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TM 10-1668

WAR DEPARTMENT TECHNICAL MANUAL

**OUTFIT, DELOUSING
GASOLINE-ENGINE DRIVEN
(DEFIANCE)**



WAR DEPARTMENT 15 SEPTEMBER 1945

**OUTFIT, DELOUSING
GASOLINE-ENGINE DRIVEN
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WAR DEPARTMENT (15 SEPTEMBER 1945)

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:

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Chief of Staff

OFFICIAL:

J. A. ULIO,
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The Adjutant General

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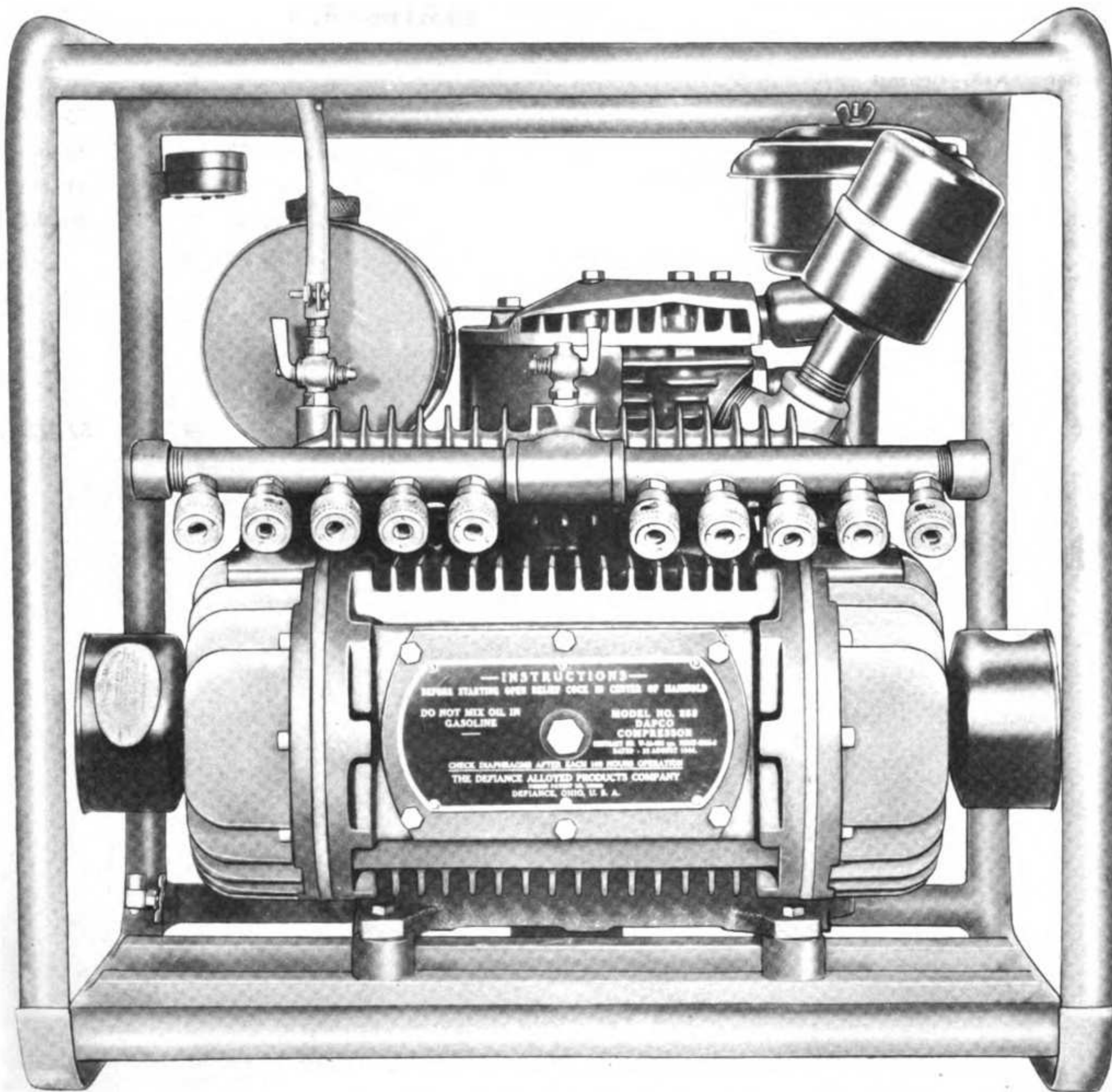


Figure 1—Delousing Outfit

PART ONE—INTRODUCTION

Section I. General

Scope	Paragraph 1
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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

Description	Paragraph 2
Tabulated Data	3

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 num-

ber 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

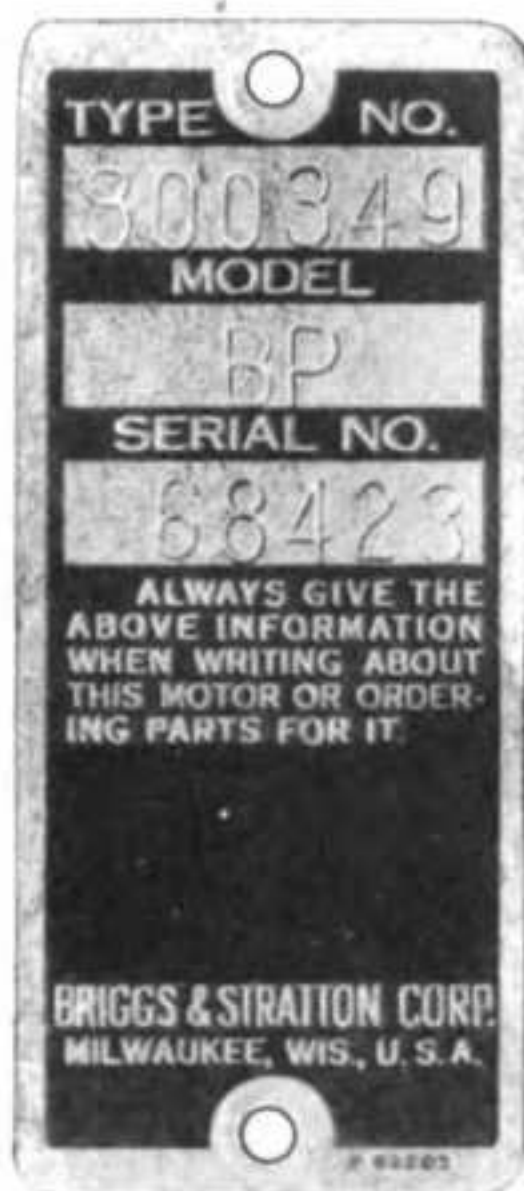


Figure 3—Engine Nameplate

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, un-
crated, 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

Tools and Equipment	Paragraph 4
---------------------------	-------------

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

Federal Stock No.	Nomenclature	Quan. Reqd.
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

Tools and Equipment

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

Federal Stock No.	Nomenclature	Quan. Reqd.
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.

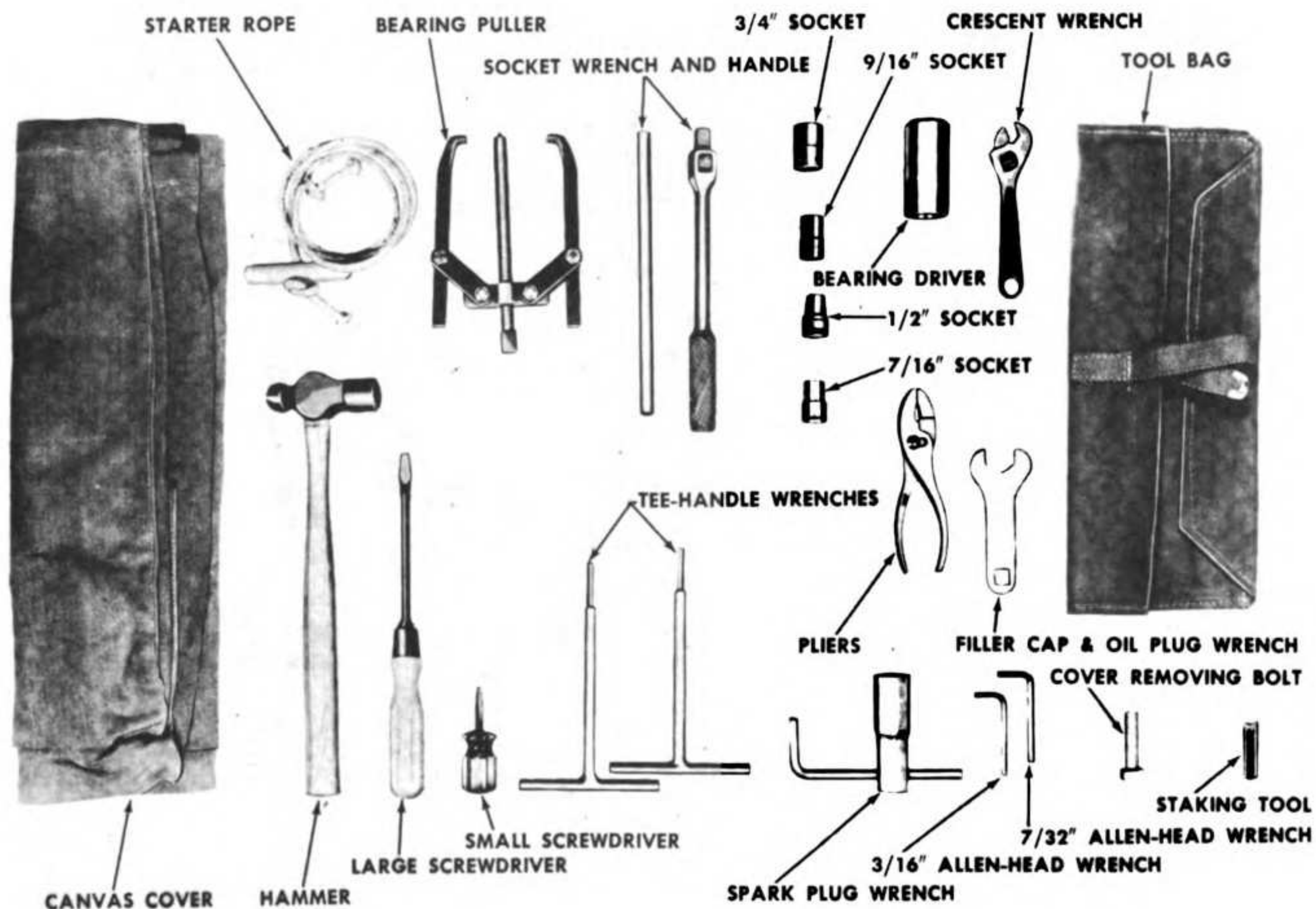


Figure 4—Tools and Equipment

Outfit, Delousing, Gasoline-Engine Driven (Defiance)

