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TM 5-1150

U.S. WAR DEPARTMENT TECHNICAL MANUAL

MAINTENANCE INSTRUCTIONS AND PARTS CATALOG

DISTRIBUTOR, WATER, TRUCK-MOUNTED, 1000 GAL., ROSCO MODEL NME

(ENGINE: WISCONSIN MODEL VE–41)

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WAR DEPARTMENT - 27 NOVEMBER 1943

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WAR DEPARTMENT

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Washington 25, D. C., Nov. 27, 1943

TM5-1150 Distributor, Water, Truck-Mounted, 1000 Gal., Rosco Model MME, is published for the information and guidance of all concerned.

(A.G. 300.7 27 Nov. 1943)

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:
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Major General,
The Adjutant General.

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GENERAL DESCRIPTION

The Rosco Water Distributor Model MME is a truck mounted unit used to apply a measured quantity of water over a large area for soil stabilization, soil cement, or any other type of surface construction when it is desirable to bring the soil up to its optimum moisture content.

This machine may also be used for applying water under low pressure for settling dust and for applying a measured quantity of dust laying oil not requiring heat for application. It is also an all-purpose power pumping unit for the unloading and transferring of water or various light liquids from one outside source to another, as well as a water transport vehicle and for auxiliary fire fighting. (CAUTION—It is not recommended for the transport of water intended for drinking purposes).

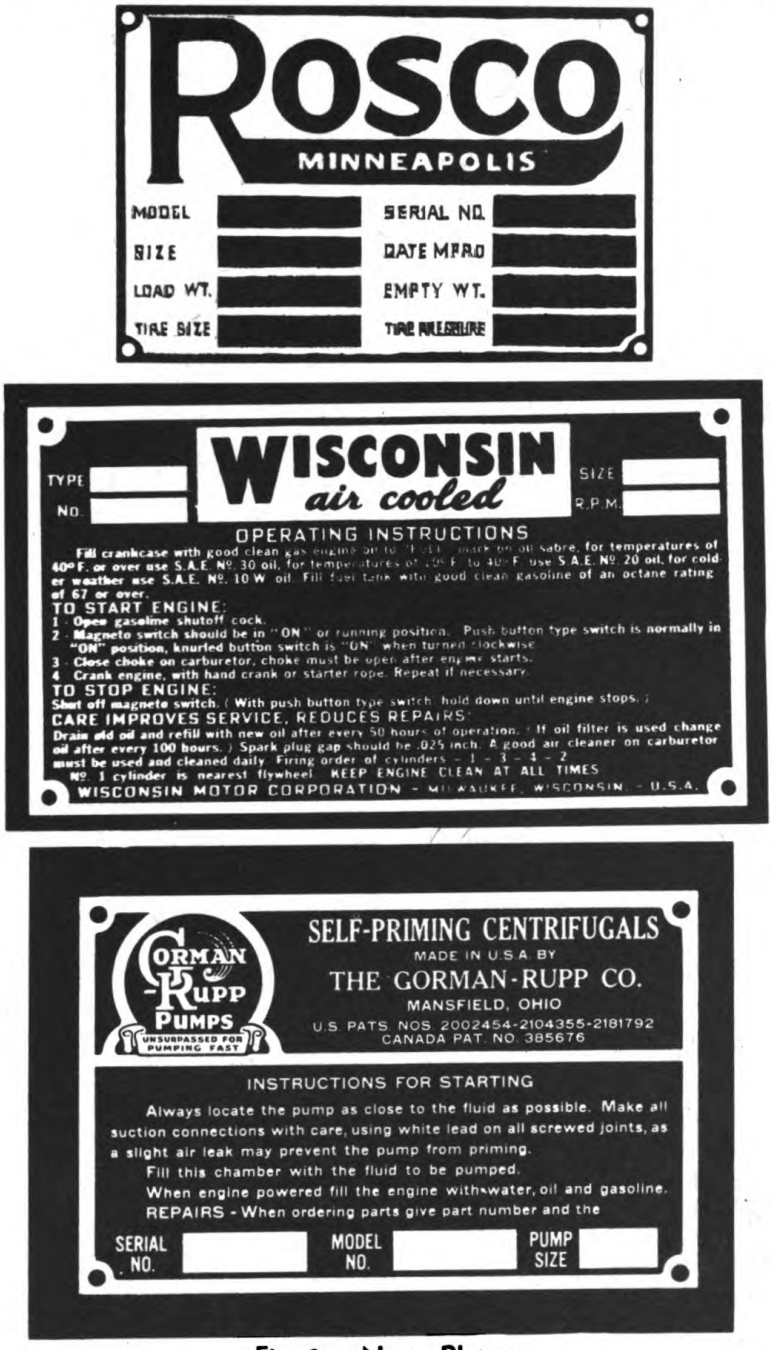

Fig. 1 Name Plates

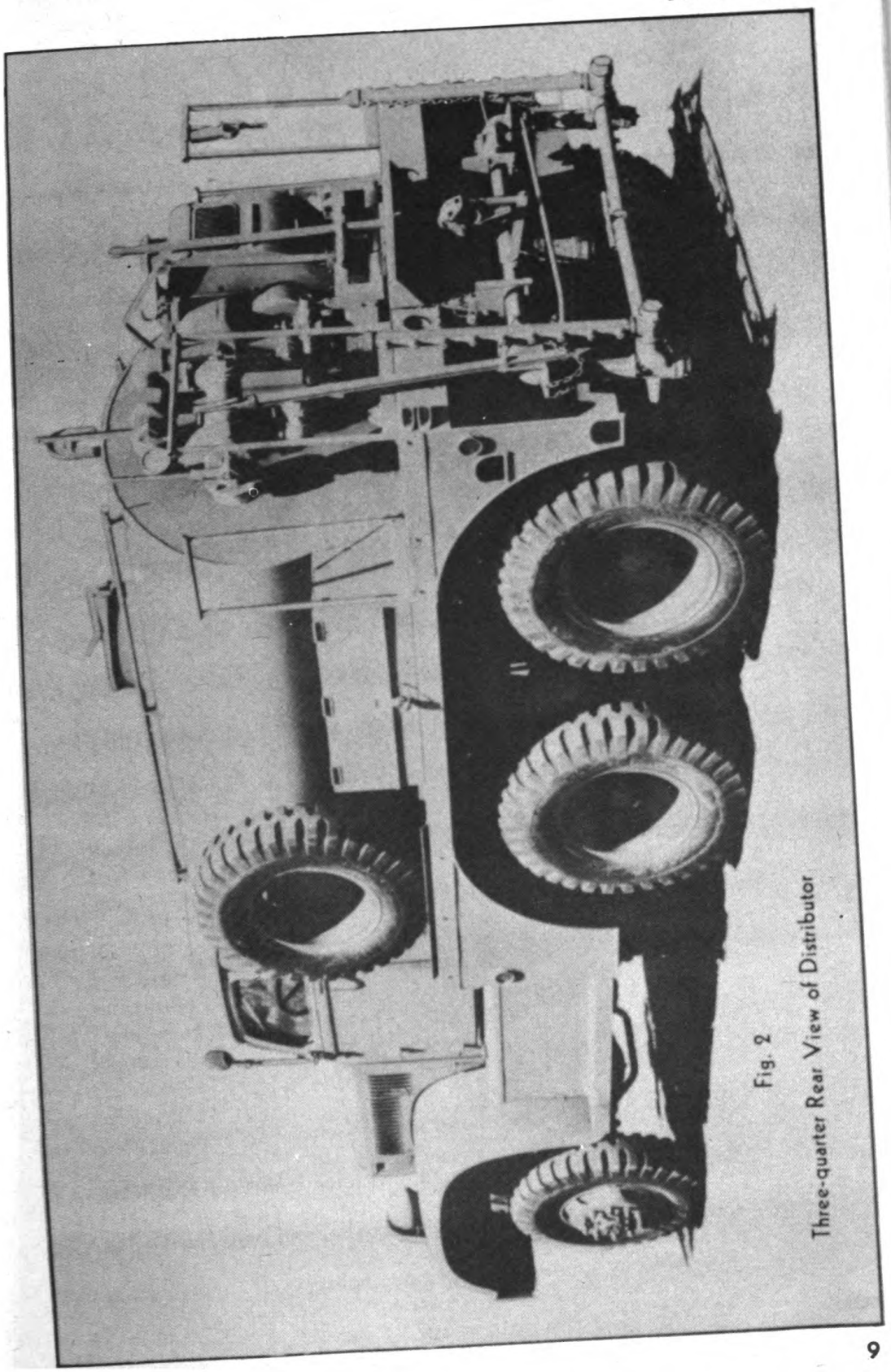

Fig. 2 Three-quarter Rear View of Distributor

DETAILED DESCRIPTION—The Rosco Water Distributor consists of a 1000 gallon tank, centrifugal pump, and engine, mounted on a common base, piping system with valves which control the flow for the various pumping functions, and a spraybar which distributes the water. This Distributor unit is furnished mounted on a QM 4 ton 6x6 Diamond T chassis 151" WB and is shipped complete and ready for use except when packed according to export regulations.

Details of components, assemblies, and accessories are as follows:

ENGINE—
Make—Wisconsin VE-4I
Type—4 Cylinder 'V', 4 cycle, air cooled
Bore—3"
Stroke—3¼"
Piston Displacement—91.9 Cubic Inches
Horsepower—20.5 at 2200 r.p.m.
Spark Plug—18 MM

CARBURETOR—Stromberg Model UC ⅞

CARBURETOR—Zenith Model 161 (Alternate)

MAGNETO—Wico Model J1343

MAGNETO—Fairbanks-Morse Model FM-JV4B7 (Alternate)

PUMP—
Make—Gorman-Rupp 30M
Type—Self Priming, Centrifugal
Discharge—3"
Suction—4"

PIPING—
Discharge—3"
Suction—4"
Transfer—1½"
Header—2½"
Spraybar—2"
Drain—3"
Sufficient valves to perform operations listed under functions.

TACHOMETER—Wheel type, with head, drive cable, and drive joint.

FRAME—Fabricated steel, electrically welded.

TANK—Elliptical, 1000 gallon capacity, fabricated steel electrically welded.

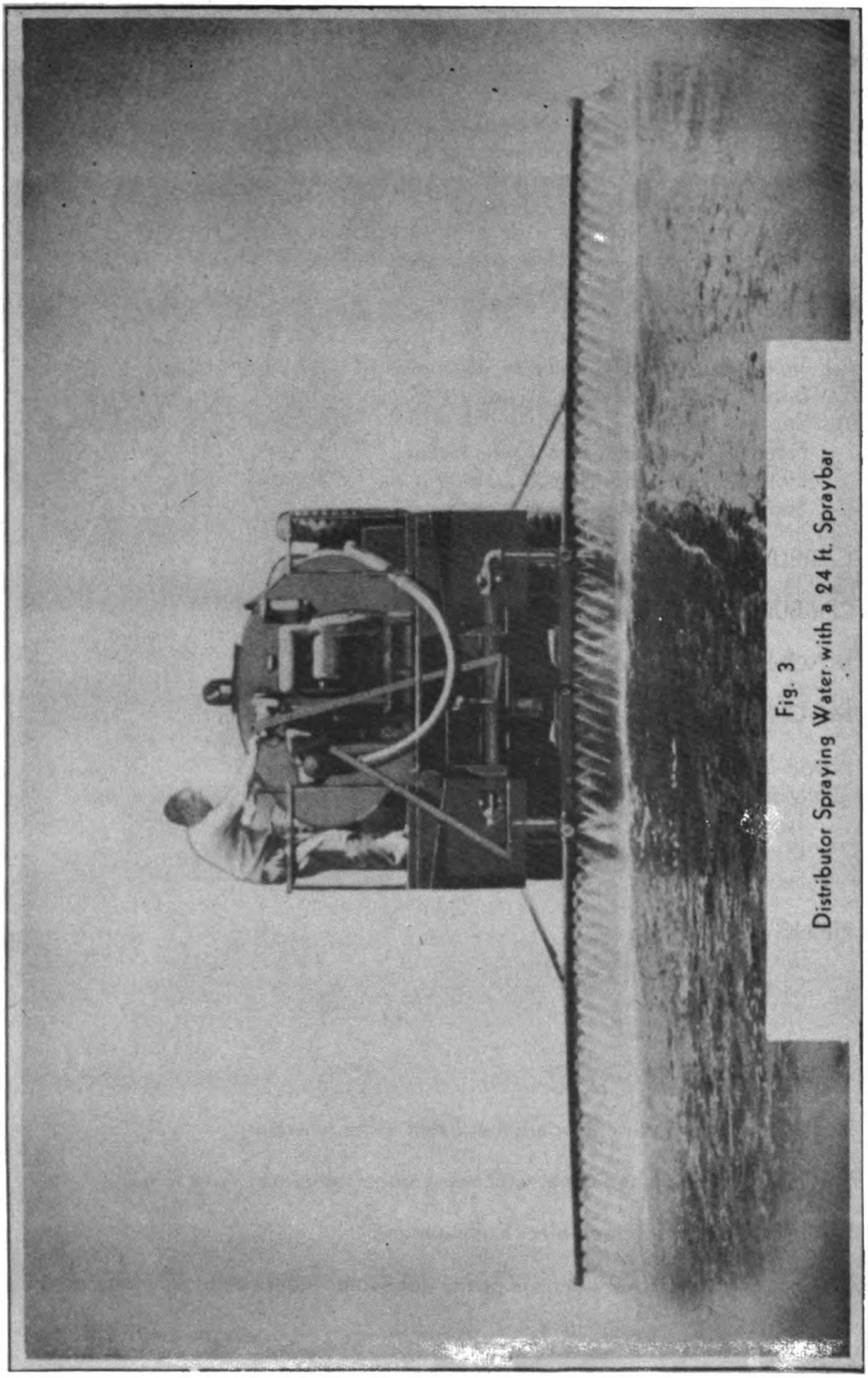

Fig. 3
Distributor Spraying Water with a 24 ft. Spraybar

FUNCTIONS OF MACHINE—

Spray—To uniformly apply quantities of water measured in gallons per square yard over a surface that is to be compacted or treated.

Load—To load the Distributor tank from an outside source with the Distributor Pump.

Transfer—To transfer liquid from one outside source to another without material entering the tank.

Auxiliary Fire Fighting—To extinguish fires with one or more discharge hose.

Pumping Service—May be used for draining surface water and ditches, dewatering barges or boats, or for any other pumping or washing service where a large volume of water is to be handled quickly.

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GENERAL PRECAUTIONS

DO NOT overlook full priming of pump.
DO NOT fail to fold up spraybar when not in use.
DO NOT neglect frequent lubrication of entire unit.
DO NOT forget to keep all suction line joints tight.
DO NOT use an unbreakable Safety Pin at center of spraybar.
DO NOT forget to clean suction line and hose strainer screens.
DO NOT tighten caps at spraybar pivot points beyond a snug fit.
DO NOT fail to follow pump and engine manufacturer's instructions.
DO NOT back up or speed truck with tachometer wheel on the ground.
DO NOT forget to use hose strainer when pumping from roadside ditch.

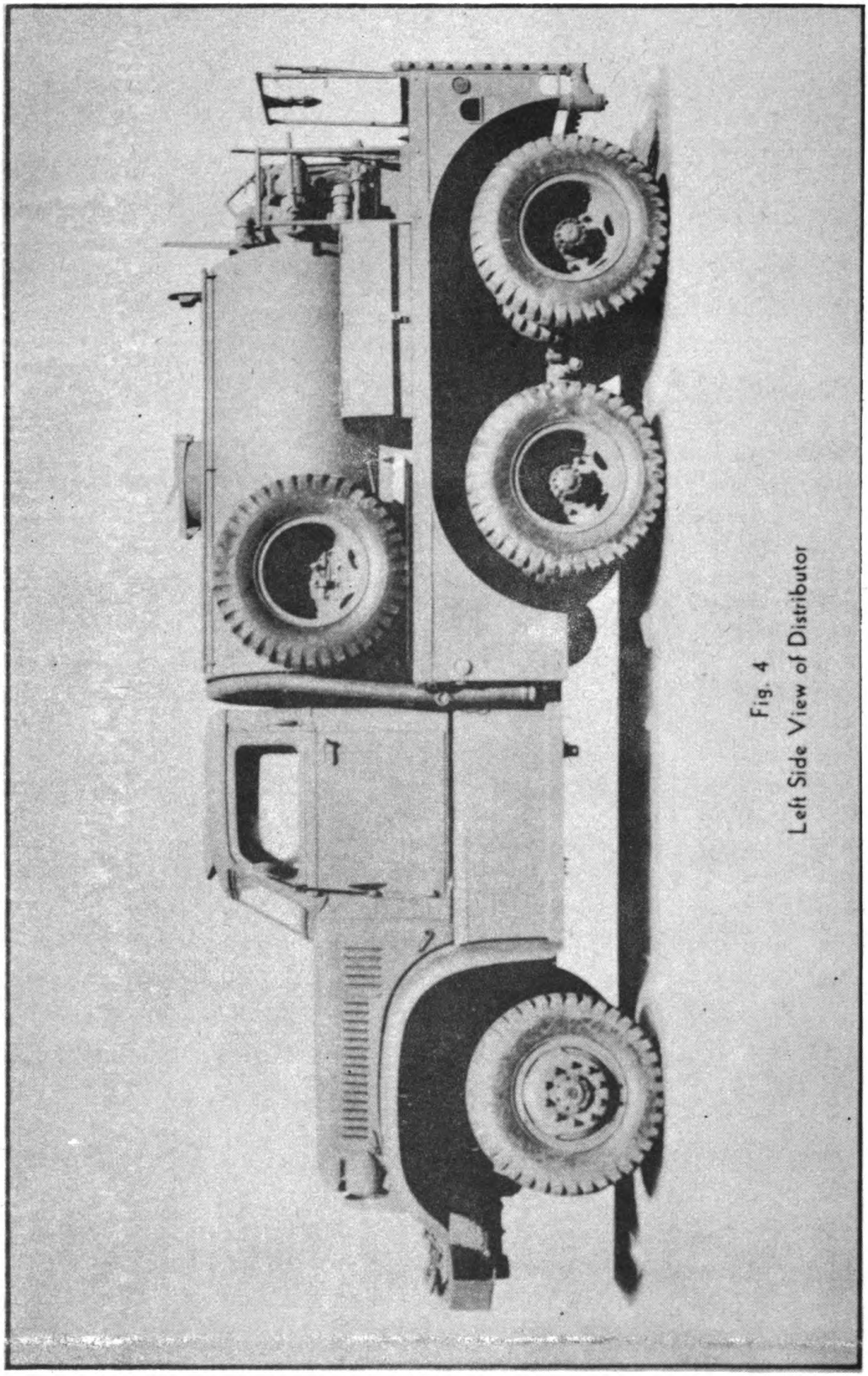

Fig. 4
Left Side View of Distributor

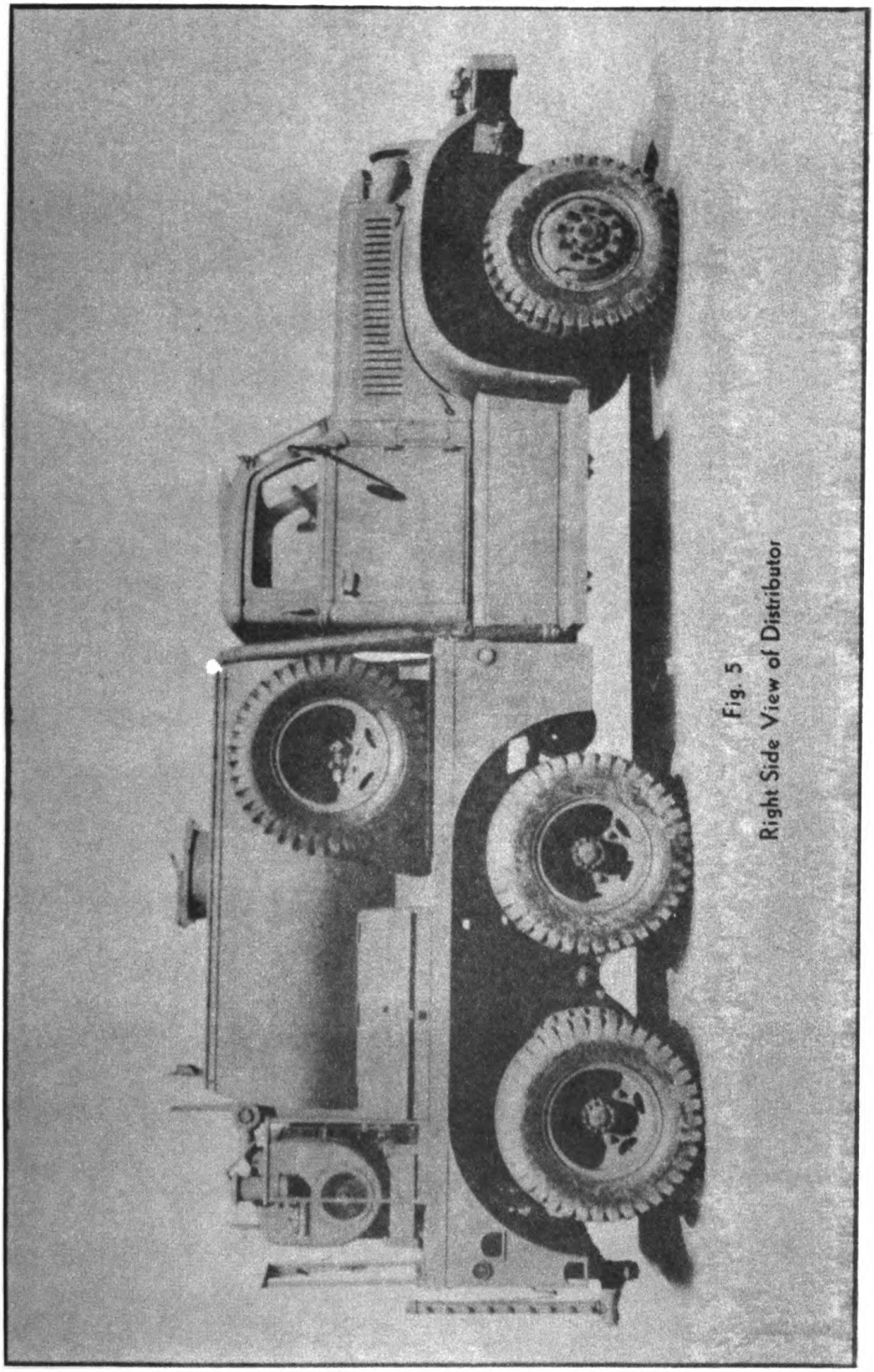

Fig. 5
Right Side View of Distributor

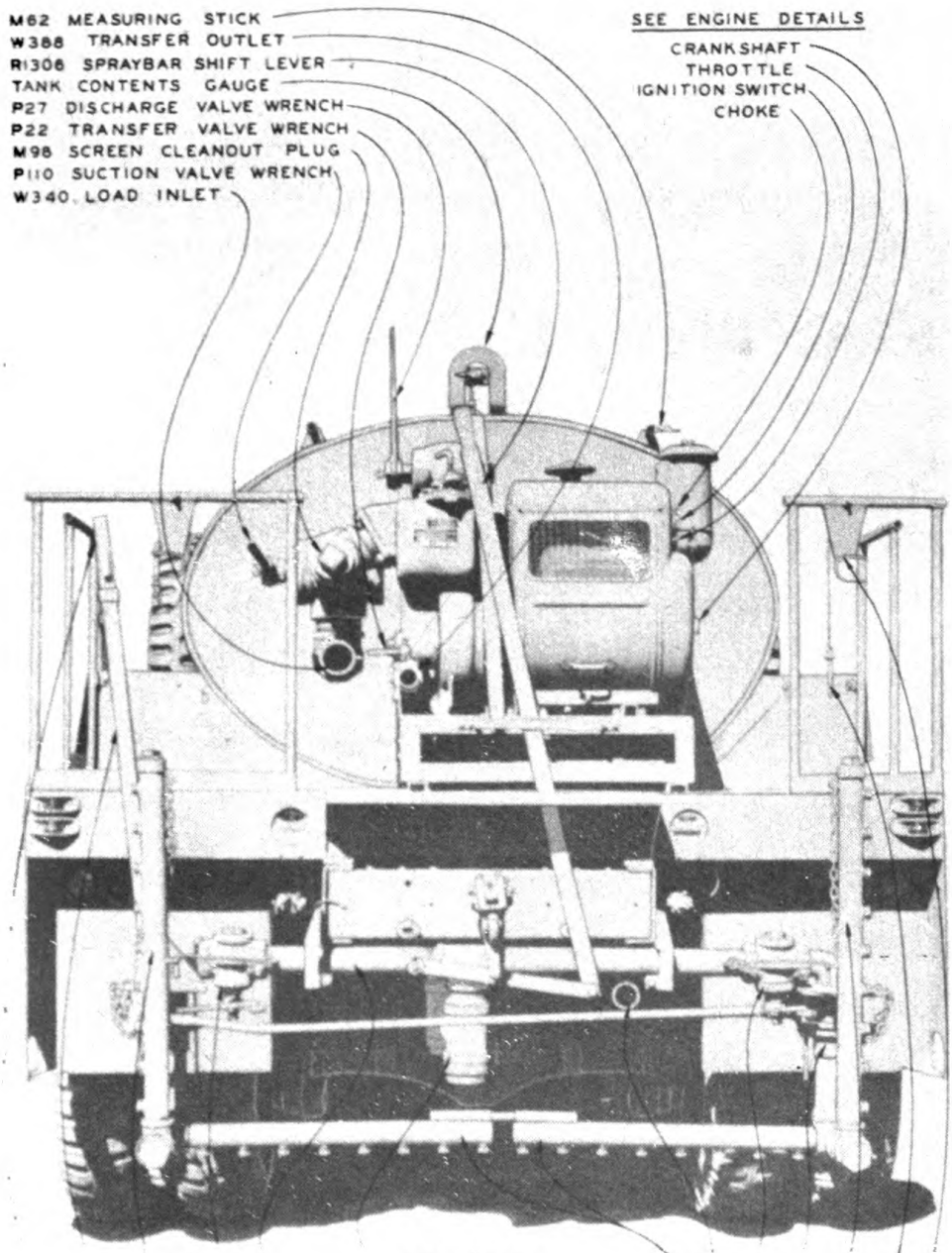

Fig. 6
Nomenclature of
Controls and Adjustments

NOMENCLATURE OF CONTROLS AND ADJUSTMENTS (Fig. 6)

P110 SUCTION VALVE WRENCH directs the flow on the suction side of the pump from either the tank or the W340 Load Inlet.

P27 DISCHARGE VALVE WRENCH provides a means of regulating the pressure in the sprayline or directs a full flow of water to the Tank or the Discharge Pipe leading to the Spraybar.

P22 TRANSFER VALVE WRENCH controls the flow of water to the W388 Transfer Outlet.

M45 DRAIN VALVE HANDLE is connected to the drain valve at the rear tank head. See (Fig. 11).

R1306 SPRAYBAR SHIFT LEVER provides a means of shifting the spraybar laterally to follow a straight line.

M65 and M66 SPRAYBAR VALVE CONTROL LEVERS provide means for independent operation of either half of spraybar.

M98 SCREEN CLEANOUT PLUG supports the suction line screen located near the pump suction inlet.

R1520 FOLDING EXTENSIONS fold within eight foot traffic clearance and also automatically cut off when placed in the vertical position.

P38 LOCK PIN AND SPRAYBAR EXTENSION SUPPORT provides additional support for long spraybars when machine is traveling to and from the job.

SHIFT PIPING consists of two swing joints connected by a horizontal nipple. Conveys water from Vertical Discharge Pipe to Header.

HEADER attached to Shift Piping carries water to the right and left P6 Spraybar Valves.

P6 SPRAYBAR VALVES control the flow of water to Spraybar, and also permits individual operation of either right or left section.

VERTICAL ADJUSTMENT sliding sleeves make it possible to vary the spraybar height from ground for various operating conditions.

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FLOW DIAGRAM (Fig. 7)

The Flow Diagram indicates the direction of flow of water on the suction side of the pump by dotted arrows and on the discharge side by solid arrows.

When the pump and engine are running the water will not flow in any other direction than that shown by the arrows. A careful study of the piping system will clarify the purpose of the various valve settings to perform the pumping operations.

Markings on the ends of the valve plugs at the center of the P17 and P18 Valves show the relation of the port openings in the plugs to the openings in the valve bodies. Wrenches illustrated on the Flow Diagram are shown in an intermediate position. Note the position of wrenches in relation to the markings on valve plugs.

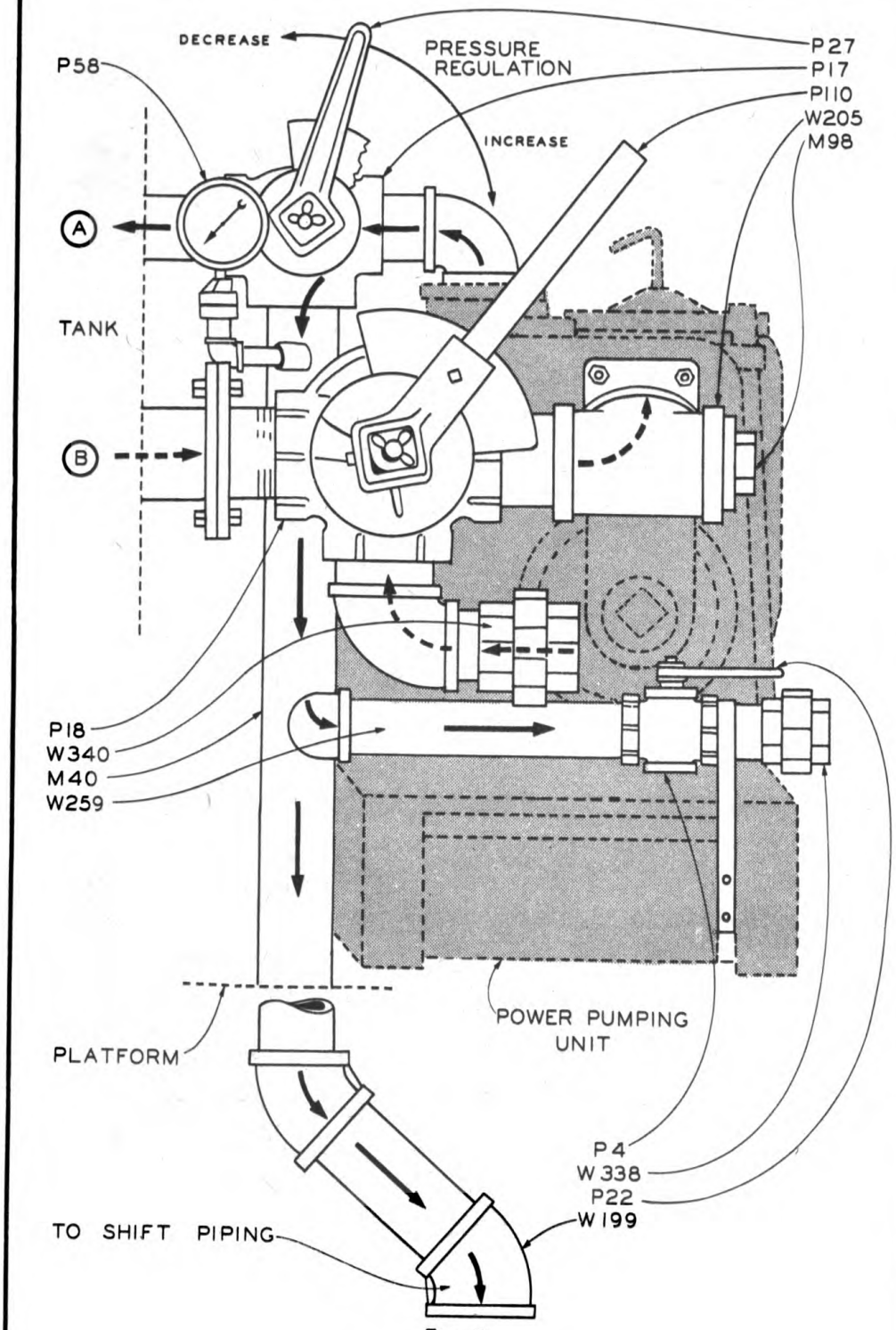

Fig. 7

FLOW DIAGRAM

TRACING FLOW OF WATER THROUGH PIPING SYSTEM (Fig. 7)

LOAD: P110 Wrench in horizontal position—P27 Wrench in vertical position—Suction Hose connected to source of supply and W340 Load Inlet. Water flows from source of supply to Load Inlet and then to P18 Valve where it is directed to the pump suction inlet. After passing through the pump the water is discharged at the top left outlet where it then flows to the P17 Valve which directs it into the tank at discharge point (A).

TRANSFER: Suction Hose connection and position of P110 Wrench the same as for LOAD—P27 Wrench in horizontal position—P6 Valves (Fig. 8) closed. Discharge Hose connected to W338 Transfer Outlet.

Water is drawn up through the pump and discharged at the top left outlet same as for the loading operating, and then flows to the P17 Valve, where it is directed down the M40 Pipe. The flow from the M40 Pipe passes through the Shift Piping and then to the Header where it is dead ended at the P6 Valves. Opening the P4 Valve permits water to flow out to the W338 Outlet to the Transfer Hose.

DISTRIBUTOR (Spraying operation): P110 Wrench in vertical position—P27 Wrench in horizontal position.

Water flows from tank at point (B) through P18 Valve and then through pump—Discharged at top left of pump water flows to P17 Valve and then to the Spraybar. Spraying operation starts when P6 Valves are opened (Fig. 6).

PRESSURE REGULATION: After the spraying operation has started the pressure is regulated by slowly moving the P27 Wrench to an intermediate position thus by passing part of the water back to the tank at point (A), the balance passing through M40 to the spraybar.

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STARTING PUMP AND ENGINE

PRIMING THE PUMP: If the machine is new or has been in storage it will be necessary to prime the pump before starting the engine. The pump is primed by removing cover over the priming chamber and filling the chamber with water.
Replace the cover as shown on (Fig. 8).

STARTING THE ENGINE: Ignition Switch Button, Choke, and Crankshaft are located on the right side of the machine as shown on (Fig. 6). Push in the Ignition Switch Button.

Pull Choke and Throttle about half-way out. (Note: Do not choke engine except when it is cold). Slip crank over end of crankshaft and rotate quickly. When engine has started push choke button in as far as it will go. Set the throttle at about half speed and allow the motor to warm up. Run engine at full speed when pumping operation starts.

