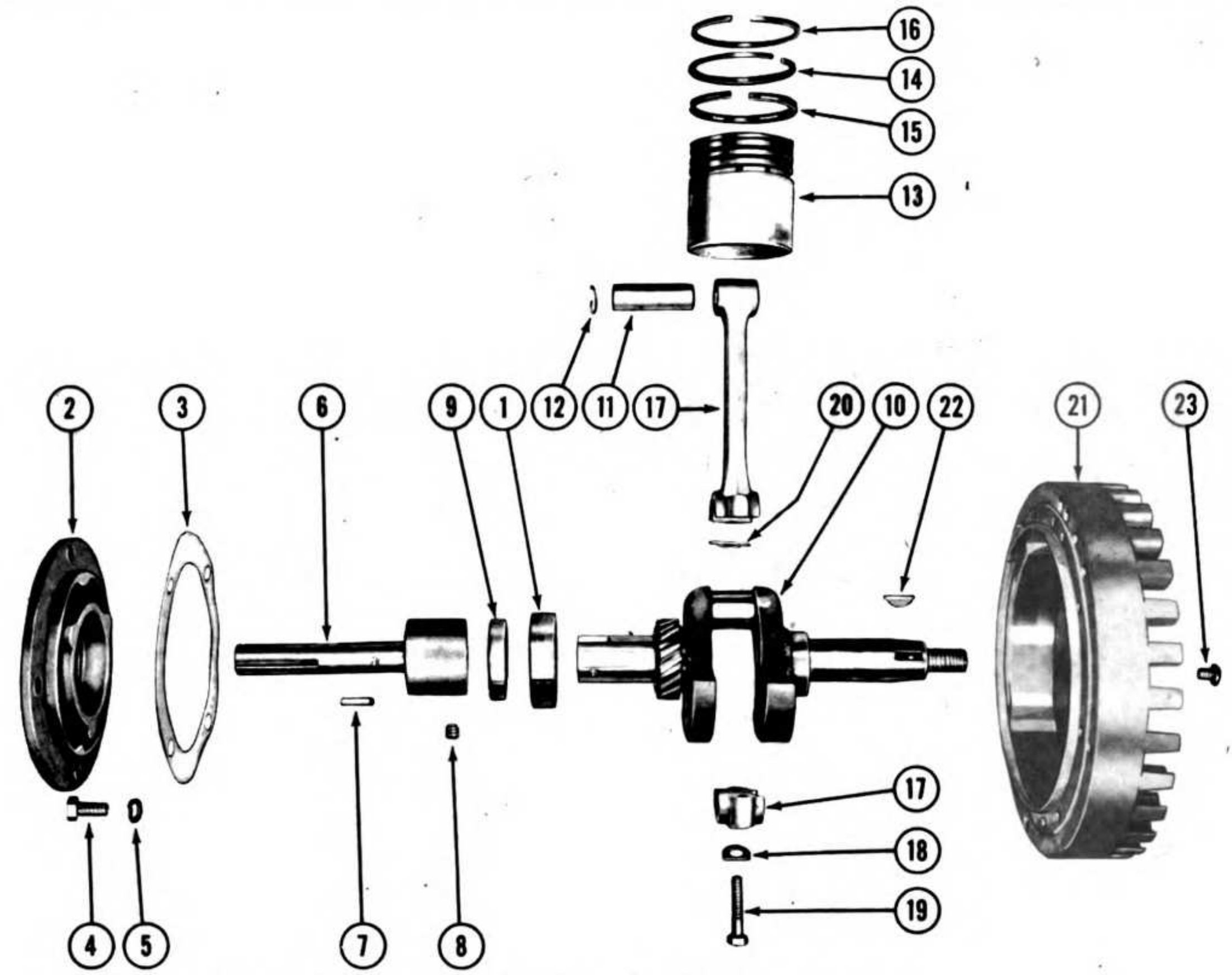

Figure 01-3—Connecting Rod, Piston, Crankshaft, and Flywheel

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			0105 — VALVES, SPRINGS AND LIFTERS, Continued			
01-4	2		SPRING, Valve	BR	65906	2
01-4	3		COLLAR, Valve spring	BR	68283	2
01-4	5		LIFTER, Exhaust valve; includes screw and washer	BR	29428	1
01-4	6		LIFTER, Intake valve	BR	63659	1
01-4	4		RETAINER, Valve spring	BR	68293	2
01-4	7		VALVE, Exhaust	BR	23638	1
01-4	8		VALVE, Intake	BR	63616	1
01-4	9		WASHER, Valve lifter	BR	62252	1
01-4	10		SCREW, Valve lifter	BR	92141	1
			0106 — CAMSHAFT			
01-4	11		GEAR, Cam	BR	61583	1
01-4	12		PLUG, Cam shaft	BR	65932	1
01-4	13		SHAFT, Cam gear	BR	63614	1

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Outfit, Delousing, Gasoline-Engine Driven (Defiance)

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			0107 — PUMP, OIL; FILLER, OIL; PAN, OIL			
			OIL PUMP			
01-5	1		BODY, Oil pump	BR	29338	1
01-5	2		SCREW, Hex cap, 5/16—24 x 3/4"			2
01-5	3		WASHER, Lock, 5/16"			2
01-5	4		PLUNGER, Oil pump	BR	29339	1
01-5	5		SPRING, Oil pump	BR	26413	1

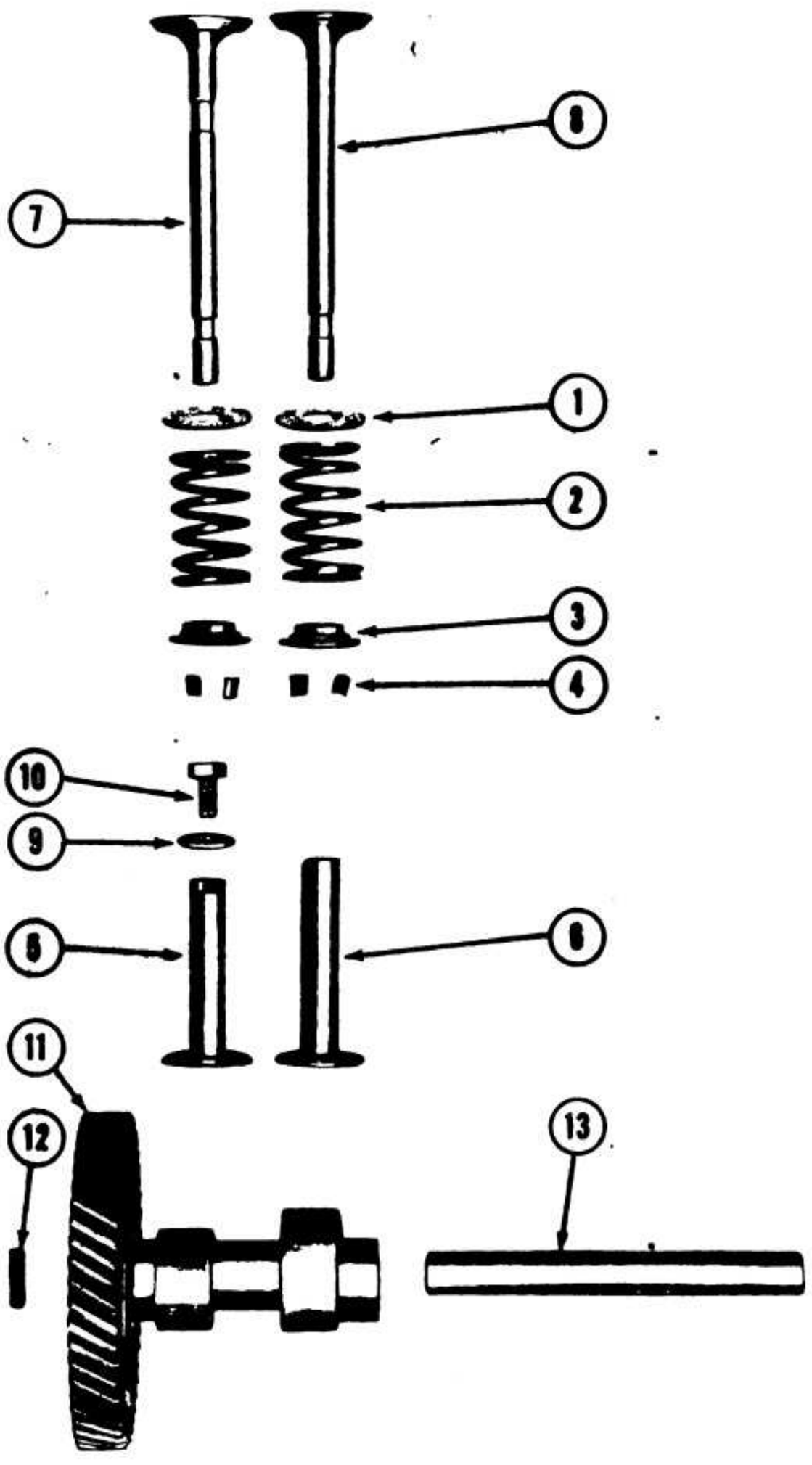

Figure 01-4—Camshaft and Valves

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Group 01 — Engine

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			OIL FILLER AND BASE PARTS			
01-5	6		BASE, Cast iron	BR	61571	1
01-5	7		GASKET, Base	BR	67127	1
01-5	8		PLUG, Oil drain	BR	91084	2
01-5	9		PLUG, Pipe	BR	91487	1
01-5	10		SCREW, Cylinder mounting, 3/8—16 x 1-1/4"			4
01-5	11		WASHER, Lock, 3/8"			4

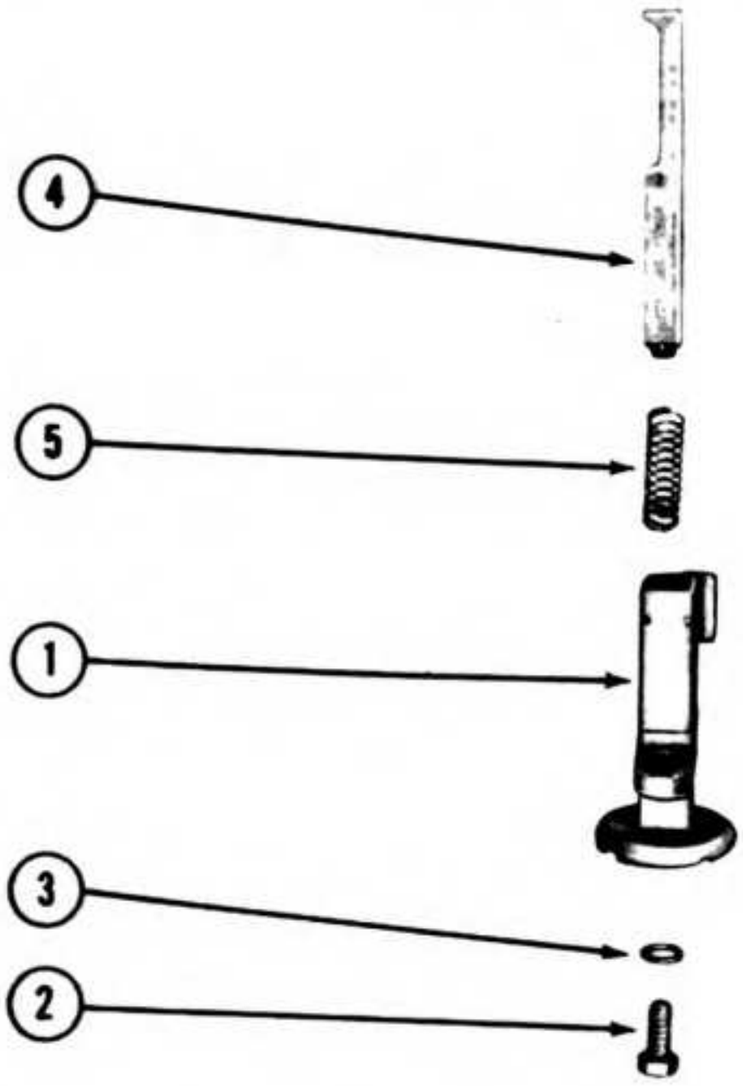

Figure 01-5—Engine Base and Oil Pump

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Outfit, Delousing, Gasoline-Engine Driven (Defiance)