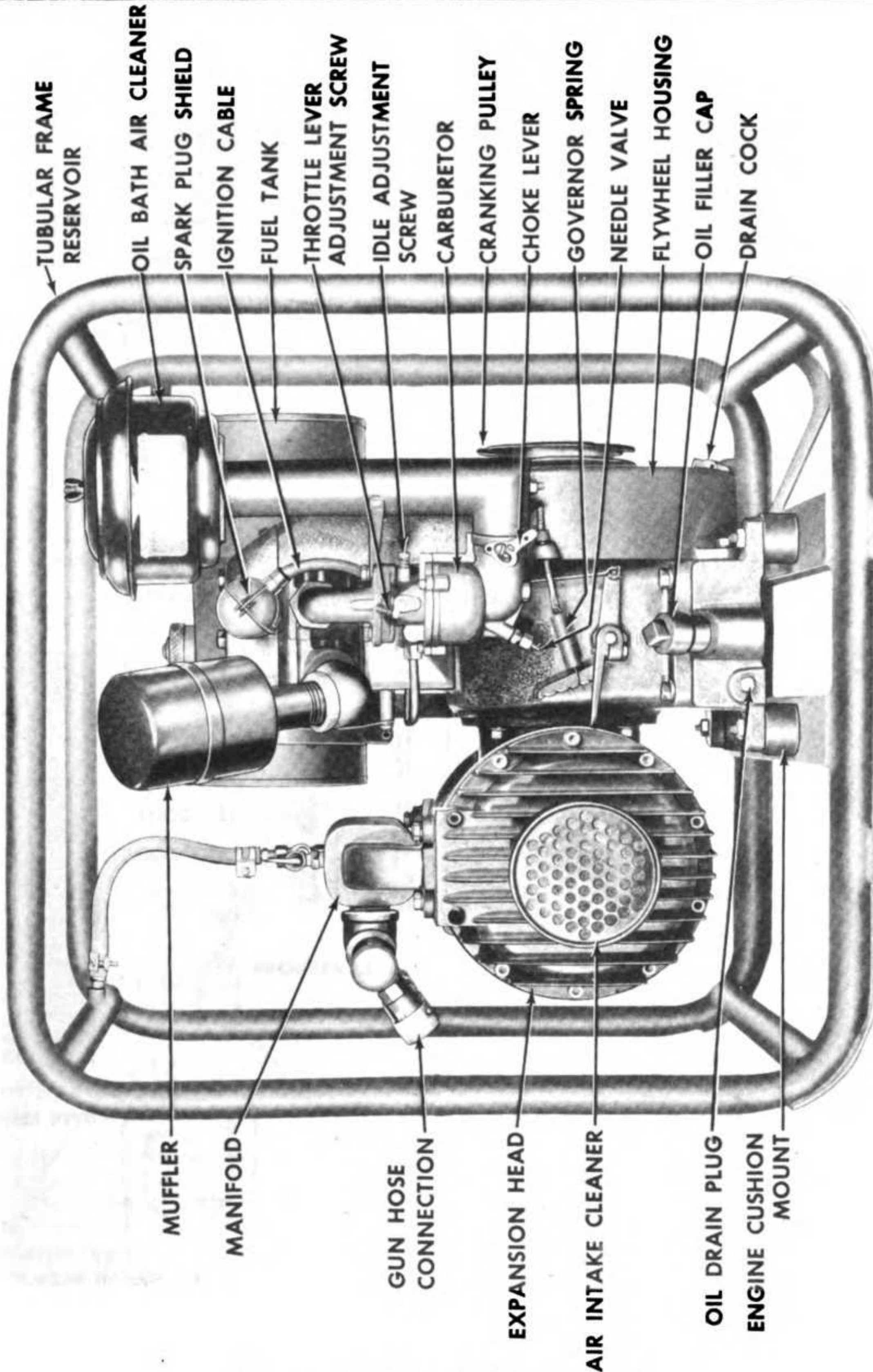


Figure 5—Left Side of Delousing Outfit

PART TWO—OPERATING INSTRUCTIONS

Section IV. General

	<i>Paragraph</i>
Scope	5

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

	<i>Paragraph</i>
Run-In Test Procedure	6

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 over-choking and oil dilution.

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

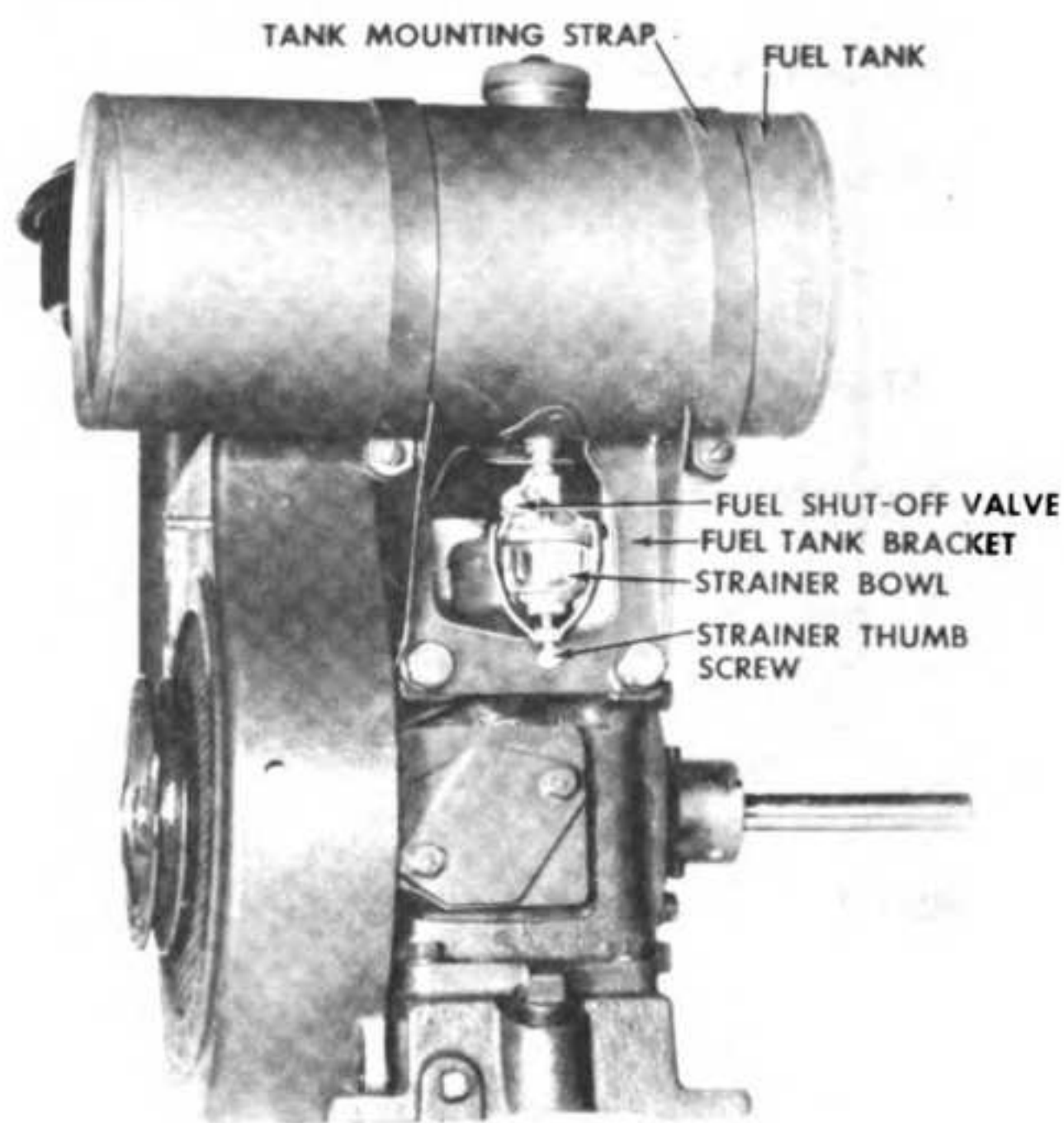


Figure 6—Engine Fuel Strainer

Outfit, Delousing, Gasoline-Engine Driven (Defiance)

(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 pres-

sure 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.

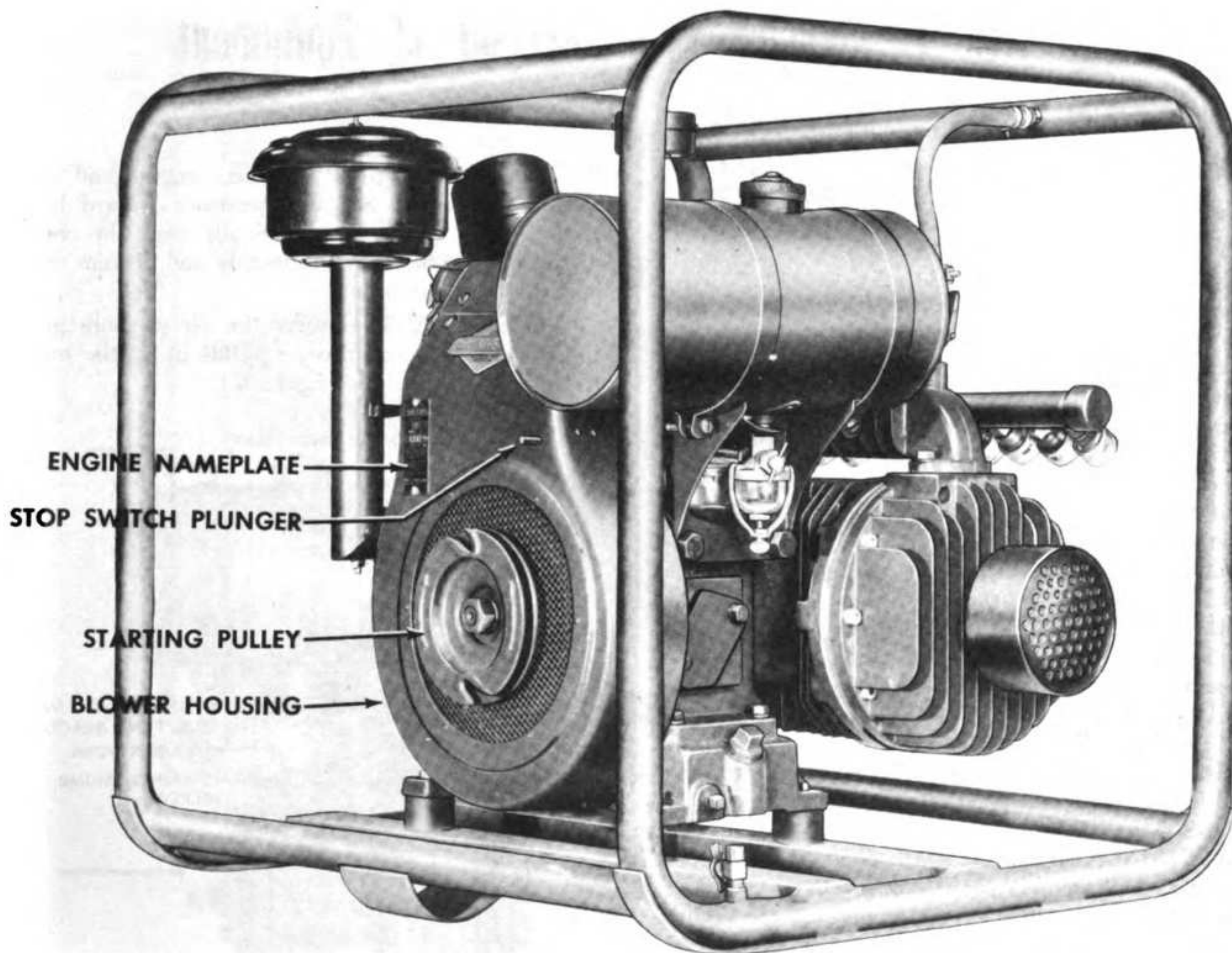


Figure 7—Blower Housing Side of Engine

Section VI. Controls and Instrument

Location of Controls	Paragraph 7
Location of Instrument	8

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.)

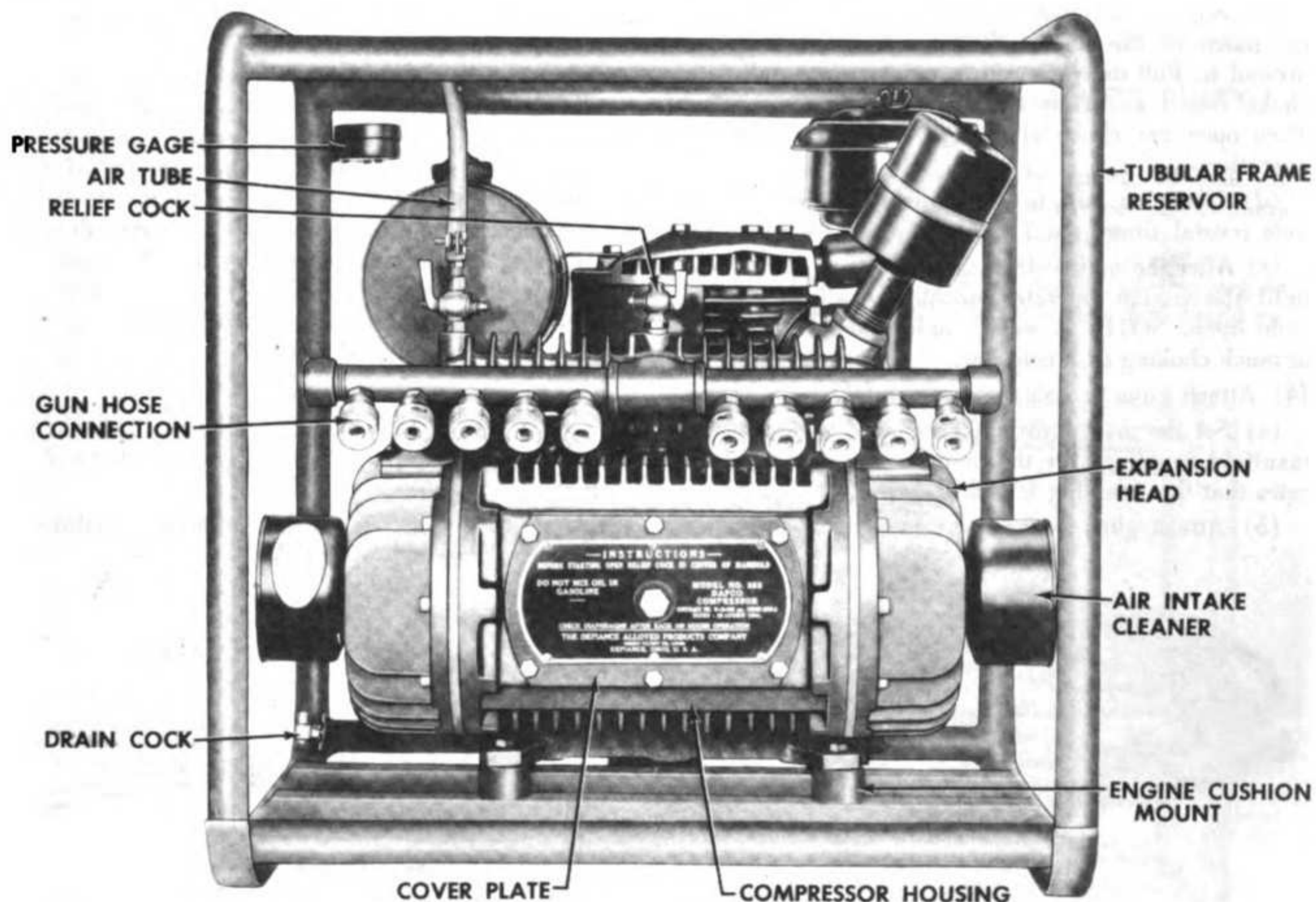


Figure 8—Front of Delousing Outfit

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

Starting, Operating, and Stopping	Paragraph 9
---	----------------

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.