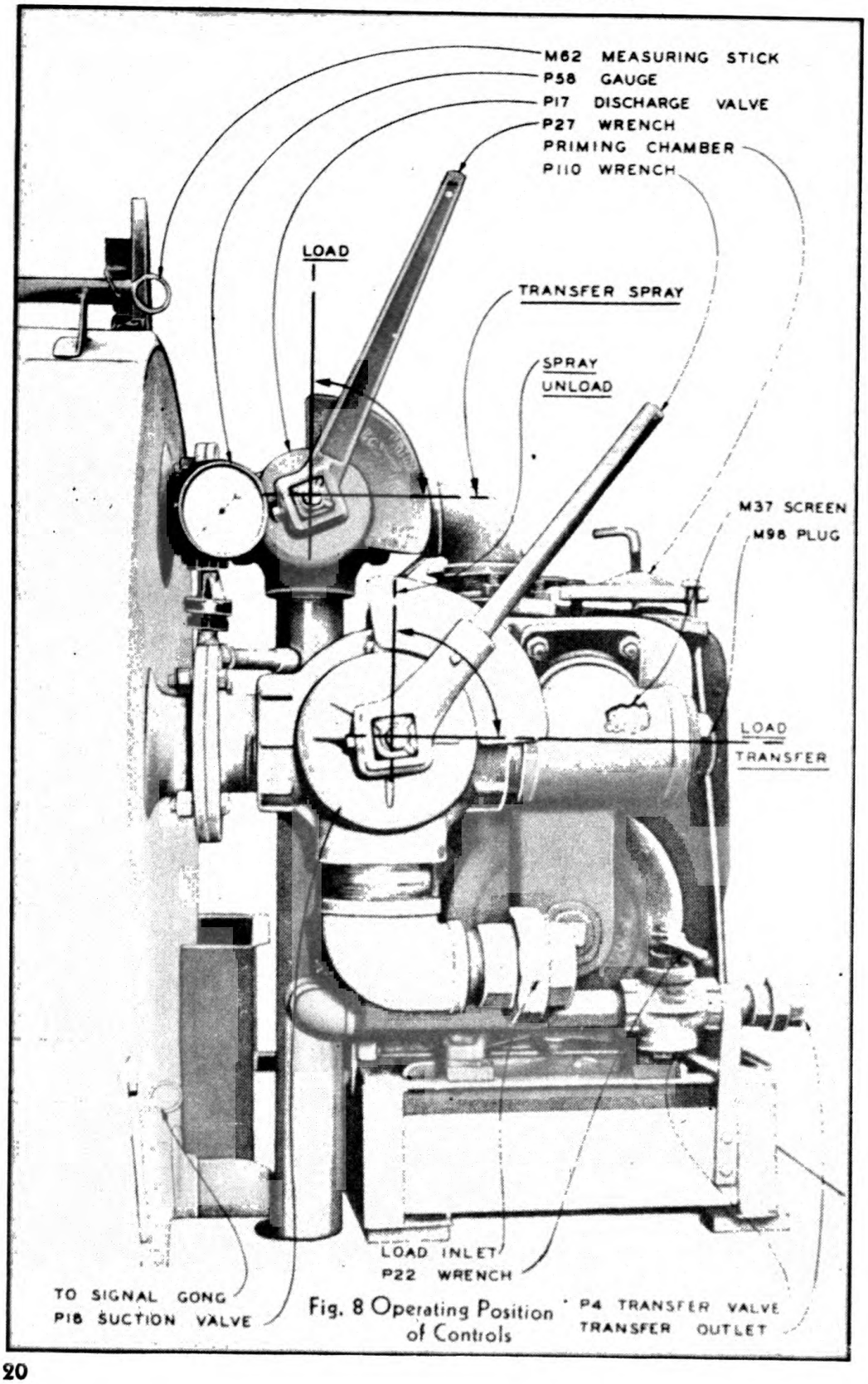


Fig. 8 Operating Position of Controls

OPERATING POSITIONS OF CONTROLS (Fig. 6 and 8)

DISTRIBUTOR

For accurate application of measured quantities of water over large areas.

May also be used for applying water under low pressure for settling dust as a sprinkling operation, and for applying a measured quantity of light dust laying oil.

SPRAYING UNIT

To pump from tank and discharge through spraybar.

(a) Place Suction Valve Wrench P110 in vertical position.
(b) Place Discharge Valve Wrench P27 in horizontal position.
(c) With pump and engine running the spraying operation starts when M65 and M66 Spraybar Control Levers are moved to the right.
(d) Regulate pressure in sprayline by slowly moving the P27 Wrench toward the vertical position.

POWER PUMPER

For draining surface water and ditches, dewatering barges and boats, water supply for irrigation and fire fighting or for any other pumping or washing service when a large volume of water is to be handled in a short space of time.

TRANSFER UNIT

Pump from one outside source to another without material entering the tank.

(a) Place Suction Valve Wrench P110 and Discharge Valve Wrench P27 in horizontal position.
(b) Keep P6 Spraybar Valves closed.
(c) Attach Suction Hose to Load Inlet and Discharge Hose to Transfer Outlet.
(d) Start engine and pump.

LOADING UNIT

Load tank from outside source.

(a) Place Suction Valve Wrench P110 in horizontal position.
(b) Place Discharge Valve Wrench P27 in vertical position.
(c) Attach hose to LOAD INLET and source of supply.
(d) Start engine and pump.

AUXILIARY FIRE FIGHTING UNIT

Pump from tank; discharge through fire hose.

(a) Place P110 Wrench in vertical position.
(b) Place P27 Wrench in horizontal position.
(c) Attach fire hose to Transfer Outlet.
(d) Start engine and pump.

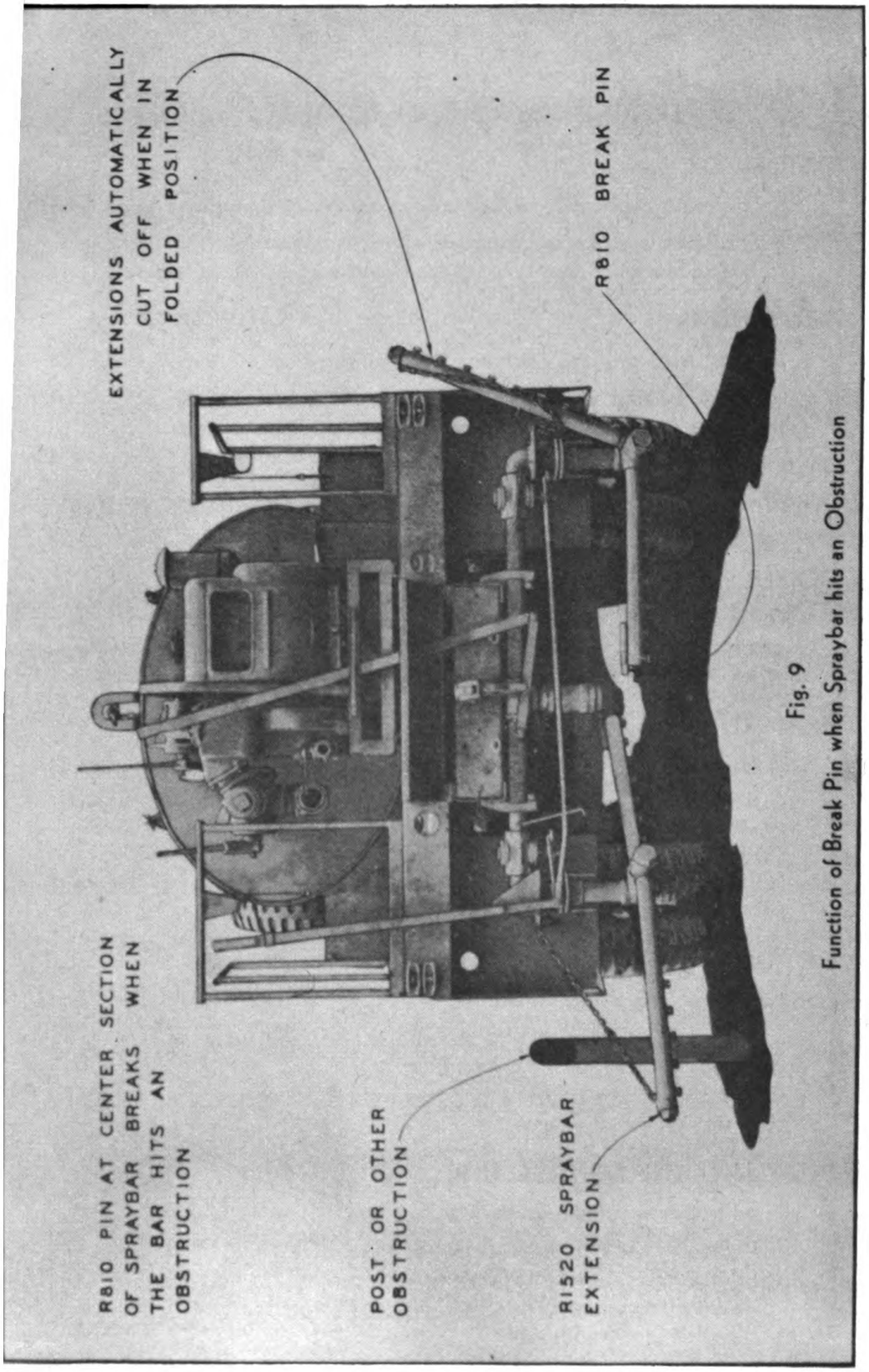


Fig. 9
Function of Break Pin when Spraybar hits an Obstruction

GENERAL TROUBLES

STARTING UNIT

When first starting a new Distributor, reasonable caution must be exercised in all matters of lubrication so as not to damage running parts. When operating trouble is experienced it is well to thoroughly check all external possibilities before even considering opening up any interior parts such as the engine, pump, valves, etc. The common causes of trouble usually are easily located and quickly corrected by carefully following factory instructions.

RESTRICTED FLOW THROUGH DISCHARGE OUTLET

(1) STRAINER—Examine and thoroughly clean Suction Hose Strainer, P57, when using on free end of Suction Hose while draining water from roadside ditch. The water being pumped should be as free from solids as possible.

(2) SCREEN—Keep Suction Strainer Screen, M37, clean or remove screen entirely when maximum discharge is desired.

(3) SUCTION LIFT TOO HIGH—The greatest volume of water can be handled when Suction Inlet is as close as possible to the source of supply.

DROP IN SPRAYLINE PRESSURE

(1) Examine and clean Strainer Screen, M37, located within the Strainer Body, W205, on suction line at pump outlet. A dirty screen is the most common cause of varying pressure or of pump failing to prime or to stop pumping.

(2) Examine entire Suction Line for air leaks. All joints in suction pipe fittings and hose must be absolutely tight.

(3) Be sure that there are no kinks in hose or that its rubber lining has not collapsed or that foreign material has not partially plugged the Suction or Discharge lines.

(4) Be sure that the P17 Discharge Valve is in the horizontal position.

SUCTION LINE SCREEN (Fig. 10)

A cylindrical screen M37 is located within the 4" Tee fitting at the pump inlet and is for the purpose of preventing silt and solids from clogging the small spraybar nozzle openings. When used for transferring only or as a power pumping unit, the screen may be removed. This screen is accessible for cleaning by unscrewing the Screen Cleanout Plug M98 and should be cleaned often.

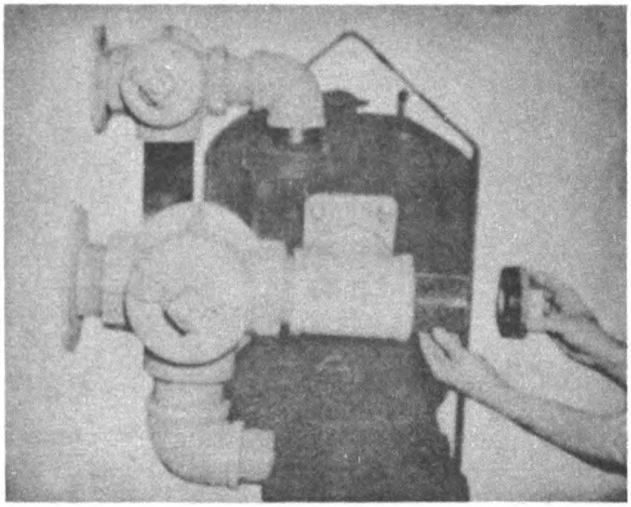


Fig. 10
Suction Line Screen

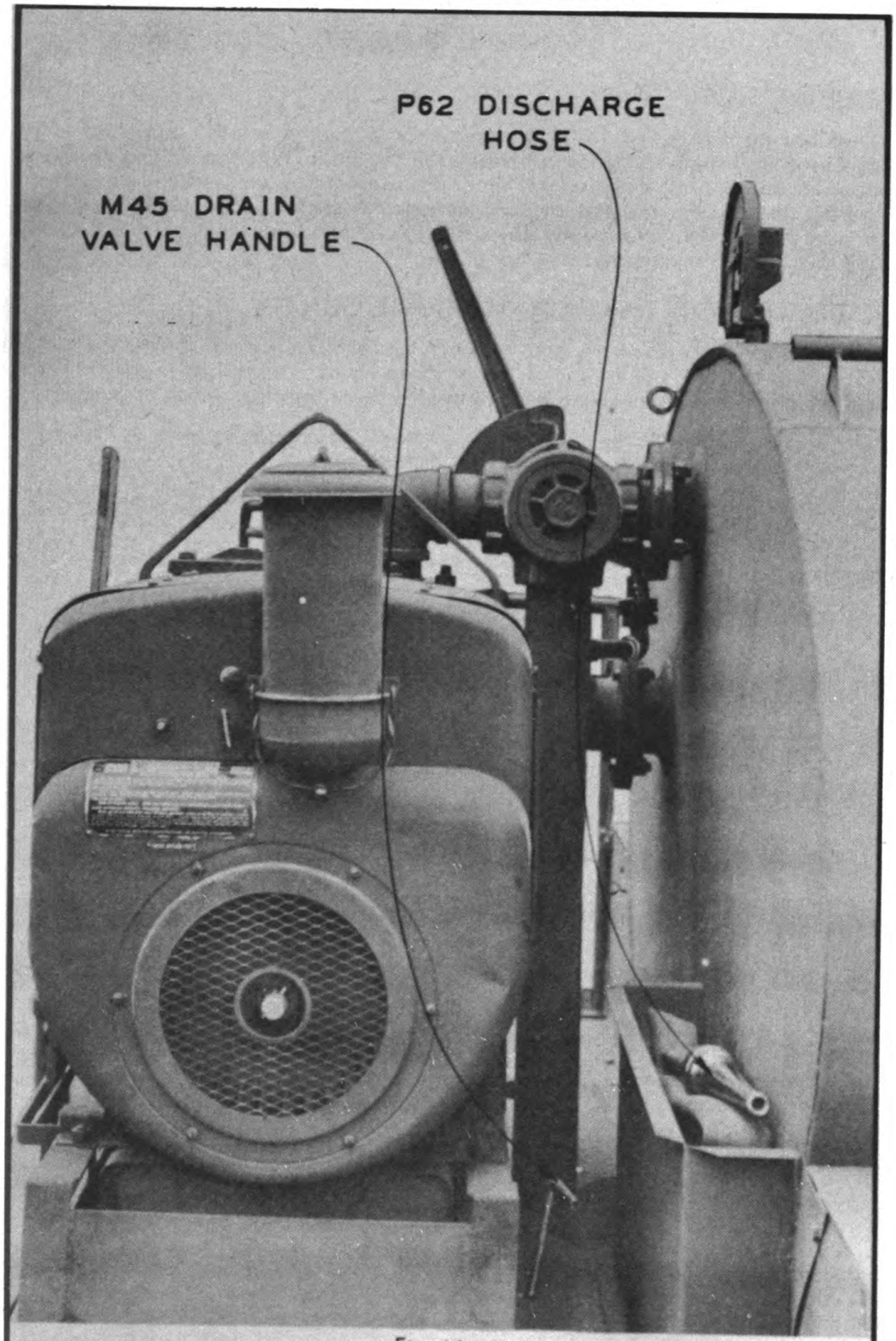


Fig. 11
Right Rear Platform showing location of Drain Valve Handle and Discharge Hose

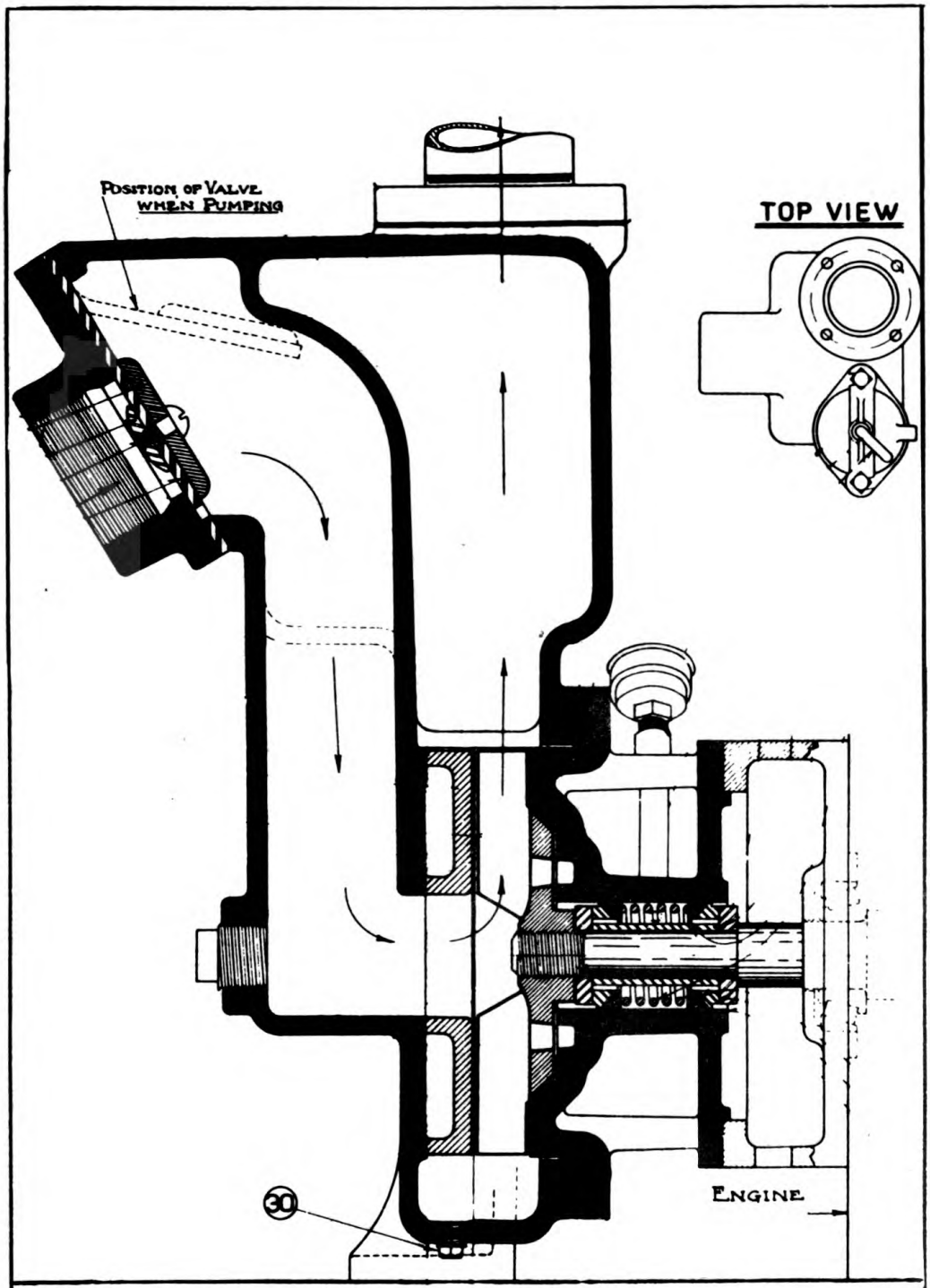


Fig. 12
Sectional View of Pump

DETAILS OF PUMP (Fig. 12)

CHECK PRIMING CHAMBER—Between fairly long periods of operation water may be lost by evaporation or by spillage when the pump has been moved, so the priming water should be checked to see that the water hopper is filled before the pump is started.

FREEZING WEATHER—In freezing weather the pump should be drained each time it is stopped for any length of time, such as overnight, by removing the drain plug (30) in the extreme bottom of the casing. If the water being pumped containes a large amount of solids, which may plug the drain hole and prevent the casing from draining properly, then a stick or wire should be run up through this hole to be sure that it is open and all water is drained. After the flow from the drain hole has ceased the engine should be operated so all water will be thrown from the impeller by centrifugal force. This will prevent a thin film of ice forming between the face of the impeller and the face of the wear plate which would seize the impeller and prevent the pump from being started.

PRECAUTIONS WHEN STARTING PUMP—When starting the pump in freezing weather the engine switch should remain "off" while the engine is being turned over by hand as if any ice has formed within the pump it will be detected while the pump is being turned over. If ice has formed it can be melted by pouring warm water into the priming chamber.

The suction strainer furnished with the pump should always be used on the end of the suction hose as solids may enter the pump which will not pass through the impeller. This will cause the impeller to be so filled that it will not pump and damage may even result to the impeller.

IF THE PUMP FAILS TO PRIME OR STOPS PUMPING

1. Look for an air leak:
    a. Loose hose connection.
    b. If the suction hose is fitted with a brass coupling either it is not tightened sufficiently; the packing gasket is not seated properly on the end of the nipple; or the hose bands, attaching the hose to the coupling, are loose.
    c. The hose has become porous due to age.
    d. Grease Seal needs replacing.
2. Lining of hose has collapsed.
3. Suction Strainer plugged.
4. Impeller clogged.
5. Impeller broken or worn out.
6. Pump may be vapor-locked because of steam generated as described by the following paragraph.

A valve in the discharge line may be closed without damage to a centrifugal pump since it is not of the positive acting type. But when the water within the pump is churned by the impeller for a long period it may get boiling hot and the steam arising may cause a vapor lock which would prevent the pump from priming especially on a high suction lift. This condition can be quickly relieved by pouring cold water into the pump.

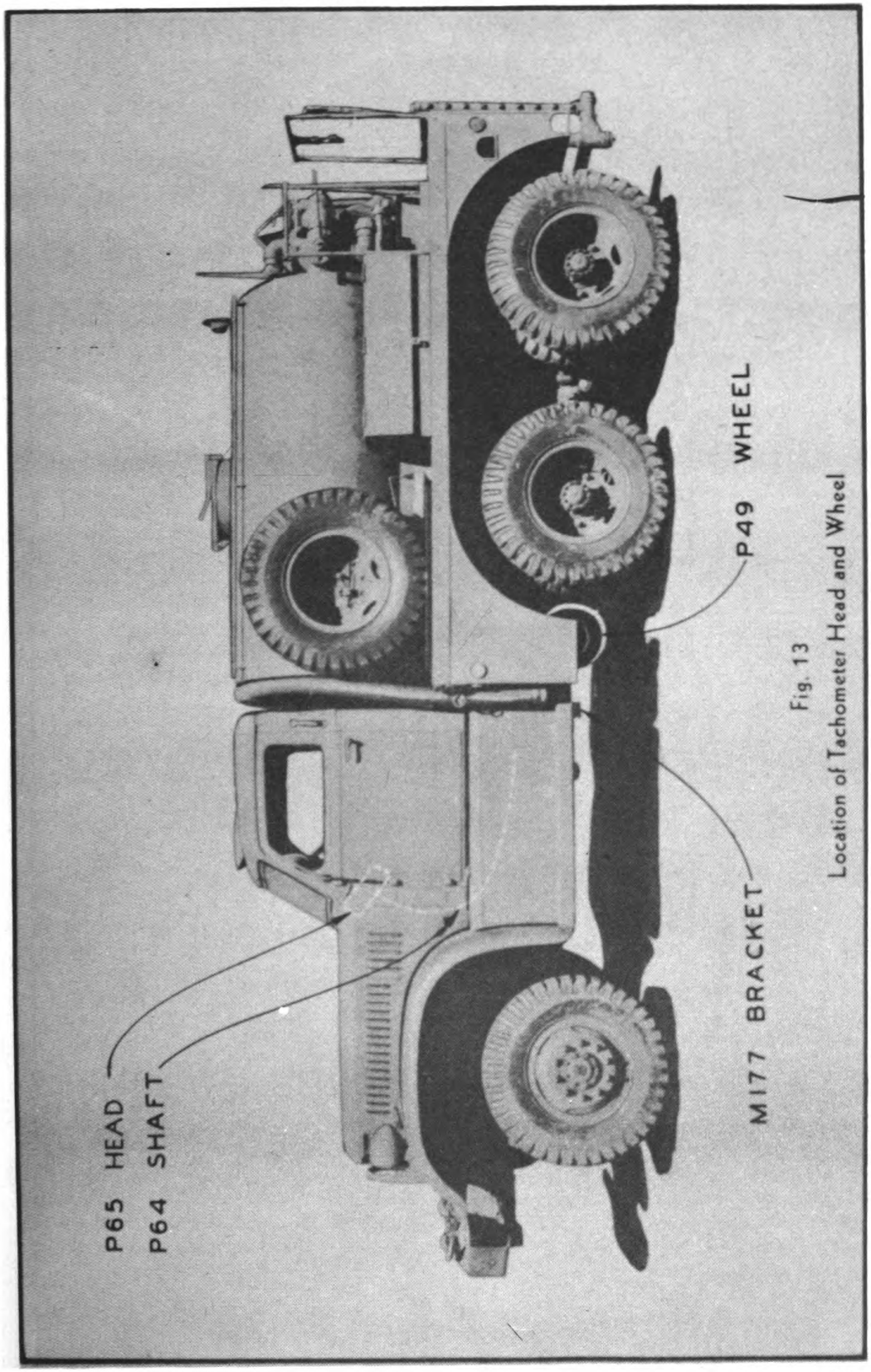
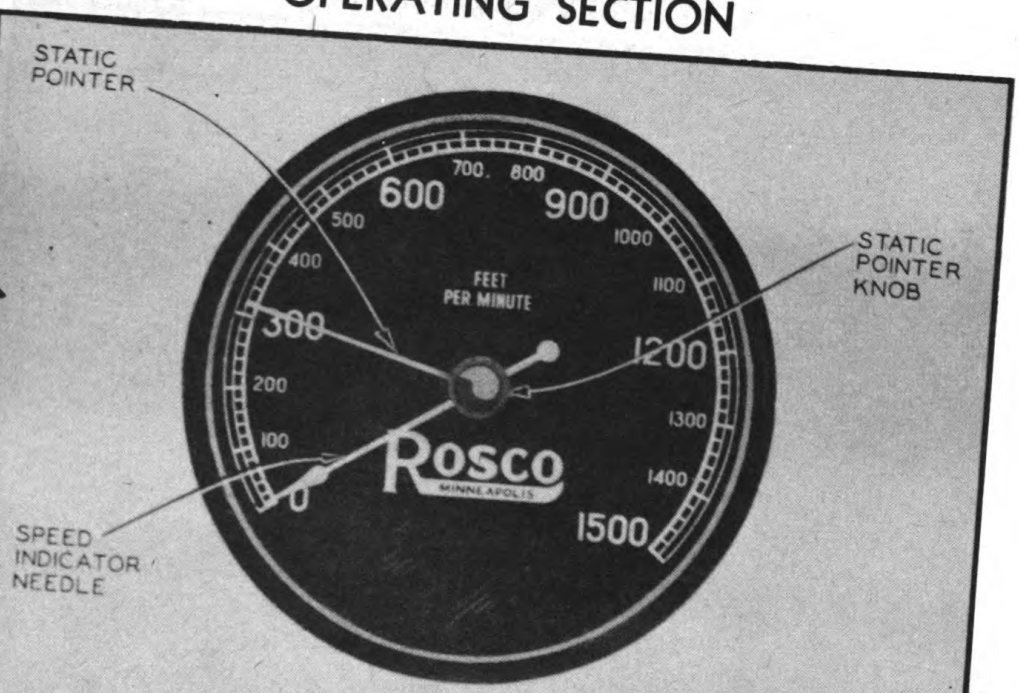
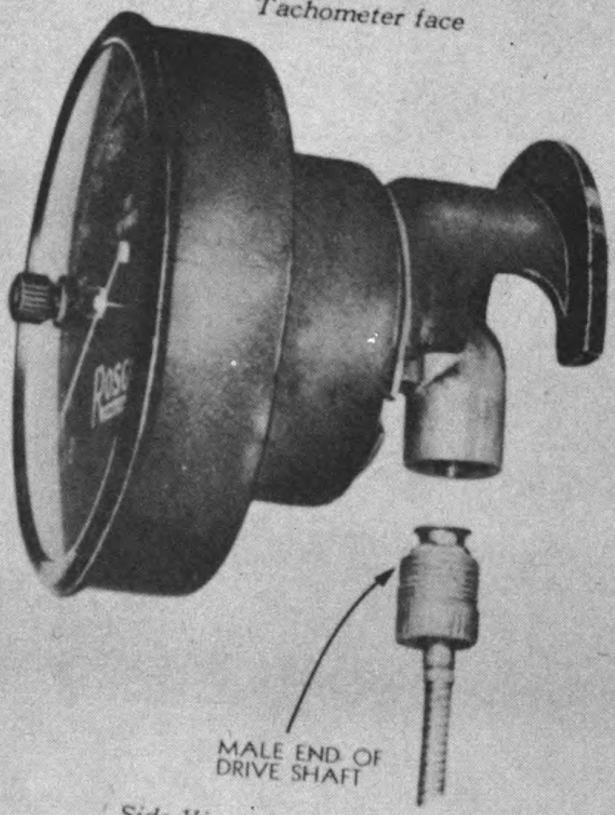


Fig. 13
Location of Tachometer Head and Wheel



Tachometer face



Side View of Tachometer Head

Fig. 14
TACHOMETER HEAD

APPLICATION PROCEDURE

EXPLANATION—The controlled application of specific quantities of water over a given area is dependent upon two major variables—PRESSURE and TRUCK SPEED If the pressure is maintained at a fixed point and the orifices (nozzles) are not altered, the machine will discharge the same amount of water in the same length of time regardless of the pump speed as the surplus water is by-passed back to the pump to maintain the previously mentioned fixed pressure.

Knowing the amount of water discharged per minute, the truck speed may be varied so that the required number of square yards will be covered with a sufficient amount of water to fulfill the application rate in gallons per square yard. In the event that it is desirable to maintain the same truck speed the application rate may also be varied by increasing or decreasing the pressure.

USE OF APPLICATION CHARTS—The Rosco Application charts are divided into 2 groups, namely the 20 pounds per square inch and 30 pounds per square inch gauge pressure. For convenience when reading, each group has been sub-divided in three foot increments. The percentage difference between the various spraybar lengths at the same pressure is very small and can practically be disregarded when applying a heavy application; however, when applying light applications at relatively high speed this difference may amount to a hundred or more feet per minute which of course, makes an appreciable correction in the truck speed.

Generally speaking it is advisable to use the 20 lb. pressure for the light applications and the 30 lb. for the heavy applications as this permits a more satisfactory operating speed for the truck.

The application rate in U. S. Gallons per square yard and the width of strip to be covered are known and it is desired to find the correct truck speed.

1. Select the pressure group as indicated above (20 lbs. for light applications and 30 lbs. for heavy.)

2. The various spraybar lengths are indicated at the bottom center of oval in large figures. Select the one corresponding to the width of strip to be sprayed and move around the curve until meeting the line running out from the center which corresponds to the specified application rate. Then read the truck speed in feet per minute.

Example: Application Rate .4 gal./sq. yd.
Width of strip to be covered—9 ft.

Then on the 20 lb. chart move around the curve marked 9 ft. until meeting the line running out from the center marked .4, which is the application rate, and read 439, the truck speed in feet per minute.

Assuming the above conditions to be the same except that the width of strip to be covered is 18 ft. instead of 9 ft. Move around the curve marked 18 ft. until meeting the line running out from .4 and read 395, the truck speed in feet per minute.

TACHOMETER SETTING

The tachometer head is located on the dash board. Release cable hook on steering post column to lower tachometer wheel when machine is ready to spray.

The Static Pointer, Fig. 14, on the Tachometer Head, acts as a permanent indication of the desired truck speed during the operating interval. The Static Pointer is set by turning the knob at the center of the Tachometer Dial until the red Static Pointer is directly above the markings which correspond to the operating speed in feet per minute. After the truck is in motion keep the Speed Indicator Needle exactly in line with the Static Pointer by varying the truck speed.

APPLICATION SUMMARY

1. Start engine, load and measure quantity of water.
2. Set static pointer on tachometer dial to desired truck speed.
3. Adjust valve on discharge side of pump until gauge reading is 10 to 15 lbs. higher than the desired operating pressure.
4. Open spraybar valves AFTER the truck has attained the operating speed.
5. Correct the pressure if necessary.
6. Upon completion of application procedure the water remaining in the tank should be measured to check the amount sprayed.

MANHOLE (Fig. 15)

Tanks are equipped with a full 18" diameter circular manhole with inside splash flanges and having a weather-tight, leak-proof cover with durable gasket. A quick acting lever type latch insures easy opening and closing.

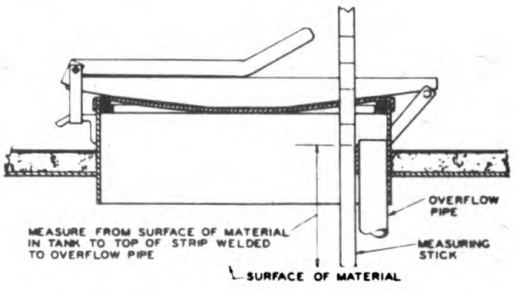


Fig. 15
Manhole

MEASURING STICK (Fig. 15)

A measuring stick calibrated in 25 gallon increments is carried within the left hand-rail (at top left rear of tank) and is used to determine the amount of material in the tank. Measurement is made from the surface of material within the tank to a guide strip welded to overflow pipe located within the manhole. The numbers marked on the stick indicate tank contents in U. S. gallons.