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			OIL FILLER AND BASE PARTS, Continued			
01-5	12		CAP, Oil filler	BR	290188	1
01-5	13		GASKET, Filler cap	BR	65434	1
01-5	14		NIPPLE, Pipe, 2″ long	BR	91371	1
			0108 — MANIFOLD, INTAKE			
03-1	1		ELBOW, Intake	BR	61890	1
03-1	2		NUT, Intake elbow lock	BR	91590	1

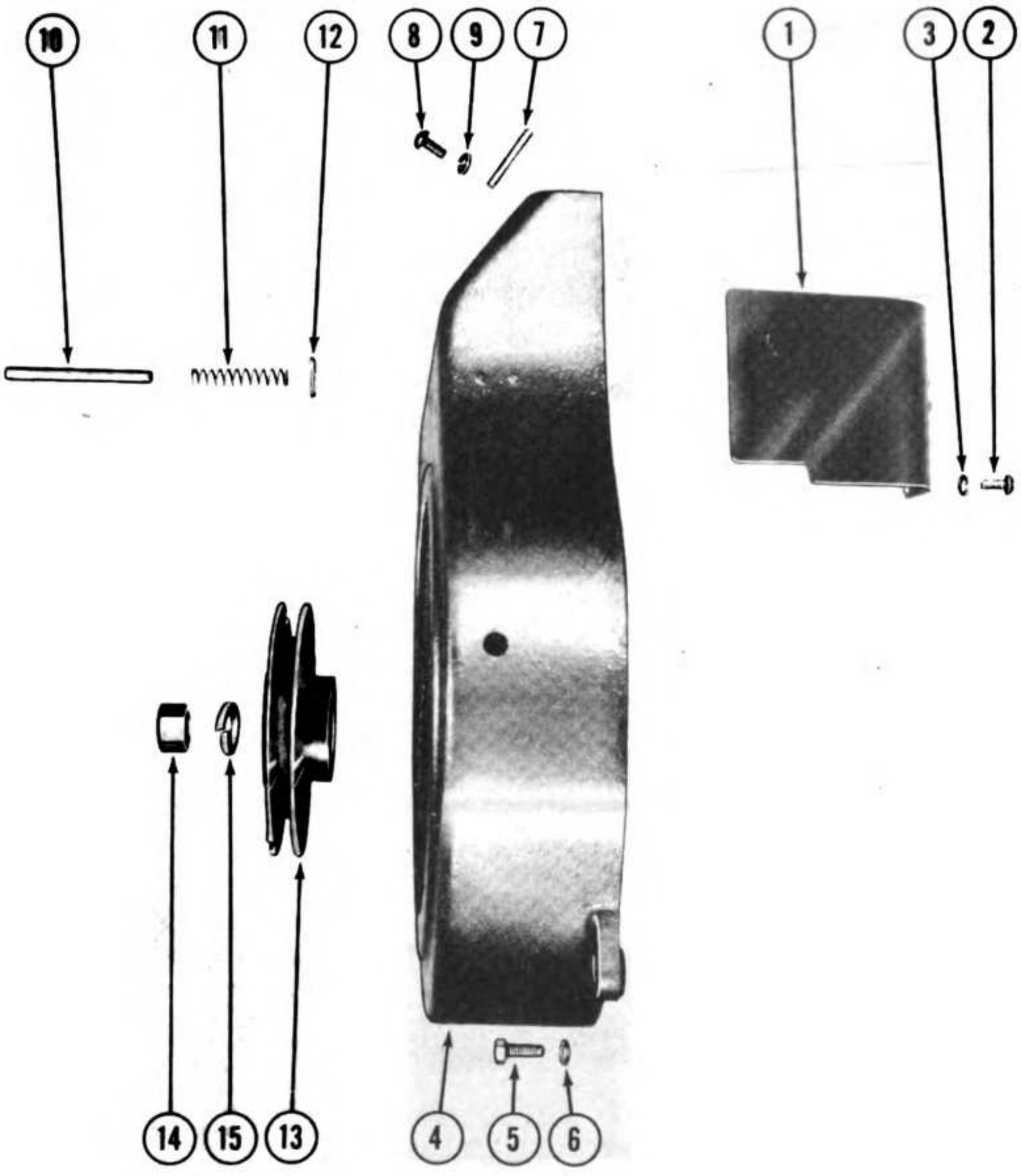

Figure 01-6—Blower Housing and Starter Pulley

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			0109 — FLYWHEEL			
01-3	21		FLYWHEEL, Magneto	BR	290412	1
01-3	22		KEY, Flywheel	BR	66403	1
01-6	4		HOUSING, Blower, with stop switch and screen	BR	89877	1
01-6	5		SCREW, Blower mounting hex head, 5/16—18 x 3/4"			2
01-6	6		WASHER,. Lock, 5/16"			2
01-3	23		SCREW, Flywheel, round head, 5/16—18 x 3/8"			2
01-6	7		BRACKET, Blower housing	BR	62177	2
01-6	8		SCREW, Round head, 1/4—20 x 5/8"			4
01-6	9		WASHER, Lock, 1/4"			2
			0110 — MOUNTINGS			
15-1	4	252104	MOUNT, Engine, Neoprene			4
15-1	5		NUT, Hex, 5/16—18			8
15-1	6		WASHER, Internal tooth lock, 5/16"			8
			0111 — ENGINE STARTING PARTS			
01-6	13		PULLEY, Starting	BR	61644	1
01-6	14		NUT, Hex crankshaft, 5/8—18			1
01-6	15		WASHER, Lock, flywheel, 21/32"	BR	90969	1
			03 — FUEL			
			0301 — CARBURETOR, AIR CLEANER			
			CARBURETOR PARTS			
03-1			CARBURETOR ASSEMBLY	BR	89914	1
03-1	3		GASKET, Carburetor mounting	BR	65647	1
03-1	4		SCREW, Carburetor mounting	BR	90700	2
03-1	5		WASHER, Lock, 1/4"			2
03-1	6		BODY ASSEMBLY, Lower carburetor; includes needle adjusting valve assembly and choke shaft and lever.	BR	89915	1
03-1	7		BODY, Upper carburetor; includes throttle shaft bushing	BR	99341	1
03-1	8		GASKET, Carburetor body	BR	27034	1
03-1	9		SCREW, Fillister head, 10—32 x 5/8"			3
03-1	10		WASHER, Lock, carburetor body, No. 10			3
			BODY ASSEMBLY, Upper carburetor; includes throttle shaft assembly, carburetor throttle lever, and carburetor idling valve and spring.	BR	99342	1
03-1	11		BUSHING, Throttle shaft	BR	23108	2
03-1	12		FLOAT, Carburetor	BR	99333	1
03-1	13		PIN, Float hinge	BR	23114	1
03-1	14		GASKET, Carburetor seat and nozzle	BR	68667	2
03-1	15		LEVER, Carburetor throttle	BR	21152	1
03-1	16		PIN, Throttle lever	BR	23125	1
03-1	17		NOZZLE, Carburetor	BR	99345	1
03-1	18		NUT, Needle valve packing	BR	23118	1

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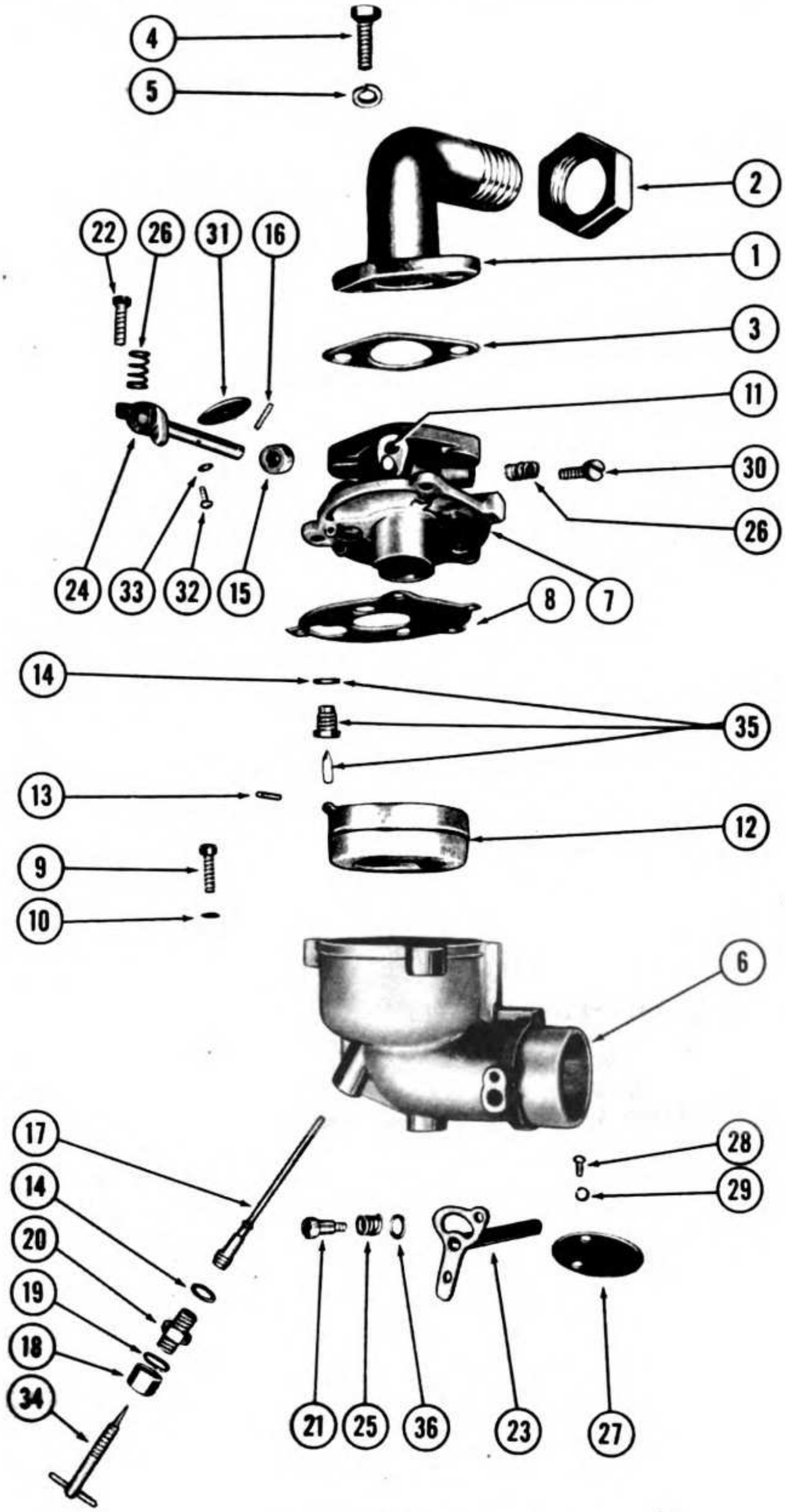

Figure 03-1—Carburetor

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			CARBURETOR PARTS, Continued			
03-1	19		PACKING, Needle valve	BR	68677	1
03-1	20		RETAINER, Needle valve	BR	23117	1
03-1	21		SCREW, Choke lever	BR	23123	1
03-1	22		SCREW, Fillister head, 8—32 x 3/4"			1
03-1	23		SHAFT AND LEVER, Choke	BR	89531	1
03-1	24		SHAFT ASSEMBLY, Throttle	BR	99524	1
03-1	25		SPRING, Choke lever	BR	26155	1
03-1	26		SPRING, Idle valve and throttle adjusting	BR	26157	2
03-1	27		VALVE, Carburetor choke	BR	62872	1
03-I	28		SCREW, Round head, 4—36 x 1/4"			2
03-1	29		WASHER, Lock, No. 4			2
03-1	30		VALVE, Carburetor idling	BR	23228	1
03-1	31		VALVE, Carburetor throttle	BR	62928	1
03-1	32		SCREW, Round head, 4—36 x 1-1/4"			2
03-1	33		WASHER, Lock, No. 4			2
03-1	34		VALVE, Needle adjusting	BR	99346	1
03-1	35		VALVE AND SEAT, Inlet; includes gasket	BR	99343	1
03-1	36		WASHER, Choke lever	BR	62899	1
			AIR CLEANER PARTS			
03-2	1		BOWL, Air cleaner	BR	29681	1
			CLEANER ASSEMBLY, Air; includes bowl, bowl gasket, cover, cover gasket, and filter.	BR	29666	1
03-2	2		GASKET, Air cleaner	BR	67247	1
03-2	3		NUT, Hex, air cleaner stem, 1/4—28			2
03-2	4		STUD, Air cleaner mounting	BR	23636	1
03-2	5		WASHER, Lock, internal tooth			1
03-2	6		COVER, Air cleaner	BR	29679	1
03-2	7		GASKET, Air cleaner cover	BR	67897	1
03-2	8		NUT, Air cleaner wing	BR	91674	1
03-2	9		FILTER, Air cleaner	BR	29680	1
03-2	10		PIPE, Air cleaner; includes stud wing nut, hex nuts and lock washers	BR	290157	1
			BREATHER			
01-1	10		BREATHER ASSEMBLY	BR	89250	1
			0302 — FILTER, FUEL			
			FILTER ASSEMBLY, Fuel	BR	99910	1
03-3	1		BOWL, Fuel filter	BR	68487	1
03-3	2		GASKET, Fuel filter	BR	68477	1
03-3	3		CONNECTOR, Fuel filter	BR	53029	1
03-3	4		CONNECTOR, Gas tank	BR	91635	1
03-3	5		COVER ASSEMBLY, Fuel filter, includes filter and tank connectors, lever, lever nut and packing, and screen.	BR	99909	1
03-3	6		LEVER, Fuel shut-off	BR	290059	1
03-3	7		NUT, Shut-off lever	BR	23699	1
03-3	8		PACKING, Shut-off lever	BR	27145	1
03-3	9		SCREEN, Fuel filter	BR	22547	1
03-3	10		YOKE, Fuel filter	BR	99665	1