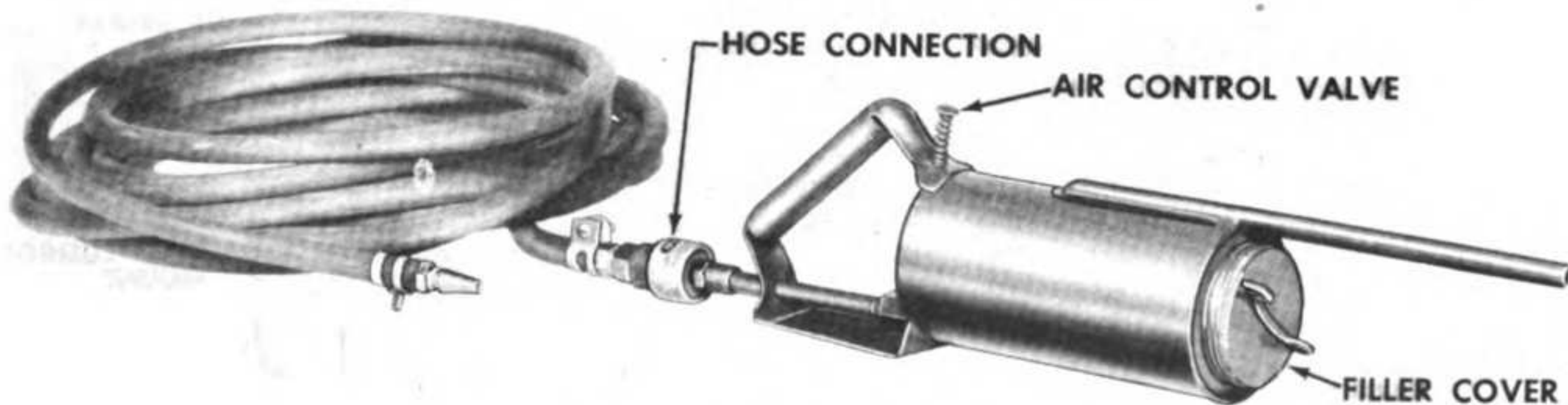


Figure 9—Dusting Gun and Hose

Section VIII. Operation Under Unusual Conditions

	<i>Paragraph</i>
Operation and Care in Extreme Heat	10
Operation and Care in Extreme Cold	11
Operation Under Extremely Dusty Conditions	12

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.

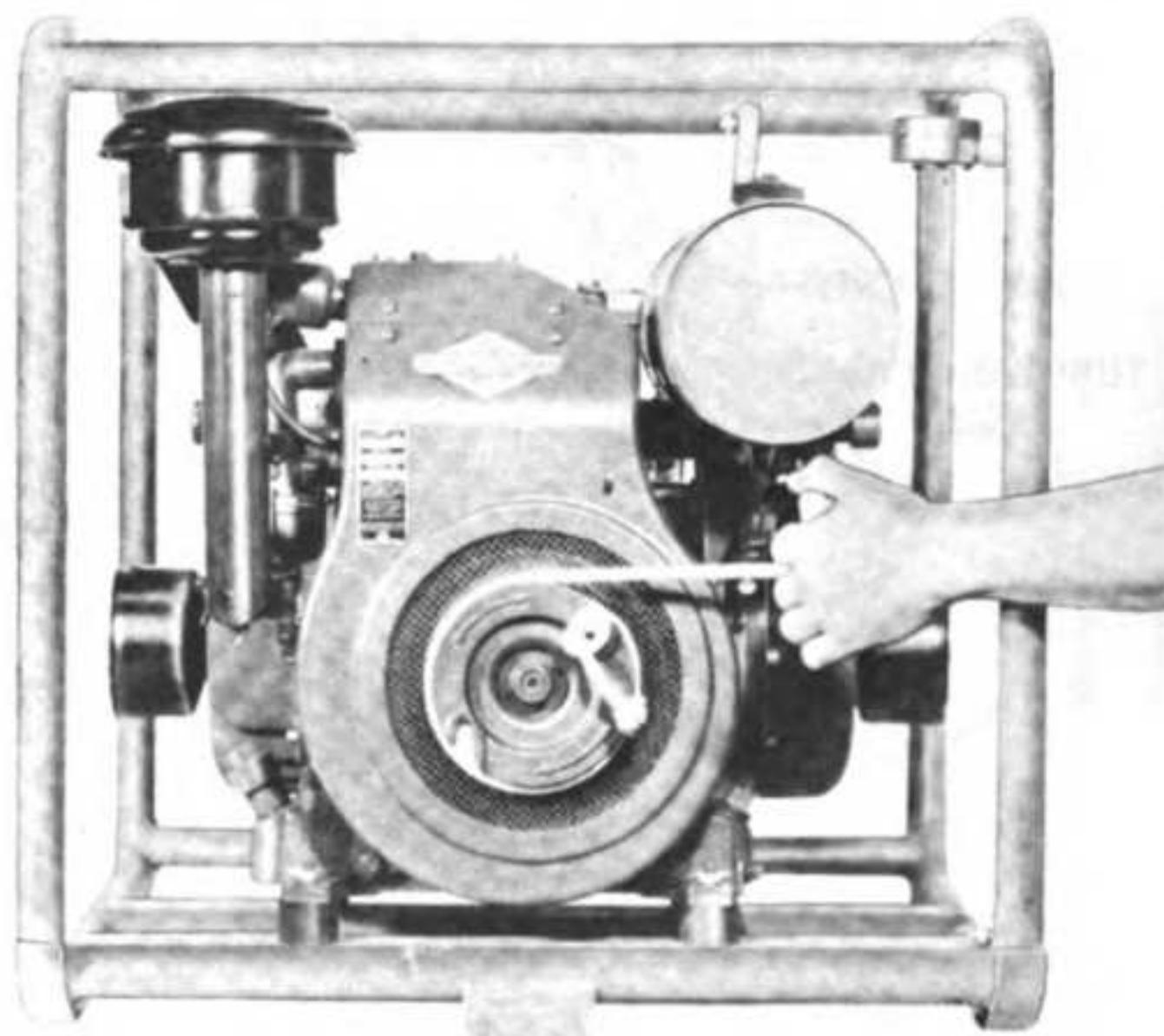


Figure 10—Starting the Engine

Section IX. Demolition to Prevent Enemy Use

	<i>Paragraph</i>
Engine	13
Compressor	14

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.

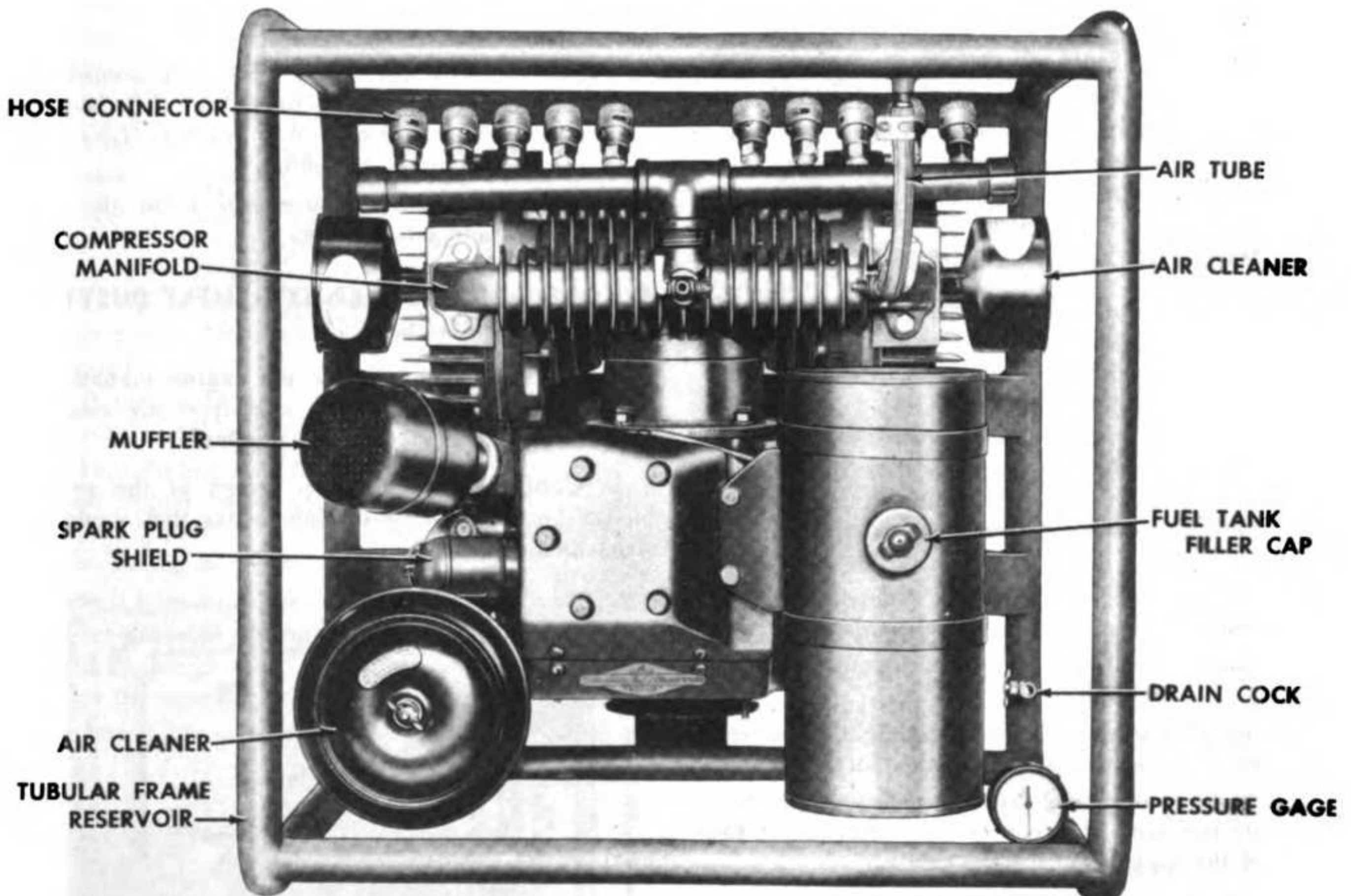


Figure 11—Top of Delousing Outfit

PART THREE—MAINTENANCE INSTRUCTIONS

Section X. General

Scope	<i>Paragraph</i> 15
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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