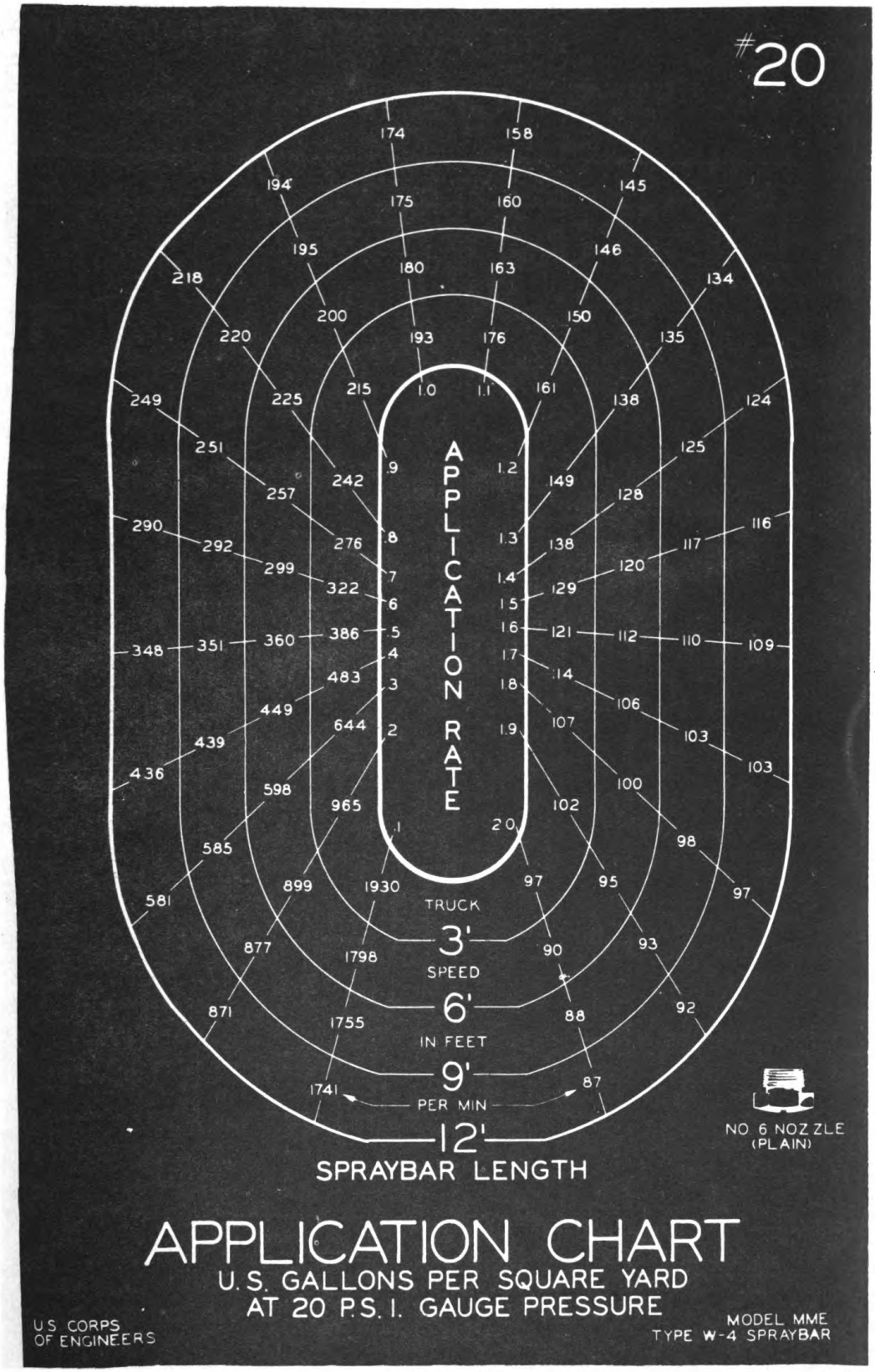


Fig. 16

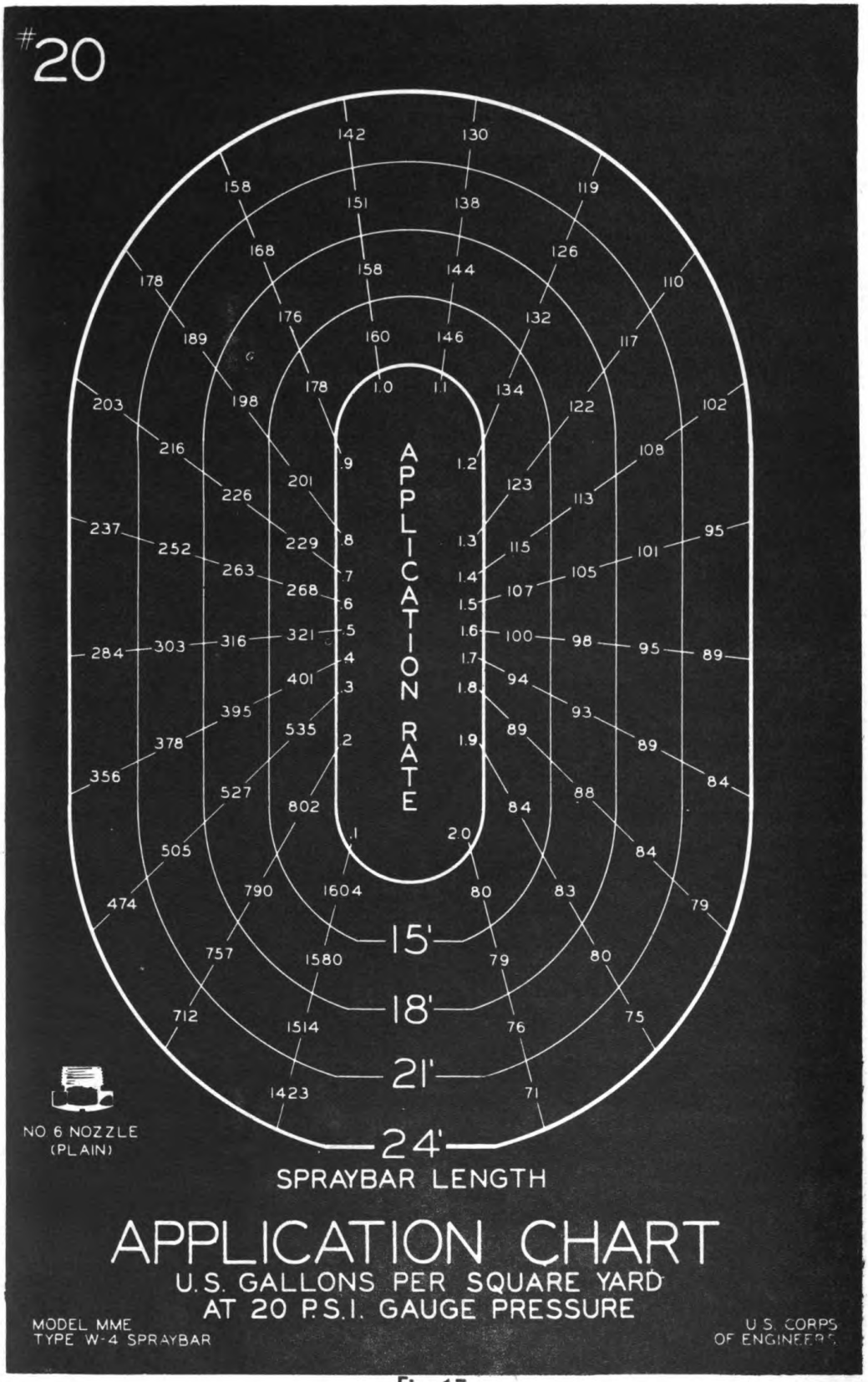


Fig. 17

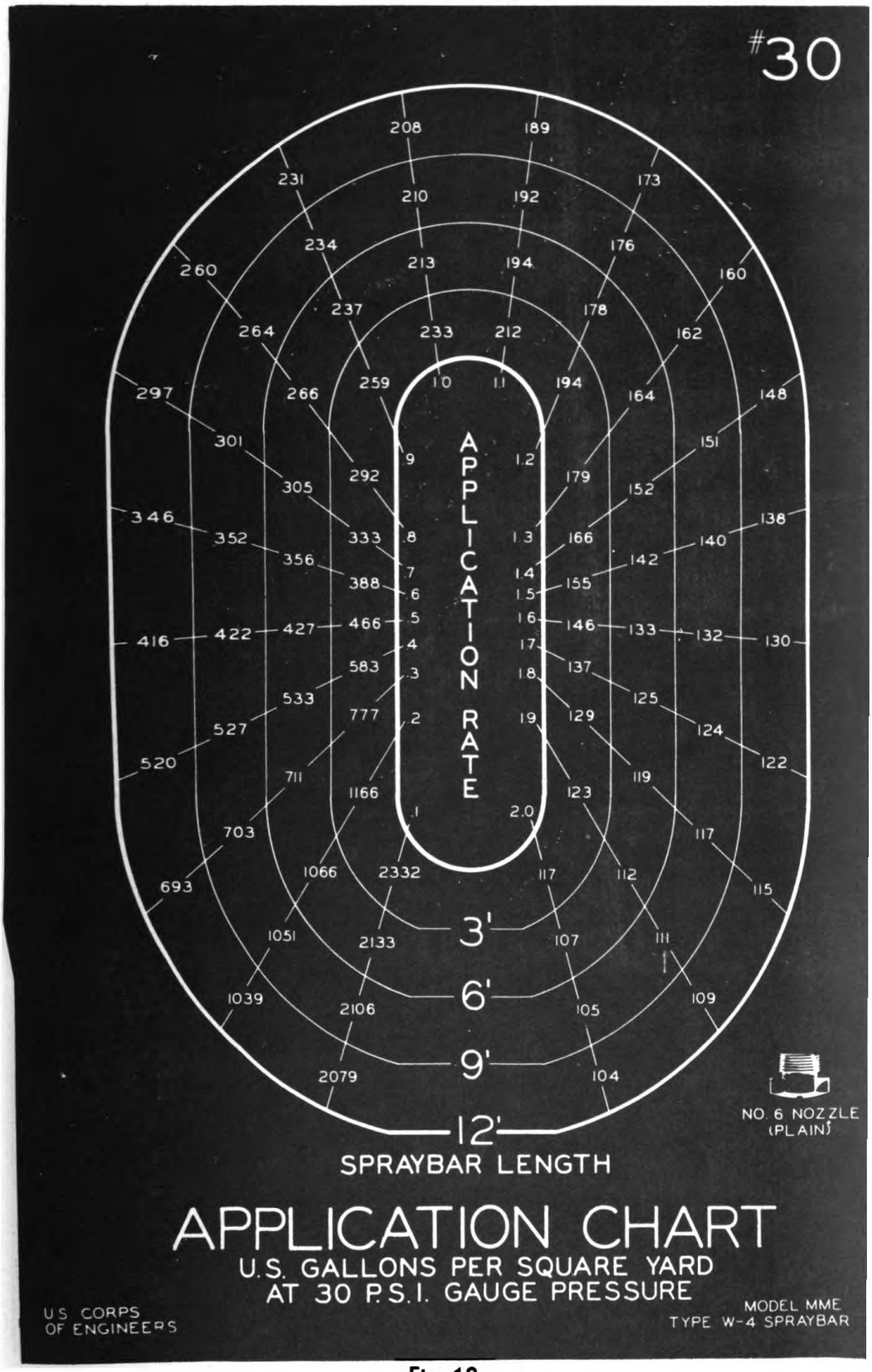


Fig. 18

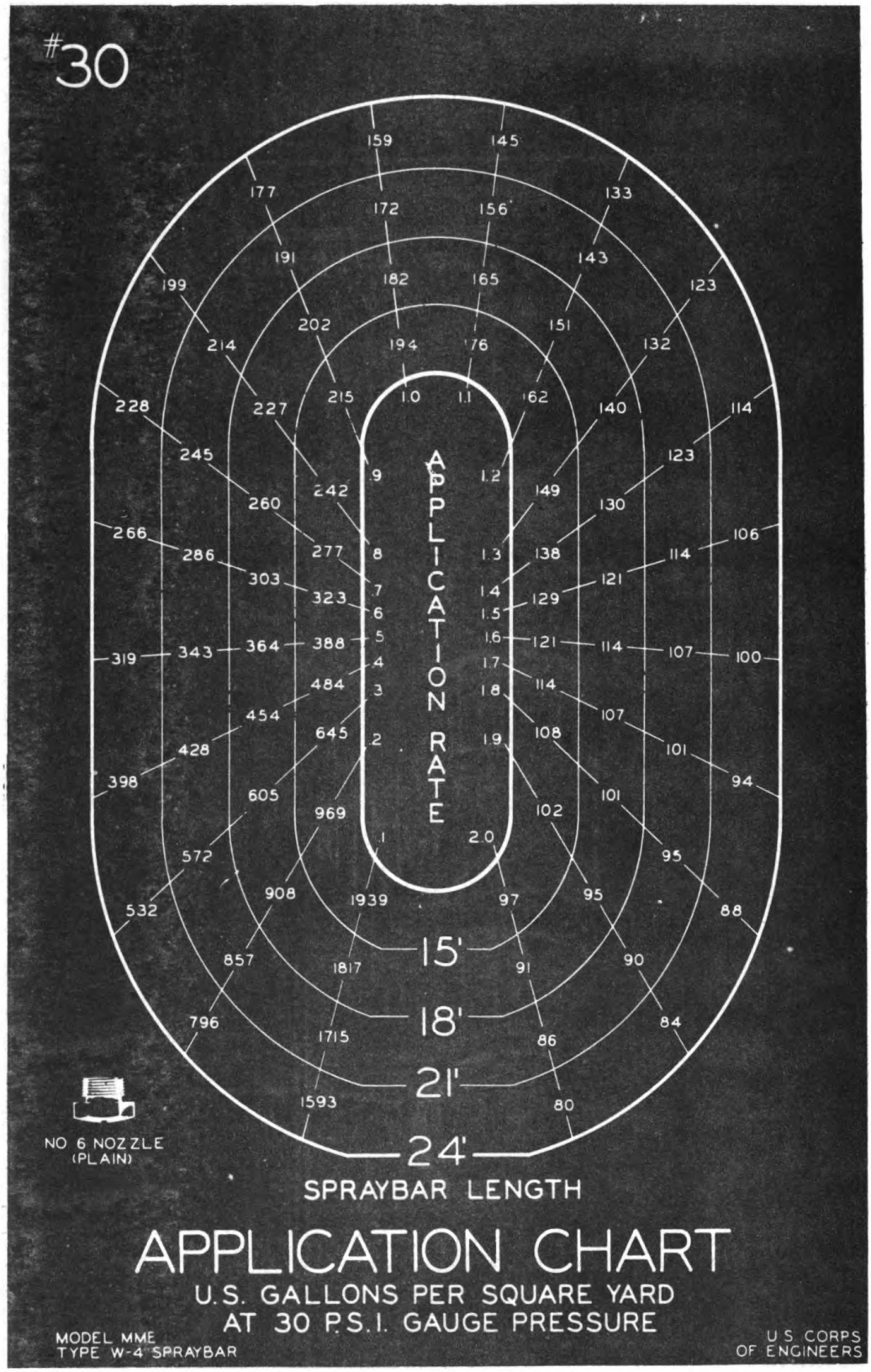


Fig. 19

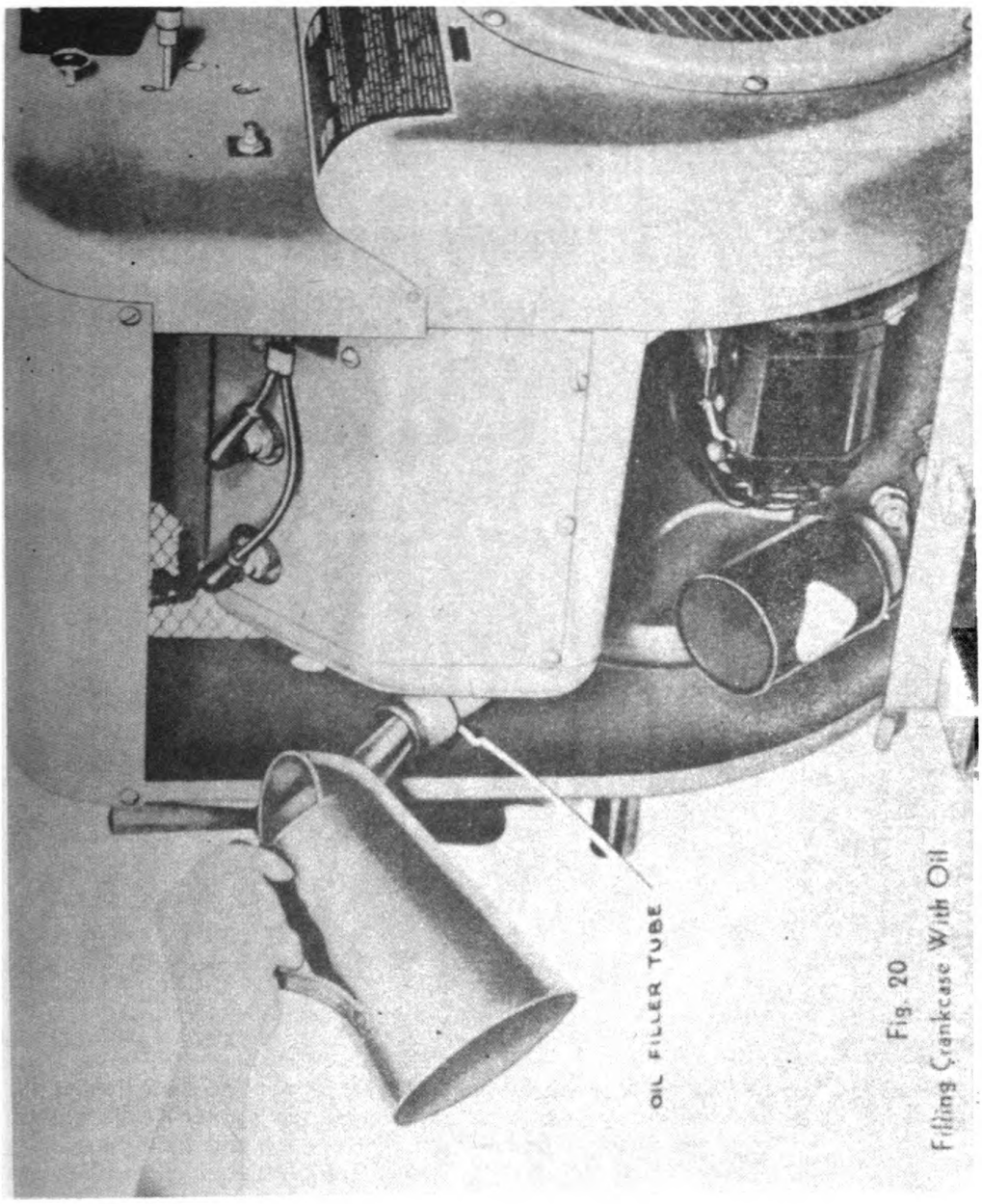
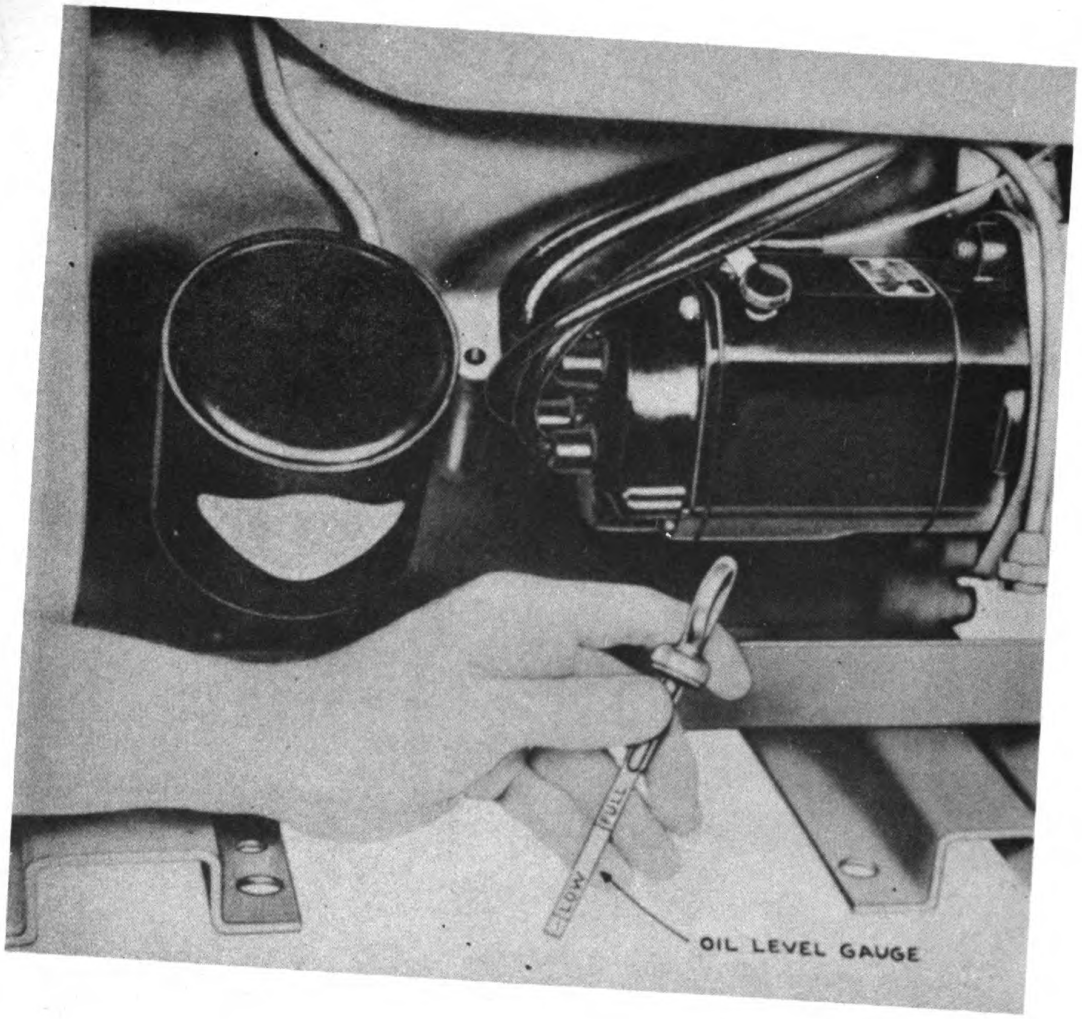


Fig. 20
Filling Crankcase With Oil



OIL LEVEL

Fig. 21

ENGINE

INTRODUCTION—The Wisconsin VE-4 engine is a four cylinder V type 4 cycle air-cooled engine.

GENERAL DESCRIPTION—The proper combustible mixture of gasoline and air is furnished by a carburetor bolted to the inlet manifold.

The spark for ignition of the mixture is furnished by a high tension magneto fitted with an impulse coupling which makes starting very easy.

The firing order of the cylinders is 1-3-4-2. Number 1 cylinder is the one nearest to the flywheel in the left bank of cylinders when viewed from the flywheel end of the engine. Number 3 cylinder is the other cylinder in this bank. Number 2 cylinder is the one nearest to the flywheel in the right bank of cylinders and number 4 is the other cylinder in this bank.

The cylinders are numbered on the air shroud near the spark plugs. The flywheel end of the engine is designated the front end, and the power take-off end, the rear end of the engine.

As this engine is of the V type, the interval between firing of the cylinders is as follows: Crankshaft rotation between firing of cylinders, No. 1 and No. 3 is 180°; between No. 3 and No. 4 is 270°; between No. 4 and No. 2 is 180°; and between No. 2 and No. 1 is 90°.

DETAILED DESCRIPTION—The crankshaft is carried on two Timken bearings. The outer race or cup of the bearing at the power take-off end of the engine is carried in a plate bolted to the crankcase. Under this plate several shims are fitted for adjusting the bearings. The bearings are properly fitted at the factory when the engine is assembled.

The connecting rod big ends are direct babbitted and fitted with laminated shims. The upper ends of the rods are fitted with hard bronze bushings. The oil streams from the oil spray nozzles strike the dipper on the connecting rod cap and lubricates the bearings.

The pistons are made of cast iron and are fitted with 2 compression, 1 scraper, and 1 oil regulating ring each.

The piston pin is a light press fit into the piston and steel wire snap rings in the piston bosses prevent end movement of the pin.

The camshaft is made of Gunite and has the cams and fuel pump eccentric formed integral. The camshaft gear is bolted to the camshaft with the three bolts.

The valve spring and tapper adjusting screws are located in the side pockets in the cylinders. Both exhaust and inlet valves are Austinetic steel. Molybdenum alloy valve seat insert rings are pressed into the cylinders. The valves are operated through mushroom type tappers.

Adjusting screws are provided to adjust the tapper clearance.

The oil pump is of the gear type located in the crankcase and extending down into the oil pan. The pump is driven by the idler gear. The suction opening in the pump is protected by a screen.

The spark plugs are located in the cylinder heads.

The crankcase is made of iron. The cylinders are cast in pairs of a special alloy iron. Two cylinder heads are also cast in pairs.

Both the cylinders and heads are provided with ample cooling fins so that the engine will not overheat even in the hottest and humid weather.

PREPARATION FOR USE OF ENGINE

BEFORE ATTEMPTING TO START ENGINE—Fill the crankcase to the proper level with OE (OIL, engine) (Fig. 20)

The crankcase holds approximately 4 quarts and should be filled to the full mark as shown on the oil level gauge. (Fig. 21)

After the above points have been carefully followed engage the starting crank and turn the crankshaft over quickly to see if the engine has compression. If considerable resistance is offered to turning compression is probably satisfactory. If no resistance is offered to turning, the oil has probably drained down past the pistons and rings during long storage. To correct this condition remove the spark plug and pour about 2 ounces of crankcase oil in each spark plug hole. With the plugs out turn the engine over with the crank for about ten complete revolutions of the crankshaft. This will then restore compression.

Replace the spark plugs and fill the gas tank with a good quality of gasoline free from dirt and water. The octane rating of the gas should be at least 67, and if non-leaded gas is available it should be used.

OPERATING INSTRUCTIONS FOR ENGINE

HOW TO START—Pull out the choke button on the control panel and crank the engine. When engaging the starting crank, enguge in such a manner that the crank may be pulled up, not pushed down. This is a matter of safety as a backfire of the engine while cranking might injure the operator's arm. It is not advisable at any time to spin the engine. The operation of cranking may have to be repeated several times to draw gas into the cylinders. To facilitate priming the engine, a priming cup is provided at the takeoff end of the engine. (Fig. 22). The valve on this priming cup should be opened and approximately two ounces of gas poured into the cup. This gas will find its way into the float chamber of the carburetor and after the engine starts, the fuel pump will immediately draw gas from the fuel tank.

After the engine starts the choke button should be gradually pushed in as the engine warms up.

A new engine may fail to start due to a clogged fuel line or carburetor. If the engine does not fire at all, the following test should be made. A small quantity of gasoline (about a teaspoonful) should be poured into each spark plug hole. If engine fires for two or three revolutions and then stops, the difficulty is in the fuel system.

TO CHECK FOR SPARK—To prove that a satisfactory spark is being delivered by the magneto, remove the ignition cable from one of the spark plugs. Hold ignition cable terminal about 1/8" from the metal shrouding or cylinder head, and turn the engine over with the crank. If the spark jumps the gap then the entire ignition system with the exception of the spark plugs is probably okay. In case the engine misses, each spark plug wire should be checked in this manner. (Fig. 23)

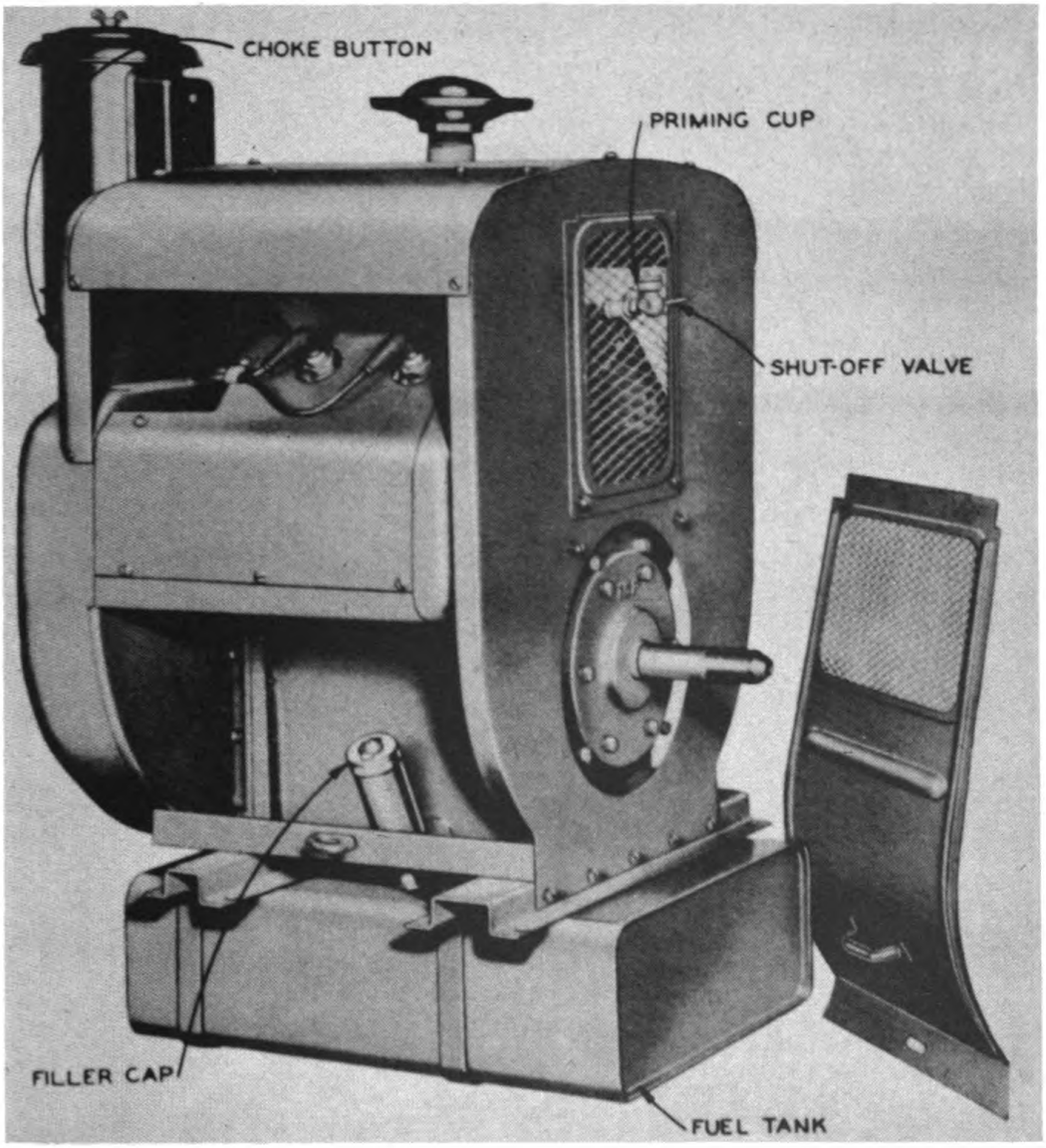


Fig. 22

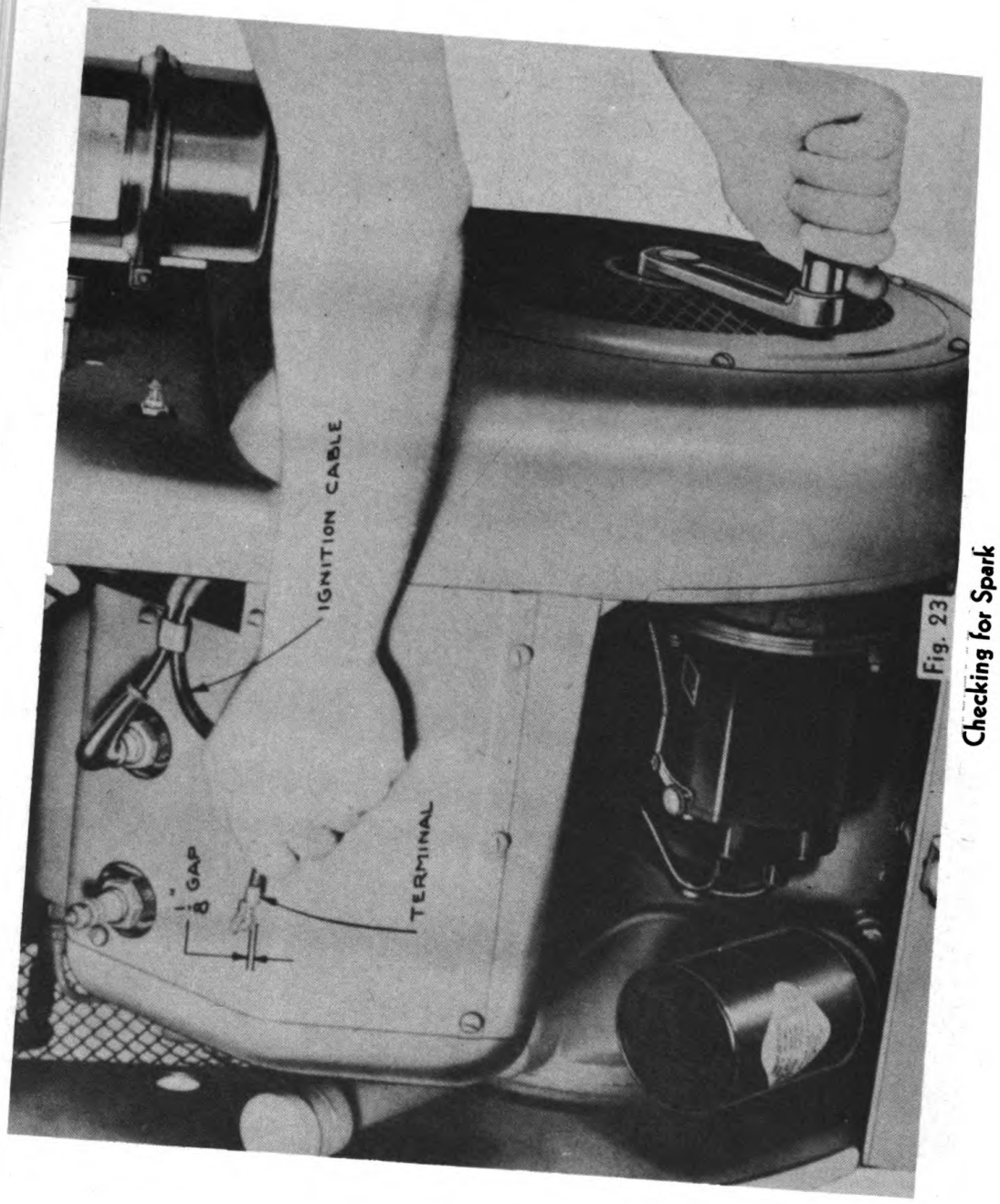


Fig. 23 Checking for Spark

LIMITED STORAGE

CLEANING—No cleaning required except to improve the appearance of machine.

LUBRICATION—All points indicated on the Lubrication Guide should be carefully serviced or checked regardless of the time interval indicated. Use standard Army lubricants as indicated on guide—no special inhibitors required for 30 days storage.

PUMP—Remove Plug No. 30 (Fig. 12) and drain all water. Replace plug and open priming chamber cover. Pour in about one quart of OE. Replace cover.

ENGINE—Check oil level and add sufficient quantity to bring it up to proper level as indicated on Guide. Remove sparkplugs and pour four tablespoons of OE into each cylinder. Turn engine over several times to coat cylinder walls. Replace Plugs.