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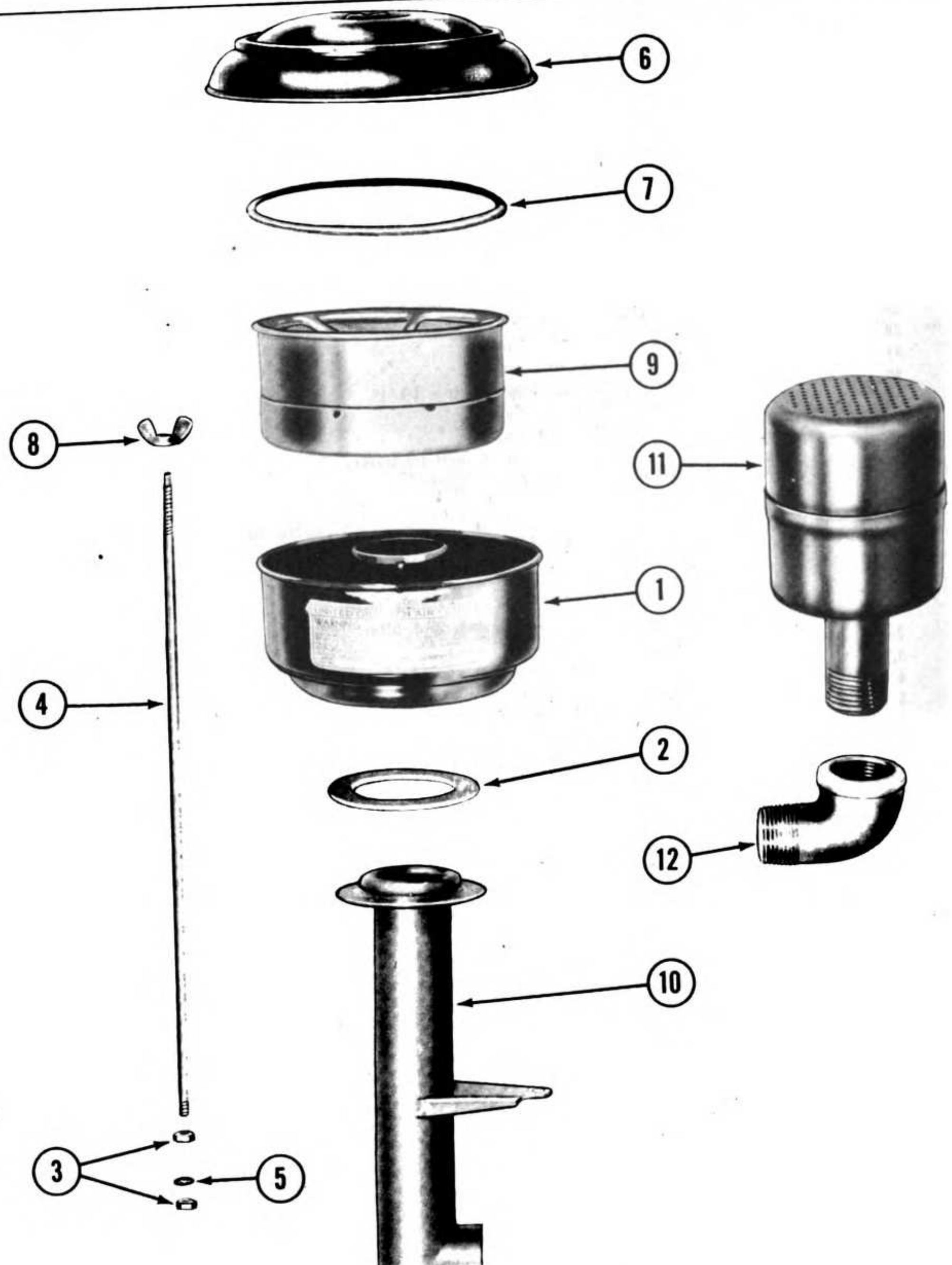

Figure 03-2—Air Cleaner and Muffler

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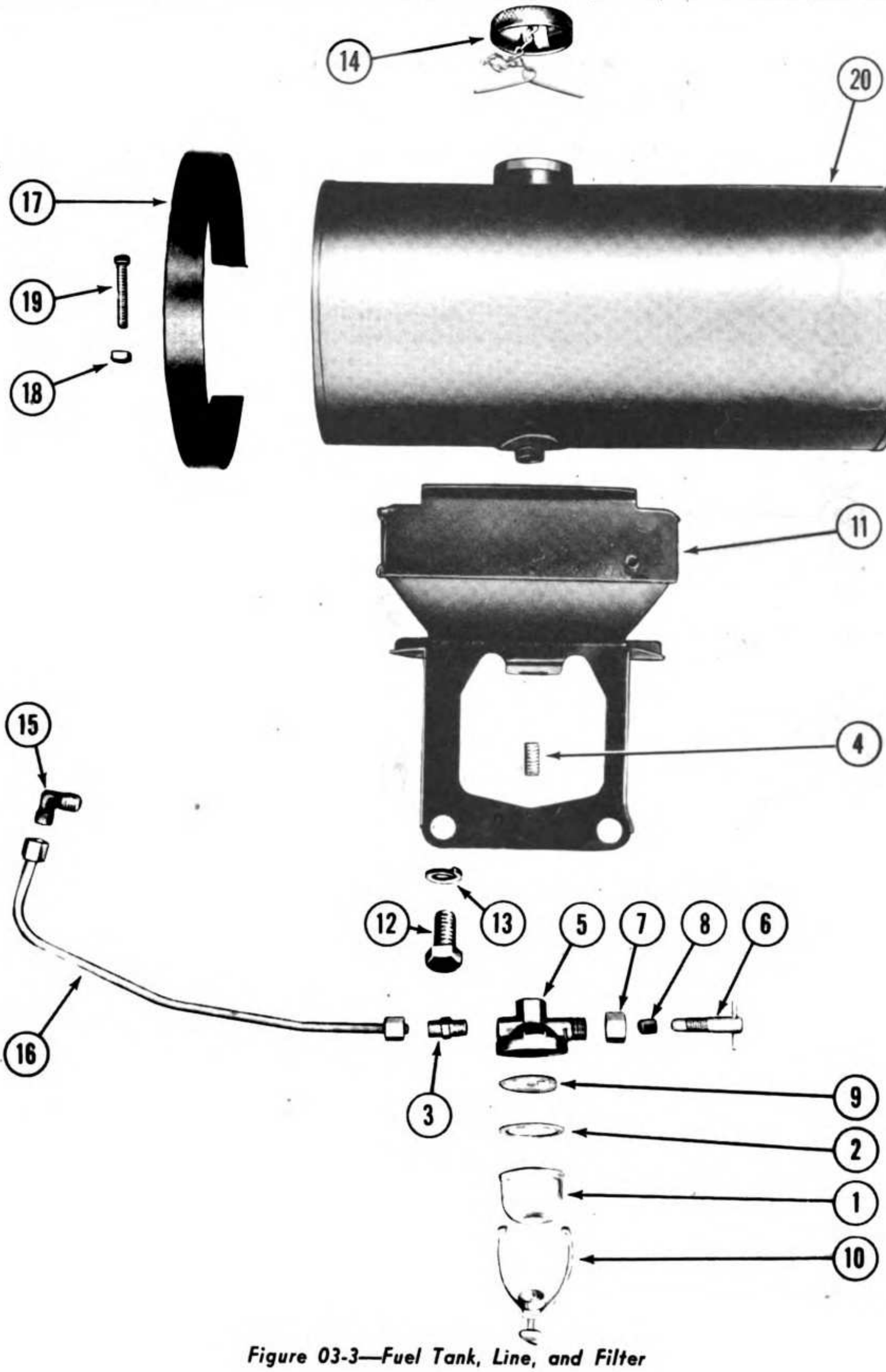

Figure 03-3—Fuel Tank, Line, and Filter

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			0304 — TANK, FUEL, LINE			
03-3	11		BRACKET, Gas tank	BR	290419	1
03-3	12		SCREW, Tank bracket	BR	91319	2
03-3	13		WASHER, Tank bracket lock	BR	90683	2
03-3	14		CAP, Fuel tank	BR	69961	1