Lubrication	<i>Paragraph</i> 16
Detailed Lubrication Instructions	17

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

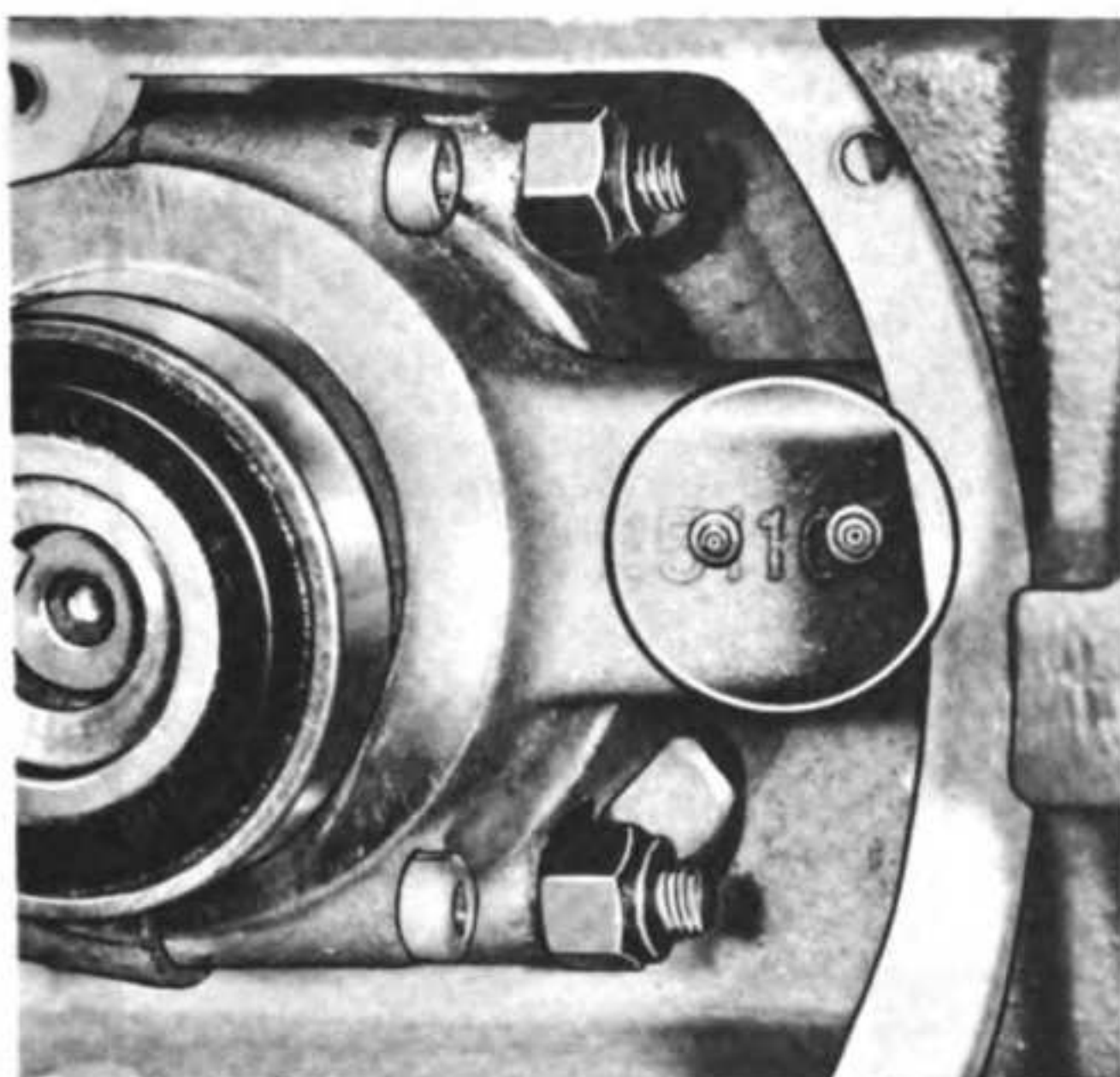


Figure 12—Compressor Bearings

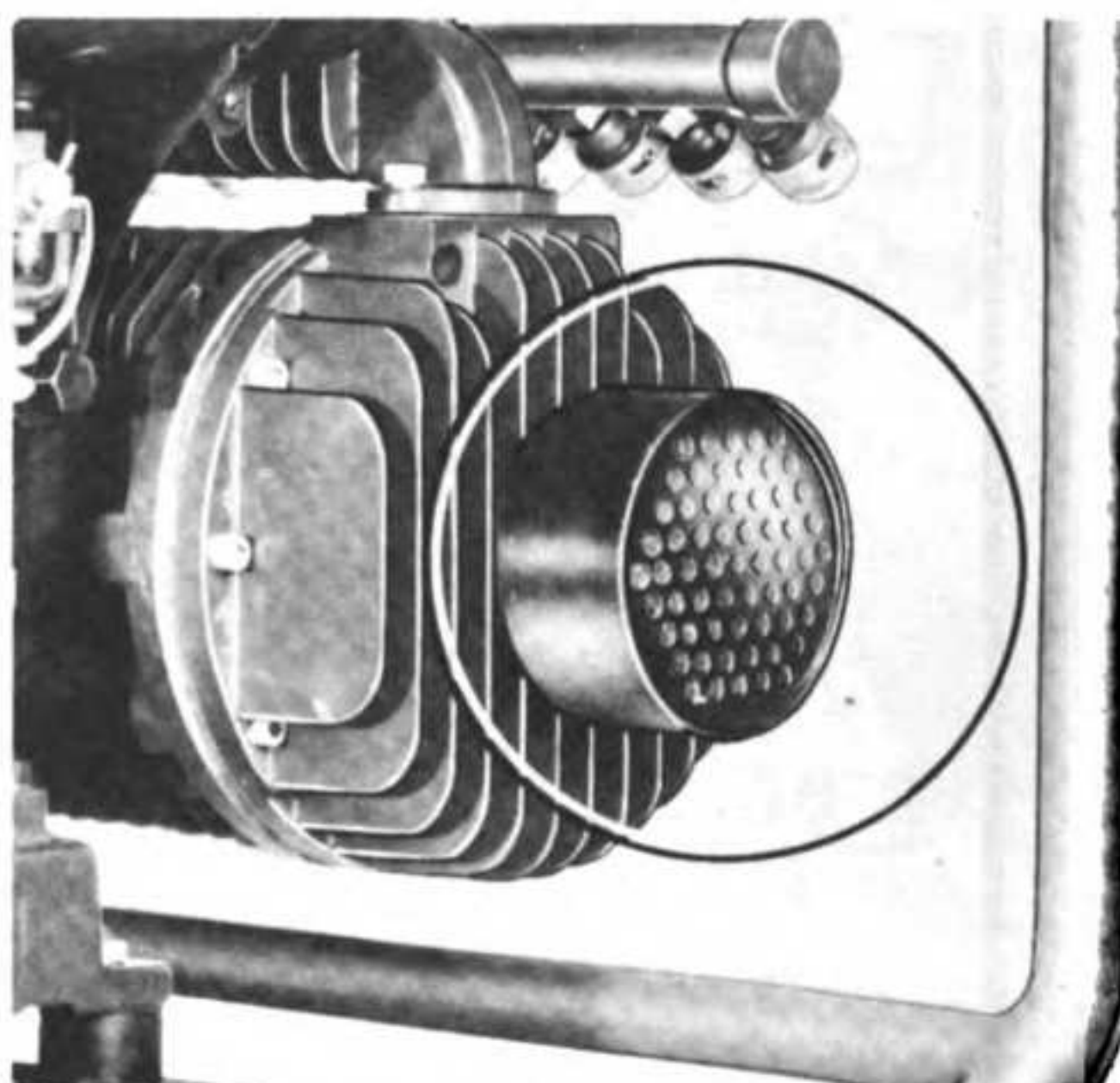


Figure 13—Compressor Air Cleaner

Outfit, Delousing, Gasoline-Engine Driven (Defiance)

LO 10-1668

WAR DEPARTMENT LUBRICATION ORDER 28 APRIL 1945

OUTFIT, DELOUSING, GASOLINE-ENGINE DRIVEN (DEFIANCE)

Reference: TM 10-1668

Interval Lubricant

Bearing W GM

Gearing W GM

Air Cleaner (see note)

Interval Lubricant

D OE Oil Path Air Cleaner
Inspect level
(see note)

1/2 D OE Crankcase Fill
Inspect level;
add when required

3D OE Crankcase Drain
Drain and refill
Capacity 3 pints
(see note)

Air Cleaner (see note)

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. re-

plenish 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

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.