DRAIN TANK—Pull up on handle located at right side of rear platform and allow water to drain.

DRAIN PIPING—Remove the four pipe plugs in caps located beneath each swing joint in pipe line. Allow water to drain and then replace plugs.

DEAD STORAGE

PUMP—Remove Plug 30 (Fig. 12) and allow all water to run out. Replace plug and remove priming chamber cover. Pour in about one quart of AXS-934 or if equipment is available, use a spray gun. Replace cover.

ENGINE—Drain oil from crankcase and refill with AXS-934. Remove sparkplugs and fill each cylinder with four tablespoons of AXS-934. Turn engine over several times by hand until cylinder walls are coated with inhibitor. Replace plugs.

DRAIN TANK—Pull up on handle at right side of rear platform and allow tank to drain.

DRAIN PIPING—Remove the four pipe plugs in caps located beneath each swing joint in pipe line. Allow water to drain.

SWING JOINTS—Remove cap and tee at the follow swing joints and coat the inside of tee as well as the spindle with AXS-673. Replace tee over spindle and tighten. Points to be treated as indicated above are—Shift Piping (Fig. 30), machined surfaces of R1225 and R970 only, Header and Feed Line assemblies (Fig. 36), lower machined surfaces of M46 only, Spraybar assembly (Fig. 36) inner machined surface of R1267 and R1268, inner machined surface of R809 Tees and also the spindles over which these tees fit.

VALVES—Lubricate in exactly the same manner as indicated on Lubrication Guide.

TIRES—Block up truck frame so weight of machine is not resting on tires.

SHIPPING

SELF-POWERED—It is recommended that this equipment be moved under its own power and completely assembled, as the minimum overall as well as operating dimensions are exactly the same.

VIA RAIL — These units may be shipped in end door box or flat cars, the latter being preferable. (Fig. 24) shows a common method of shipping these machines on a flat car. Twelve beveled blocks approximately 24x12x6 are nailed to floor of car at both ends of each wheel. Suitable side bracing may be nailed to floor as shown in illustration. Six straps (10 gauge x 1 band iron) are placed over the axles and nailed to the floor. No disassembly is required when shipping in either type of car.

EXPORT SHIPMENT—Refer to TB5-9711-1 Instructions for Preparation of Corps of Engineers Equipment for Export, issued by Engineer Field Maintenance Office, P.O. Box 1679, Columbus, Ohio.

ENGINE—Process engine in accordance with TM5-9715. Preparation of Corps of Engineers Equipment for Storage, issued by Engineer Field Maintenance Office, P. O. Box 1679, Columbus, Ohio.

SHIPPING DATA	H	W	L	Cubic Feet	Net Weight
OVERALL—Set up on wheels and ready for use (domestic shipment)	100 in.	94 in.	22 ft., 2 in.	1440	18750
KNOCKED DOWN—Solid Boxed (overseas shipment)	108 in.	106 in.	23 ft.	1830	24500
SKID MOUNTED—on wood shipping skids	58 in.	94 in.	132 in.	420	3350

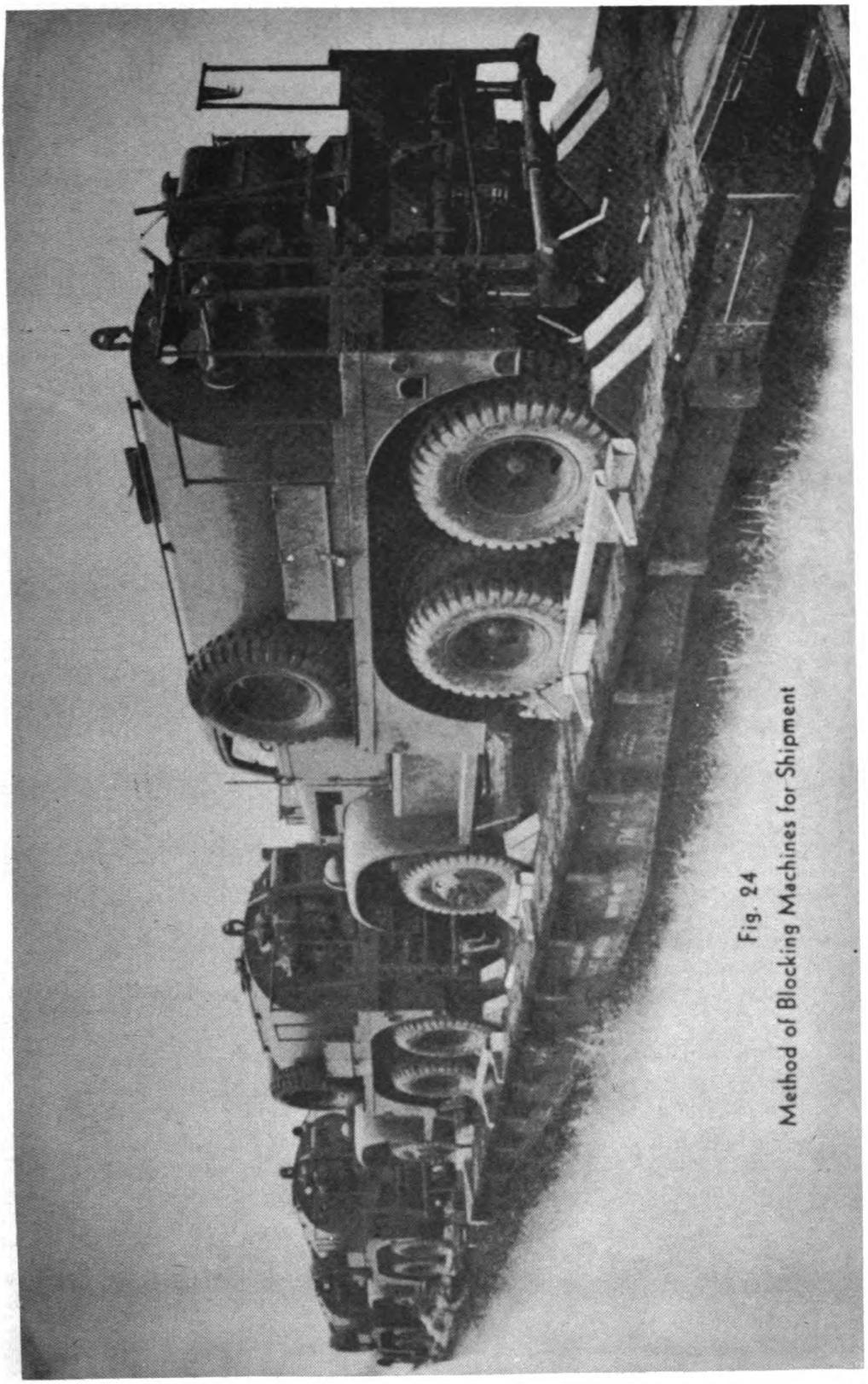
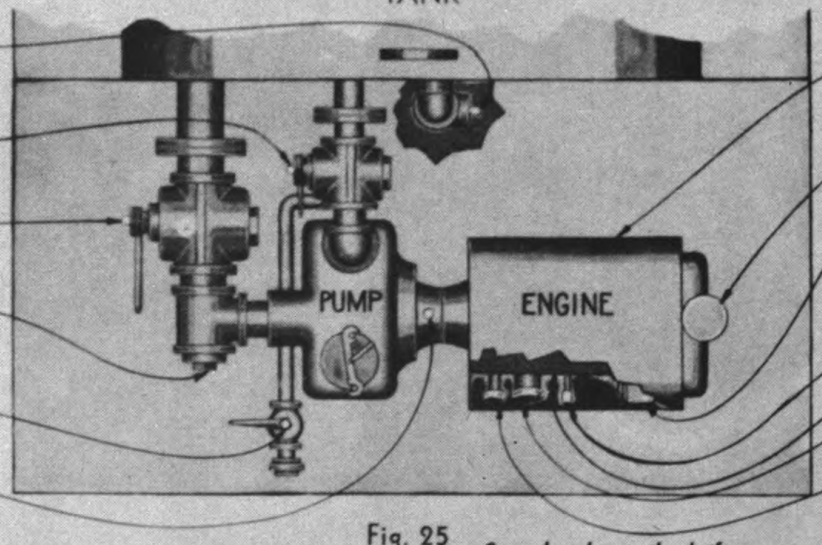


Fig. 24
Method of Blocking Machines for Shipment

LUBRICATION GUIDE

WATER DISTRIBUTOR
ROSCO MODEL MME



	Lubricant	Hours
Drain Valve Under platform (Note 3)	WP	64
Discharge Valve (Note 3)	WP	64
Suction Valve (Note 3)	WP	64
Screen Cleanout Plug—Remove and clean screen	—	8
Transfer Valve (Note 3)	WP	64
Pump Shaft Automatic Feed Refill Cup (Note 4)	CG	64

Hours	Lubricant	
4		Gas tank beneath engine shroud. Fill from this side.
8	OE	Air Cleaner (Note 5)
512	OE	Magneto (Note 6)
		Crankcase Drain Plug (Note 8)
		Oil Gauge (Note 8)
256		Oil Filter—Replace (Note 7)
64	OE	Crankcase—Drain and refill (See Table) Check Level every 4 hours (Note 8)

Fig. 25 *Spraybar beneath platform*

KEY

LUBRICANTS

CG—GREASE, General Purpose
No. 1 (Above +32° F.)
No. 2 (Below +32° F.)

WP—GREASE, Water Pump
Waterproof No. 4

SEE ENGINE MAINTENANCE SECTION FOR DETAILS OF MAJOR OVER-HAUL

SEE FOLLOWING PAGE FOR SPRAYBAR AND TACHOMETER LUBRICATION

TABLE OF CAPACITIES AND LUBRICANTS TO BE USED

UNIT	CAPACITY	LOWEST EXPECTED AIR TEMPERATURE		
		Above 32°F.	32°F. to 0°F.	Below 0°F.
Crankcase	4 qt.	**OE** SAE 30	**OE** SAE 10	See note 8

NOTES

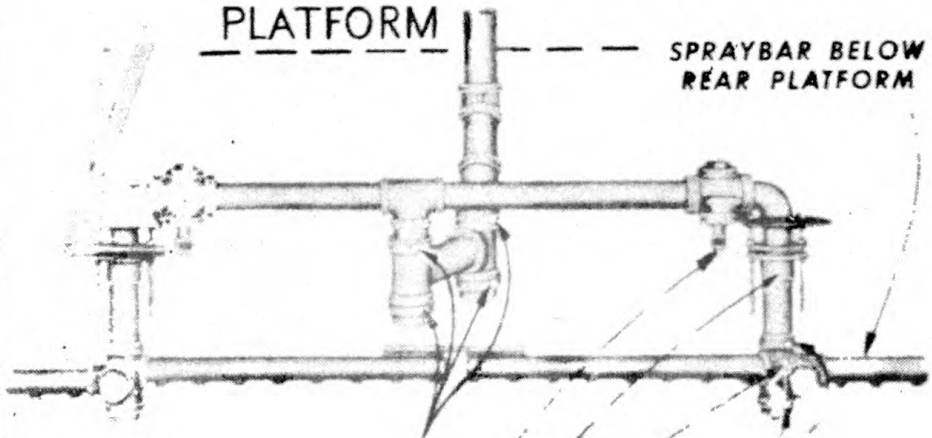
1. FITTINGS—Clean thoroughly before applying lubricant gun.
2. HOURS—The hours indicated are for normal service. For extreme conditions of dust or heat, change oil in cases and lubricate more frequently.
3. VALVES—Remove screw at end of valve plug and fill cavity with WP. Replace screw and turn down all the way. Repeat until grease appears between plug and valve body.
4. PUMP SHAFT—Every 64 hours remove top and fill bottom of cup with WP Replace top. A spring actuated plunger automatically feeds grease to pump shaft bearing.
5. AIR CLEANER—Every 8 hours clean and refill oil cup to top of baffle with OE. Every 64 hours clean entire assembly.
6. MAGNETO—Machines equipped with Fairbanks Morris Magneto need no lubrication. Machines equipped with Wico Magnetos are lubricated in the following manner. Remove the two brass oil-hole plugs at top of magneto. Add 5 drops OE (SAE 10) to each hole. Replace plugs.
7. OIL FILTER—Every 256 hours remove old filter element by turning in a counter-clockwise direction. Discard old element and replace with a new one.
8. CRANKCASE—Check oil level every 4 hours. Fill to proper level as marked on gauge if necessary. Drain and refill with OE every 64 hours. Note engine must be warm before draining—Below 0°F. dilute OE SAE 10 with not more than 20% gasoline for fluid mixture.
9. TACHOMETER—Every 1024 hours remove plug from drive joint and add grease if necessary. Every 2048 hours remove drive joint and cable. Clean drive joint and repack with CG. Remove flexible drive shaft from casing, clean and coat with CG. Liberally coat threaded ends of casing before replacing.
10. OIL CAN POINTS—Every 64 hours lubricate linkages, throttle controls, etc., with OE.

See Diamond 'T' Truck Diagram for chassis lubrication.

LUBRICATION GUIDE

WATER DISTRIBUTOR

Rosco Model MME



CAUTION —

Hours	Lubricant
64	CG
64	CG
64	CG
64	WP
64	CG
1024	CG
64	CG

TACHOMETER
Located beneath truck cab

KEY

LUBRICANT	TIRE PRESSURE
CG— WP—	

Fig. 26

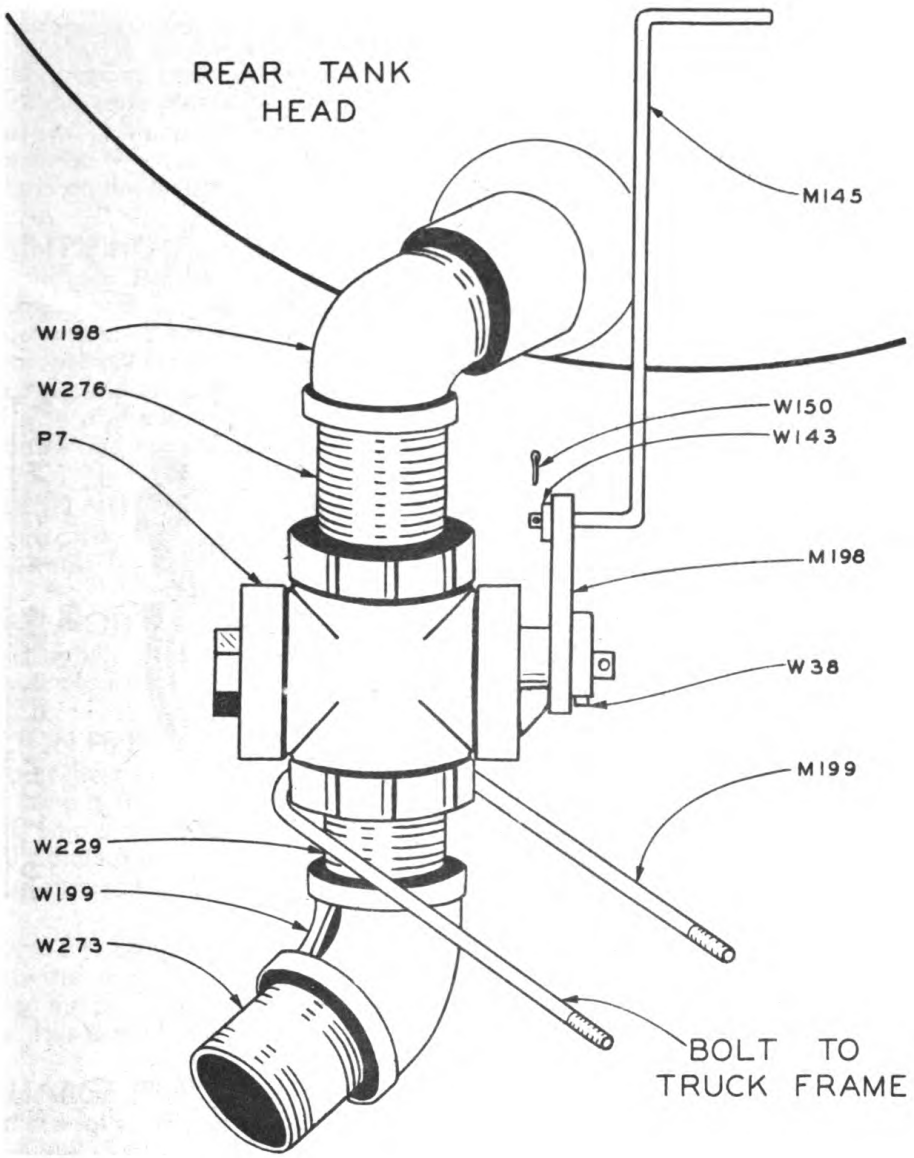


Fig. 27

DRAIN PIPING ASSEMBLY

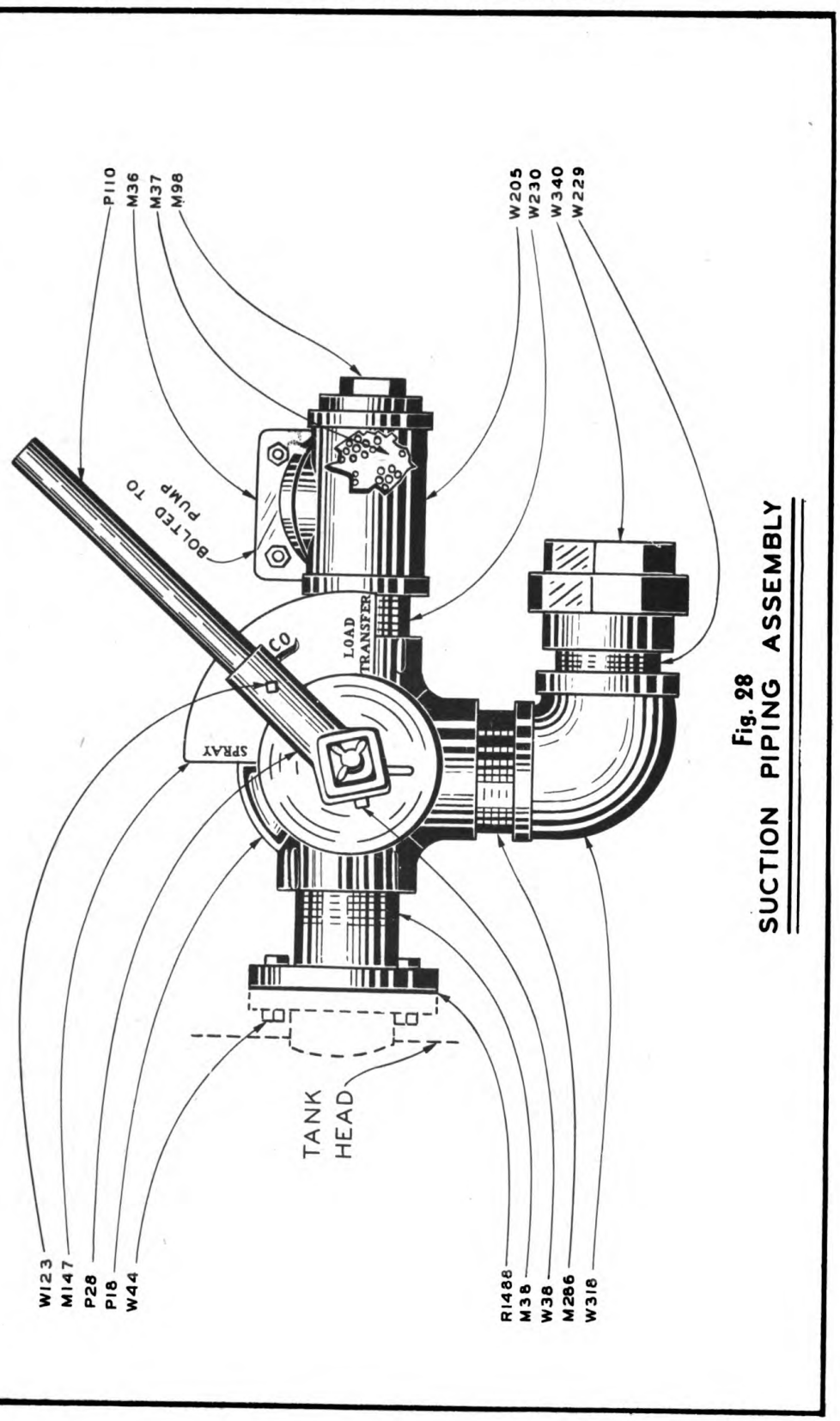


Fig. 28
SUCTION PIPING ASSEMBLY

GENERAL PROCEDURE—The following assemblies are arranged in the sequence in which they would normally be installed on the machine. The disassembly of the piping is an exact reverse of the assembly with the exception of the replacement of individual gaskets. This subject is treated separately under the heading "Gasket Replacement"

The engine and components are divided into the customary assembly and disassembly. Check the serial number of the machine before servicing the carburetor or magneto as several combinations have been used. The correct carburetor or magneto may be determined by comparing the serial number of the machine with the series of serial numbers on the flyleaf preceding each make of carburetor or magneto.

DRAIN PIPING (Fig. 27)—Located at bottom of rear tank head and projecting down beneath rear platform. Turn a W198 Street Elbow into the drain outlet at bottom of tank head and leave the outlet of the elbow pointing downward. Screw a W276 nipple into the Elbow by hand and then the valve onto the nipple. On the opposite of the valve place a W229 nipple and a W199 elbow. Draw this assembly up tight with a pipe wrench. Then turn in a W273 Nipple and shift the entire assembly to the right side of the machine. The M199 Brace is placed through the holes provided in the frame and drawn up tight with two nuts and lockwashers.

REAR PLATFORM SHEET—After the Drain Piping has been installed the Rear Platform Sheet is placed over the frame members with the hole in the center adjacent to the tank. The engine and pump base bolts hold this sheet in place.

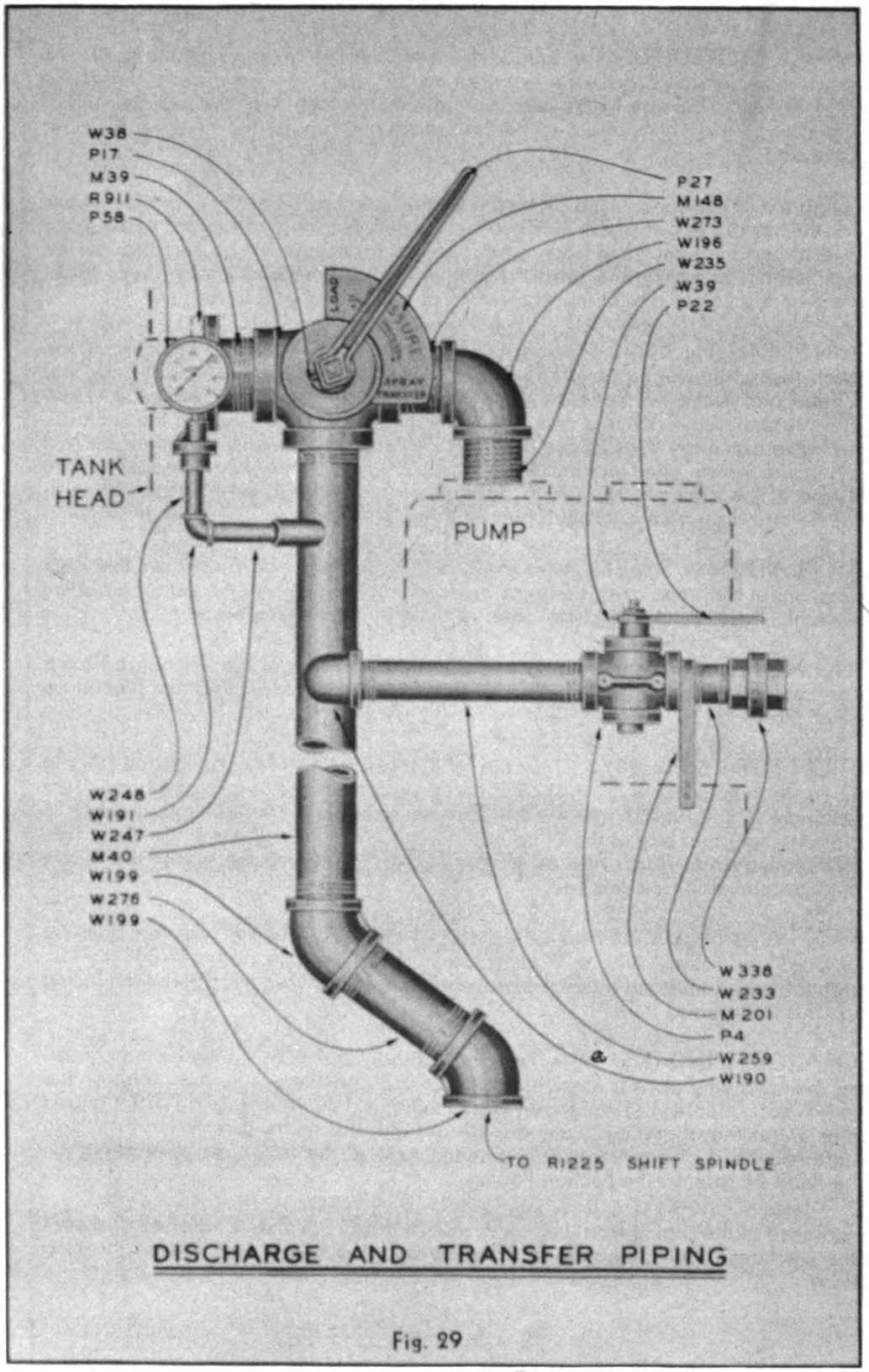
PIPING NOTE—The Suction Piping and the upper portion of the Discharge Piping are assembled and bolted to the pump before the engine and pump are placed on the rear platform.

SUCTION PIPING (Fig. 28)—Screw the W205 Tee onto the M36 Flanged Nipple and bolt the nipple to the pump suction outlet located at the side of the pump. Turn in by hand a W230 Nipple into the left side (facing pump) of the Tee and then a P18 Valve onto the other end of the Nipple. Draw the Valve up tight and leave the side outlet pointing downward. Turn an M38 Flanged Nipple into the end of the Valve on the opposite side from the Tee.

Screw a W286 Nipple into the side outlet of the Valve which was left pointing downward and follow with a W318 Elbow, W229 Nipple and a W340 Union. Tighten the pipe joints and leave the assembly pointing toward the right when facing pump. This is the Load Inlet.

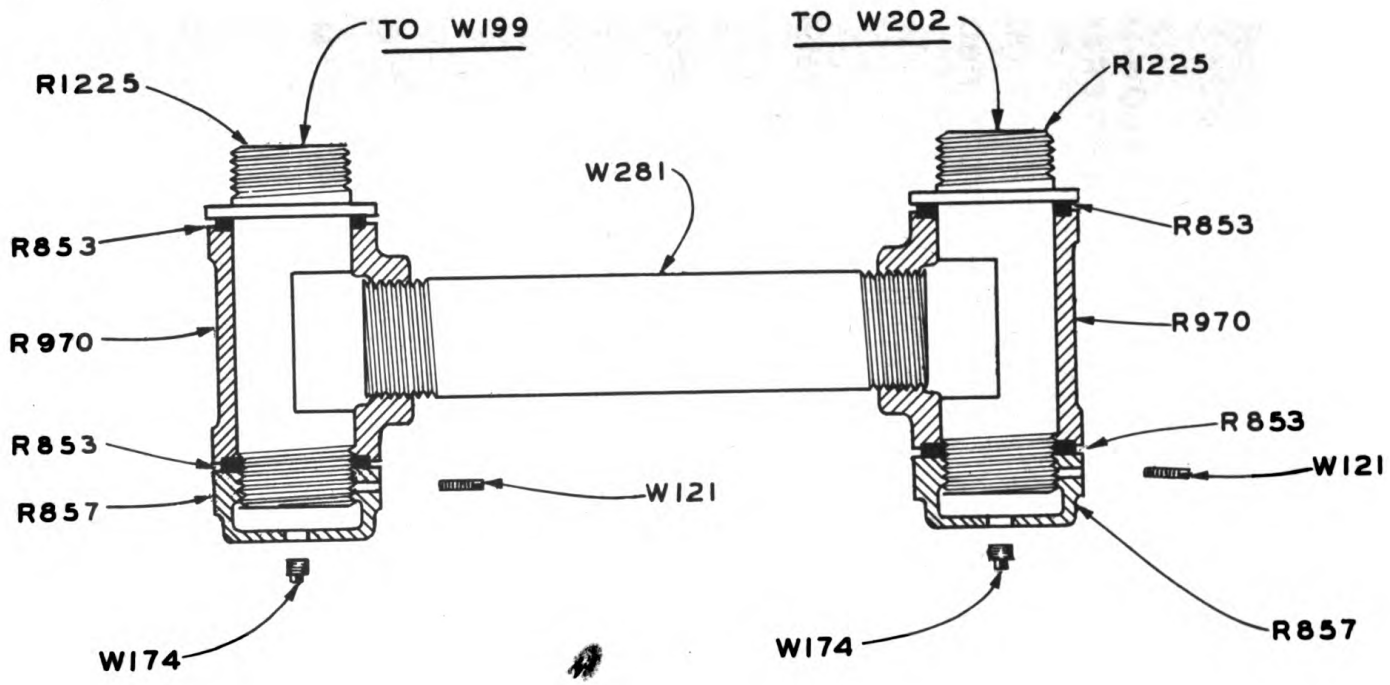
DISCHARGE PIPING (Fig. 29)—The upper portion of the Discharge Piping consisting of the following parts is screwed together and attached to the top outlet on the pump—W235 Nipple, W196 Elbow, W273 Nipple, P17 Valve, and M39 Flanged Nipple. After the above parts are drawn up tight, the entire assembly is turned so that the M39 end of the assembly is pointing toward the left in the same direction as the M38 Nipple on the Suction Piping.

The balance of the piping from the lower side of the P17 Valve is installed as shown on the Discharge Piping illustration after the pumping unit is installed on the rear platform.



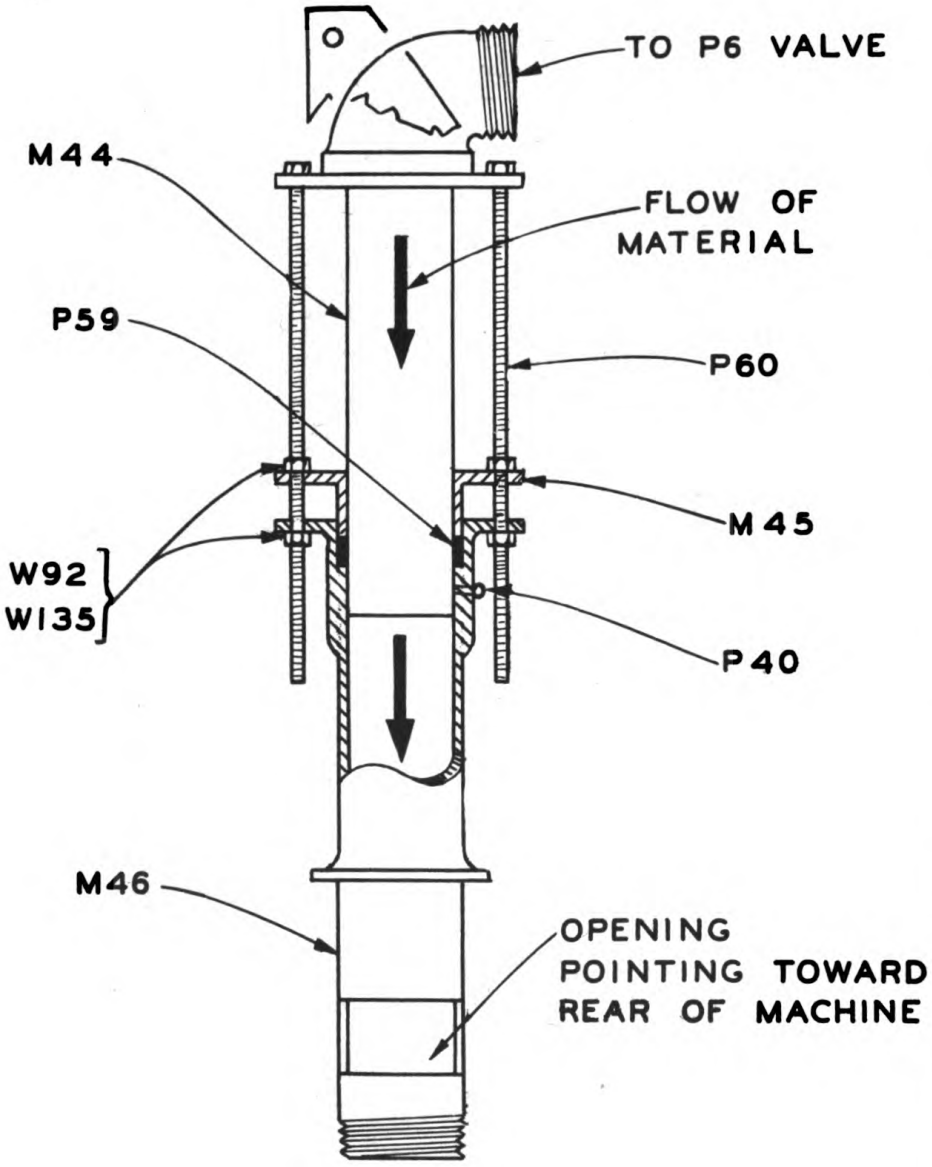
DISCHARGE AND TRANSFER PIPING

Fig. 29



SHIFT PIPING

Fig. 30



SECTIONAL VIEW OF VERTICAL HEIGHT ADJUSTOR L.H.

Fig. 31

SHIFT PIPING (Fig. 30)—The Shift Piping is a swing line that connects W199 Elbow on the Discharge Piping to the center Tee which is a part of the M41 Header. This Shift Piping is installed in the following manner after the Discharge and Header Piping are in place. Screw one R1225 Spindle into W199 Elbow on the bottom of the Discharge Line (Fig. 29) and leave the opening pointing toward the rear of the machine. After the Header and Feed Lines (Fig. 36) are in place, screw another R1225 into the Tee in the center of the M41 Header and leave the opening pointing toward the front of the machine.

Turn on the side outlet of an R970 Tee to each end of the W281 Nipple. When the Tees are tight, the openings in the ends should be left parallel to each other. An R853 Gasket is placed beneath the collar of each R1225 Spindle and then the assembled Tees and Nipple is slipped over the Spindles.

VERTICAL HEIGHT ADJUSTOR (Fig. 31) The Vertical Height Adjustors are screwed into the P6 Valves at either end of the Header. These adjustors may be assembled complete before attaching to Valves or M44 L.H. and M43 R.H. pieces may be screwed into the Valves and the balance of the parts assembled after the Header is in place. Either method is satisfactory depending on conditions.