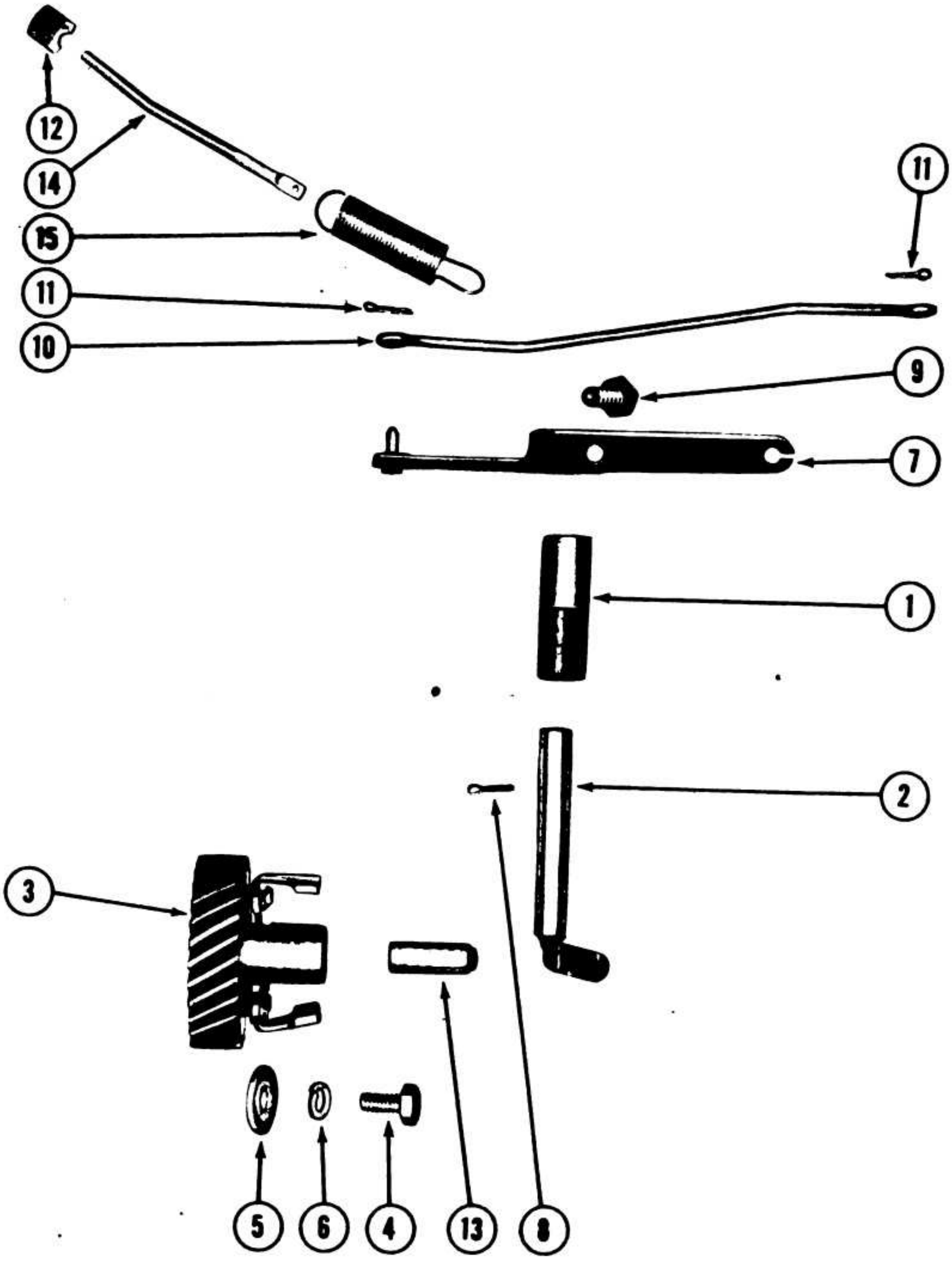

Figure 03-4—Governor Parts

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Group 03 — Fuel

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			0304 — TANK, FUEL, LINE, Continued			
03-3	15		ELBOW			1
03-3	16		LINE, Gasoline	BR	29464	1
03-3	17		STRAP, Fuel tank, includes screw and nut	BR	69296	2
03-3	18		NUT, Square, 1/4—20			2
03-3	19		SCREW, Fillister head, 1/4—20 x 1-1/2"			2
03-3	20		TANK, Fuel, including cap	BR	290232	1
			0305 — GOVERNOR			
03-4	1		BUSHING, Governor crank	BR	63341	1
03-4	2		CRANK, Governor, includes cotter pin	BR	69926	1
03-4	3		GEAR, Governor	BR	69839	1
03-4	4		SCREW, Governor retainer, hex head, 1/4—20 x 1/2"			1
03-4	5		WASHER	BR	92305	1
03-4	6		WASHER, Lock, 1/4"			1
03-4	7		LEVER, Governor, includes cotter pin and screw	BR	29343	1
03-4	8		PIN, Cotter, 1/16 x 3/8			1
03-4	9		SCREW, Governor lever	BR	92412	1
03-4	10		LINK, Throttle	BR	22731	1
03-4	11		PIN, Cotter, 1/16 x 3/8			2
03-4	12		NUT, Governor adjusting	BR	63520	1
03-4	13		PLUNGER, Governor	BR	63335	1
03-4	14		ROD, Governor spring	BR	63334	1
03-4	15		SPRING, Governor	BR	67316	1

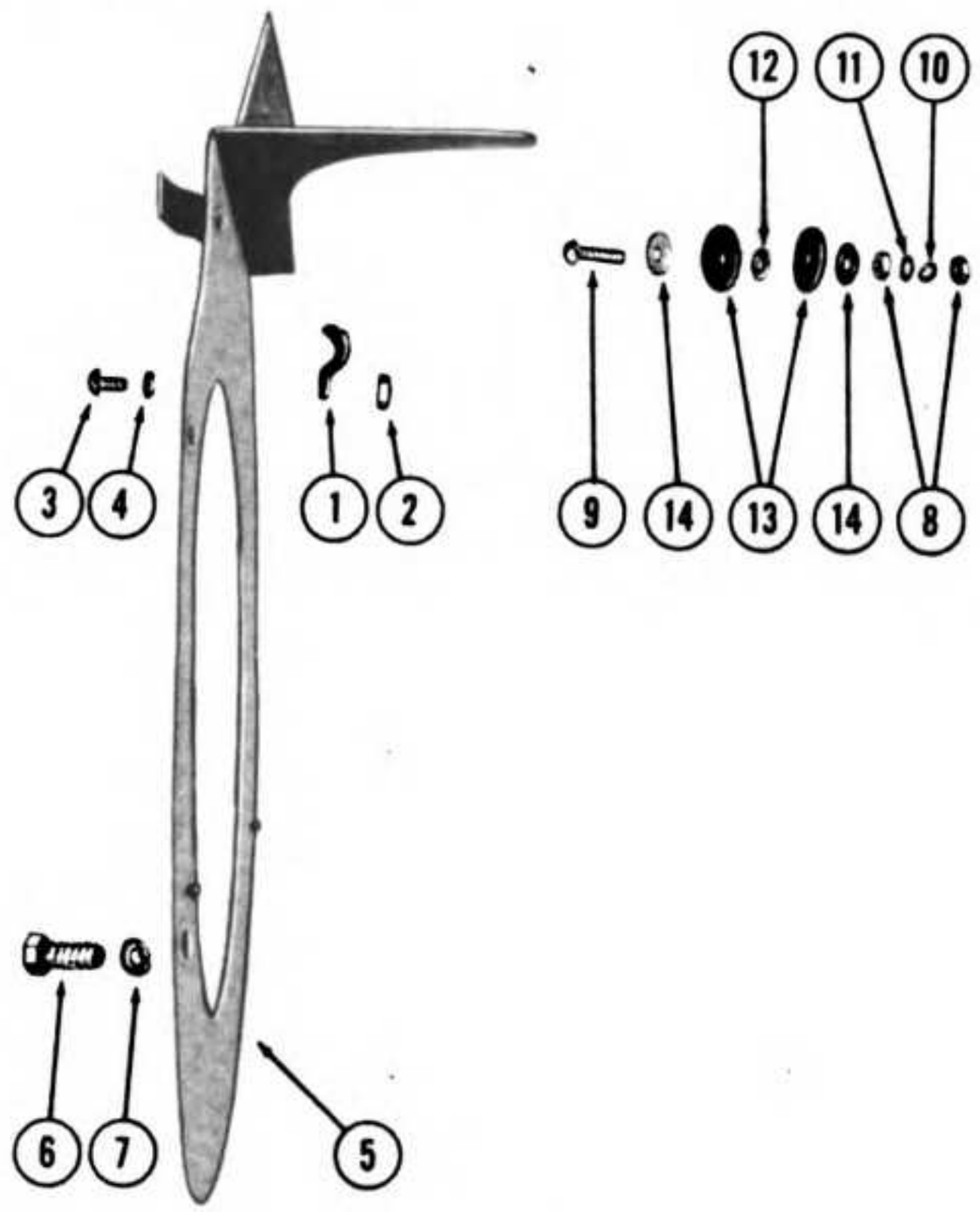

Figure 06-1—Stop Switch Parts

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			04 — EXHAUST			
			0401 — MUFFLER			
03-2	11		MUFFLER ASSEMBLY	BR	69134	1
			0402 — PIPE			
03-2	12		ELL, Street, 1"			1
			06 — ELECTRICAL			
			0604 — SWITCH STOP, PLUG SPARK			
06-1	1		CLAMP, Cable	BR	23581	1
06-1	2		NUT, Hex, cable clamp, 10—32			1
06-1	3		SCREW, Round head, clamp 10—32 x 1/2"			1
06-1	4		WASHER, Lock, cable clamp, No. 10			1

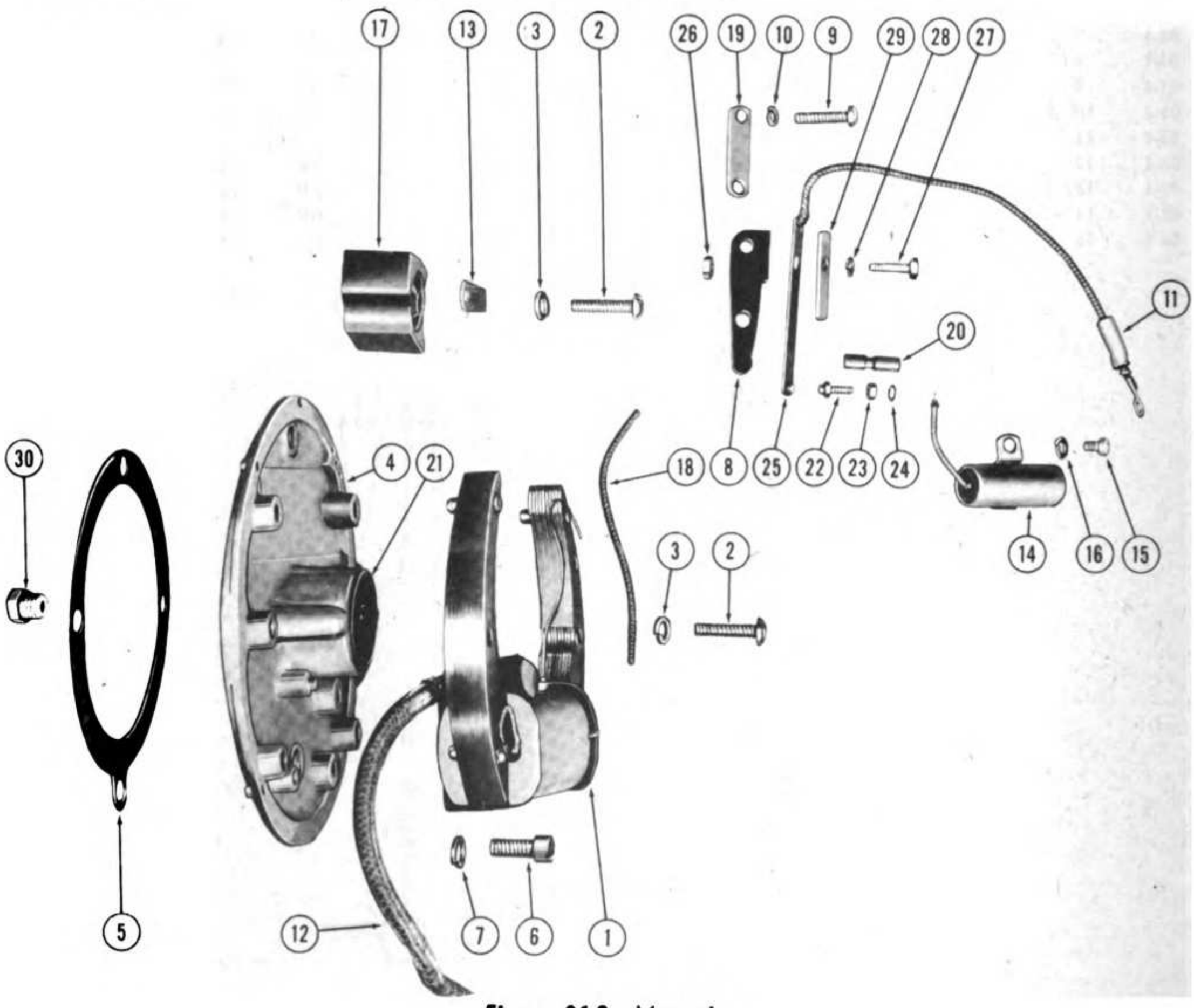

Figure 06-2—Magneto

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			STOP SWITCH PARTS			
06-1	5		GUIDE, Air, includes stop switch	BR	89981	1
06-1	6		SCREW, Hex head, 1/4—20 x 3/8"			4
06-1	7		WASHER, Lock, 1/4"			4
06-1	8		NUT, Stop switch, hex brass, 8—32	BR	90337	2
01-6	12		PIN, Cotter, 1/16 x 3/8"			1
01-6	10		ROD, Stop switch push	BR	23639	1
06-1	9		SCREW, Stop switch, round head brass, 8—32 x 5/8"			1
01-6	11		SPRING, Stop switch	BR	26483	1
06-1	10		WASHER, Lock, stop switch No. 8	BR	91287	1
06-1	11		WASHER, Plain, No. 8			1
06-1	12		WASHER, Stop switch	BR	66164	1
06-1	13		WASHER, Stop switch	BR	66154	2
06-1	14		WASHER, Stop switch	BR	26404	2
			SPARK PLUG			
01-2	6		PLUG, Spark, with gasket	BR	89572	1
01-2	7		GASKET, Spark plug	BR	27090	1
01-2	8		SHIELD, Spark plug	BR	89720	1
			0605 — INSTRUMENT			
15-1	3	252070	GAGE, Pressure	*	P-160-RS80-2A	1
			0611 — MAGNETO			
06-2			MAGNETO ASSEMBLY, Includes ground wire	BR	290516	1
06-2	1		ARMATURE	BR	29656	1
06-2	2		SCREW, Round head, 1/4—20 x 1"			2
06-2	3		WASHER, Lock, 1/4"			2
06-2	4		BEARING, Magneto plate, includes retainer ring	BR	69911	1
06-2	5		GASKET, Magneto plate .005" thick	BR	66527	1
06-2	5		GASKET, Magneto plate .009" thick	BR	66537	1
06-2	5		GASKET, Magneto plate .015" thick	BR	66457	1
06-2	6		SCREW, Magneto mounting	BR	92166	4
06-2	7		WASHER, Lock, magneto mounting	BR	92167	4
06-2	8		BLOCK, Contact	BR	65078	1
			BLOCK ASSEMBLY, Contact, includes block, spring and point assembly, and spring stop.	BR	69780	1
06-2	9		SCREW, Round head, 10—32 x 7/8"			2
06-2	10		WASHER, Lock, No. 10			2
06-2	11		BUSHING, Rubber	BR	65634	1
06-2	12		CABLE, Ignition	BR	290403	1
06-2	13		CLIP, Dust cover	BR	68876	1
06-2	14		CONDENSER	BR	290593	1
06-2	15		SCREW, Fillister head, 10—32 x 1/4"			1
06-2	16		WASHER, Lock, No. 10			1
06-2	17		COVER, Magneto point dust	BR	65198	1
06-2	18		INSULATOR, Armature lead	BR	65725	1
06-2	19		PLATE, Contact block	BR	62178	1
06-2	20		PLUNGER, Magneto point	BR	65414	1
06-2	21		RING, Oil retainer	BR	62235	1
06-2	22		SCREW, Contact point	BR	63238	1
06-2	23		NUT, Contact lock	BR	23402	1
06-2	24		WASHER, Contact screw shakeproof	BR	92181	1