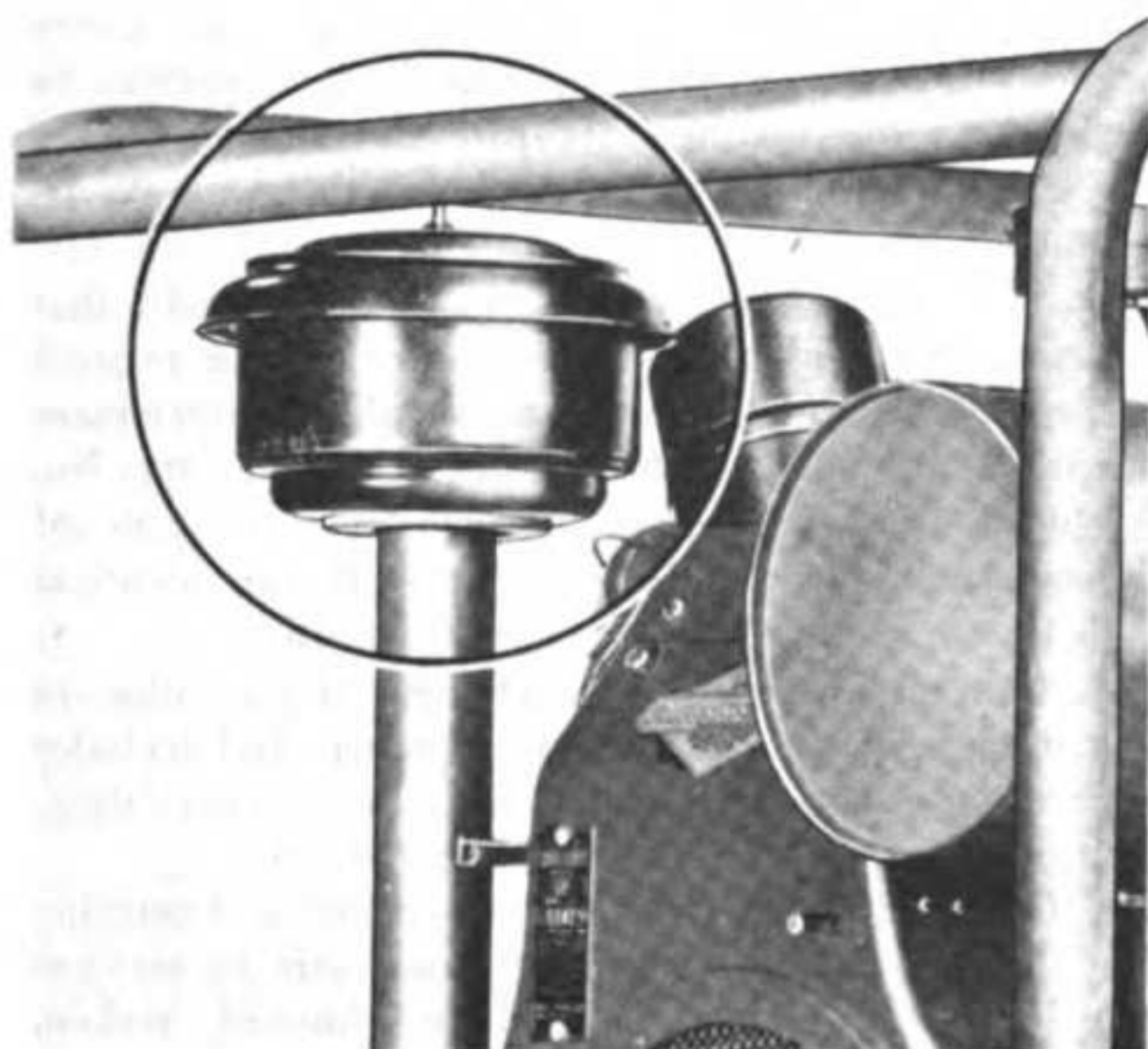


Figure 15—Engine Air Cleaner

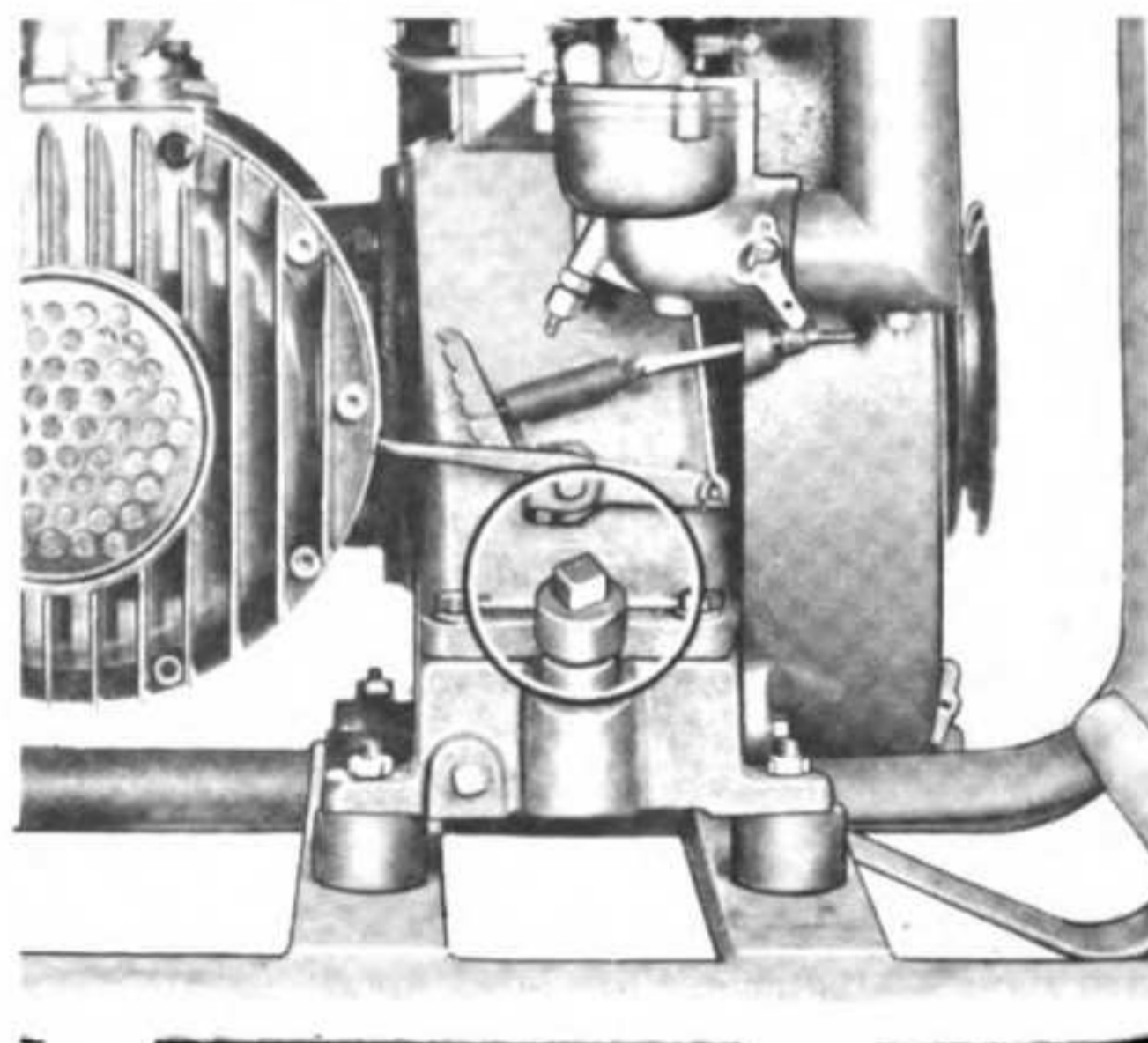


Figure 16—Crankcase Fill

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

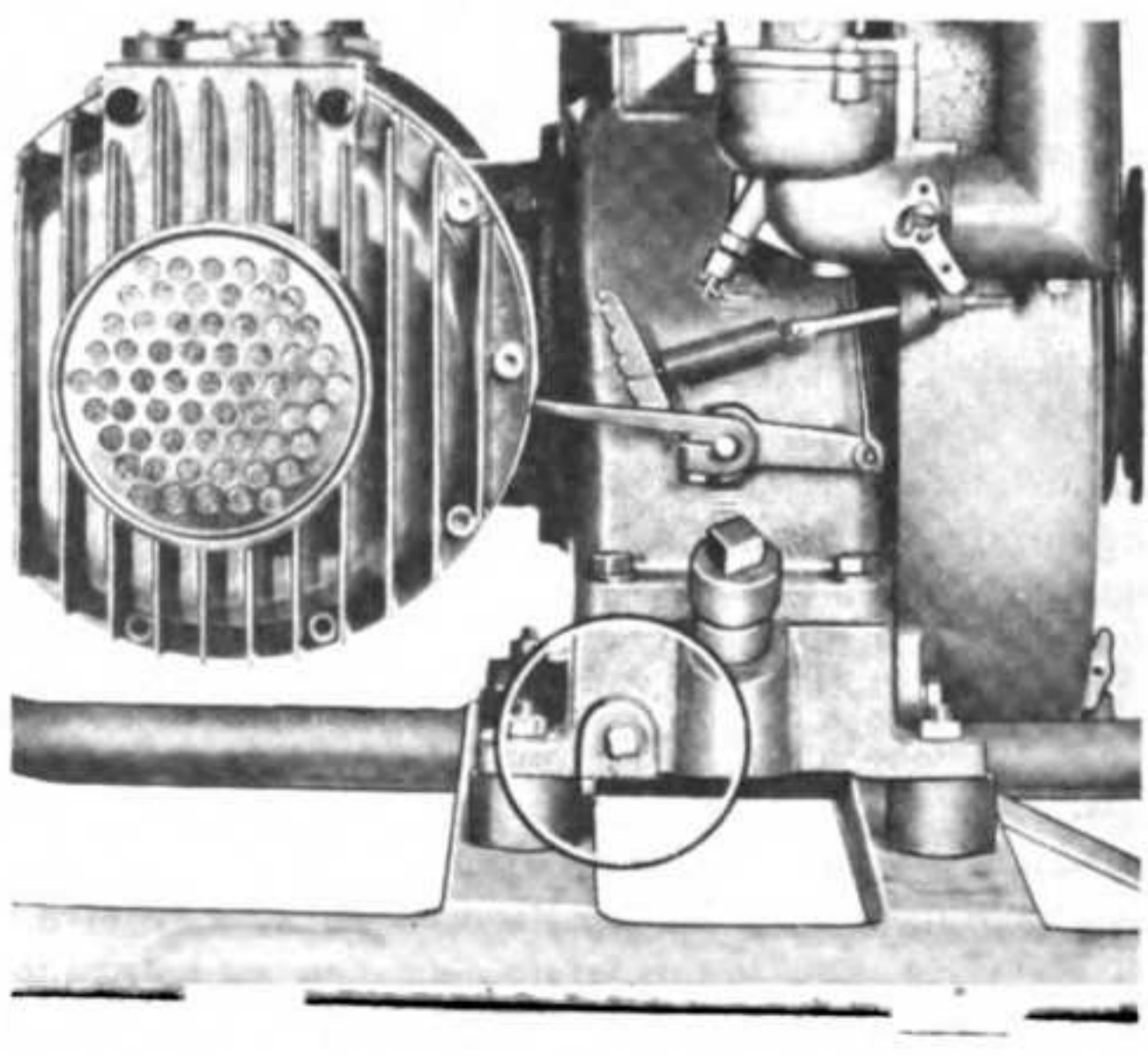


Figure 17—Crankcase Drain

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 re-installed 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

	<i>Paragraph</i>
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First Echelon Preventive Maintenance Services	19
Before-Operation Service	20
During-Operation Service	21
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Second Echelon Preventive Maintenance Service	23

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 elimi-

nated 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

Preventive Maintenance Services

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.

(3) ITEM 63, SUBASSEMBLIES. Inspect the carburetor, 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

Preventive Maintenance Services

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.

MAINTENANCE		
Monthly	Weekly	
20		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.
21		Compression Test. Inspect the engine to determine whether it bounces back freely when pulled up smartly against compression, and then releases.
23	23	Crankcase. <i>NOTE: If an oil change is due, follow instructions in Lubrication Order.</i>
28	28	Compressor. Wipe the compressor clean; inspect for leaks at manifold valves, gaskets, air hose to tubular frame reservoir, and hose couplings. Correct leaks.
28	28	SERVE. Remove air intake cleaner from both compressor expansion heads and wash in SOLVENT, dry cleaning. Dry thoroughly and reinstall.
32	32	Wire. Inspect wire for good condition, secureness of terminals, and cleanliness of insulation and connections.
33	33	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.
33		TIGHTEN. Secure muffler nipple and carburetor connecting flange nuts carefully.
34	34	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.
34	34	CLEAN AND SERVE. Follow instructions on Lubrication Order. Reinstall the air cleaner securely; be sure the gasket is in good condition and secure.
35	35	Breather. Disassemble breather and install new sisal filtering material; wash out old sisal thoroughly in SOLVENT, dry-cleaning, if new sisal is not available.
36	36	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.
37	37	Fuel Filter, Screen, and Line. See that the fuel filter sediment bowl, fuel line and connections are in good condition, secure, and not leaking.
37	37	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.
40	40	Leaks. Inspect under the unit for engine oil or fuel leaks. Trace all leaks to their source, and report or correct them.
41	41	Ignition Timing. Check ignition timing.
42	42	Engine Idle Test. Observe whether the engine idles smoothly at normal idle speed.
42	42	ADJUST. Adjust the engine to its normal idle speed by means of the throttle stop screw.
63	63	Engine Mountings. Inspect engine mountings; tighten if loose.

Preventive Maintenance Services

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

Description of Schedule	Paragraph 24
Trouble Shooting Schedule	25

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.

25. TROUBLE SHOOTING SCHEDULE.

<i>Symptom</i>	<i>Possible Cause</i>	<i>Remedy</i>
(1) ENGINE DIFFICULT TO START.	No fuel in tank.	Replenish fuel supply.
	Fuel flow obstructed.	Clean fuel filter and line. (See paragraph 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.
	Valve 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.)
(3) ENGINE LOSING POWER.	Valves warped or broken.	Replace. (See paragraph 29.)
	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.	

Trouble Shooting

<i>Symptom</i>	<i>Possible Cause</i>	<i>Remedy</i>
(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. Lack of oil.	Tighten. (See paragraph 30.) 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. Sediment or water in fuel tank.	Open. Clean. (See paragraph 32.)
(6) EXCESSIVE SMOKE.	Carburetor needle valve open too far. Carburetor float sticking or leaking.	Adjust. (See paragraph 32.) 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. Intake lifter set too close.	Replace. (See paragraph 29.) 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. Cylinder head loose.	Tighten. Tighten. (See paragraph 27.)
	Scored cylinder.	Report to designated individual in authority. (See paragraph 52.)
(9) COMPRESSOR BUILDS UP RESERVOIR PRESSURE SLOWLY.	Worn piston and cylinder.	Report to designated individual in authority. (See paragraph 52.)
	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.)

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

	<i>Paragraph</i>
Description and Tabulated Data	26
Cylinder Head Gasket	27
Valve Cover Gasket	28
Valve Lifter Adjustment	29
Ignition System	30
Air Cleaner	31
Fuel System	32
Exhaust System	33

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	2 ⁵ / ₈ in.
Stroke	2 ⁵ / ₈ 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 valve010 in.
Exhaust valve008 in.

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.)