Place the M45 Gland over the M44 Upper Sleeve and then the M46 Lower Sleeve over the M44 Upper Sleeve. The P60 Thread Rods are attached to the plates with W92 Nuts and W135 Washers in the manner shown on the illustration. The adjustment is made by loosening the nuts bearing on the M45 Gland and tightening those on the underside of the plate which is part of M46. This operation raises the spraybar while reversing the procedure will lower it.

The P59 Packing is wound around the lower end of the M44 Sleeve and forced into the stuffing box by tightening the nuts which bear upon the plate of the M45 Gland. Note that these Vertical Height Adjustors also act as feed line so when assembled the openings at the lower portion of the M46 sleeves are pointing toward the rear of the machine. The water will then be discharged into the Spraybar Sump R1267 and R1268 (Fig. 37).

HEADER AND FEED LINES (Fig. 36)—The P6 Valves are screwed on to the ends of the M41 Header with the stems pointing downward and the Vertical Height Adjustors are installed as mentioned in the preceding paragraph. The entire assembly is placed inside the M61 Brackets which are bolted to the truck frame. The Header is supported by passing a stove bolt through the legs of each bracket. A short piece of pipe goes over the bolt and between the legs of the bracket to act as a spacer.

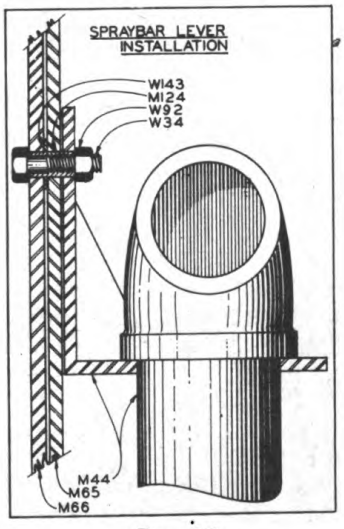


Fig. 32

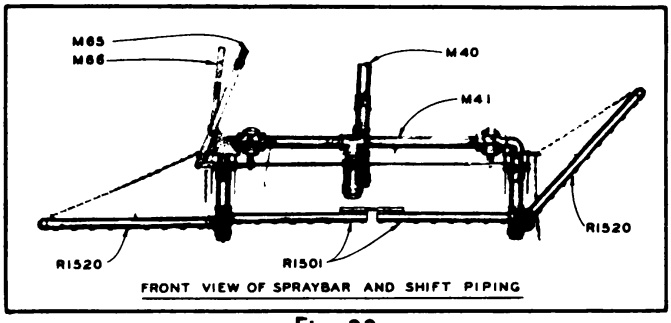


Fig. 33

SPRAYBAR LEVER (Fig. 32)—The M65 and M66 Levers are bolted to the plate which is part of the M44 Upper Sleeve. Valve Handles R1515 are held in place with setscrews which go into the side of the handles adjacent to the valve stems. M67 and M68 Connecting Rods are attached to the Valve Handles.

SHIFT LEVER (Fig. 36)—The M63 Guide is slipped over the R1306 Shift Lever and then bolted to the pump base to act as an additional support. The R856 Caps shown on the Header and Feed Line illustration indicate the relationship of Cap to Feed Line and are put on after the R1267 and R1268 Spraybar Sump are in place.

SPRAYBAR (Fig. 37)—Screw a R1501 Spraybar Center Section into the side outlet of the R1267 R.H. and R1268 L.H. Spraybar Sumps. Slide an R852 Gasket onto the M46 Sleeve until it rests next to the collar (Fig. 34). The Sump and Center Section of the Spraybar are then slid onto the sleeve and an additional R852 Gasket placed at the bottom of the sump.

The R856 Cap is screwed onto the end of the M46 and holds the sump in one place. The Cap is locked with a W121 Setscrew.

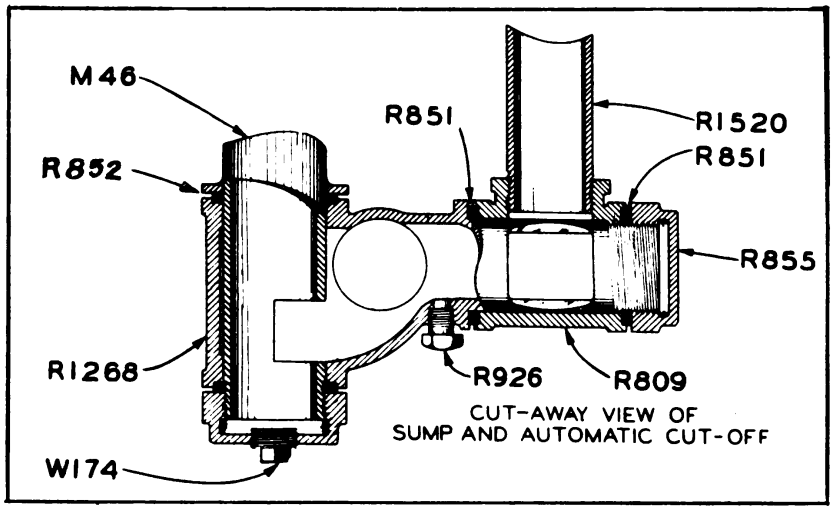


Fig. 34

FOLDING EXTENSION (Fig. 34)—Screw the R1520 into the side outlet of the R809 Folding Collar. Slide an R851 Gasket onto the Spindle of the Sump and follow with the assembled collar and Extension. Another R851 Gasket is placed over the Spindle and next to the outside edge of the collar. The Collar is held in place by an R855 Cap. The Cap is locked in place with a W121 Setscrew. NOTE: All parts of the spraybar can be used either on the right or left side with the exception of the R1267 Sump R.H. and the R1268 Sump L.H.

NOZZLES (Fig. 35)—The R926 Nozzles are screwed into the openings at the bottom of the Spraybar and when tight are left slightly offset (Fig. 35) so that adjacent lines of spray will not intermingle and cause uneven distribution.

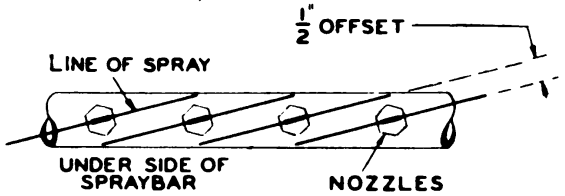


Fig. 35

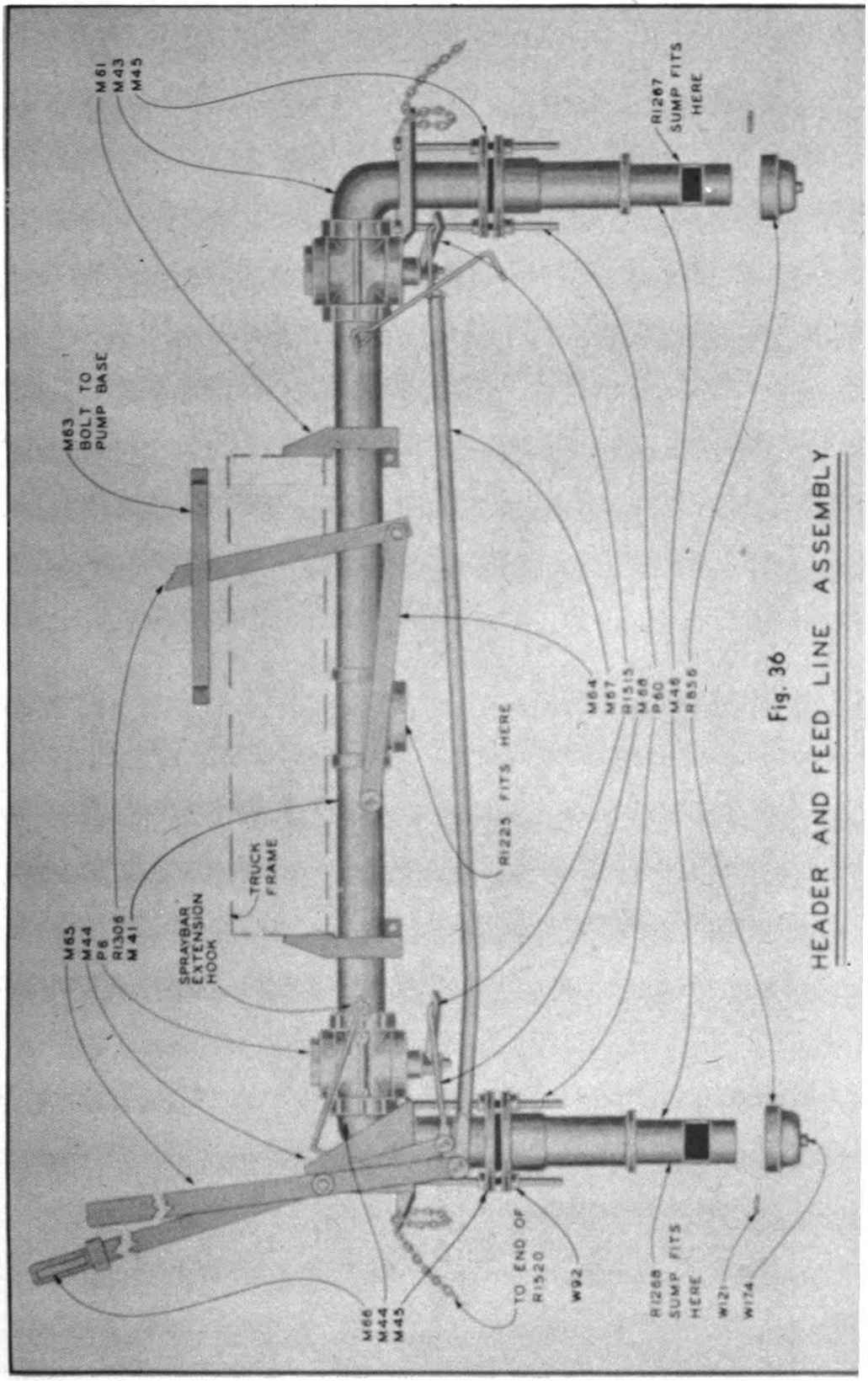


Fig. 36 HEADER AND FEED LINE ASSEMBLY

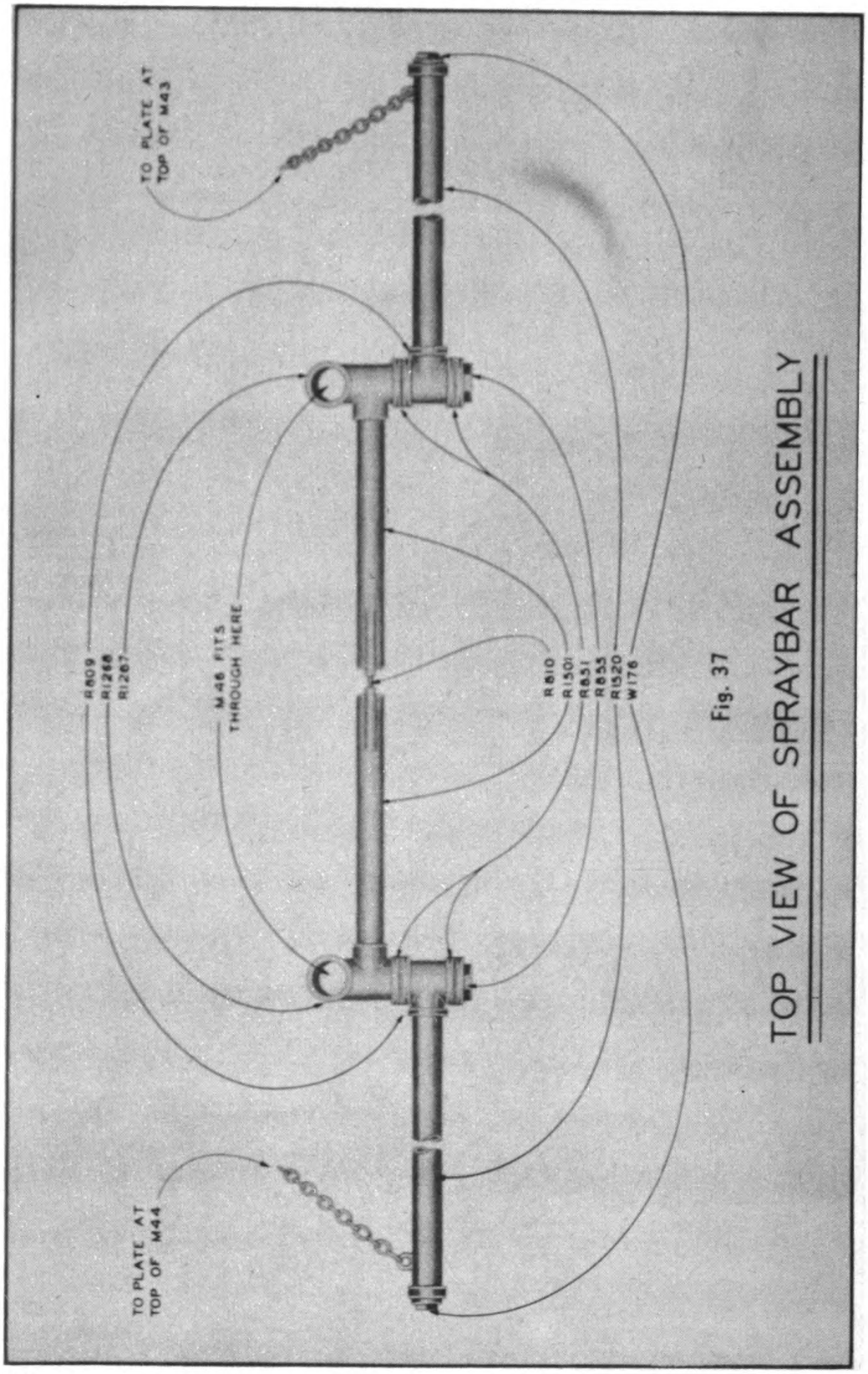


Fig. 37

TOP VIEW OF SPRAYBAR ASSEMBLY

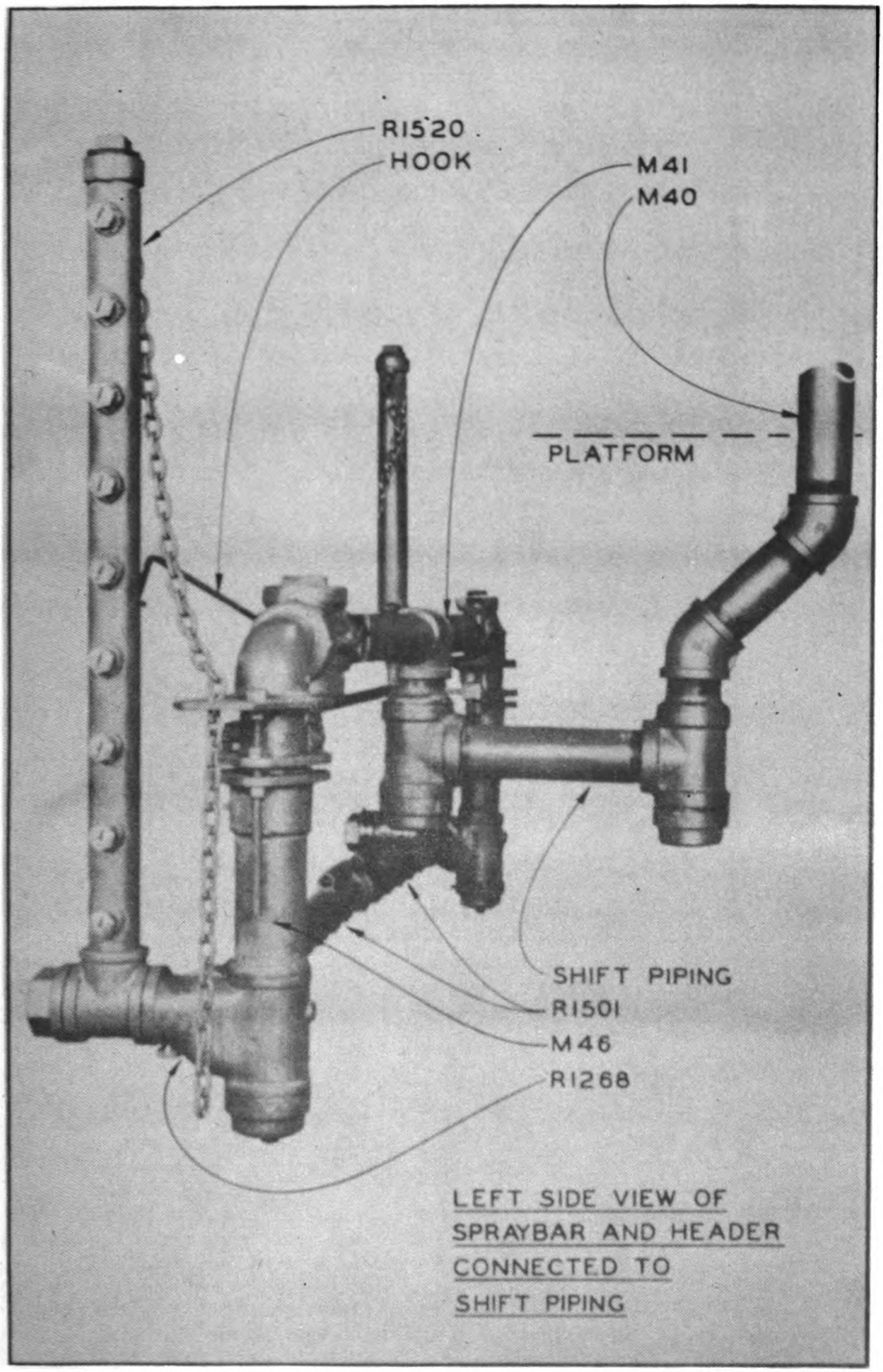


Fig. 38

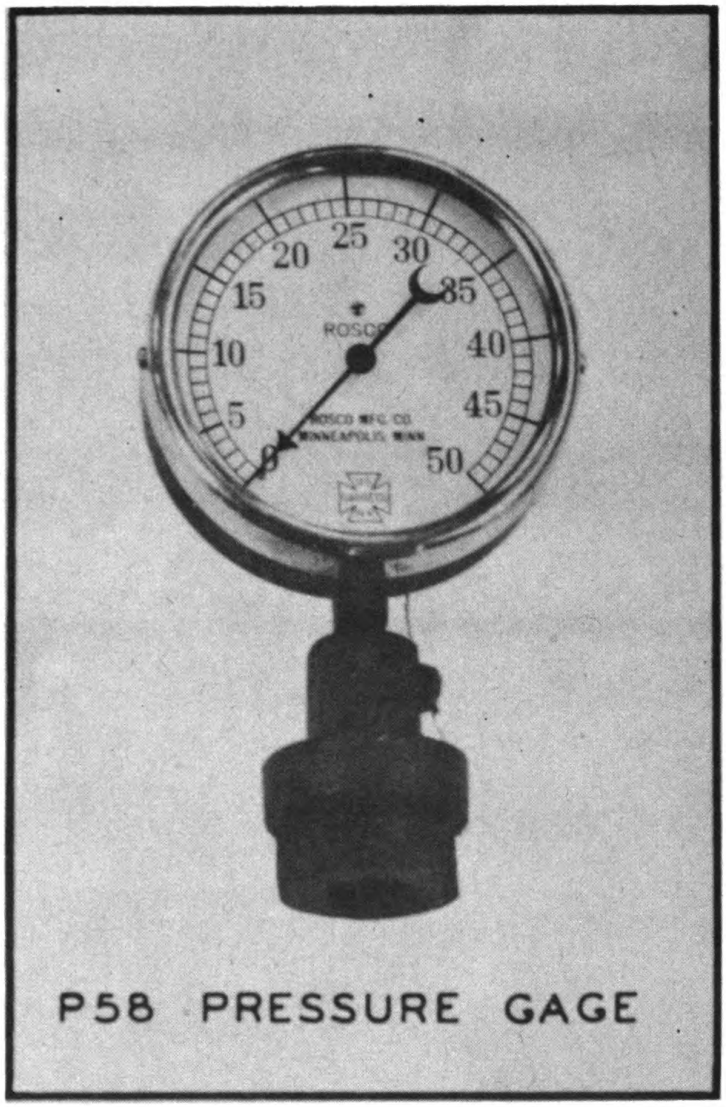


Fig. 39

PRESSURE GAGE—The P58 Gage is connected to the side outlet of the M40 Vertical Discharge Pipe (Fig. 29) and indicates the pressure in the spray line in pounds per square inch. A diaphragm fitting seals an exact quantity of special liquid within the gage mechanism and prevents the accumulation of silt or solids within the gage which would eventually cause it to become inoperative. This Instrument in conjunction with the Tachometer is the means by which the water is metered in gallons per square yards, so care must be exercised to prevent it from becoming damaged if accurate metering results are to be obtained.

NEVER build up sprayline pressure beyond the calibration shown on the face of the gage, as forcing the gage pointer beyond its capacity will cause irreparable damage to its delicate interior parts and thereafter render the gage inaccurate.

Generally the pointer of an inaccurate gage will not return to zero when the pressure has been released in the sprayline in which event the gage should be discarded and a new one installed. Another simple method of checking a gage is to attach it to the same air or water line that also has a gage of known accuracy connected to it.

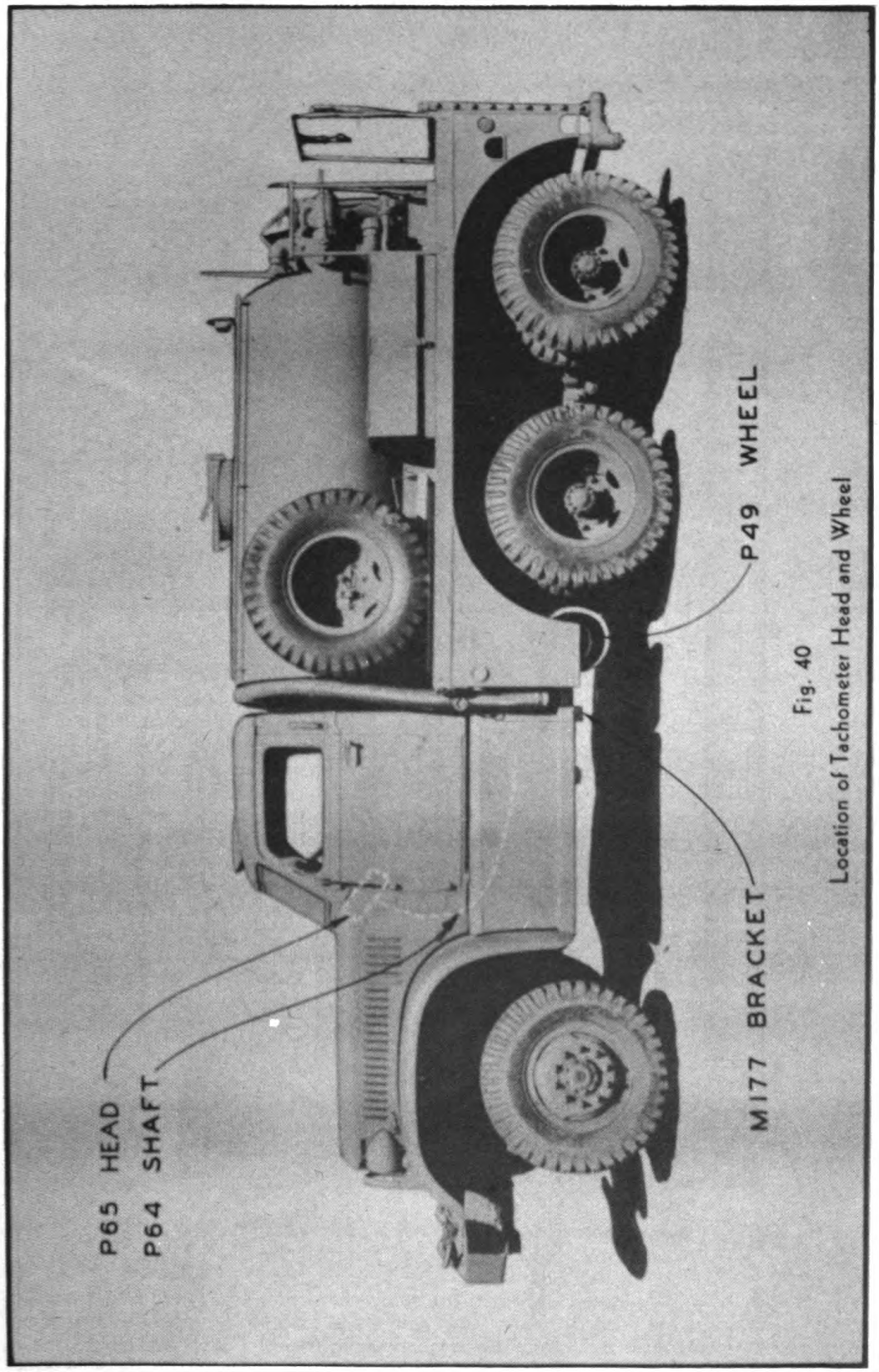
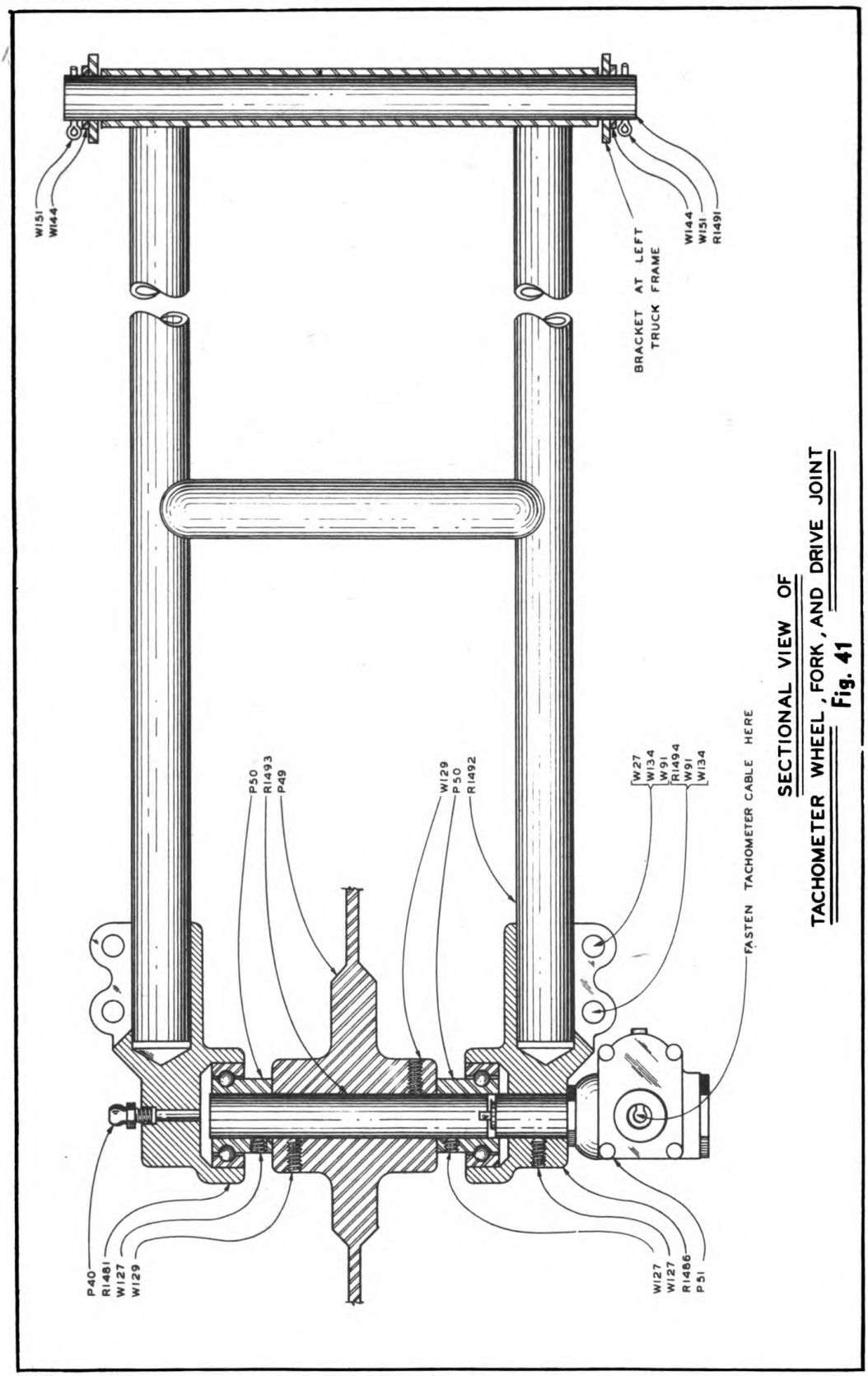


Fig. 40
Location of Tachometer Head and Wheel



SECTIONAL VIEW OF
TACHOMETER WHEEL, FORK, AND DRIVE JOINT
Fig. 41

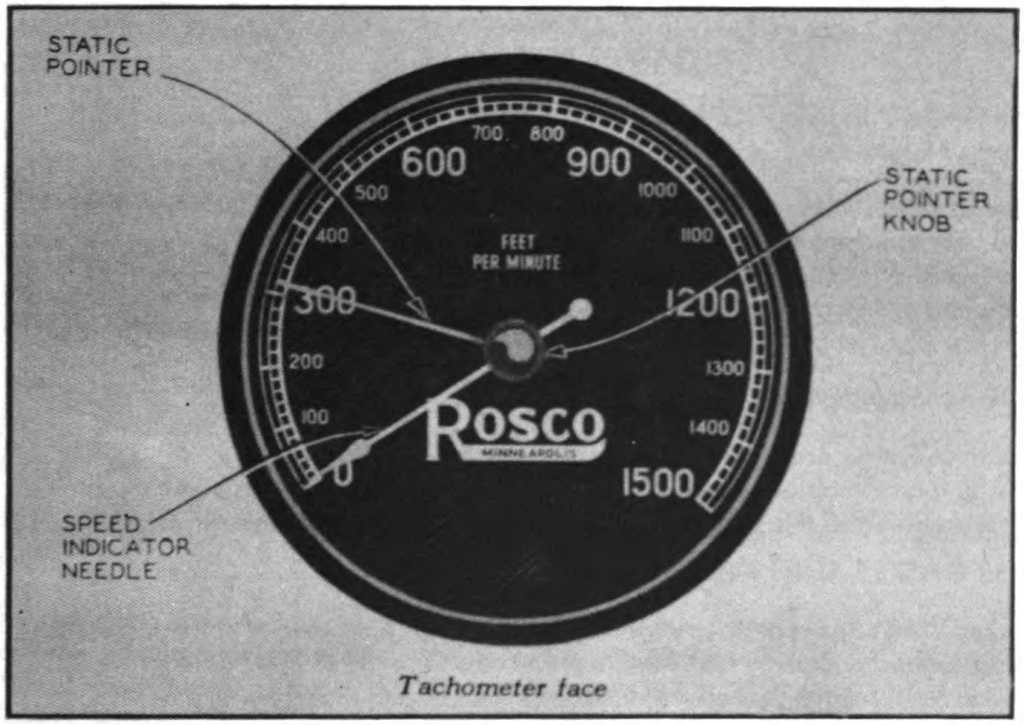


Fig. 42

WHEEL TYPE TACHOMETER (Fig. 41)—The sectional view of tachometer wheel, fork, and drive joint, shows the relation of parts which are assembled prior to fastening the fork to brackets which are welded to underside of the tachometer box.

Pass the R1493 Shaft through hub of the P49 Wheel and tighten W129 Setscrew sufficiently to hold it in place. Press a P50 Bearing into each of R1481 and R1486 Bearing Supports and then place R1493 Shaft through bearings. The sleeves of R1481 and R1486 are thrust onto the ends of R1492 Tachometer Fork and held in place by fastening the R1494 Yoke in the rear holes with W91 Nuts and W134 Washers. Place a W27 Screw through the front holes and turn on W134 Washer and W91 Nuts. Sleeve Slots in the side of R1481 and R1486 Supports will permit clamping on the ends of the fork when the nuts are drawn up tight.

Lock the Shaft to the Bearings and Wheel hub by tightening the Setscrews W129. Place the shaft of the P51 Drive Joint through hole in side of R1486 and lock by a W127 Setscrew. Note that the tongue and groove in Drive Joint and Shaft must match. Screw in a P40 Grease Fitting in the side of R1481 to provide lubrication for the bearings.

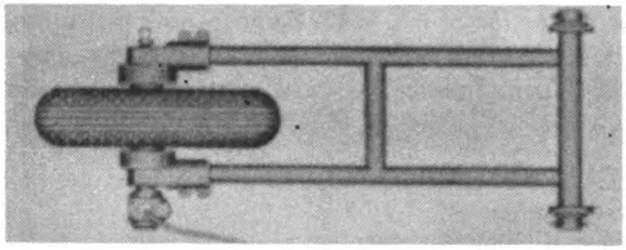


Fig. 43

When the Wheel, Fork and Drive Joint are assembled, place the cross tube of the Fork between the M177 Brackets which are bolted beneath the left truck running board. Pass the R1491 Bar through the Brackets and cross tube and lock in place with two W151 Pins. Attach one end of the P64 shaft to Drive Joint and the other end to the Tachometer Head.

GASKET REPLACEMENT

R1488 GASKET, SUCTION LINE—Located between tank outlet flange and M38 Flange Nipple.

Remove bolts which hold M38 Flange Nipple to tank flange at suction outlet and also bolts which hold M39 Flange Nipple to tank flange at discharge inlet. Remove bolts which hold pumping unit to base. Use crowbar or timber to move entire pumping unit and piping back sufficiently to insert a new gasket.

R911 GASKET, DISCHARGE LINE—Located between Tank Outlet Flange and M39 Flange Nipple.

Exactly the same procedure as replacing the above R1488 Gasket.
NOTE: It is advisable to replace both the R1488 and R911 Gaskets when the piping is disassembled to this extent even though one Gasket may appear to be all right.

R853 GASKET, SHIFT PIPING—Located at either end of the R970 Tees.

Loosen W121 Setscrews and remove the R857 Caps below each of the R970 Tees. Slide the Tees with the W281 Nipple attached off the R1225 Spindles. Remove R853 Gasket from beneath the collar of the R1225 Spindle and replace with a new Gasket. Slide the Tees and Nipple back on the Spindles and place an additional R853 Gasket at the bottom of each Tee. Replace the R857 Caps and tighten the W121 Setscrews.

P59 PACKING, VERTICAL HEIGHT ADJUSTOR—Located in the stuffing box of the M46 Sleeves.

Loosen the W92 Nuts which bear on the plate of the M45 Packing Gland. Slide the M45 Gland up on the M44 Sleeve. Wrap the P58 Packing around the M44 Sleeve and force down into the stuffing box at the top of the M46 Sleeve. Slide M45 Gland back in place and tighten the W92 Nuts sufficiently to prevent leaks.