*Jos. P. Marsh Co., Chicago

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			0611 — MAGNETO, Continued			
06-2	25		SPRING AND POINT ASSEMBLY, Contact	BR	69754	1
06-2	26		NUT, Contact block, No. 8—32 hex			1
06-2	27		SCREW, Contact block	BR	63369	1
06-2	28		WASHER, Lock, contact block	BR	92187	1
06-2	29		STOP, Contact spring	BR	62100	1
06-2	30		VALVE, Oil return	BR	89307	1

12 — COMPRESSOR, DUSTING GUNS

1213 — COMPRESSOR HOUSING PARTS

12-1	1	252458	EXTENSION, Housing	1
12-1	2		SCREW, Socket head, housing extension, 5/16—24 x 1-1/2"	6
12-1	3	251008	HOUSING, Compressor	1
12-1	4		BOLT, Hex head, housing mounting, 3/8—16 x 1-1/4"	4
12-1	5		WASHER, Lock, 3/8" internal tooth	4
12-1	6	251001	PLATE, Cover	1
12-1	7		BOLT, Hex head, front cover plate, 1/4—20 x 3/4"	6
12-1	8		WASHER, Lock, 1/4" standard	6
12-1	9		SCREW, Hex head, cover plate plug, 1/2—20 x 1/2"	1

EXPANSION HEAD PARTS

12-2	1	252389	BRACKET, Check valve	4
12-2	2		SCREW, Round head, check valve bracket, 8—32 x 3/8"	8
12-2	3		WASHER, Lock, No. 8 internal tooth	4

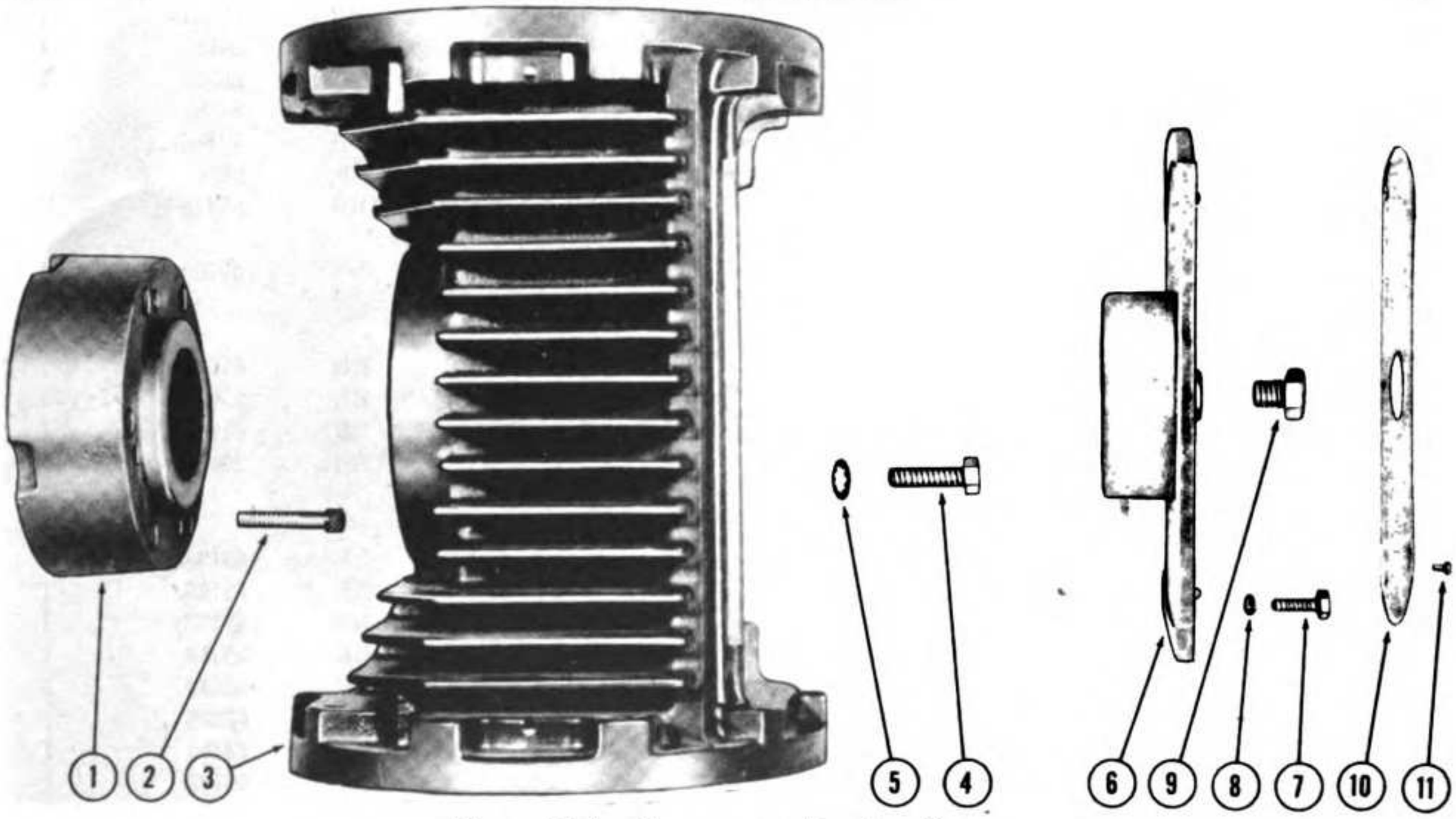

Figure 12-1—Compressor Housing Parts

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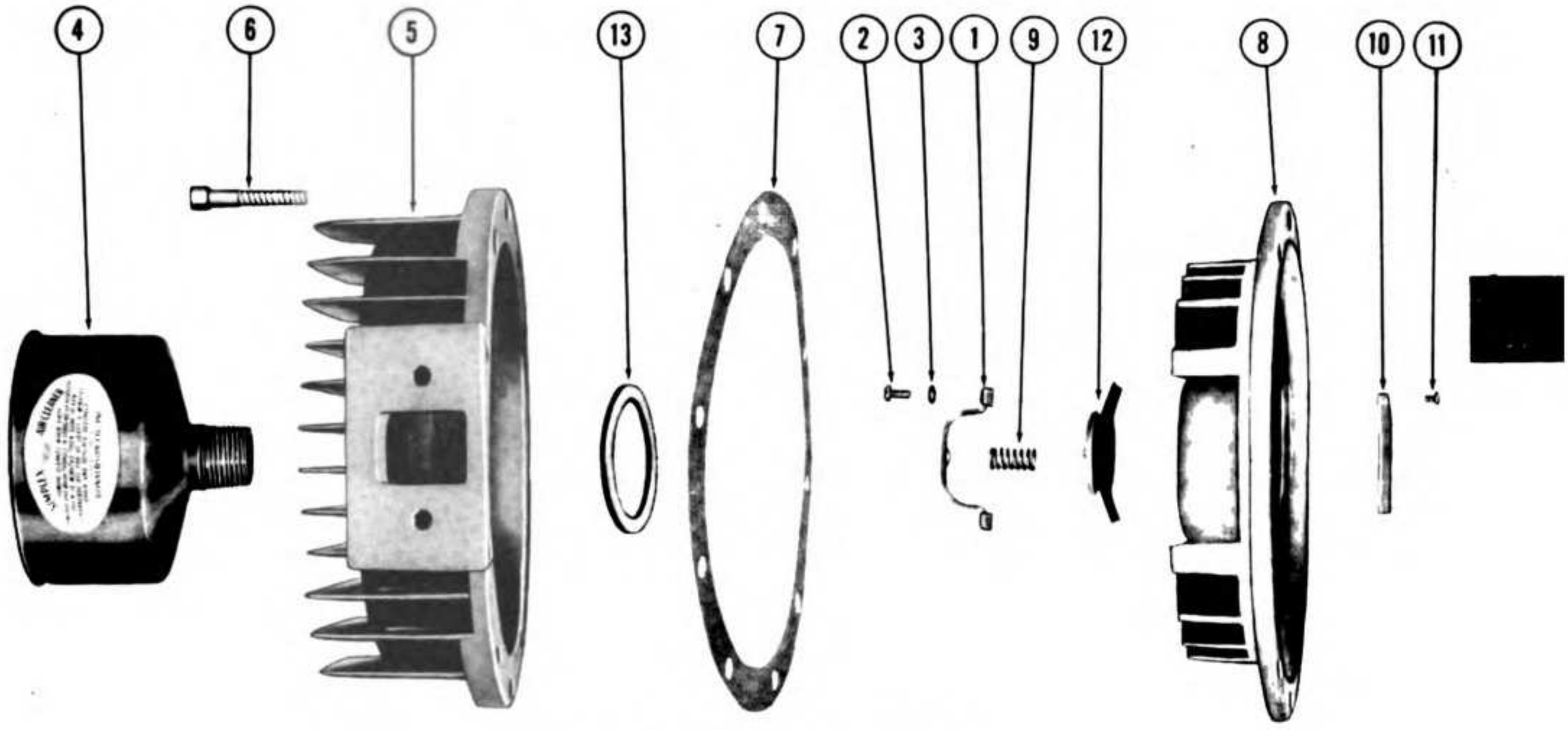

Figure 12-2—Expansion Head Parts

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			EXPANSION HEAD PARTS, Continued			
12-2	4	252231	CLEANER, Compressor air	DN	P-2819	2
12-2	5	251004	HEAD, Expansion			2
12-2	6		BOLT, Socket head, 5/16—18 x 1-3/4"			20
12-2	7	252017	GASKET, Expansion head			2
12-2	8	252005	PLATE, Compression			2
12-2	9	252388	SPRING, Check valve			4
12-2	10	252014	VALVE, Intake			4
12-2	11		SCREW, Round head, intake valve, 6—32 x 3/16"			8
12-2	12	255317	VALVE ASSEMBLY, Check			4
12-2	13	252101	WASHER, Neoprene			2
			CONNECTING ROD, BEARINGS, PISTONS AND DIAPHRAGMS			
12-3	1	252025	BEARING, Ball, connecting rod			2
12-3	2	250025	BEARING, Ball, front cover			1
12-3	3	250030	BEARING, Needle			2
12-3	4	252238	BEARING, Thrust, Super Oilite			2
12-3	5	251107	CAP, Connecting rod (used on units to and including serial number 3179.)			2
12-3	5	255267	CAP, Connecting rod (used on serial number 3180 and above.)			2
12-3	6	255321	BOLT, With nut, connecting rod, 5/16—18 x 2-1/2"			4
12-3	7	250102	CUSHION, Neoprene			4
12-3	8	252013	DIAPHRAGM, Compressor			2
12-3	9	252109	ECCENTRIC, Back			1
12-3	10	250321	KEY, Back eccentric			1
12-3	11		SCREW, Socket head set, 3/8—24 x 3/8"			2
12-3	9	251009	ECCENTRIC, Front			1
12-3	10	250320	KEY, Front eccentric			1
12-3	11		SCREW, Socket head set, 3/8—24 x 3/8"			2