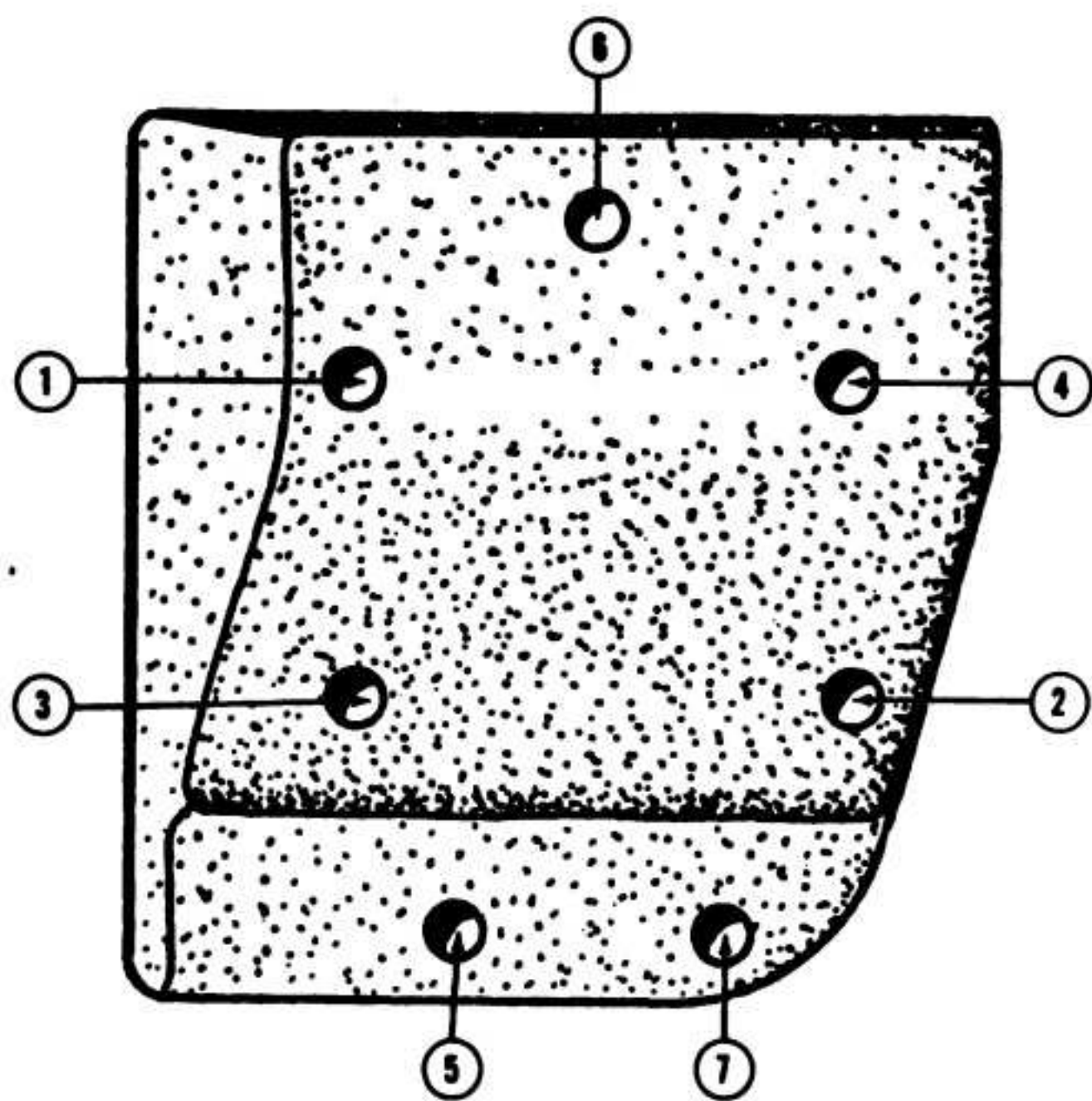


Figure 18—Cylinder Head Tightening Chart

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

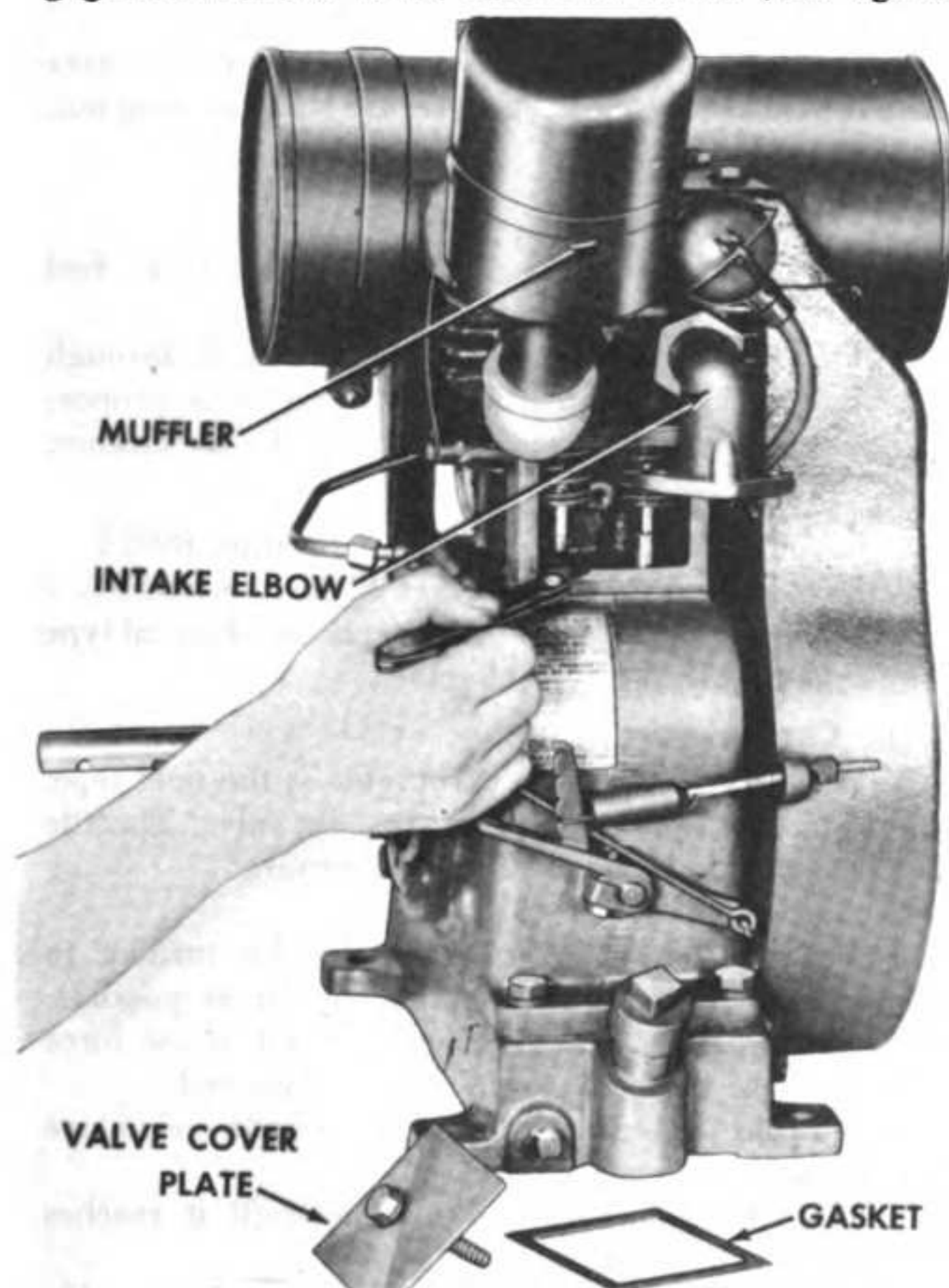


Figure 19—Inspecting Valve Lifter Clearance

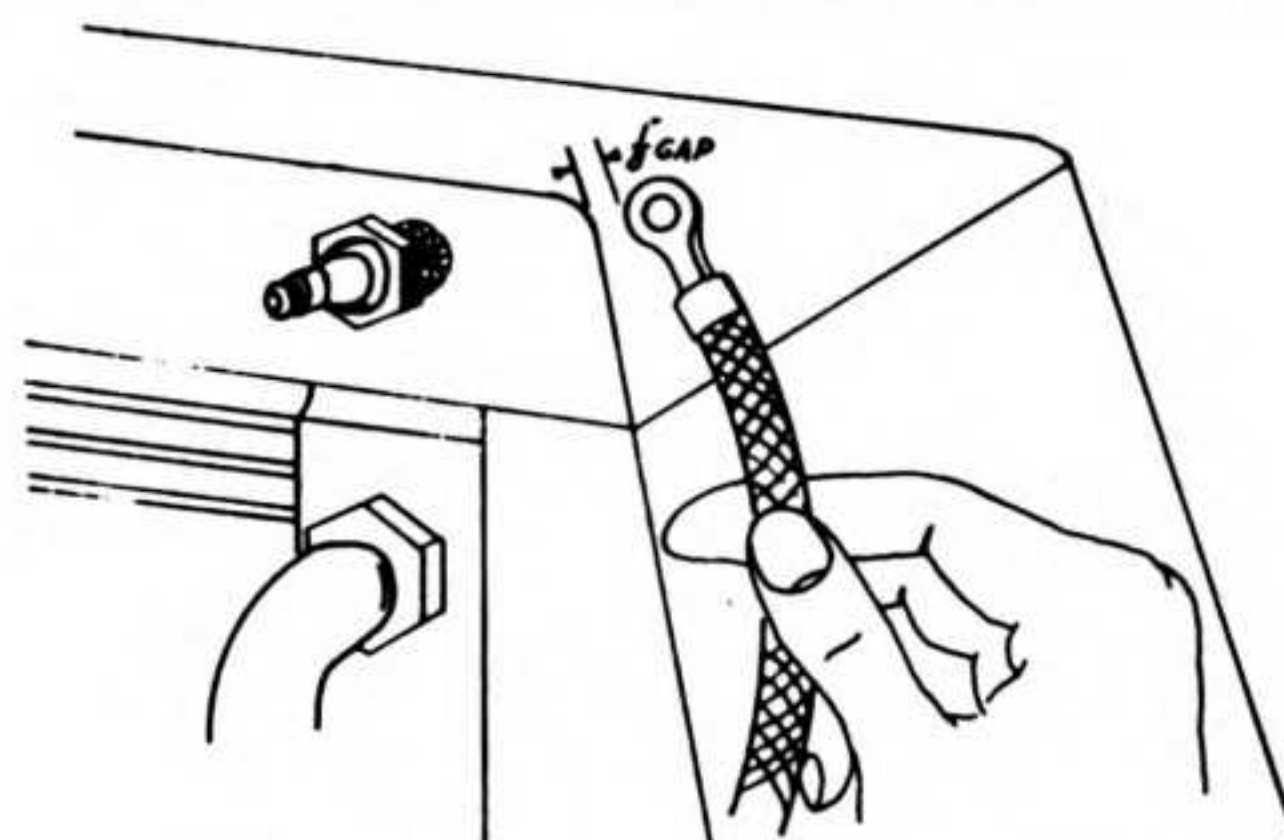


Figure 20—Inspecting Ignition Spark

- 19.) Clearances, with engine cold, should be .010-inch for the intake valve; .008-inch for the exhaust valve.

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.)

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.)

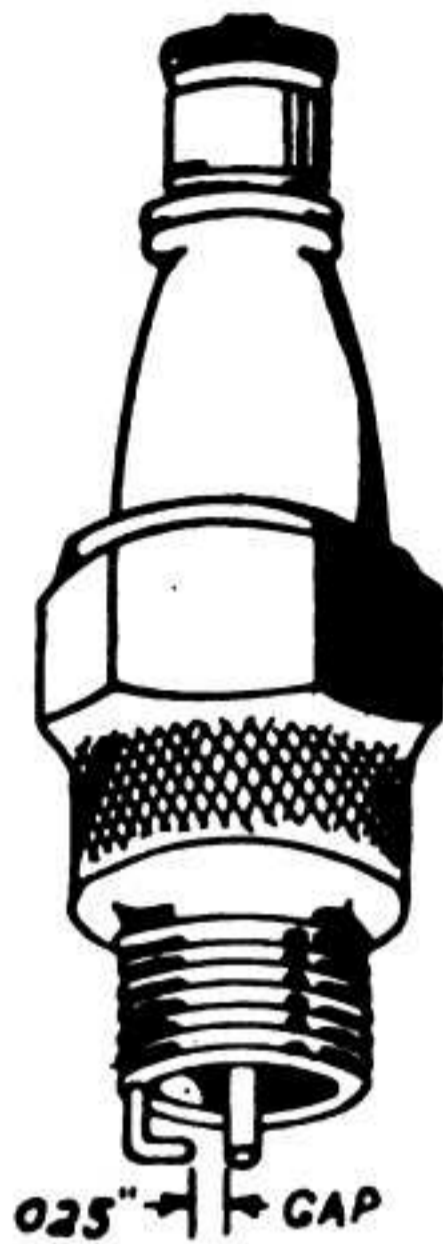


Figure 21—Spark Plug Gap

- (2) Hold the ignition cable about 1/8-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 size18 MM
Gap025-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.

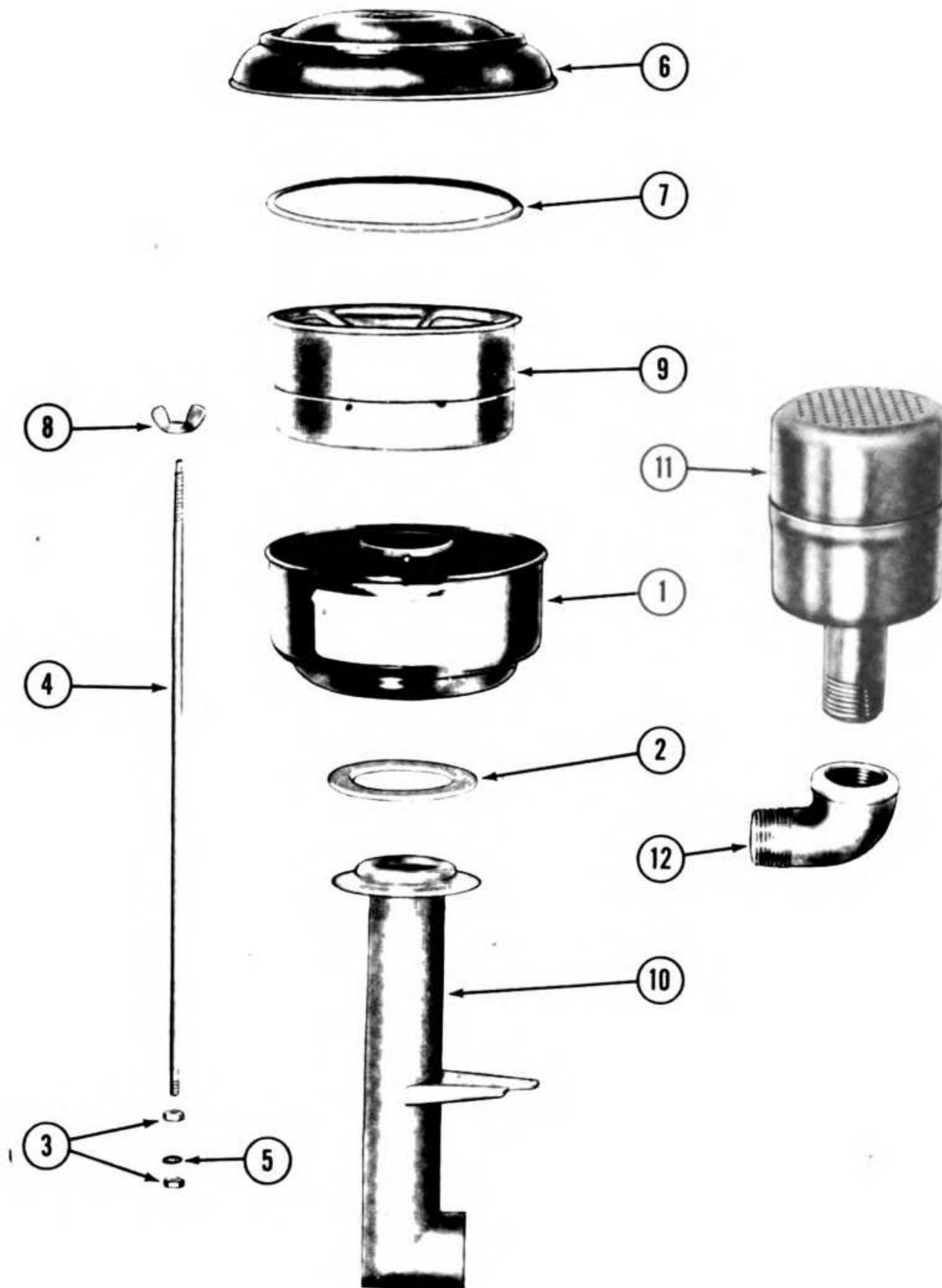
(2) ADJUSTMENT.