R852 GASKET, SPRAYBAR SUMP—Located at the top and bottom of the R1267 and R1268 Sumps.

Remove R810 Break Pin at center of Spraybar. Loosen the W121 Setscrew in the side of the R856 Cap directly below the Sump. Remove Cap and the R852 Gasket beneath the Sump and allow the Spraybar to slide off the M46 Sleeve. Remove the R852 Gasket under the collar of the M46. Replace new gasket under collar and slide the Sump back on the Sleeve. Place another R852 Gasket beneath the Sump and replace the R856 Cap. Tighten the W121 Setscrew to prevent the cap from turning.

R851 GASKET, FOLDING SECTION COLLAR—Located on both sides of the R809 Folding Section Collar.

Remove W121 Setscrew in the R855 Cap and unscrew the cap. Remove the outside R851 Gasket and slide off the R809 Collar. Remove the other R851 Gasket which is on the opposite side of the Collar and replace with a new one. Screw on the R855 Cap and lock in place with a W121 Setscrew.

R911 GASKET, PUMP FLANGE—Located beneath the flange at the pump discharge outlet.

Remove bolts from M39 Flange Nipple at tank head, W300 Flange at top of pump and the M201 Bracket on the Transfer Line. Remove R857 cap from the bottom of the R1225 Spindle which is screwed into the W190 Elbow at the bottom of the Discharge Line. Attach a small hoist or other suitable device which will give a mechanical advantage and lift the entire Discharge Piping sufficiently to remove and insert a new R911 Gasket.

NOTE: Renewal of flange gaskets is rarely necessary except when installing a new part in the piping.

131-C VALVE, PUMP FLAP—Located at the pump suction inlet at the side of the pump.

Remove bolts from M38 Flange Nipple at tank head, and from M36 Flange Nipple at pump suction inlet. This releases entire suction line from pump and tank. The Flap Valve also acts as a gasket at the suction inlet. Remove old Flap Valve and replace with a new one. Bolt Suction Piping back in place.

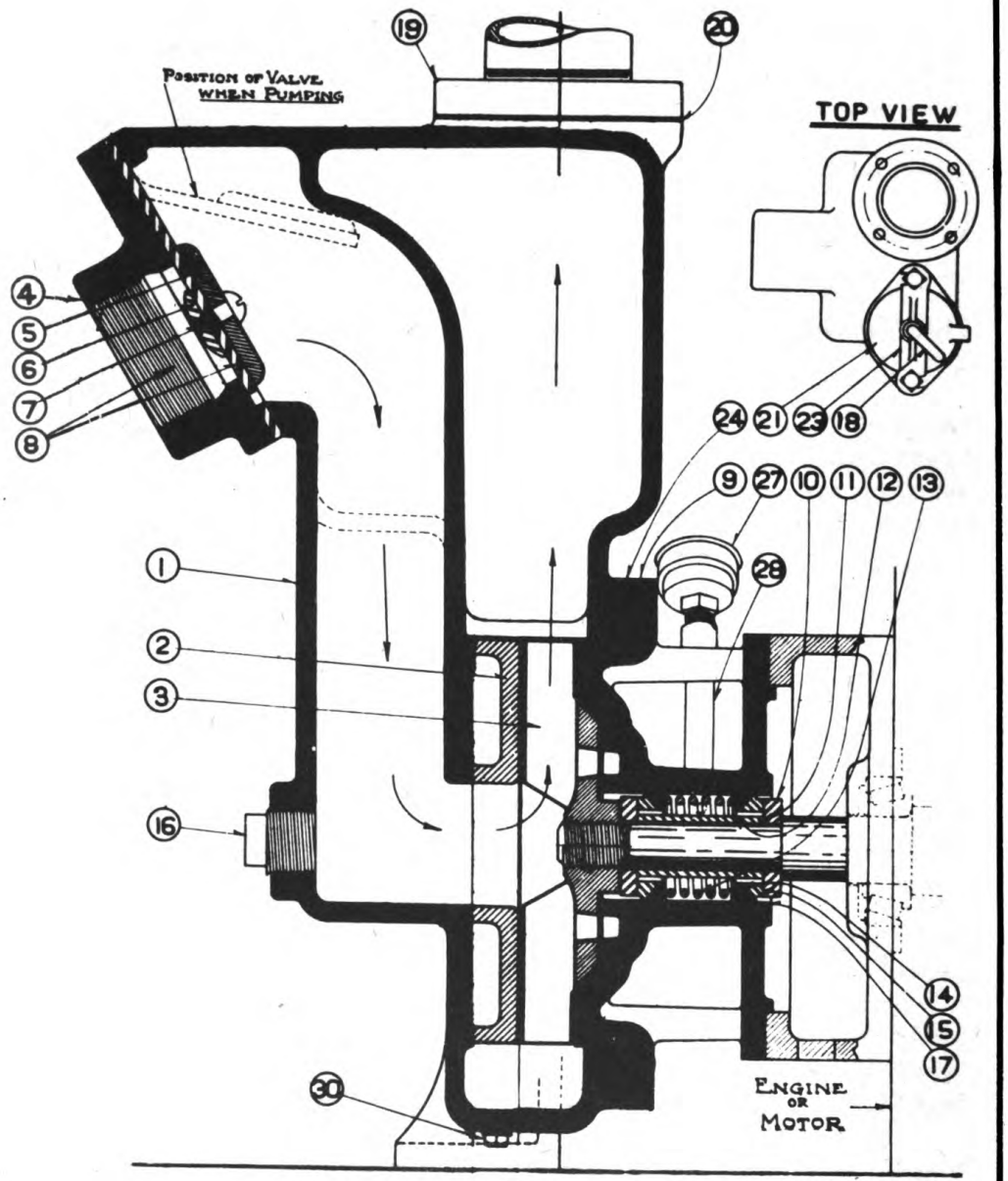


Fig. 44
Sectional View of Pump

PUMP

PROPER LUBRICATION OF THE GREASE SEAL (Fig. 44)—The grease seal is a great improvement over the customary stuffing box with packing, in fact, without it the self-priming centrifugal pump does not operate satisfactorily. The purpose of the seal is:

1. To keep air from entering the pump around the engine shaft during priming or pumping.
2. To prevent water from leaking out around the shaft when pumping.

When properly lubricated the seal will perform these two functions thoroughly for a long period of continuous operation. (See Lubrication Guide Fig. 25).

The grease seal is made up of parts 10 to 15, inclusive, and 17.

If water is seen to drop from around the grease seal retainer where the engine shaft enters the intermediate coupling, it is a sign that the seal is leaking and either some parts or the entire seal should be replaced. If operated too long in this condition water may enter the crankcase of the engine, causing the cylinder oil to emulsify which eventually would ruin the engine Timken bearings.

TO REPLACE GREASE SEAL ASSEMBLY (Fig. 44)—Remove pump body (1) from intermediate part (9) which exposes impeller (3). The impeller shaft is a right hand thread so to unscrew impeller place a hard wood block on the end of an impeller vane and strike the block a sharp blow with a hammer. If the impeller vane is not protected by the wood block and is struck directly with the hammer it may be broken.

After unscrewing the impeller from the shaft the grease seal parts may be removed from the seal housing by means of a stiff piece of wire bent on the end at right angles about ¼". Or if no wire is available the intermediate part (9) may be unbolted from the engine and removed from the shaft. Then the parts making up the grease seal can easily be pushed out of the seal housing with a screwdriver.

Before installing new seal parts, clean the shaft and the inside of the housing thoroughly with gasoline. Then the seal parts should be replaced in their respective positions as disclosed by the sectional drawing. Slip seal ring (10) onto the shaft against the shaft shoulder illustrated. Then slip the spacer sleeve (11) against the seal ring (10). Then seal cone (15) followed by rubber packing ring (14). Against this is placed flat washer (12). Then follows the compression spring and the remaining half of the seal with the parts placed in position in the reverse order described above.

Before the two seal cones, part 15, are placed in the seal the flat ground surface of each should have a light application of the soft grease used to lubricate the seal. Then the adjusting washers, between the last seal ring and the hub of the impeller, should be placed in their original position. These washers space the impeller properly with respect to the intermediate part (9).

Next screw the impeller back onto the shaft using a stick of wood inserted endwise between the impeller vanes, to tighten it firmly against the washers and the seal parts. After the pump is in operation the impeller will be further tightened by the pumping load.

Be sure to use the same thickness of gaskets, when attaching the pump body to the intermediate part (9), as these gaskets space the impeller properly with respect to the wear plate. The spacing of the impeller with respect to the wear plate (2) and also with respect to the intermediate part (9) can be determined by looking down through the discharge outlet of the pump. The proper spacing is 1/32" or about the thickness of a hand saw blade.

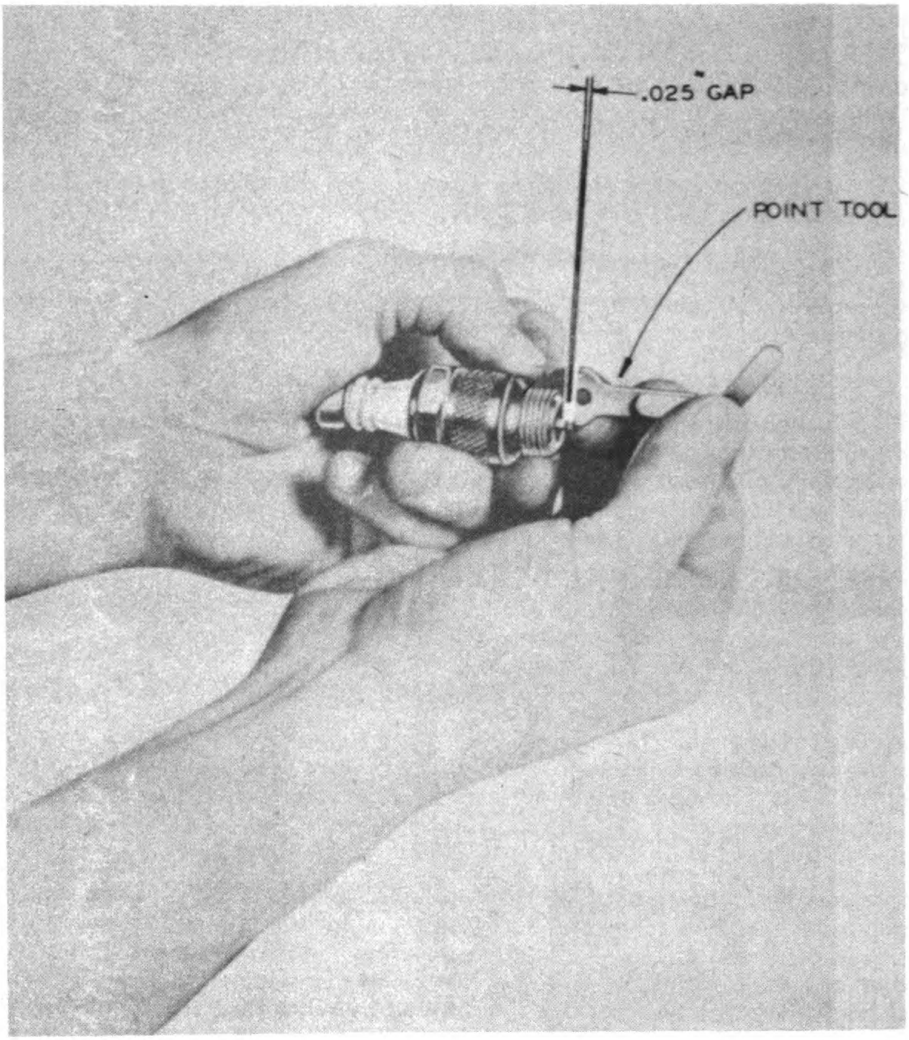


Fig. 45
INSPECTION OF ENGINE

64 HOURS—INSPECTION OF COOLING FINS—The fins on the cylinder and head must be kept clean at all times to insure proper cooling of the engine. If a collection of dust or other foreign matter is present upon inspection, it is recommended that the air shroud be removed and the fins cleaned. A stiff wire brush should be used.

256 HOURS—INSPECTION OF SPARK PLUG POINTS—The spark plugs should be removed after every 256 hours of operation, and thoroughly inspected and cleaned. The insulator which surrounds the center electrode must not be cracked or chipped or the plug will have to be replaced. Using a spark plug point wrench or a similar tool adjust the point to .025" after they have been cleaned and scraped. (Fig. 45) If the spark plug has to be replaced, use a Champion No. 7.

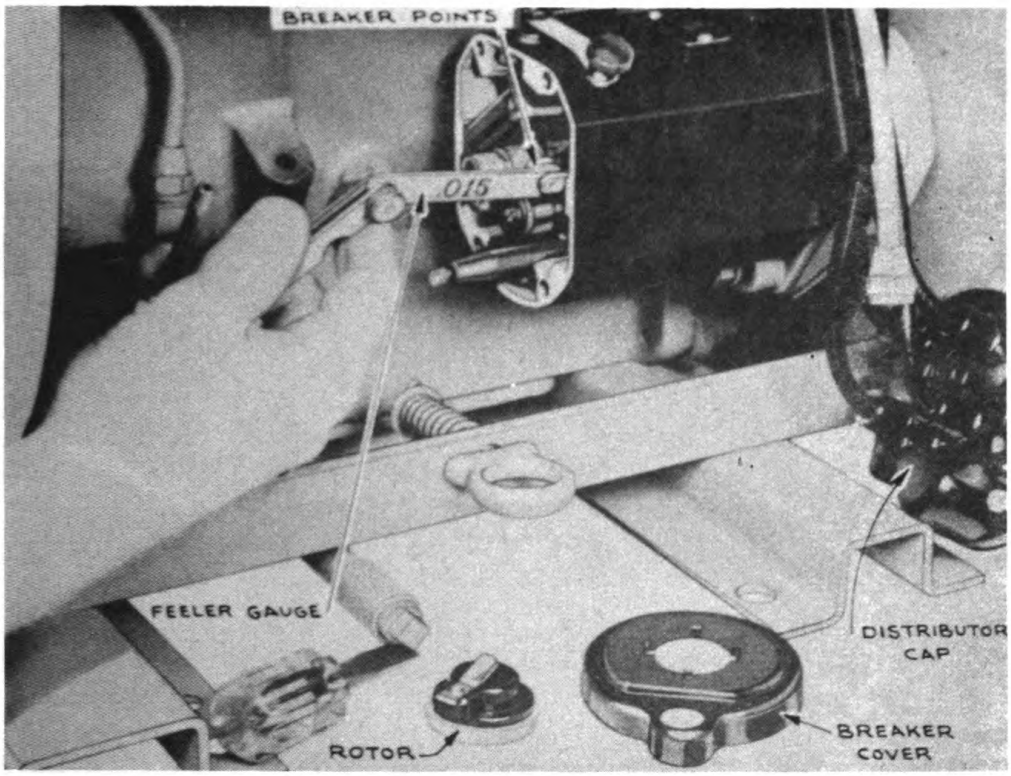


Fig. 46 CHECKING MAGNETO POINT CLEARANCE

256 HOURS—INSPECTION AND ADJUSTMENT OF MAGNETO POINTS— The magneto cover should be removed which will expose the points and the distributor rotor. The rotor should be removed by pulling it off of the shaft. The breaker points should be adjusted to .015" when fully open. Adjustment is made by shifting the fixed contact by means of the eccentric screw. After adjustment tighten the fixed contact screw. A feeler gauge should be used to set the gap at .015". If the contact points are found pitted or pyramided upon examination, they should be resurfaced using a small Tungsten file or fine stone. (Fig. 46)

STICKY VALVES—Sticky valves may be evidenced by a lack of power, hard starting or uneven power. This condition is usually brought about by the lead in gasoline and carbon deposit from oil forming on the head and stems of the valves. To definitely determine whether sticky valves are present, check compression of engine. If very little resistance to turning is evidenced by cranking, a sticky valve condition probably exists. If it is determined that sticky valves are present, the valves should be removed and ground as outlined under overhaul instructions.

SPECIAL INSTRUCTIONS FOR CARE OF ENGINE IN MOIST CLIMATES— At the end of each operating day, it is absolutely necessary to inject some "top oil" or a 50-50 mixture of kerosene and good gas engine oil, (same kind as used in crankcase of engine) into pet cock on intake manifold while engine is running at moderate speed. When heavy bluish smoke appears at exhaust stack, the engine should be shut off at magneto switch. This will cause a coating of oil to form on valves and will prevent rusting and sticking of valve stem due to moist atmosphere.

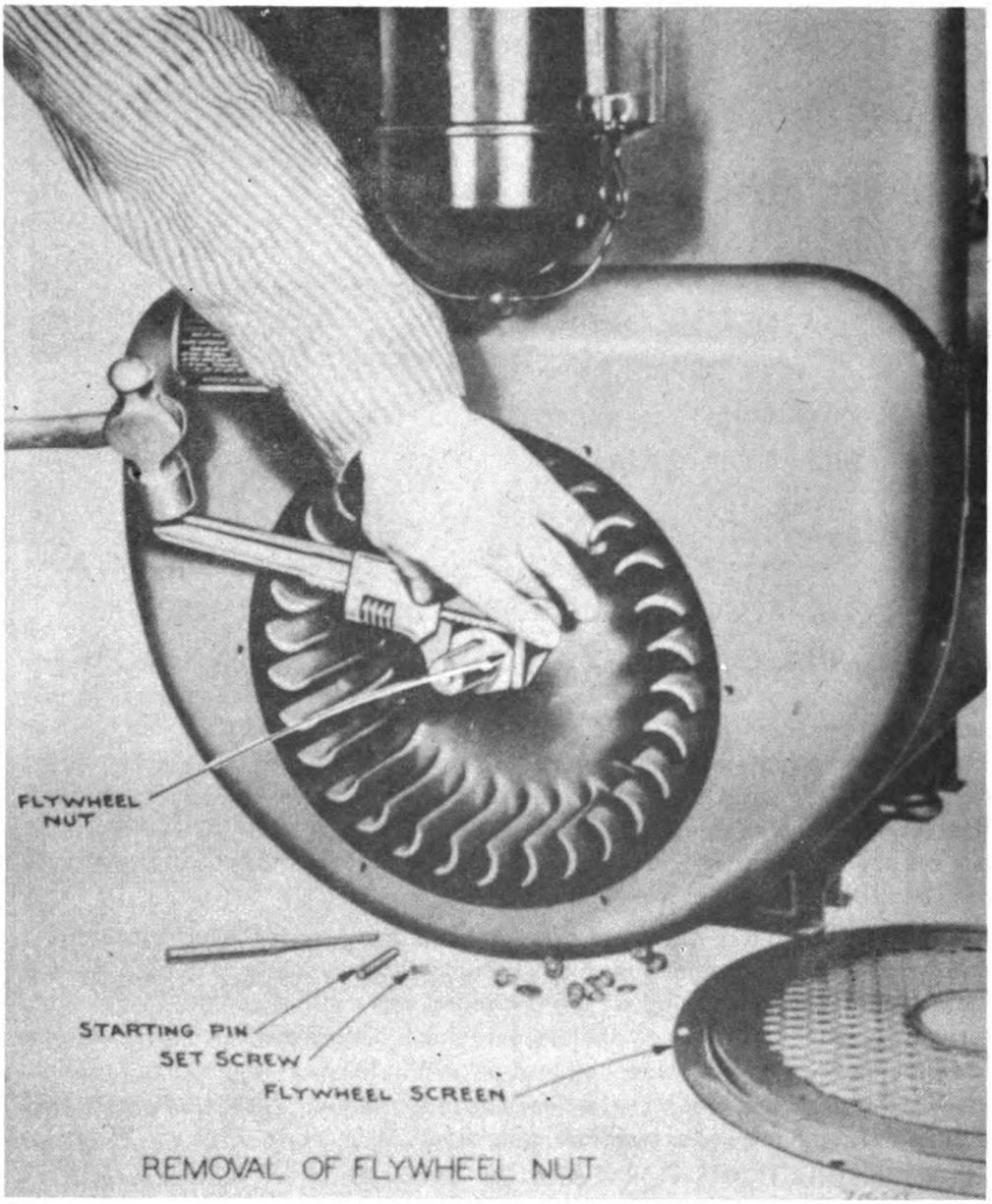
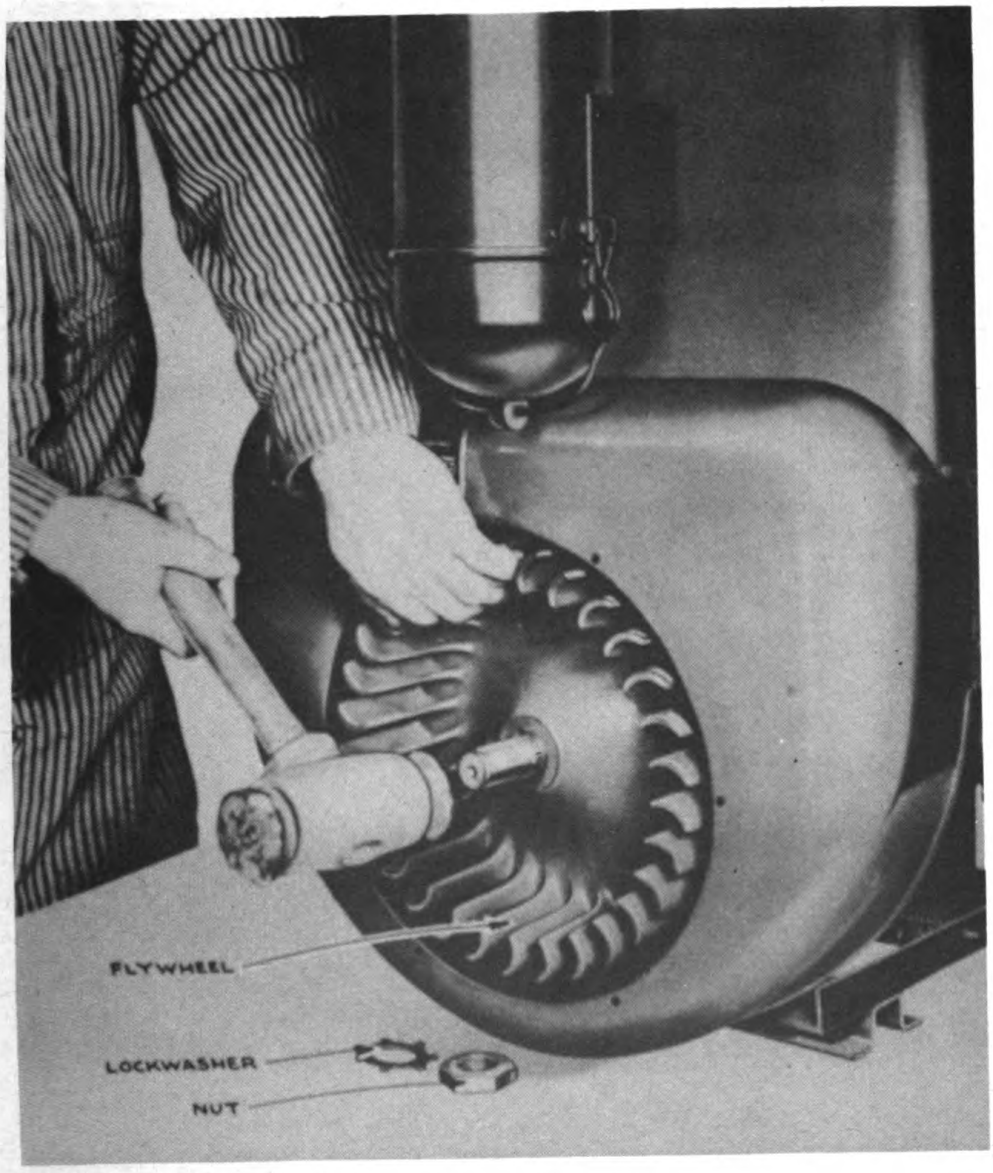
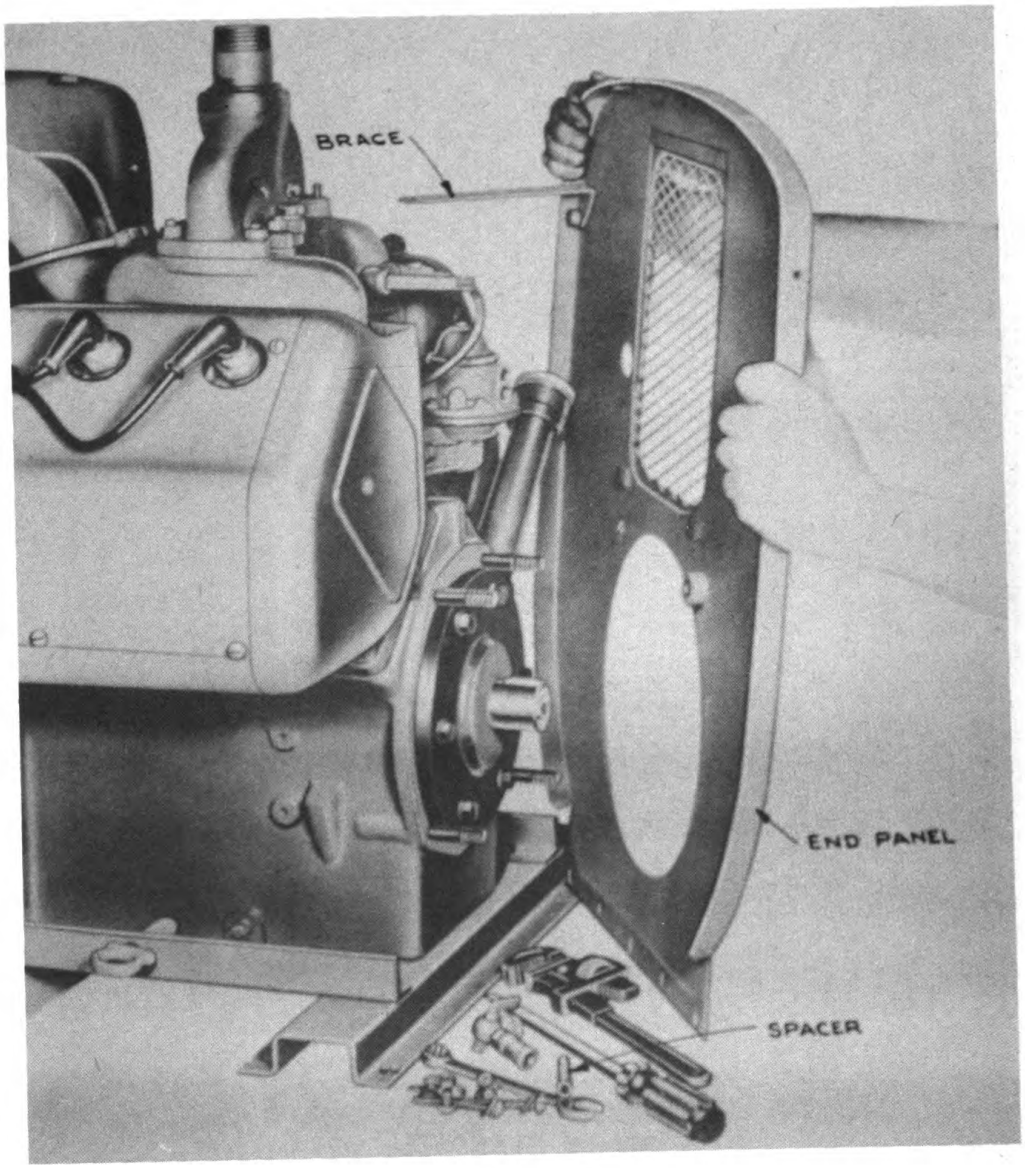


Fig. 47



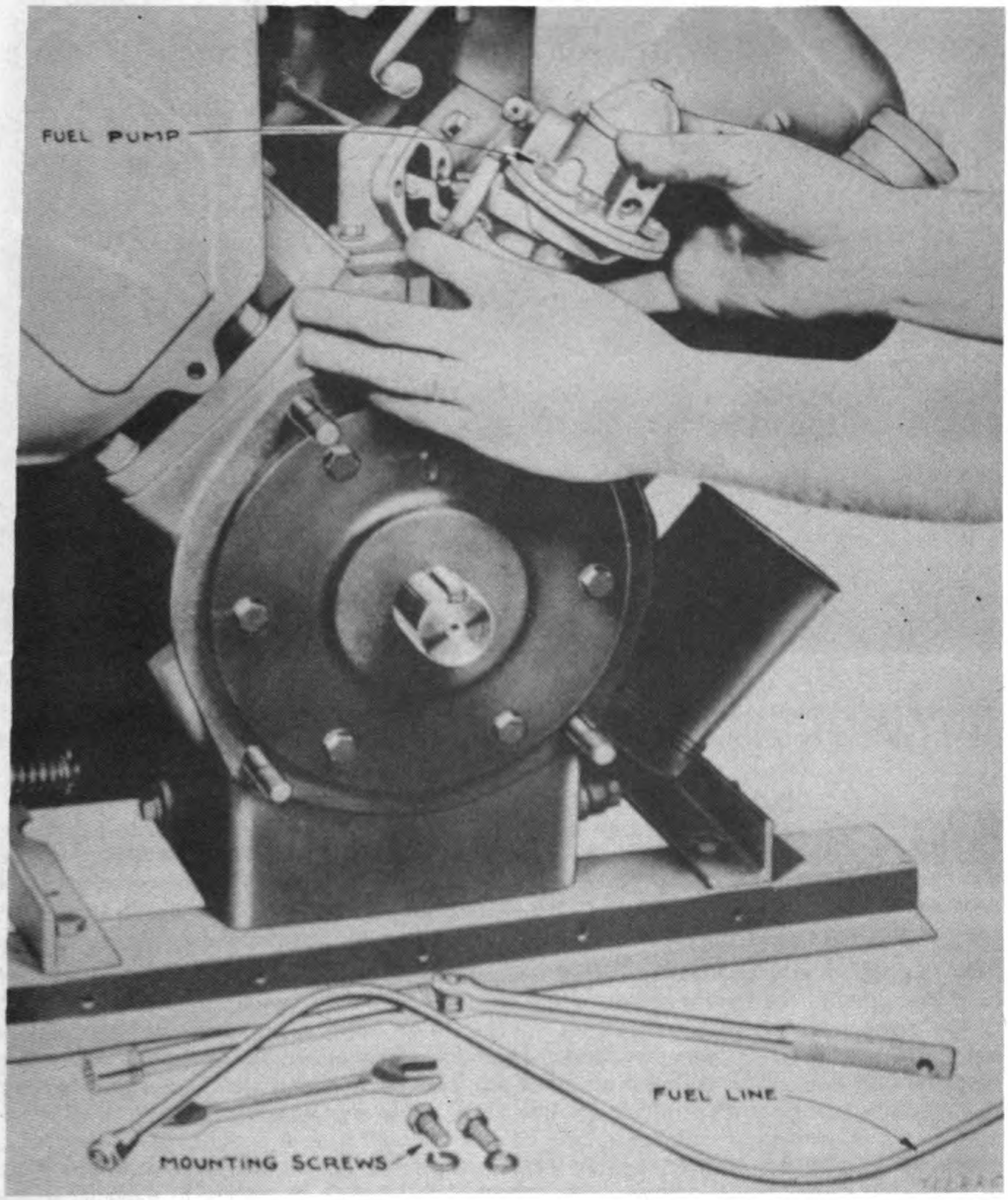
REMOVAL OF FLYWHEEL

Fig. 48



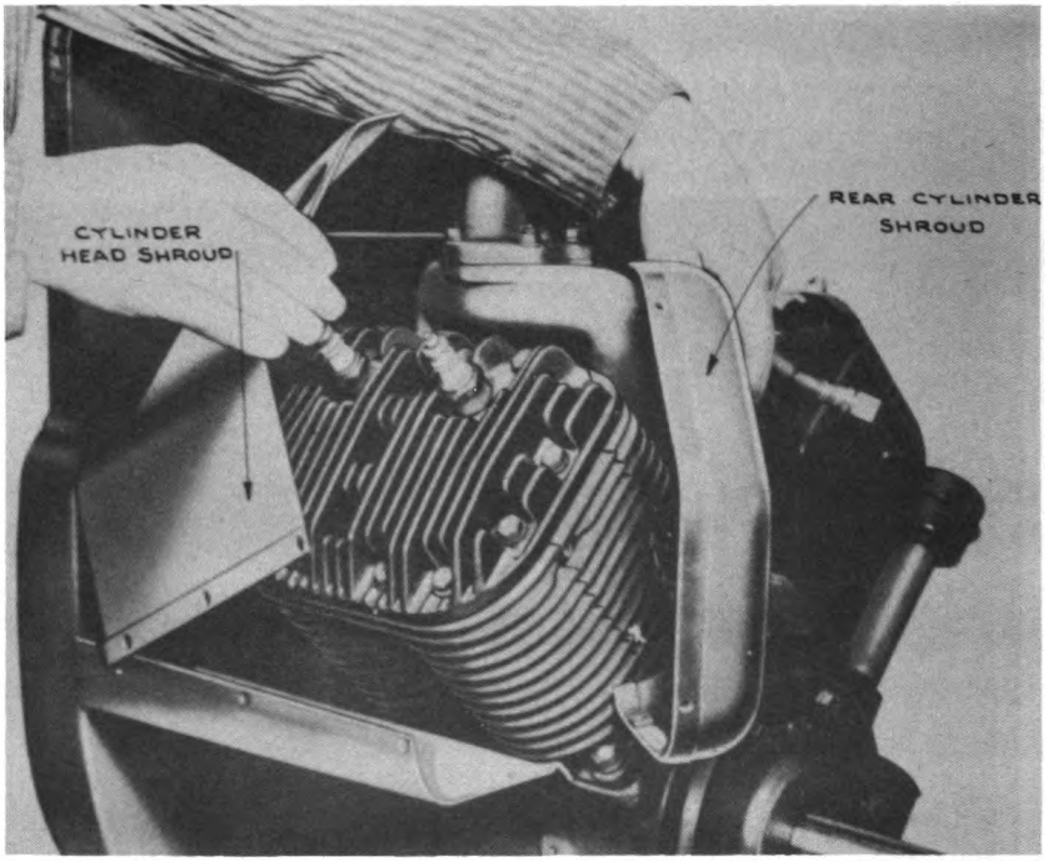
REMOVAL OF END PANEL

Fig. 49



REMOVAL OF FUEL PUMP

Fig. 50



REMOVAL OF CYL. SHROUDING
Fig. 51

DISASSEMBLY OF WISCONSIN VE4 ENGINE

GENERAL PROCEDURE—First, remove the side doors of the engine house. Remove the flywheel screen by removing and loosening the 6 round head screws and lockwashers which hold the screen in place. Remove setscrews for starting pin and drive out the starting pin with a drift punch.