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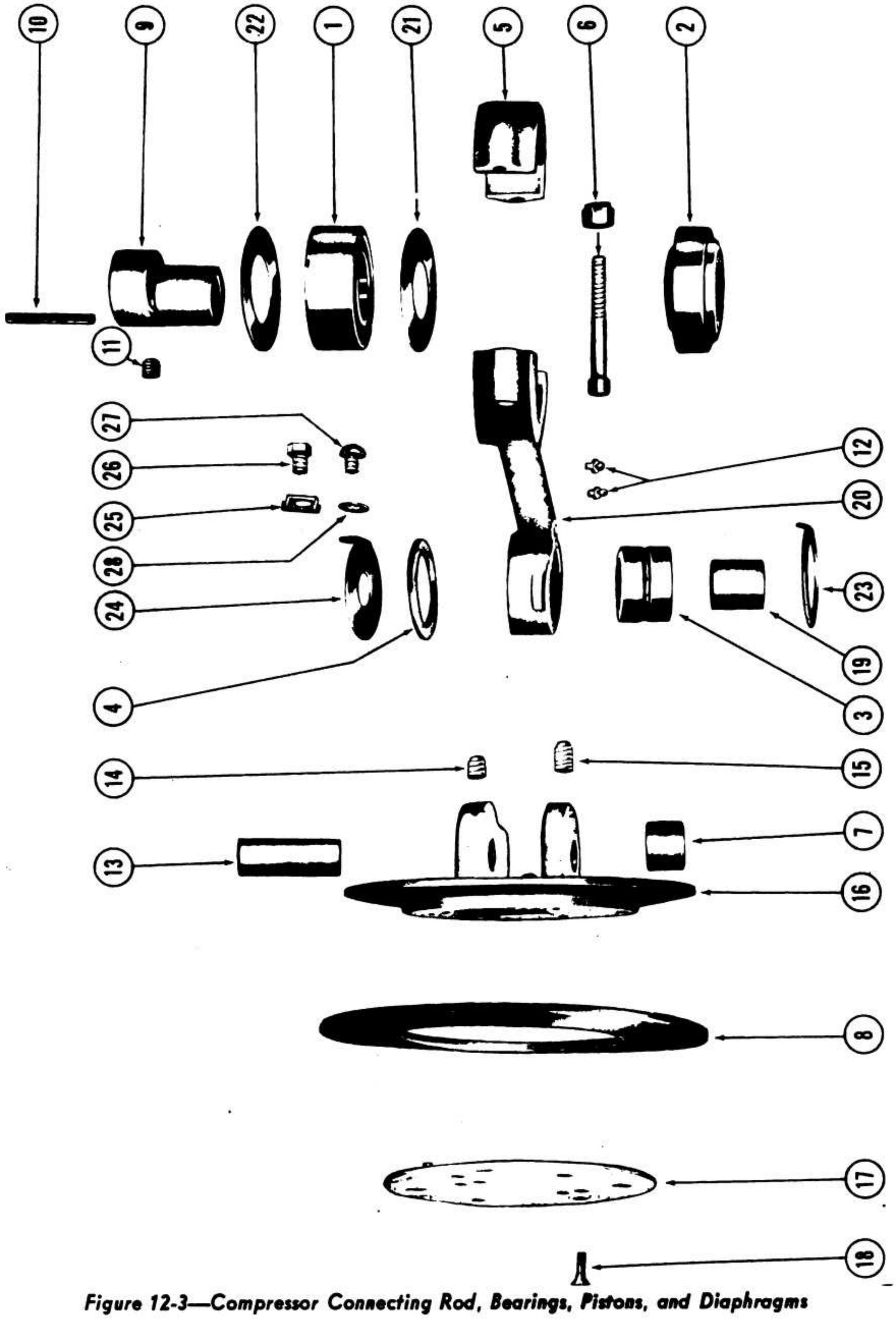

Figure 12-3—Compressor Connecting Rod, Bearings, Pistons, and Diaphragms

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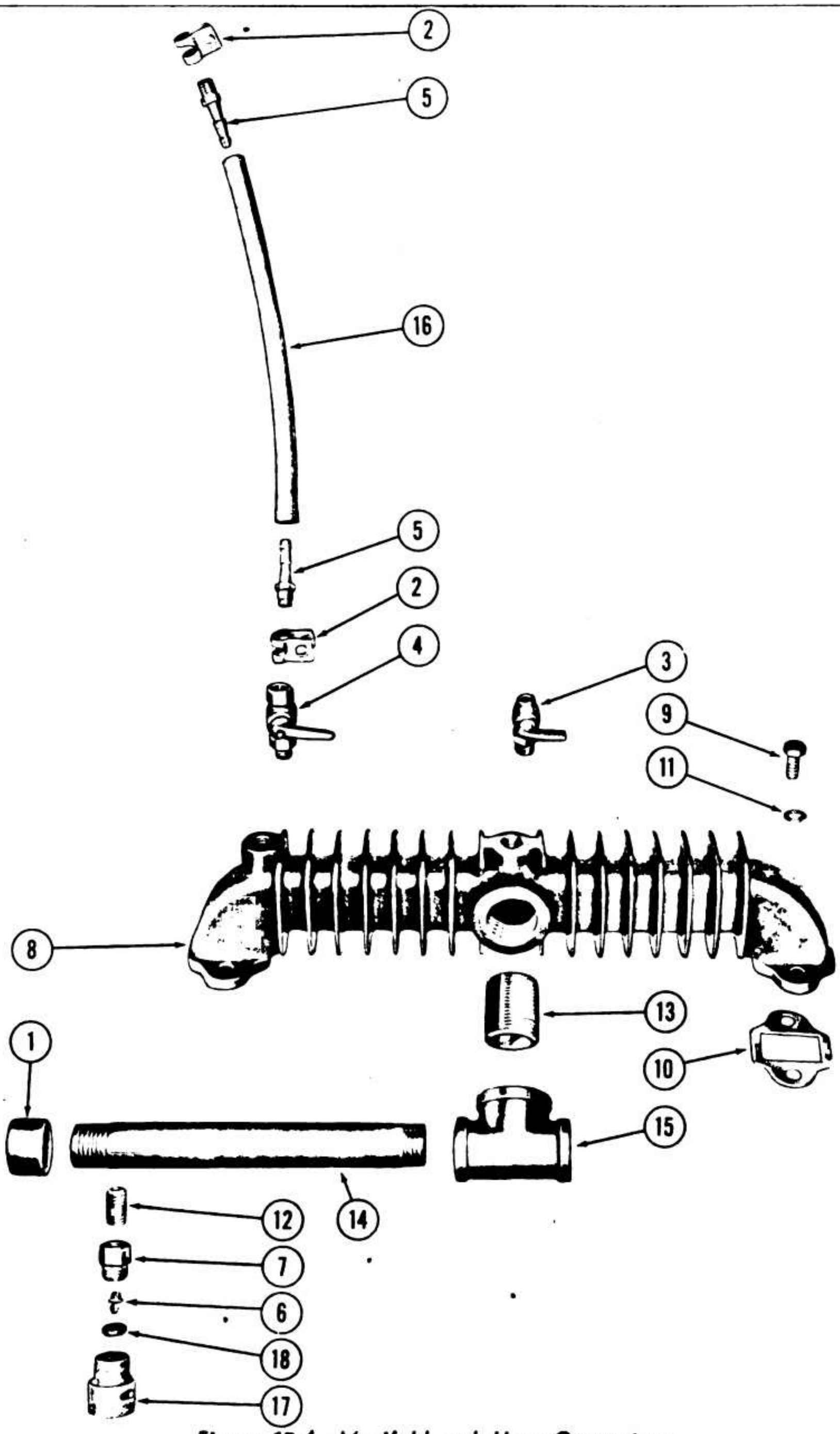

Figure 12-4—Manifold and Hose Connectors

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Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			CONNECTING ROD, BEARINGS, PISTONS AND DIAPHRAGMS, Continued			
12-3	12	252383	FITTING, Lubrication, straight, 3/16″	SW	1728-J	4
12-3	13	252003	PIN, Piston			2
12-3	14		SCREW, Socket head set, 5/16—18 x 3/8″			2
12-3	15		SCREW, Socket head set, 5/16—18 x 1/2″			2
12-3	16	251006	PISTON, Compressor			2
		255316	PISTON ASSEMBLY, Includes connecting rod, cap, needle bearing and race, Oilite bearing, thrust washers, Neoprene cushions, and piston pin.			2
12-3	17	252012	PLATE, Retainer			2
12-3	18	255318	SCREW, Flat head, retainer plate, 12—24 x 5/8″			12
12-3	19	250031	RACE, Inner			2
12-3	20	251106	ROD, Connecting			2
12-3	19	255266	ROD, Connecting, drilled right (used on serial number 3180 and above.)			1
12-3	19	255276	ROD, Connecting, drilled left (used on serial number 3180 and above.)			1
12-3	21	252386	SHIELD, Inner grease			2
12-3	22	252387	SHIELD, Outer grease			2
12-3	23	252241	WASHER, Inner thrust			2
12-3	24	252240	WASHER, Outer thrust			2
12-3	25	252379	PLATE, Screw locking (used on units beginning serial number 3393.)			2
12-3	26		SCREW, Cap 5/16—18 x 3/8″ (used on units beginning serial number 3393.)			2
12-3	27		SCREW, Round head, 5/16—18 x 3/8″			2
12-3	28		WASHER, Internal tooth lock, 5/16″			2
			MANIFOLD AND HOSE CONNECTORS			
12-4	1		CAP, Pipe, 3/8″			2
12-4	2	252085	CLAMP, Hose			2