(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



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

Figure 22—Exploded View of Air Cleaner and Muffler

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

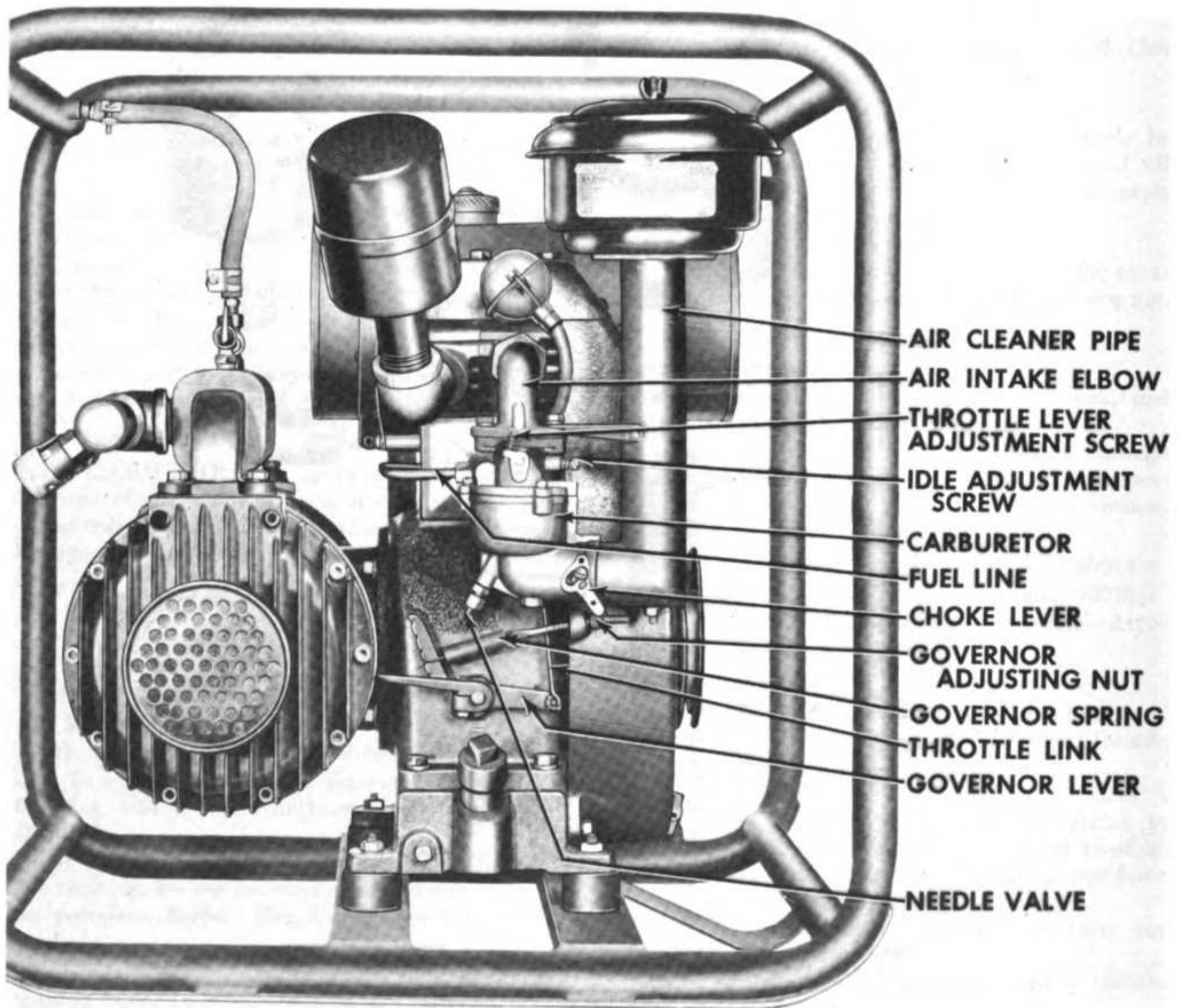


Figure 23—Carburetor and Governor Detail

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 authority. (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.

Section XV. Compressor

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Expansion Head Gasket	36
Manifold Gasket	37
Valves	38
Diaphragms	39

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

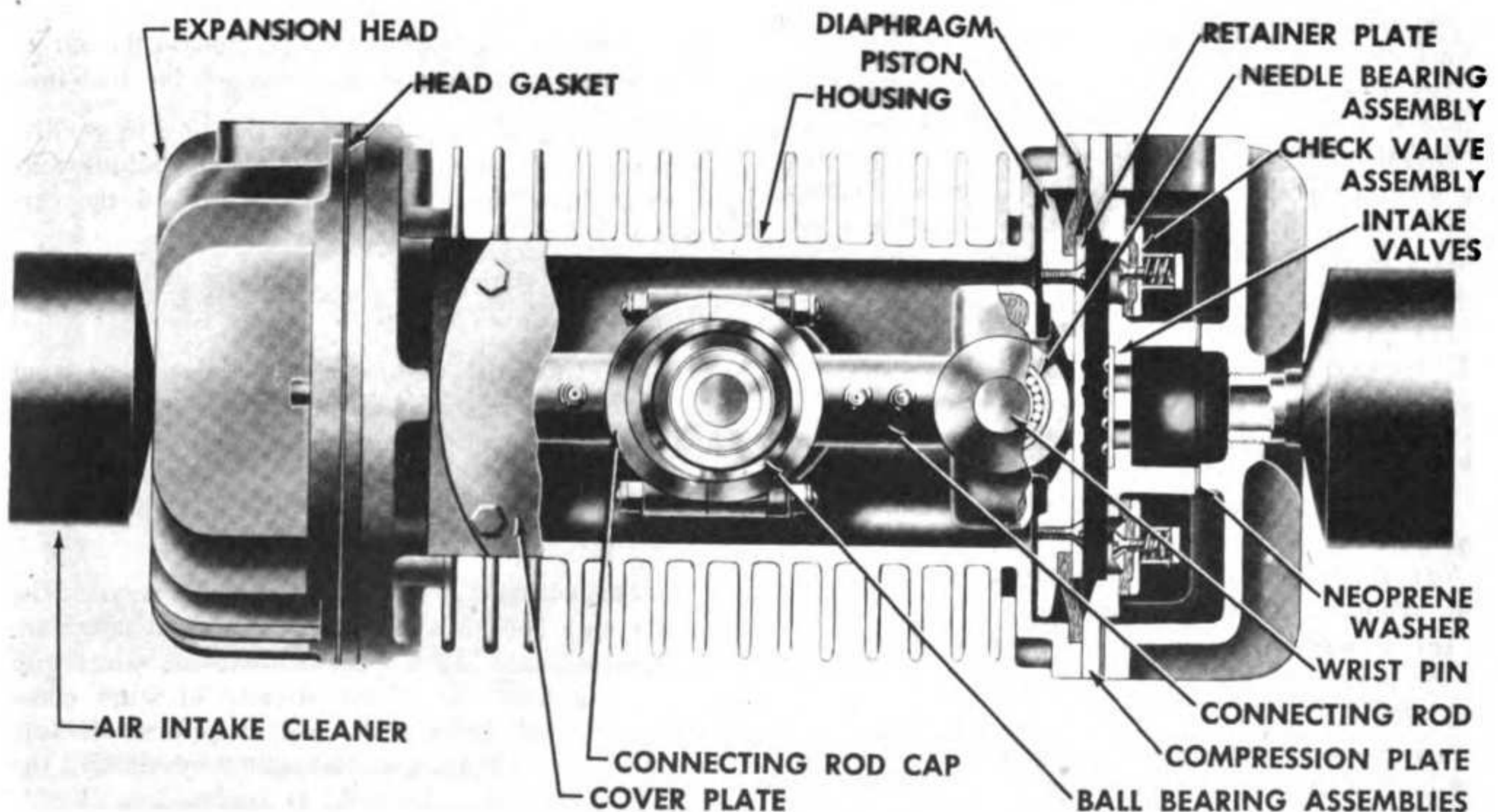


Figure 24—Cross Section of Compressor—Front View

Compressor

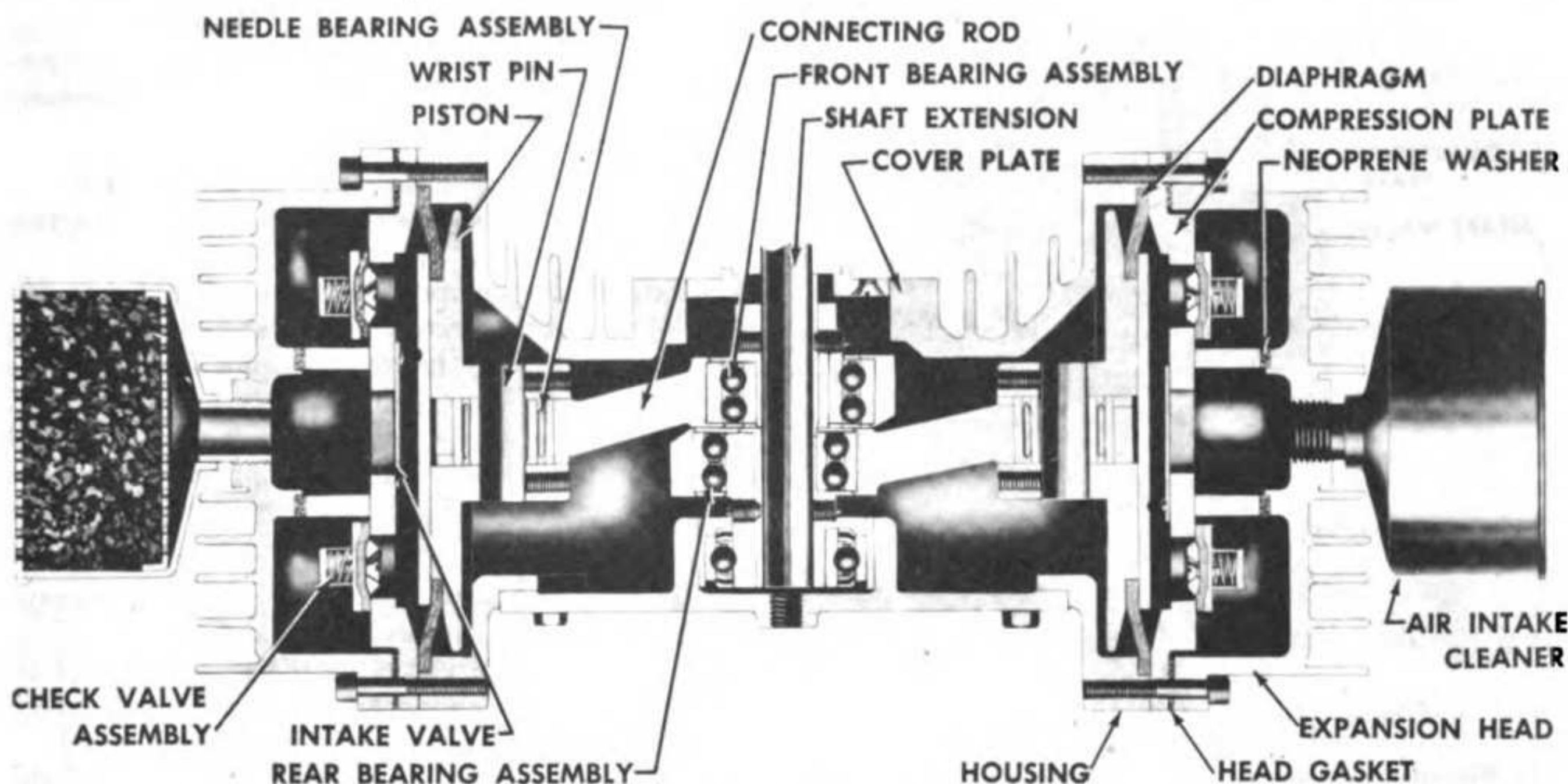


Figure 25—Cross Section of Compressor—Top View

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.)