Next, using a flat nozed punch straighten out the parts of the star washer which lock over the sides of the flywheel nut. Using a large monkey wrench, hammer on the end of the wrench to loosen the flywheel nut (Fig. 47). After starting nut is loosened remove it, together with the lockwasher. The flywheel fits on a taper on the crankshaft and can be removed by giving the end of the shaft several sharp blows with a babbitt or fibre hammer. (Fig. 48)

After the flywheel is loosened, it will slide off of the taper. Remove the round head screws and lockwashers holding the canopy. The entire canopy can then be lifted off of the engine house. The next step is to remove the end panel. (Fig. 49). This is accomplished by loosening and removing the round head screws and lockwashers which hold the end panel and spacer to the engine. By removing the nut and lockwasher on the manifold which holds the brace in place, the panel can then be removed. Remove the underslung fuel tank by first disconnecting the fuel line and then remove the nuts and lockwashers which hold the tank straps to the engine supports. The straps and tank can then be removed.

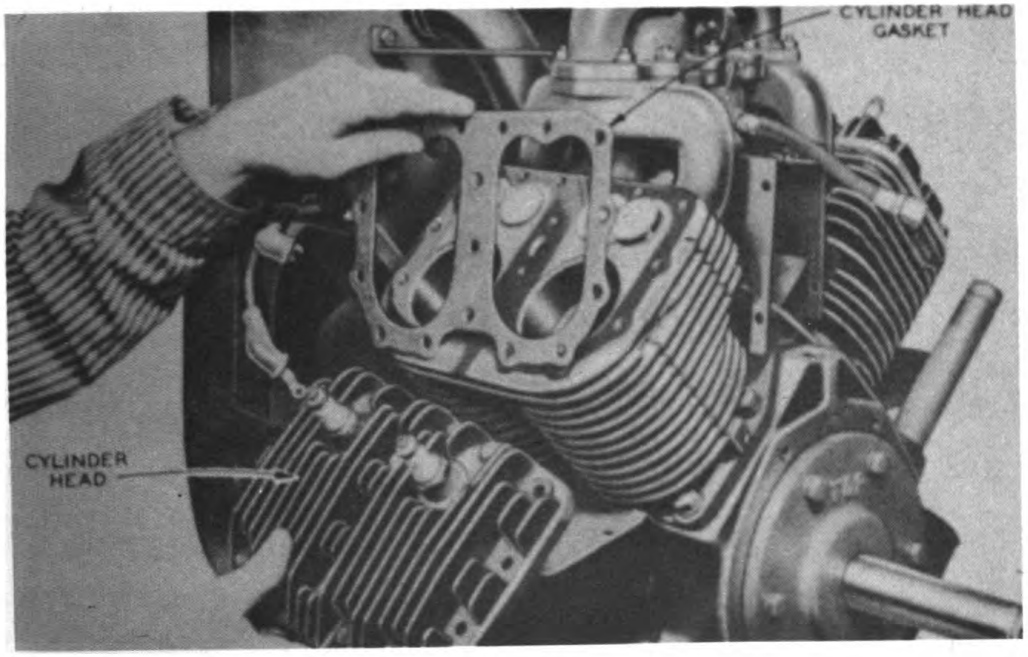


Fig. 52

The fuel pump can be removed by loosening and removing the two cap-screws and lockwashers which hold the pump to the adaptor (Fig. 50). Next, remove the round head and hexagon head screws and lockwashers which hold the rear cylinder shroud and the cylinder head shroud to the engine (Fig. 51).

After these screws have been removed the air shroud rear cover and cylinder head shroud may be removed. Next, remove the cylinder heads by loosening and removing the capscrews and washers and then lifting the cylinder head and gasket off the cylinder. (Fig. 52)

Next, loosen the clamp for the air cleaner hose nearest the carburetor. The choke control wire should then be removed by loosening the screw and nut which clamp the choke control cable to the carburetor. The screw which clamps the choke wire to the carburetor arm should also be loosened. The choke control wire can then be pulled off of the carburetor. Remove the governor control rod by removing the cotter pin which fastens the rod to the governor control lever and then unthread the rod from the carburetor.

Next, loosen and remove the nuts and lockwashers which hold the upper branch of the manifold to the lower branch and the front panel brace can also be removed. The panel brace fastens to one of the studs which hold the upper and lower manifold together. The manifold should then be rocked back and forth slightly with the exhaust pipe for leverage. This will break the manifold loose from the gaskets and the entire upper branch of the manifold should be pried off of the lower branch using a screw-driver or similar tool (Fig. 53).

NOTE—When prying the upper branch of the manifold off care should be taken that it is pried off evenly from both ends so that the outer manifold flanges will not crack or chip off.

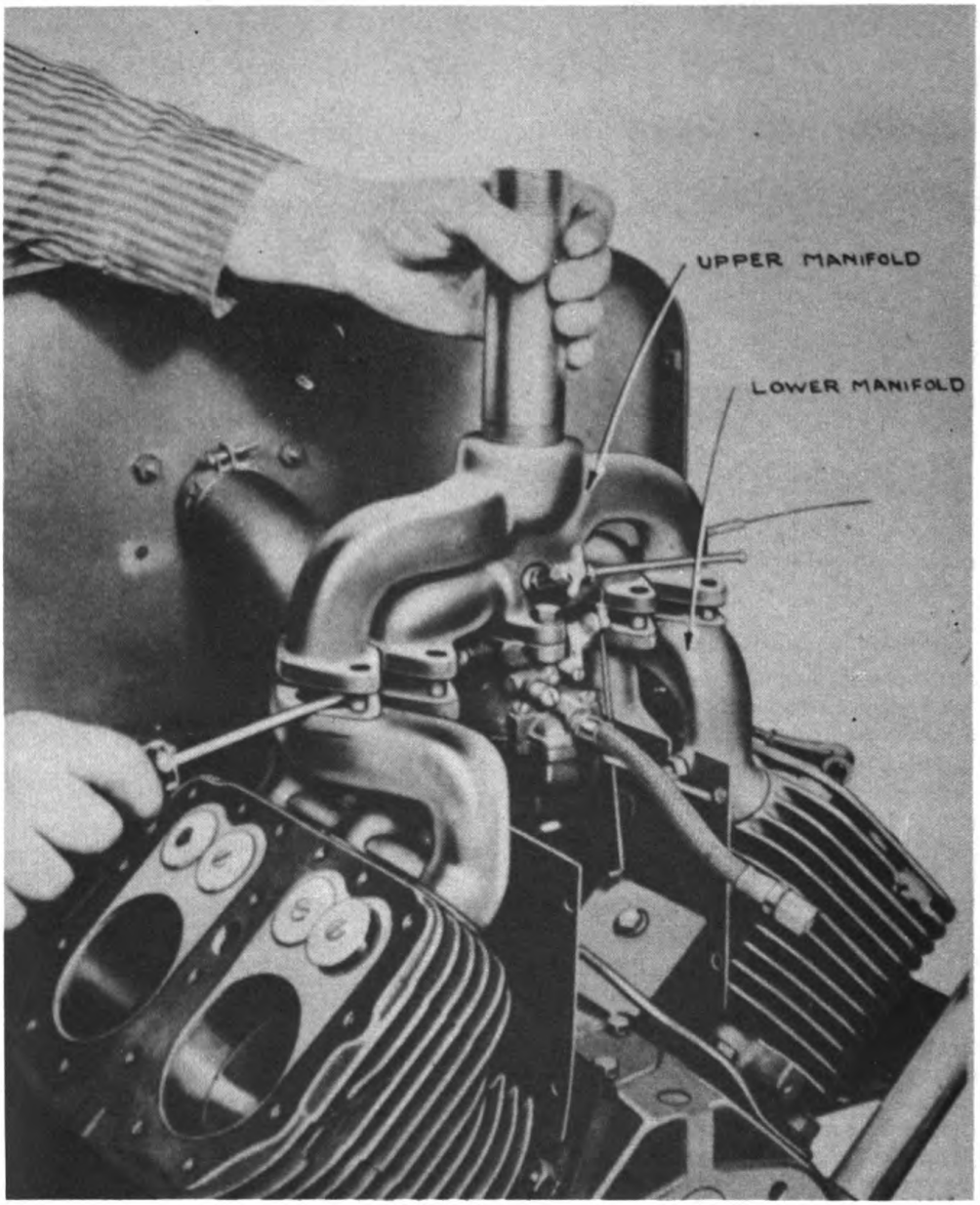


Fig. 53
Removal of Manifold

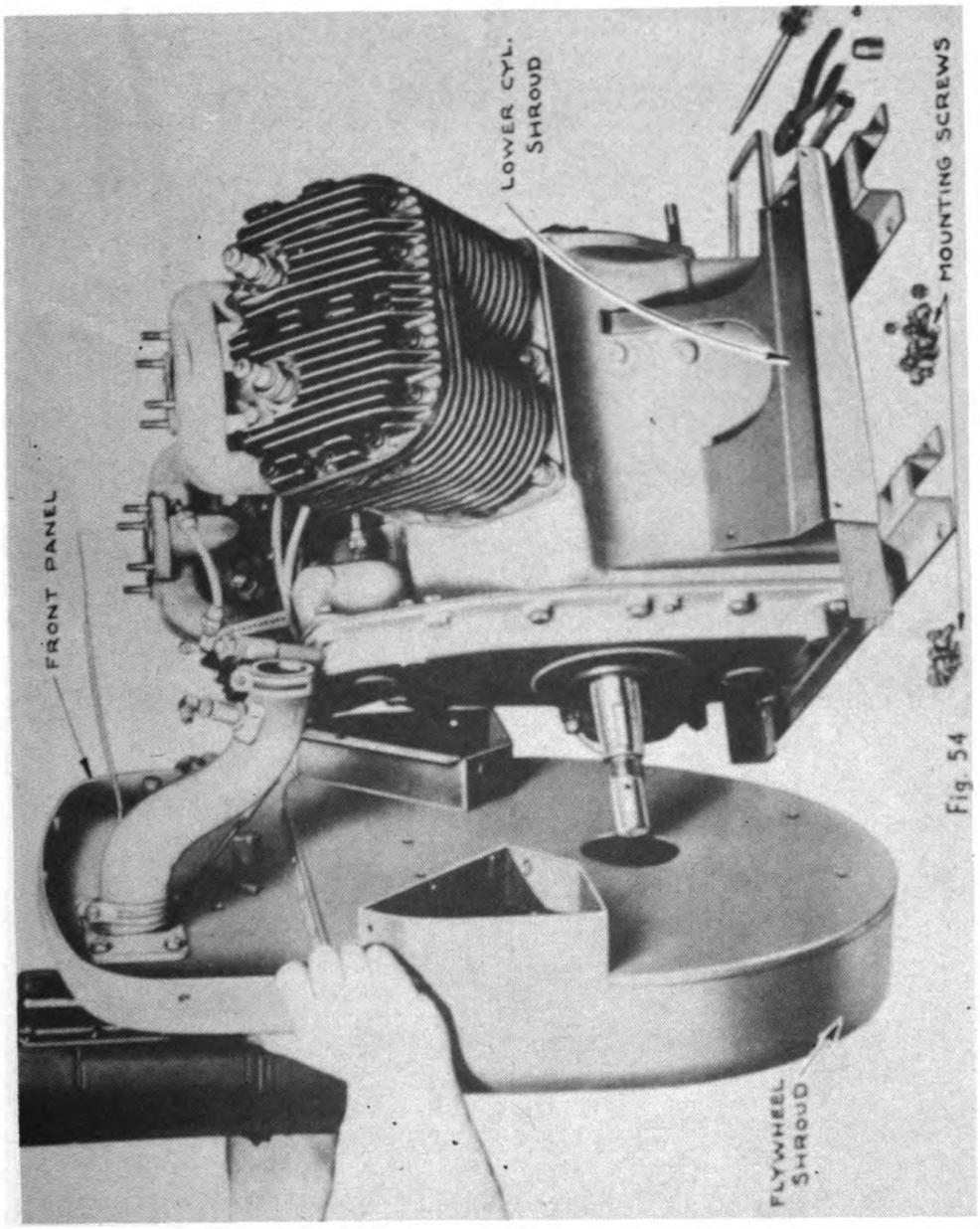
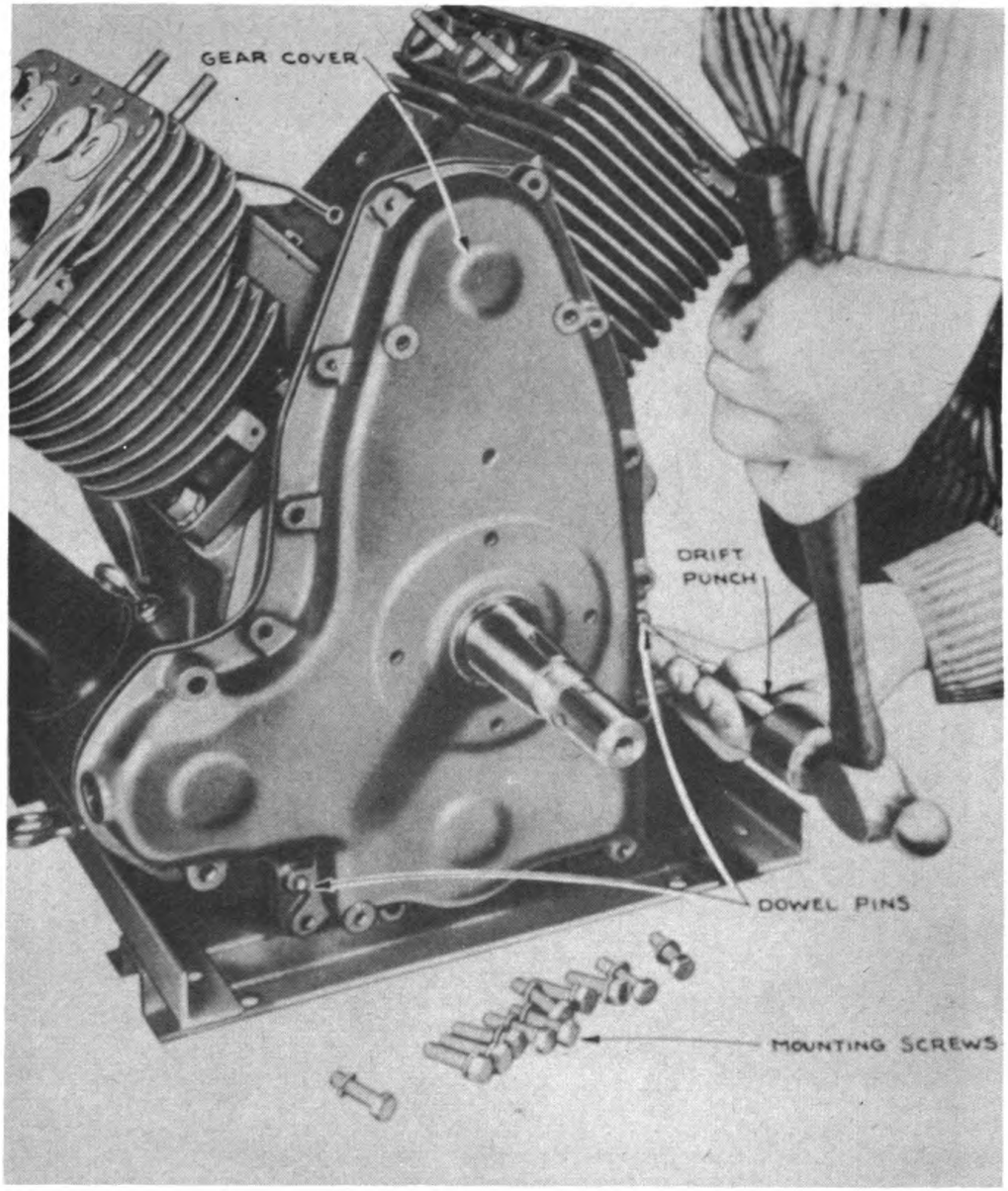
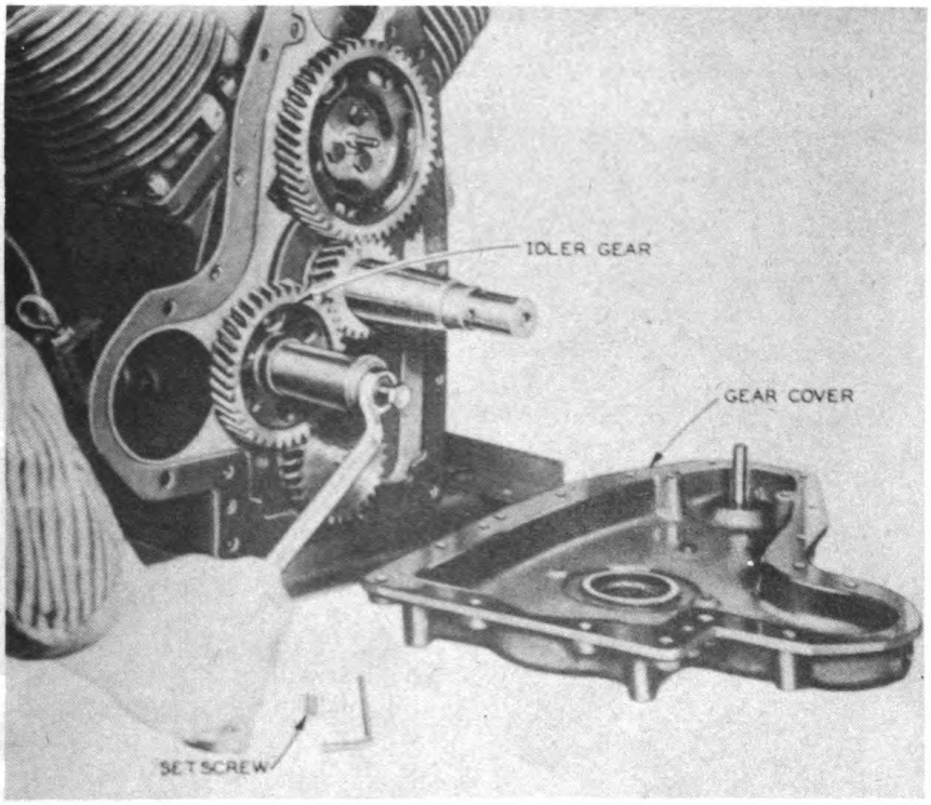


Fig. 54 REMOVAL OF FLYWHEEL SHROUD



REMOVAL OF GEAR COVER

Fig. 55



REMOVAL OF IDLER GEAR & SHAFT

Fig. 56

Remove the governor spring from the governor control lever using pointed nosed pliers. Next, loosen the lock nut on the governor adjusting screw support pin and unthread the support pin from the manifold using the adjusting screw as a lever. The entire assembly of the governor spring, governor adjusting screw, and governor adjusting screw support pin can then be removed as a unit. Next, remove the cylinder head deflector and the lower cylinder shroud, by the removal of the round head capscrews which hold same to the flywheel shroud.

Remove the ignition wire from the ignition switch. Remove the 6 capscrews and lockwashers which hold the flywheel shroud to the gear cover. The entire flywheel shroud can then be pulled off of the engine.

The air cleaner and air cleaner hose and clamps, and also the front panel will be removed as an assembly with the flywheel shroud. (Fig. 54). Next, loosen and remove the nuts and lockwashers which hold the intake and exhaust manifolds to the cylinders. This will expose the manifold gaskets which should also be removed.

Remove the 4 capscrews and copper washers which hold the valve tapper inspection plates to the cylinders. The gaskets which seal these plates will normally remain attached to the cylinder. Next, remove the 4 capscrews and lockwashers which hold the governor housing to the gear cover, and remove the governor housing. The entire governor assembly, together with the weights can then be pulled off of the governor shaft.

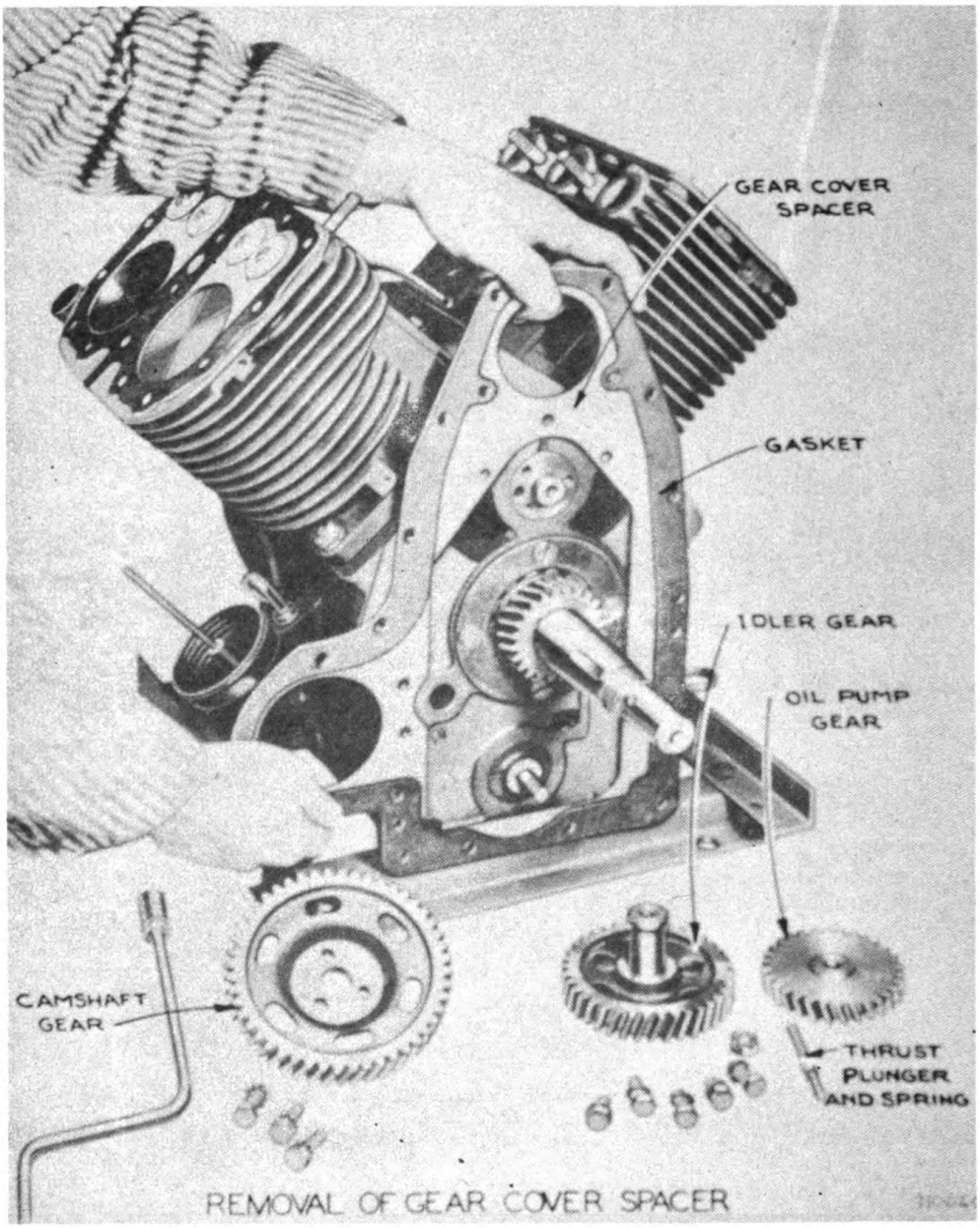
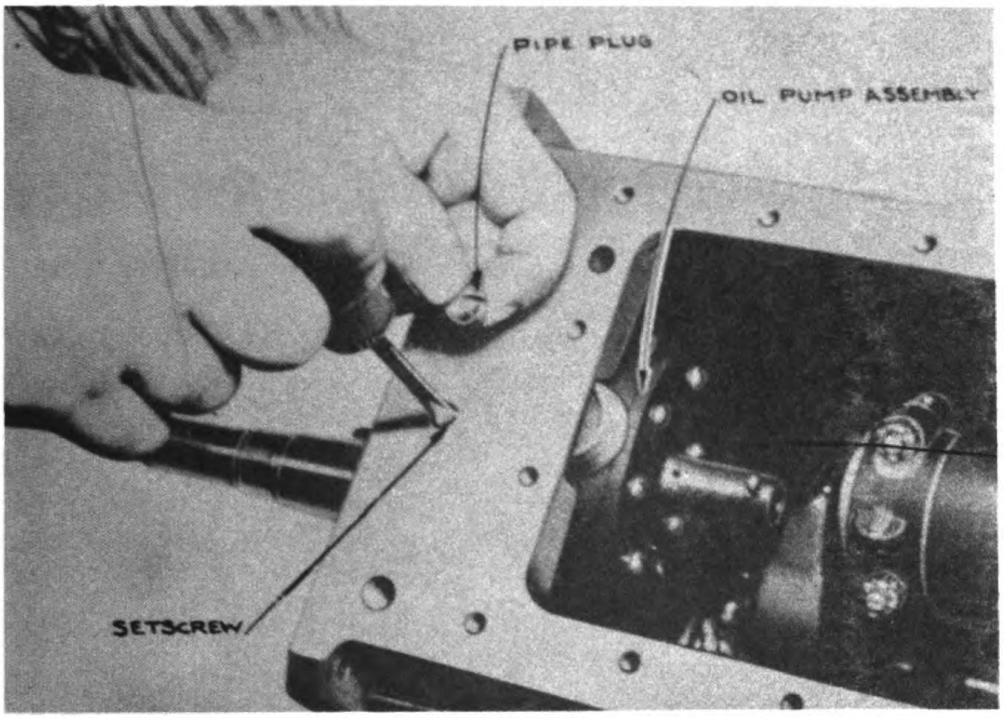


Fig. 57



REMOVAL OF OIL PUMP ASSEMBLY **Fig. 58**

The magneto should be removed next by loosening and removing the lower bolt, lockwashers, and nut, and also the upper lockwasher and nut. The entire magneto assembly, together with the gear can then be pulled off of the engine.

Remove the capscrews and lockwashers which hold the gear cover to the crankcase. The gear cover is doweled to the crankcase to maintain gear centers and these dowels must be driven out with a drift punch before the gear cover can be removed. (Fig. 55). After these dowels are driven out the gear cover may be pulled off of the engine. This will expose the timing gear train.

Remove the Allen head setscrew, on the magneto side of the crankcase which locks the idler shaft in position. With the use of a puller the idler shaft and idler gear assembly can be removed from the crankcase. (Fig. 56). Next, remove the camshaft thrust plunger and spring. This spring and plunger is set into a recess in the end of the camshaft and can be lifted out with the fingers.

Loosen the cotter pin and nut holding the oil pump drive gear to the oil pump shaft and with a screwdriver or similar tool pry the oil pump gear off of the shaft.

Remove the camshaft gear by loosening and removing the 3 capscrews and lockwashers which hold the gear to the end of the camshaft. It is to be noted that the mounting holes in the camshaft gear are staggered in such a manner that the gear can be assembled to the shaft only one way which will automatically time the gear to the shaft.

After the 3 screws and lockwashers holding the gear to the shaft are removed the gear should be pried off of the camshaft, using a screwdriver or similar wedge tool. The gear cover gasket can now be pulled off of the gear cover spacer.

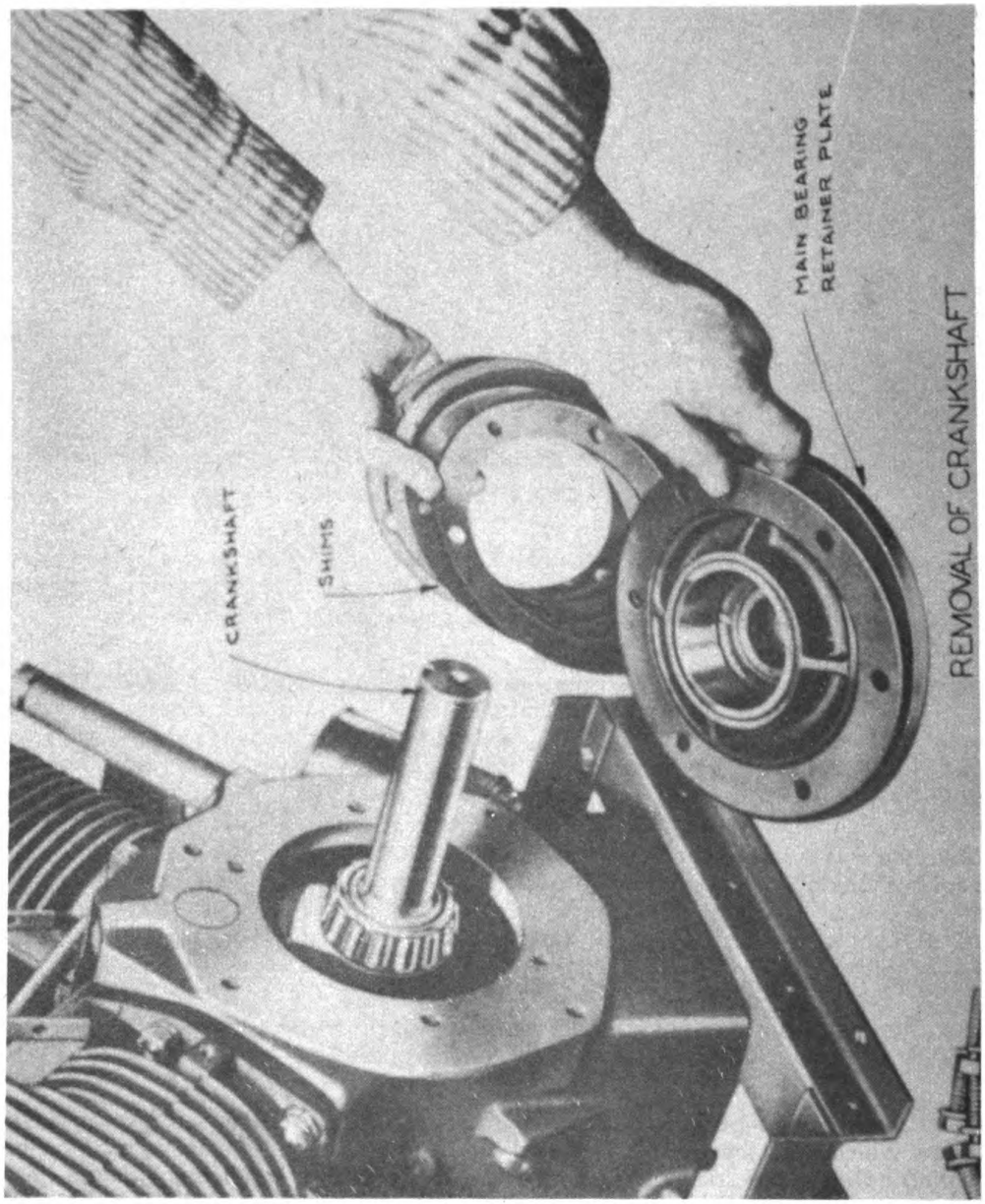


Fig. 59

Remove the gear cover spacer by loosening and removing the 5 capscrews and lockwashers which hold same to the engine crankcase. (Fig. 57). After all of the above parts have been disassembled this will leave the crankcase and cylinders still assembled. This assembly should then be tipped over to stand on one of the cylinder blocks.

The engine supports together with the side rails of the engine house should be removed as an assembly by the removal of the 4 capscrews and lockwashers which hold same to the bottom cover of the crankcase. Next, remove the crankcase bottom cover plate by the removal of the 14 capscrews and lockwashers. The bottom cover, together with the gaskets, can then be lifted off of the crankcase.

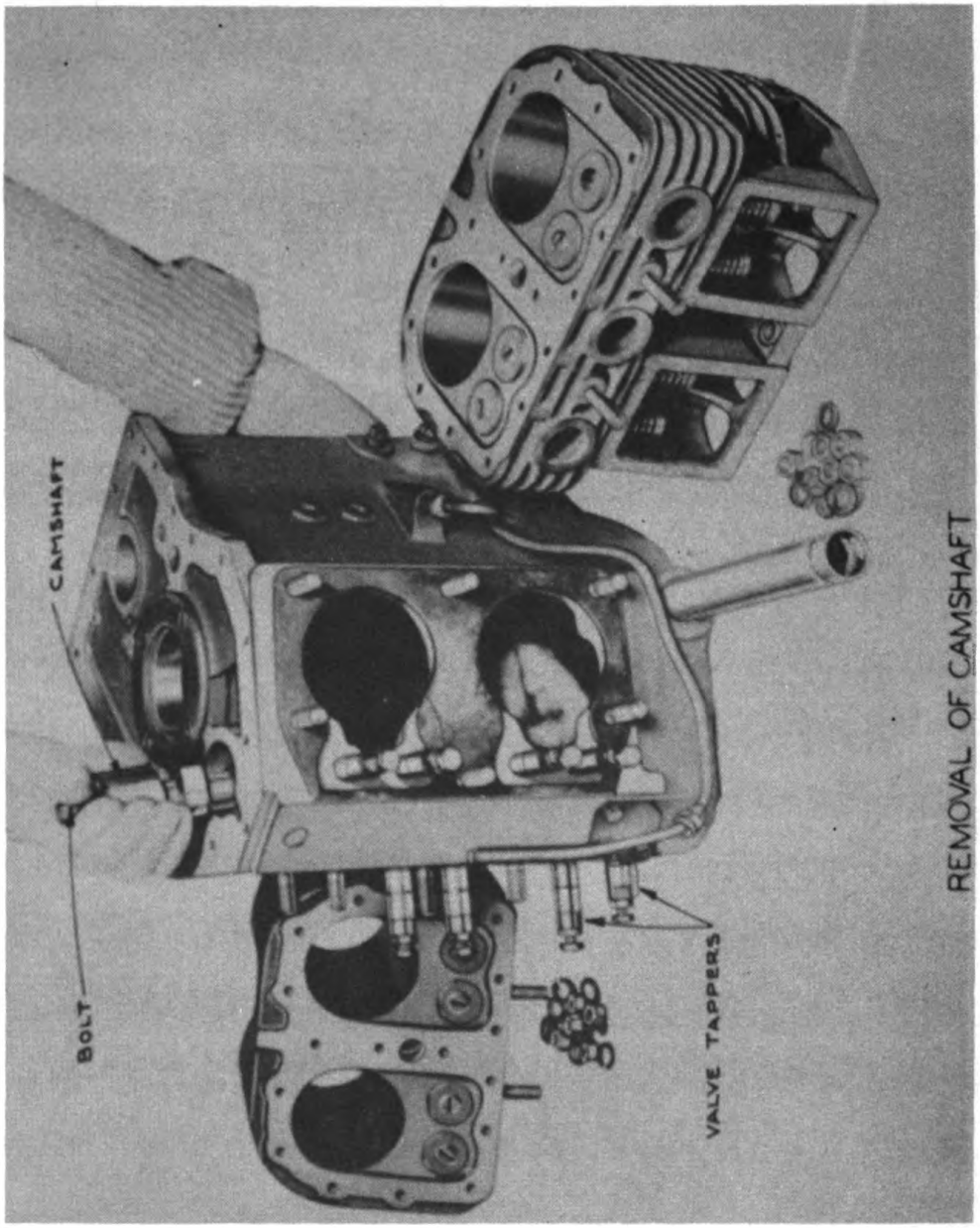
Remove the 1/8" pipe plug on the bottom of the crankcase. This will expose the setscrew which holds the oil pump assembly in the crankcase. (Fig. 58). Then, using a babbitt hammer, tap against the oil pump shaft and drive entire oil pump assembly into the crankcase. The oil pump assembly may then be removed through the bottom opening in the crankcase. Next, remove the 8 cotter pins which lock the connecting rod nuts in place. Then, using a socket wrench, remove the nuts from the connecting rod bolts. Removal of the connecting rod nuts is facilitated by use of a universal joint socket arrangement.