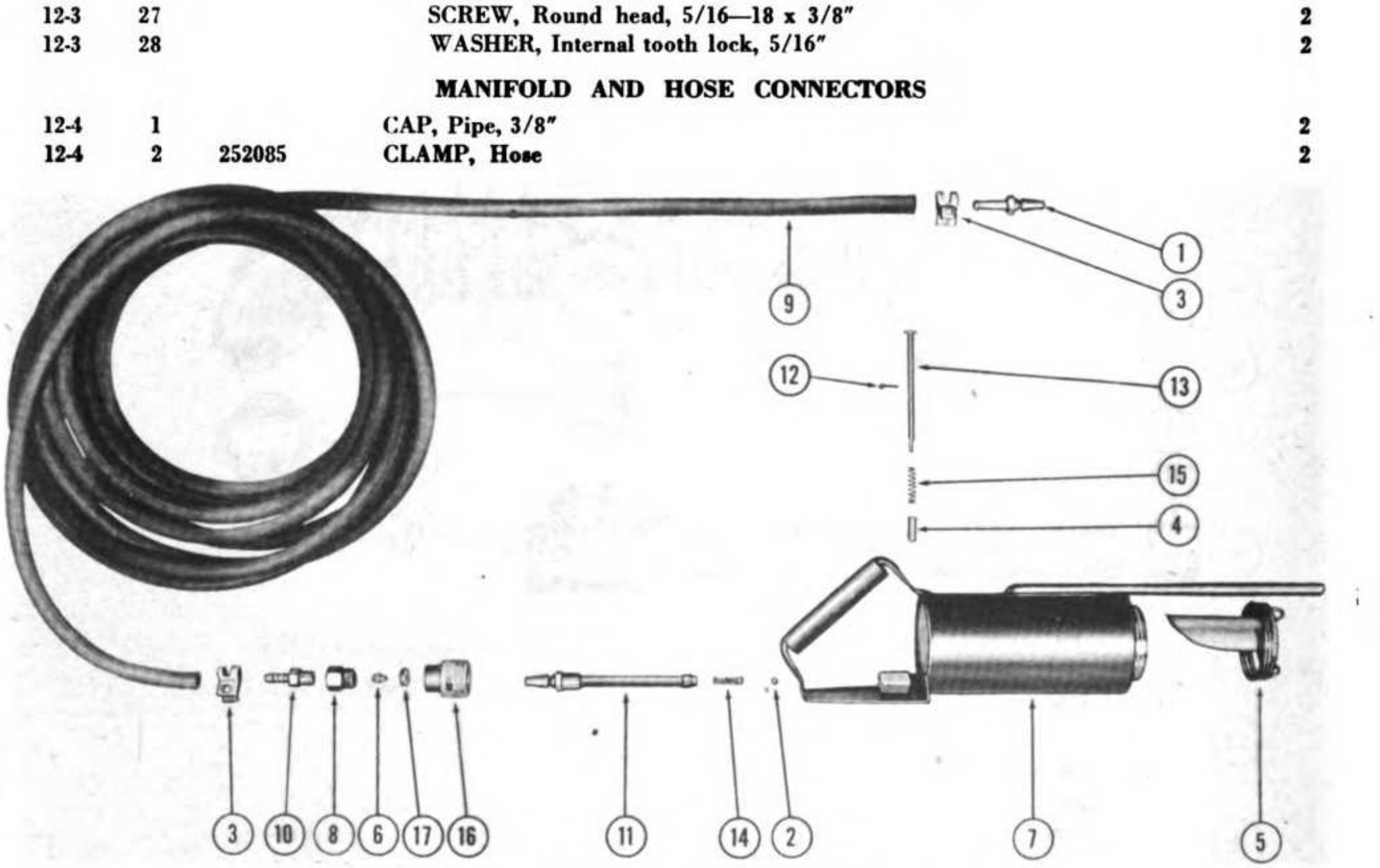

Figure 12-5—Dusting Gun and Hose

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Group 15 — Frame

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			MANIFOLD AND HOSE CONNECTORS, Continued			
12-4	3	252056	COCK, Relief			1
12-4	4	252052	COCK, Shut-off			1
12-4	5	252174	CONNECTOR			2
12-4	6		DEFLATOR	SV	7103-7	10
12-4	7		HOLDER, Washer	SV	8050-196	10
12-4	8	252010	MANIFOLD			1
12-4	9		BOLT, Hex cap, manifold mounting, 5/16—18 x 1"			4
12-4	10	252018	GASKET, Manifold			2
12-4	11		WASHER, Lock, 5/16" standard			4
		255328	MANIFOLD ASSEMBLY, complete with couplers			1
12-4	12		NIPPLE, Close pipe, 1/4"			10
12-4	13		NIPPLE, Close pipe, 1"			1
12-4	14	252405	NIPPLE, Pipe			2
12-4	15		TEE, Pipe, 3/4" x 3/4" x 1"			1
12-4	16	252077	TUBE, Air			1
12-4	17		UNIT, Check	SV	8052-A-12	10
		252071	UNIT, Check, manifold end, including nipple			1
12-4	18		WASHER, Rubber	SV	8602	10
			DUSTING GUN AND HOSE			
12-5	1	252072	ADAPTER	SV	8787-11	10
12-5	2		BALL, Stainless steel, 1/4"	*	R-11	10
12-5	3	252085	CLAMP, Hose			20
12-5	4		COUPLING	*	1823	10
		255315	COUPLING, Hose, gun end, includes hose clamp, barbed insert, washer holder, deflator, rubber washer, and check unit.			10
12-5	5		COVER ASSEMBLY, Dusting gun	*	1988	10
12-5	6		DEFLATOR	SV	7103-7	10
12-5	7	252408	GUN, Dusting		142	10
12-5	8		HOLDER, Washer	SV	8050-196	10
12-5	9	255314	HOSE, Complete with couplers, 25'			10
12-5	10	870179	INSERT, Barbed			10
12-5	11		NIPPLE ASSEMBLY, Connecting	*	1987	10
12-5	12		PIN, Cotter, 1/16 x 3/8"			10
12-5	13		PIN, Valve push	*	1985	10
12-5	14		SEAT ASSEMBLY, Spring	*	1984	10
12-5	15		SPRING, Push pin	*	R-3011	10
12-5	16		UNIT, Check	SV	8052-A-12	10
12-5	17		WASHER, Rubber	SV	8602	10
			15 — FRAME			
			1506 — FRAME			
15-1	1	252057	COCK, Compressor drain			1
15-1	2	252309	FRAME, Tubular reservoir			1
			22 — MISCELLANEOUS BODY PARTS			
			2202 — PLATES, IDENTIFICATION			
12-1	10	255137	PLATE, Compressor name			1
12-1	11		SCREW, Drive, nameplate mounting, No. 4 x 3/16"			6

*Dobbins Manufacturing Co., North St. Paul, Minn.

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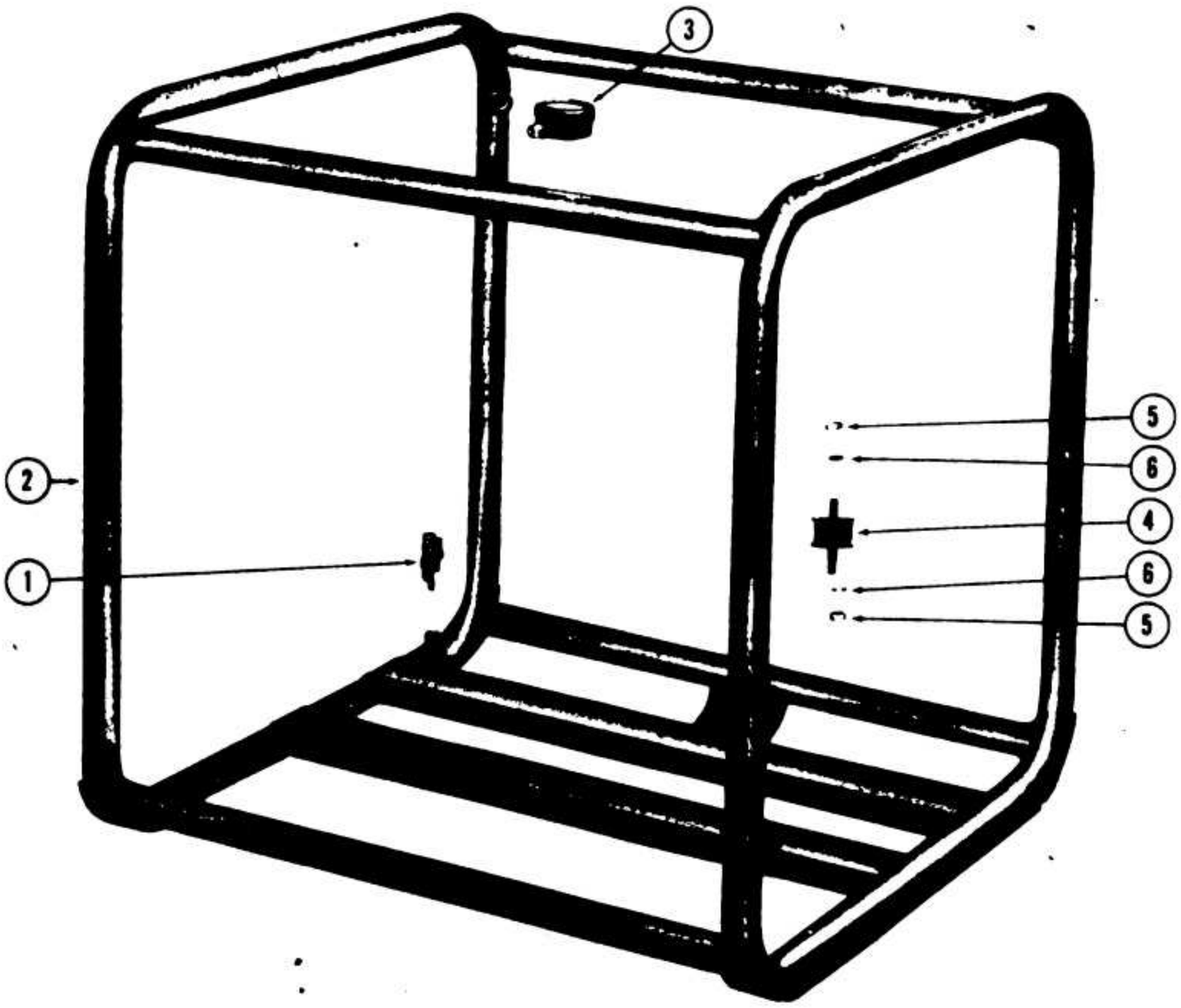

Figure 15-1—Tubular Frame and Gage

23 — GENERAL USE — STANDARDIZED PARTS

Description	*No. Used*
2304 — PARTS COMMON	
BOLT — HEX HEAD	
BOLT, Hex head, 1/4—20 x 3/4"	6
BOLT, Hex head, 5/16—18 x 1"	4
BOLT, Hex head, 3/8—16 x 1-1/4"	4
BOLT, Hex head, 1/2—13 x 2"	1
CAP — PIPE	
CAP, Pipe, 3/8"	2
NIPPLE — PIPE	
NIPPLE, Close pipe, 1/4"	10
NIPPLE, Close pipe, 1"	1
NUT — HEX	
NUT, Hex, 8—32	1
NUT, Hex brass, 8—32	2
NUT, Hex, 10—32	1
NUT, Hex, 1/4—28	2
NUT, Hex, 5/16—18	8

Description	*No. Used*
NUT — SQUARE	
NUT, Square, 1/4—20	2
PIN — DOWEL	
PIN, Dowel, 1/4 x 1-1/4"	2
PIN — COTTER	
PIN, Cotter, 1/16 x 3/8"	14
SCREW — DRIVE	
SCREW, Drive, No. 4 x 3/16"	6
SCREW — FILLISTER HEAD	
SCREW, Fillister head, 8—32 x 3/4"	1
SCREW, Fillister head, 10—32 x 1/4"	1
SCREW, Fillister head, 10—32 x 5/8"	3
SCREW, Fillister head, 1/4—20 x 1-1/2"	2
SCREW — FLAT HEAD	
SCREW, Flat head, 12—24 x 5/8"	12
SCREW — HEX HEAD	
SCREW, Hex head, 1/4—20 x 3/8"	4
SCREW, Hex head, 1/4—20 x 1/2"	1

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Group 23 — General Use — Parts Common

Description	*No. Used*
SCREW, Hex head, 1/4—20 x 5/8″	4
SCREW, Hex head, 5/16—18 x 3/8″	2
SCREW, Hex head, 5/16—18 x 3/4″	2
SCREW, Hex head, 5/16—18 x 2″	1
SCREW, Hex head, 5/16—18 x 2-1/2″	5
SCREW, Hex head, 5/16—24 x 3/4″	2
SCREW, Hex head, 3/8—16 x 1-1/4″	4
SCREW, Hex head, 1/2—13 x 1/2″	1
SCREW, Hex head, 1/2—20 x 1/2″	1
SCREW — ROUND HEAD	
SCREW, Round head, 4—32 x 1/4″	1
SCREW, Round head, 4—32 x 1-1/4″	2
SCREW, Round head, 6—32 x 3/16″	8
SCREW, Round head, 8—32 x 3/8″	8
SCREW, Round head brass, 8—32 x 5/8″	1
SCREW, Round head, 10—32 x 1/2″	1
SCREW, Round head, 10—32 x 7/8″	2
SCREW, Round head, 1/4—20 x 1/2″	1
SCREW, Round head, 1/4—20 x 1″	2
SCREW, Round head, 5/16—18 x 3/8″	2
SCREW — SOCKET HEAD	
SCREW, Socket head, 5/16—18 x 1-3/4″	20
SCREW, Socket head, 5/16—24 x 1-1/2″	6
SCREW — SOCKET HEAD SET	
SCREW, Socket head set, 5/16—18 x 3/8″	2
SCREW, Socket head set, 5/16—18 x 1/2″	2
SCREW, Socket head set, 3/8—24 x 3/8″	6
TEE — PIPE	
TEE, Pipe, 3/4″ x 3/4″ x 1″	1
WASHER — LOCK, STANDARD	
WASHER, Lock, No. 4	2
WASHER, Lock, No. 8	1
WASHER, Lock, No. 10	7
WASHER, Lock, 1/8″	4
WASHER, Lock, 1/4″	12
WASHER, Lock, 5/16″	17
WASHER, Lock, 3/8″	4
WASHER — LOCK, INTERNAL TOOTH	
WASHER, Lock, internal tooth, No. 8	4
WASHER, Lock, internal tooth, 1/4″	7
WASHER, Lock, internal tooth, 5/16″	2
WASHER, Lock, internal tooth, 3/8″	4