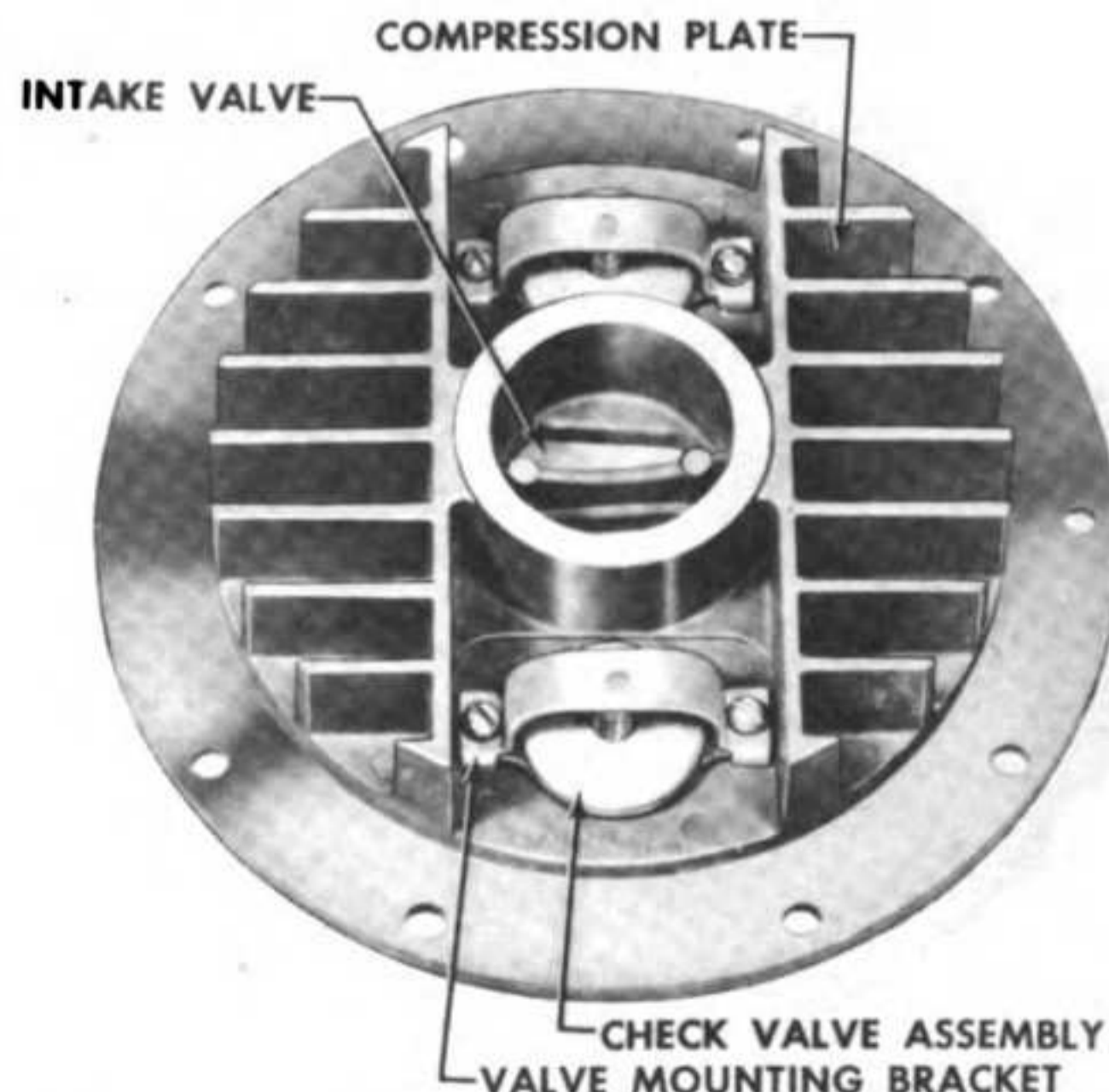


Figure 26—Check Valve Side of Compression Plate

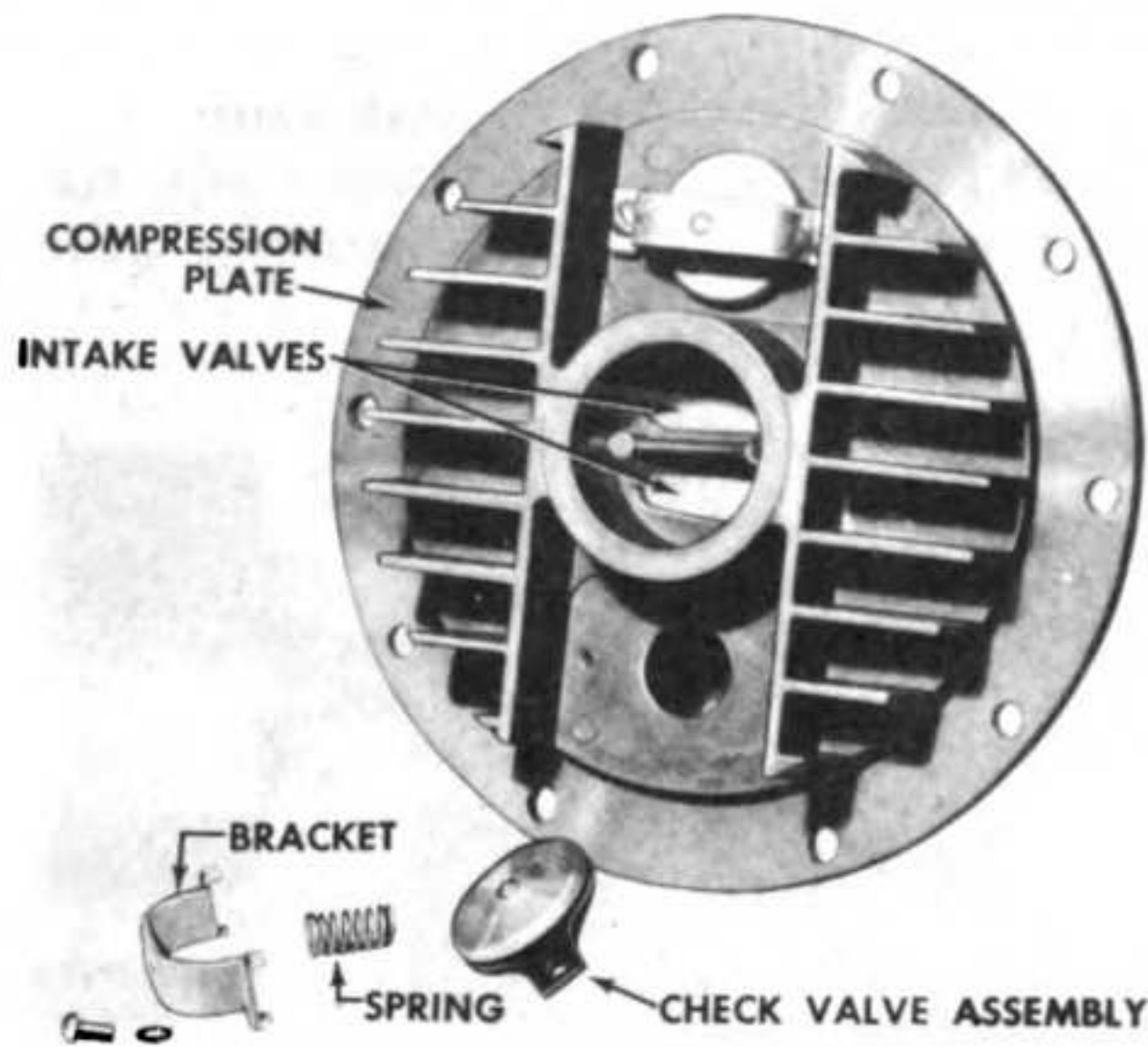


Figure 27—Check Valve Removed

(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.

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.)

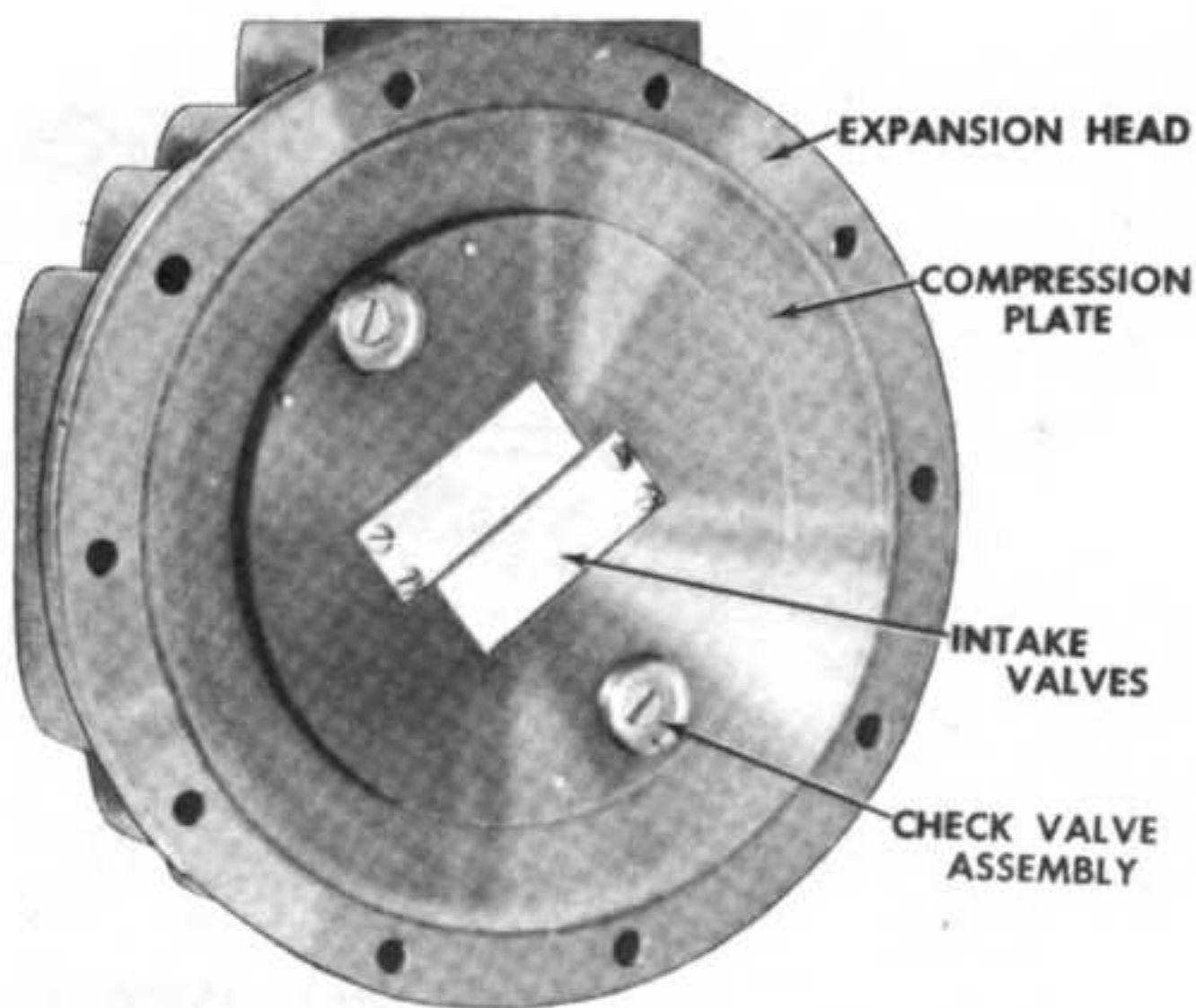


Figure 28—Compression Plate Positioned in Expansion Head