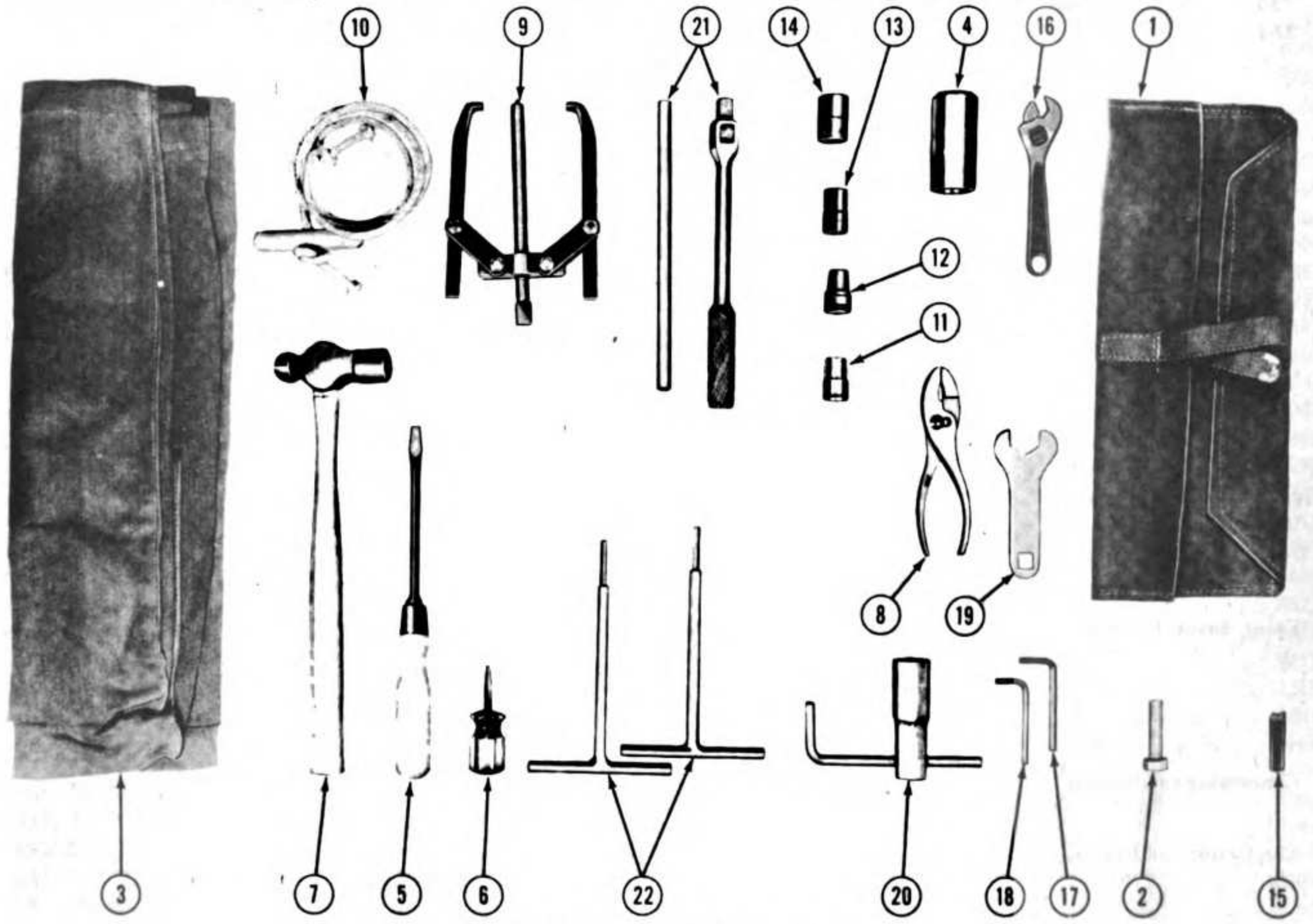

Figure 23-1—Tools and Equipment

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Outfit, Delousing, Gasoline-Engine Driven (Defiance)

Fig. No.	Ref. No.	Defiance Part No.	Nomenclature	Unit Mfr's Symbol	Unit Mfr's Part No.	Number Reqd.
			2306 — TOOLS AND EQUIPMENT			
23-1	1	255477	BAG, Tool			1
23-1	2		BOLT, Cover removing, 1/2—13 x 2"			1
23-1	3	252380	COVER, Canvas			1
23-1	4	255303	DRIVER, Bearing			1
23-1	5	255501	DRIVER, Screw, large			1
23-1	6	255502	DRIVER, Screw, small			1
			GUN, lubricating, hand operated, push-type nozzle, 1½ oz.	AD	6566Z	1
23-1	7	255504	HAMMER, 1 lb.			1
23-1	8	255503	PLIERS, pair			1
23-1	9	255513	PULLER, Bearing, 4" and 3-1/2"			1
23-1	10	252254	ROPE, Starter	BR	69932	1
23-1	11	255506	SOCKET, 7/16"			1
23-1	12	255507	SOCKET, 1/2"			1
23-1	13	255508	SOCKET, 9/16"			1
23-1	14	255509	SOCKET, 3/4"			1
23-1	15	255304	TOOL, Staking			1
23-1	16	255510	WRENCH, Adjustable 6" Crescent			1
23-1	17	255512	WRENCH, Allen-head, 7/32"			1
23-1	18	255511	WRENCH, Allen-head, 3/16"			1
23-1	19		WRENCH, Filler cap and oil plug	BR	68652	1
23-1	20	255514	WRENCH, Spark plug			1
23-1	21	255505	WRENCH, Square socket, flexible 1/2", with handle			1
23-1	22	252305	WRENCH, Tee-handle			2

GROUP 25 — BEARING CHART

Major Unit & Nomenclature	Type	Defiance Part No.	Vendor's Code	Vendor's Part No.	Sub-Group Number	Number Reqd.
ENGINE						
Crankshaft bearing	Ball		BR ND	29530 7506	0102	1
COMPRESSOR						
Connecting rod bearing	Ball	252025	MG ND FAF MRC	5206-M 5206 5206-W 5206-K	1213	2
Front cover bearing	Ball	250025	MG ND FAF MRC BCA	206-FF 88506 206-KLL 206-MFF 206-SS	1213	1
Connecting rod bearing	Needle	250030	TR MG	162416 MO-16	1213	2
Connecting rod bearing inner race	Race	250031	TR MG	121616 MI-12	1213	2

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ALPHABETICAL INDEX

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ALPHABETICAL INDEX, Continued

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ALPHABETICAL INDEX, Continued

Nomenclature	*Group No.*
SOCKET, 7/16"	2306
SOCKET, 9/16"	2306
SPACER, Cylinder head	0101
SPRING, Check valve	1213
SPRING, Choke lever	0301
SPRING, Push pin	1213
SPRING, Governor	0305
SPRING, Idle valve and throttle adjusting	0301
SPRING, Oil pump	0107
SPRING, Stop switch	0604
SPRING, Valve	0105
SPRING AND POINTS ASSEMBLY, Contact	0611
STOP, Contact spring	0611
STRAP, Fuel tank, includes screw and nut	0304
STUD, Air cleaner mounting	0301
TANK, Fuel, including cap	0304
TOOL, Staking	2306
TUBE, Air	1213
UNIT, Check	1213
UNIT, Check, Manifold end, including nipple	1213
VALVE ASSEMBLY, Check	1213
VALVE, Carburetor choke	0301
VALVE, Carburetor idling	0301
VALVE, Carburetor throttle	0301
VALVE, Exhaust	0105
VALVE, Intake	1213
VALVE, Intake	0105
VALVE, Needle adjusting	0301
VALVE, Oil return	0611
VALVE AND SEAT, Inlet, includes gasket	0301
WASHER	0305
WASHER, Choke lever	0301
WASHER, Contact screw	0611
WASHER, Inner thrust	1213
WASHER, Lock	0101
WASHER, Lock contact block	0611
WASHER, Lock flywheel, 21/32"	2306
WASHER, Lock magneto mounting	0611
WASHER, Neoprene	1213
WASHER, Outer thrust	1213
WASHER, Rubber	1213
WASHER, Stop switch	0604
WASHER, Tank bracket lock	0304
WASHER, Valve tappet	0105
WRENCH, Adjustable 6" Crescent	2306
WRENCH, Allen-head, 7/32"	2306
WRENCH, Allen-head, 3/16"	2306
WRENCH, Filler cap and oil plug	2306
WRENCH, Spark plug	2306
WRENCH, Square socket, flexible, 1/2", with handle	2306
WRENCH, Tee-handle	2306
YOKE, Fuel filter	0302

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NUMERICAL INDEX

Part Number	Sub-Group No.	Part Number	Sub-Group No.	Part Number	Sub-Group No.	Part Number	Sub-Group No.
R-11	1213	29681	0301	66527	0611	92181	0611
1823	1213	53029	0302	66537	0611	92187	0611
1984	1213	61571	0107	67127	0107	92272	0109
1985	1213	61583	0106	67137	0102	92305	0305
1987	1213	61644	0111	67247	0301	92369	0101
1988	1213	61889	0101	67253	0101	92412	0305
R-3011	1213	61890	0108	67316	0305	92421	0101
6566Z	2306	61906	0103	67897	0301	99153	0103
8602	1213	61907	0103	67487	0302	99199	0103
21152	0301	61908	0103	67997	0101	99200	0103
22073	0104	61917	0103	68283	0105	99201	0103
22085	0101	61918	0103	68293	0105	99333	0301
22246	0104	61919	0103	68477	0302	99341	0301
22547	0301	61920	0103	68546	0103	99342	0301
22731	0305	61921	0103	68652	2306	99343	0301
23108	0301	61922	0103	68667	0301	99345	0301
23114	0301	61923	0103	68677	0301	99346	0301
23117	0301	61924	0103	68876	0611	99524	0301
23118	0301	61925	0103	69134	0401	99665	0302
23123	0301	62100	0611	69298	0304	99909	0302
23125	0301	62177	0109	69754	0611	99910	0302
23228	0301	62178	0611	69780	0611	250025	1213
23402	0611	62222	0105	69911	0611	250030	1213
23581	0604	62235	0611	69926	0305	250031	1213
23636	0301	62252	0105	69961	0304	250102	1213
23638	0105	62872	0301	7103-7	1213	250320	1213
23639	0604	62899	0301	89250	0301	250321	1213
23699	0302	62928	0301	89307	0611	251001	1213
26155	0301	63238	0611	89531	0301	251004	1213
26157	0301	63334	0305	89572	0604	251006	1213
26404	0604	63335	0305	89720	0604	251008	1213
26413	0107	63341	0305	69839	0305	251009	1213
26483	0604	63369	0611	89914	0301	251106	1213
27034	0301	63520	0305	89915	0301	251107	1213
27090	0604	63614	0106	89877	0109	252003	1213
27145	0302	63615	0103	89981	0604	252005	1213
29269	0104	63616	0105	89983	0101	252010	1213
29290	0101	63659	0105	89985	0102	252012	1213
29338	0107	63671	0103	90683	0304	252013	1213
29339	0107	65078	0611	90700	0301	252014	1213
29343	0305	65198	0611	90969	0111	252017	1213
29407	0103	65237	0105	91084	0107	252018	1213
29408	0103	65414	0611	91162	0104	252025	1213
29409	0103	65434	0107	91203	0101	252052	1213
29410	0103	65634	0611	91319	0304	252056	1213
29428	0105	65647	0301	91371	0107	252057	1501
29464	0304	65725	0611	91471	0102	252070	1501
29529	0102	65906	0105	91487	0107	252071	1213
29530	0102	65932	0106	91590	0108	252072	1213
29531	0102	65942	0105	91635	0302	252077	1213
29656	0611	66154	0604	91674	0301	252085	1213
29666	0301	66164	0604	92141	0105	252101	1213
29679	0301	66403	0109	92166	0611	252104	1501
29680	0301	66457	0611	92167	0611	252109	1213

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NUMERICAL INDEX, Continued

Part Number	Sub-Group No.	Part Number	Sub-Group No.	Part Number	Sub-Group No.	Part Number	Sub-Group No.
252174	1213	252389	1213	255317	1213	255511	2306
252231	1213	252408	1213	255321	1213	255512	2306
252238	1213	252458	1213	255328	1213	255513	2306
252240	1213	255137	2202	255477	2306	255514	2306
252241	1213	255235	0101	255501	2306	290059	0302
252254	2306	255266	1213	255502	2306	290157	0301
252305	2306	255267	1213	255503	2306	290188	0107
252309	1501	255270	1213	255504	2306	290232	0304
252379	1213	255276	1213	255505	2306	290403	0611
252380	2306	255303	2306	255506	2306	290412	0109
252383	1213	255304	2306	255507	2306	290419	0304
252386	1213	255314	1213	255508	2306	290516	0611
252387	1213	255315	1213	255509	2306	290593	0611
252388	1213	255316	1213	255510	2306	8050-196	1213
						8050-A-12	1213
						870179	1213

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