Remove the lower connecting rod cap. It is always advisable to remove one connecting rod cap at a time. After the cap has been removed, on number 1 piston, the exposed part of the connecting rod should be tapped with the handle of a hammer and forced out of the cylinder bore. As soon as the piston extends up and over the end of the cylinder the piston should be grasped with the hand and the entire connecting rod and piston assembly should be pulled out of the cylinder bore. The two connecting rod shims should remain on the connecting rod bolts during the removal of the rod and piston assembly, and the lower cap should then be replaced on the rod together with the nuts so that it gives no possibility of mixing up the lower caps. The same cap must be used on the same connecting rod when the rods are reassembled together with the proper shim.

After the 4 connecting rod and piston assemblies have been removed the crankshaft can then be removed from the engine. This is accomplished by loosening and removing the 6 capscrews and lockwashers which hold the rear main bearing plate in place.

After the main bearing plate is removed the crankshaft can be slipped out of the opening made by the removal of the main bearing plate (Fig. 59). Care should be taken that the bearings on the crankshaft are protected when the crankshaft is removed so that they do not bump against the side of the case.

Remove the cylinder blocks by removing the 6 lockwashers and nuts which hold each cylinder to the crankcase. The cylinder and cylinder base gaskets may then be lifted off of the crankcase.



REMOVAL OF CAMSHAFT

Fig. 60

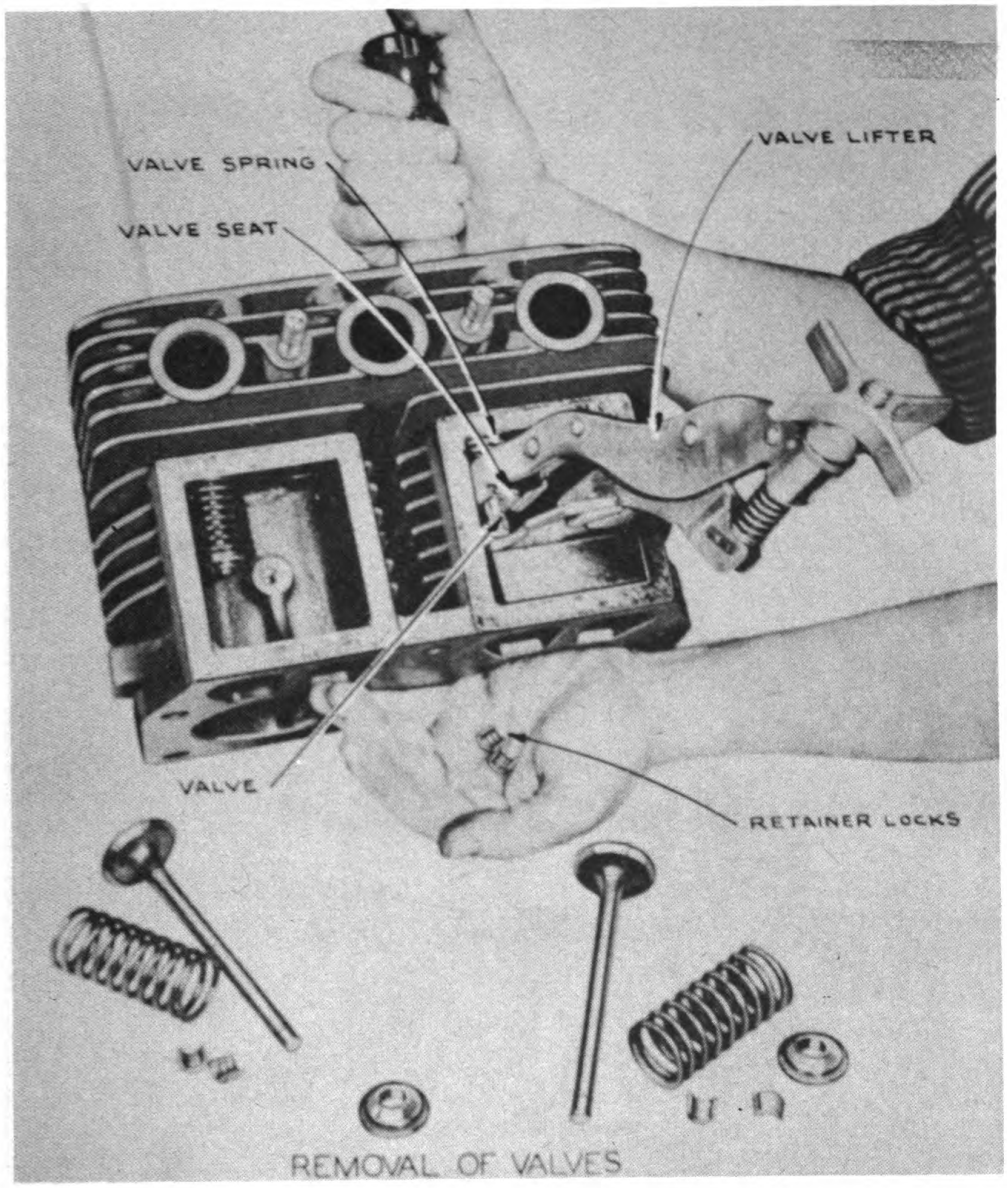
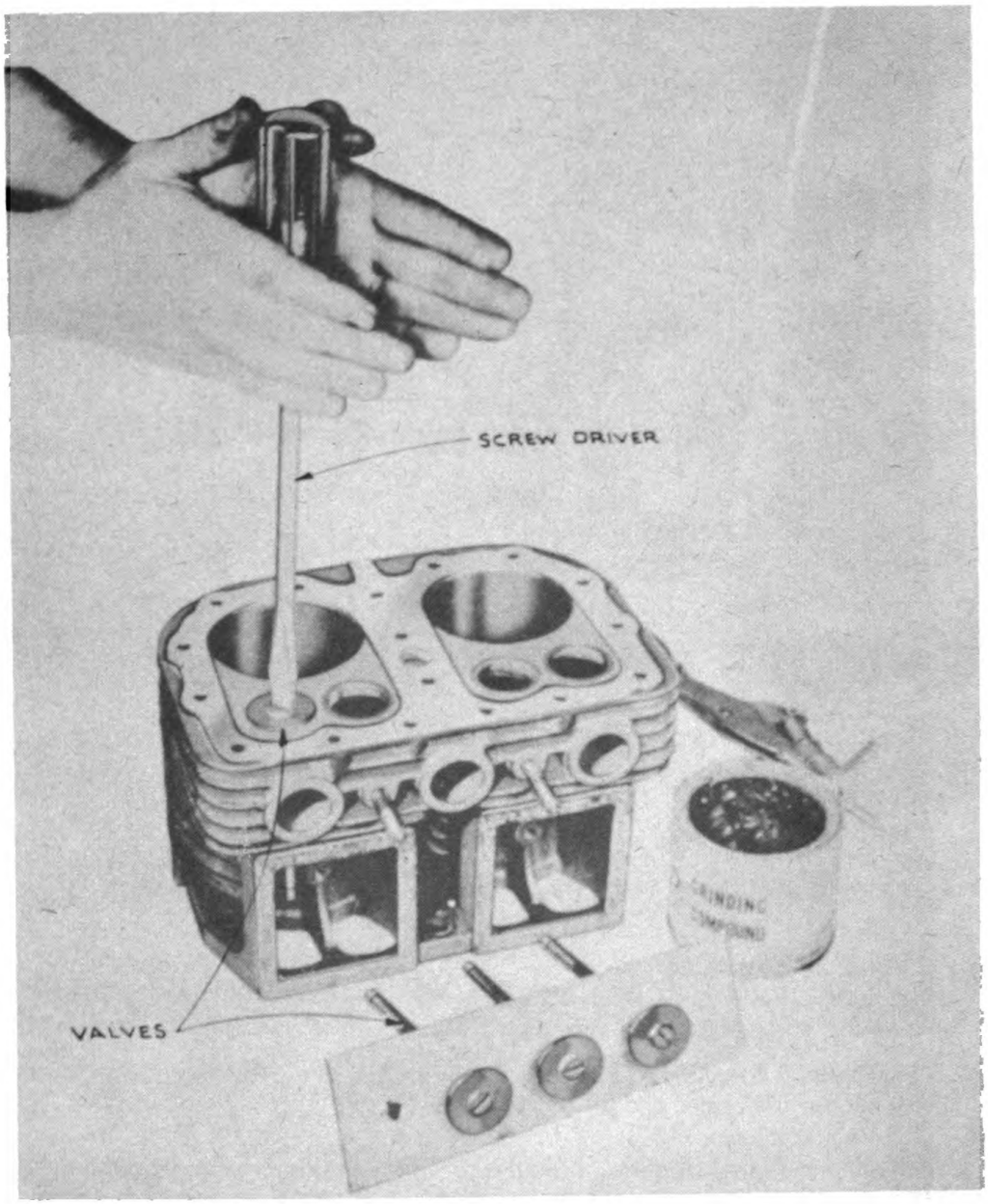


Fig. 61

REMOVING CAMSHAFT—Place the crankcase on the power take-off end, which will expose the upper end of the camshaft.

Pull all of the valve tappers toward the outside of the crankcase as far as they will go. A 5/16" bolt should be threaded into one of the camshaft gear retaining holes in the camshaft, and the entire assembly can be lifted out of the crankcase. (Fig. 60). The reason for pulling the tappers in an outward direction is so that they will clear the camshaft cams when the camshaft is lifted out of the crankcase.

REMOVAL OF VALVES AND SPRINGS—Using a standard valve lifter, compress the valve springs. With the handle of a screwdriver gently pound the valve downward toward the valve seat, while holding the hand under the valve spring opening. The valve spring retainer locks will then fall out. (Fig. 61). The engine is now completely disassembled.



GRINDING VALVES

Fig. 62

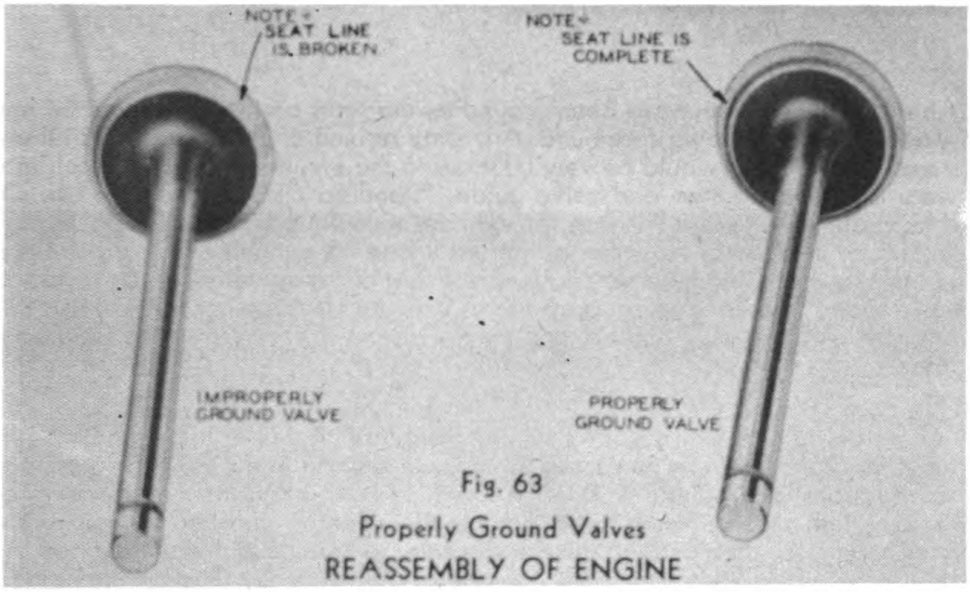


Fig. 63
Properly Ground Valves

REASSEMBLY OF ENGINE

VALVE SEATS—After the valves have been removed the valve seat should be carefully inspected and if any sign of pitting or burning is evidenced the valve seat should either be ground or replaced. If it is decided that the seats can be ground, a standard automotive type valve seat insert grinder should be used. The seat angle is 45°. The insert ring should be ground down to a point where all of the signs of burning or pitting are removed. If it is found that the insert has to be ground too far to clean up, a new insert should be used. In this case the old insert can be removed by cracking with a sharp chisel and prying out.

GRINDING AND REASSEMBLY VALVES—After the valves are removed from the engine they should, in some manner, be kept in order so that the person repairing the engine knows which valve belongs in which guide. This can be done by cutting small holes in a piece of cardboard or wood, and marking the holes with the number—1, 2, 3, and 4.

A small spring should be used under the valve head when grinding to lift the valve away from the seat when desired. The valve should be scraped clean of carbon and any gum deposit which might be present. It should be cleaned with alcohol to dissolve the gum.

After the valves are cleaned they may be ground in. This is accomplished by using a medium grade of valve grinding compound on the seat of the valve. The valve should be ground in, using a screwdriver to twirl the valves in the seat.

Caution should be taken in grinding in the valves that an entire circle, or two, of the valve is made as well as a back and forth or grinding motion. (Fig. 62).

During the grinding operation both the seat of the valve and the seat of the valve insert in the cylinder block should be inspected at intervals. When the valve is properly ground it will be indicated by a dull gray ring completely around the seat of the valve and valve insert. The actual width of the valve seat should be about $\frac{3}{32}$". (Fig. 63).

After all of the valves have been ground in, the seats and valves should be entirely washed free of grinding compound. Any small amount of compound left on the valve stems or valve seats would be very injurious to the engine and would result in rapid wear of the valve stem and valve guide. (Standard clearance is .003" to .005"). When reassembling the valve to the cylinder the spring should be held in place so that when the stem of the valve is inserted it is in the center of the spring. The valve spring seat should then be slipped over the end of the valve under the spring, and a valve spring lifter used to compress the spring. The two retainer locks should be held in place with the small end up, and the valve spring gently lowered to engage the locks.

The valve tappers are installed in the crankcase from the inside and it is merely necessary to push these into the valve tapper guides. The proper clearance of the valve tapper in the guide is .001" to .0025". Next, install the main bearing cup on the flywheel end of the engine, and the cup retainer. The bearing cup should be pressed into the case and the retainer mounted over same with the 4 flat head screws and lockwashers. This should be tightened down securely. The cylinder and valve assembly should be mounted to the crankcase as a unit. The cylinder should be lowered over the studs and pressed firmly against the crankcase.

A new gasket should be used in all cases. Then tighten the cylinder down using the nuts and lockwashers provided. The camshaft is now ready to be installed. The crankcase should be set on end with the power take-off side at the bottom. The tappers should then be pulled outward so that sufficient clearance is allowed for the camshaft to be lowered into the crankcase. The camshaft bearing surfaces bear directly in the bore in the crankcase. The camshaft bearing is fitted to the crankcase with a clearance of .002" to .0035".

Next, install the crankshaft. The crankcase should be set bottom side up on one of the cylinders and the crankshaft should be slid into the case from the take-off end of the engine. (This is the large hole.) After the bearing cone at the flywheel end of the engine is moved properly into the cup, the bearing plate, with the bearing cup pressed into it and with the shims and gaskets in proper place, should be moved inwards. (Fig. 64)

The main bearing plate should be installed with the proper amount of shims so that there is an end clearance of .003" to .005". This clearance is obtained by either the removal or addition of shims. A new paper gasket should be placed on both sides of the required number of steel shims for proper oil seal.

INSTALLATION OF CONNECTING ROD AND PISTON—The piston is held to the connecting rod by means of a wrist pin. This wrist pin is fitted to the connecting rod bearing with a clearance of .005" to .001" at the factory. End movement of this pin is prevented by the use of retainer locks which slip into the ends of the piston boss. If it is noted upon inspection that the connecting rod bushing is worn so that the wrist pin fits loosely the bushing should be reamed out and an oversize wrist pin installed. The wrist pin is a push fit into the piston bosses and if considerable wear is noticed so that the wrist pin fits loosely in these bosses, the wrist pin should be replaced.

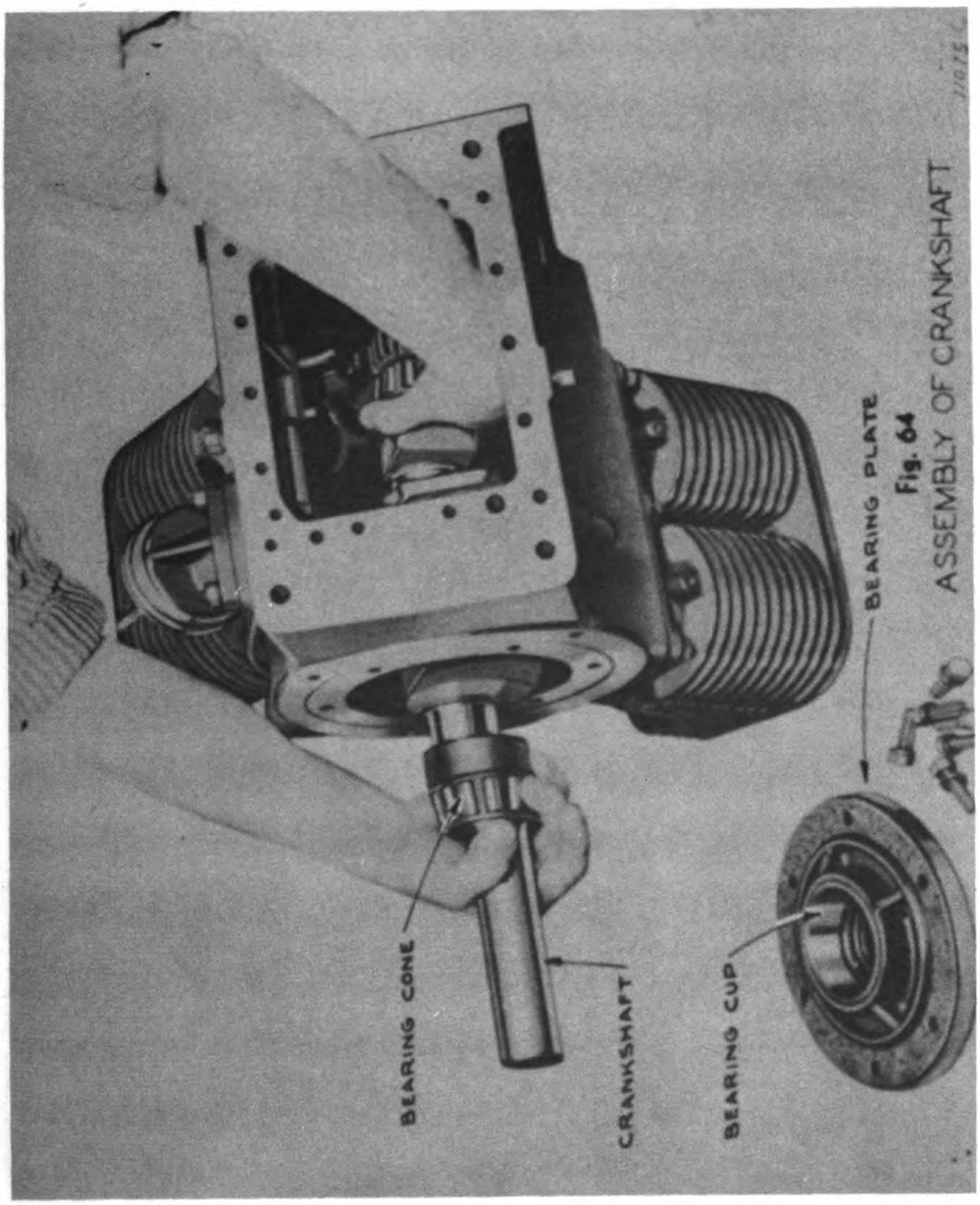


Fig. 64 ASSEMBLY OF CRANKSHAFT

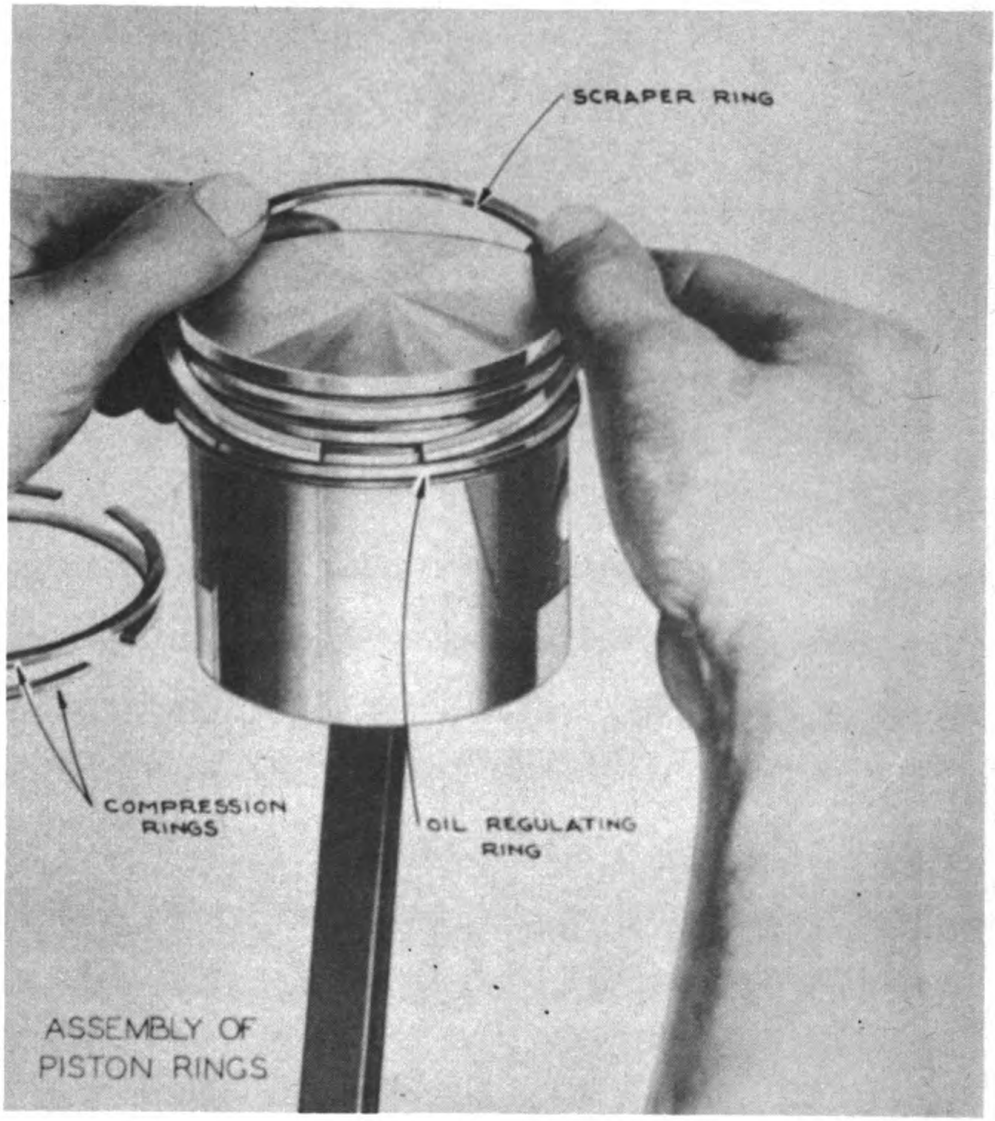
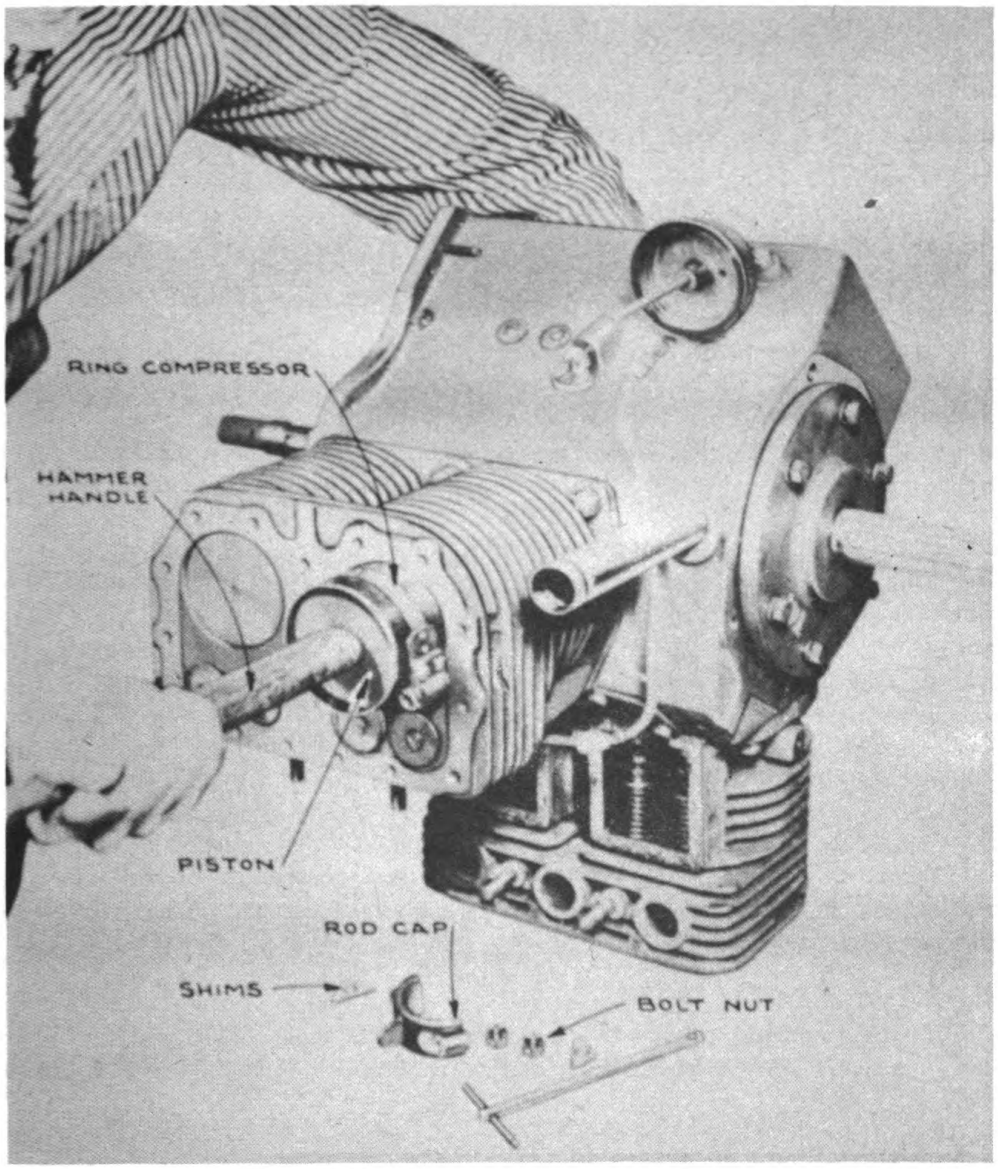


Fig. 65



ASSEMBLY OF PISTON & ROD

Fig. 66

After the piston has been reassembled to the connecting rod wrist pin, retainer rings should be installed and care should be taken that they snap firmly into the depression in the piston bosses. As a matter of safety it is advisable to use new retainer rings.

INSTALLATION OF PISTON RINGS—Piston rings are very easily installed. The piston should be held firmly in both hands and the oil ring should be assembled first into the proper groove. The piston ring can be pried down over the top of the piston until it settles into the proper groove (Fig. 65). The saw tooth part of the ring must be toward the piston skirt.

The entire connecting rod and piston assembly can now be installed. The lower connecting rod bearing is fitted to the crankshaft with a clearance on the bearing of .006" to .002". Shims are provided so that this clearance can be readily obtained. If a new rod is being assembled to an old crankshaft which might be slightly oversize the following procedure should be taken. .001" shims should be removed gradually and equally from both sides of the connecting rod until a tightness is noticed in the turning of the crankshaft. After this tightness is noticed in the turning of the crankshaft a .001" shim should be replaced on both sides. This should then give the proper clearance. Extreme care should be taken that metal chips or other foreign matter is entirely removed from the shims and also the parts of the connecting rod and cap which the shims contact, otherwise the proper clearance cannot be obtained.

Care should also be taken that in the reinstallation the same connecting rod that was originally fitted to the crankshaft is fitted to the same pin on the crankshaft. When installing the connecting rod and piston assembly the lower cap should first be removed from the connecting rod. The rod, should then be lowered into the proper cylinder until the expanded rings contact the top of the cylinder. A standard piston ring compressor should be used to compress the rings into the groove of the piston and with the handle of a hammer. The pistons should be tapped gently into the cylinder. (Fig. 66).

The rod cap and rod are stamped with a number on the connecting rod bolt boss. The cap must be assembled to the rod so that these numbers are on the same side; also the rod must be assembled on to the crankshaft so that the oil hole in the rod cap faces the oil spray nozzles in the crankcase (Fig. 67).

REASSEMBLY OF OIL PUMP—The oil pump in this engine is of the gear type and should under ordinary circumstances, operate for the life of the engine. The life of the oil pump is dependent mainly upon the cleanliness of the oil which is used in the engine.

If dirt is allowed to enter the crankcase when oil is added this dirt may be drawn up by the oil pump and small particles will get through the oil pump screen and could cause excessive wear in the gears in the pump as well as the pump body and cover. If the oil pump does not operate it is recommended that it be changed as a complete unit. When this pump is built in the factory it is built to very close tolerances and it is not recommended that the pump be repaired in the field.

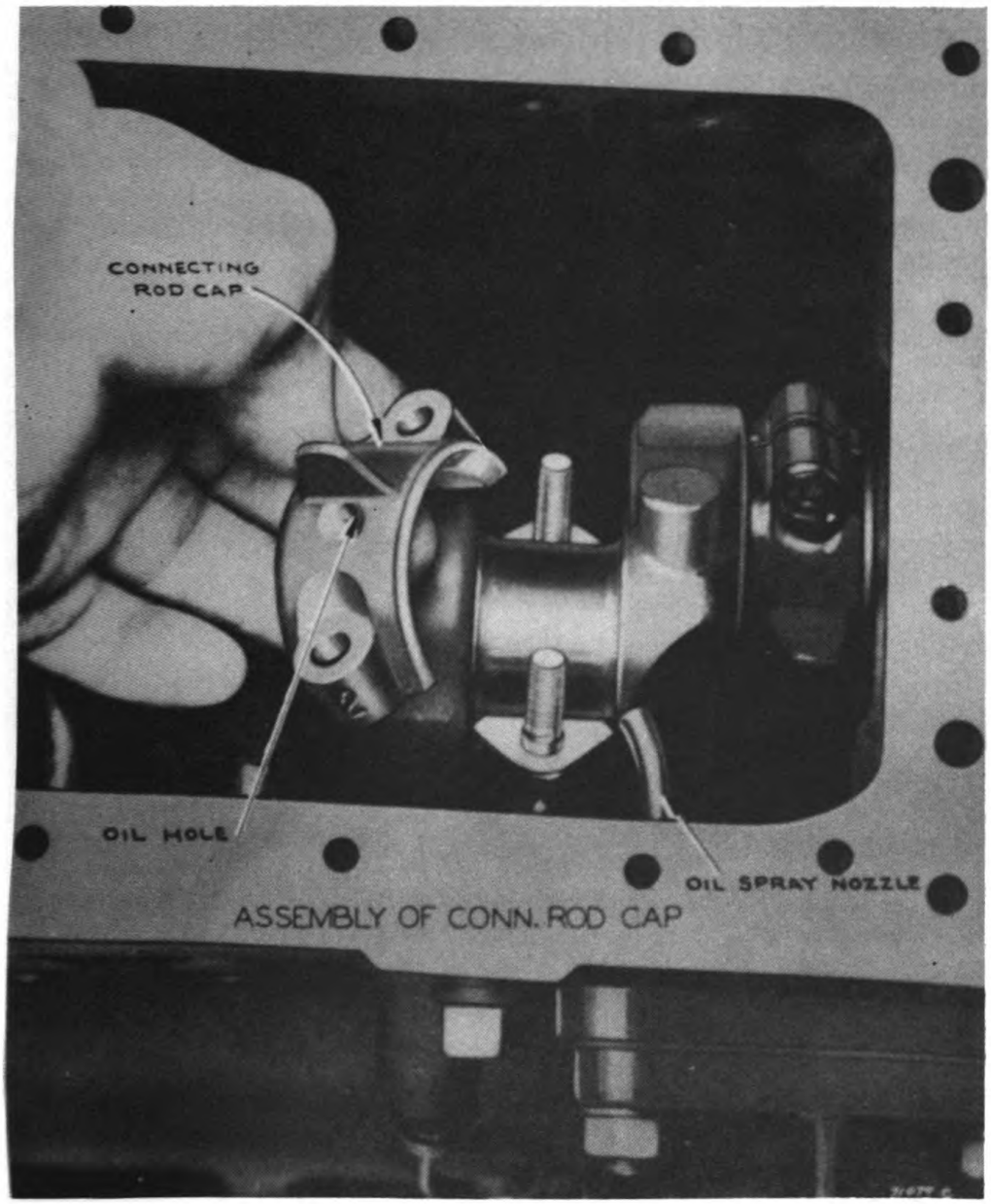


Fig. 67

In reinstalling the pump it should be lowered in through the opening at the bottom of the engine and inserted into the boss in the crankcase. The oil screen must be in a downward position and it will fit into the opening in the crankcase provided for it. Using a fibre hammer the pump should then be driven into the bore in the crankcase provided for it.

The oil pump lockscrew which holds the pump in place should then be inserted (Fig. 58). After this lockscrew has been firmly tightened the slotted steel pipe plug which seals the lockscrew hole should be replaced. The crankcase bottom coverplate can now be replaced. A new gasket should be used and the bottom plate bolted to the crankcase with the bolts and washers provided. It is advisable to tighten the bolts alternately so that the plate is drawn down tight. (Fig. 68)

INSTALLATION OF TIMING GEAR TRAIN

ASSEMBLY OF CAMSHAFT GEAR—The camshaft gear can now be assembled to the camshaft. The 3 holes in the camshaft and the gear are staggered in such a manner that they are lined up in only one position. Using the capscrews and lockwashers provided the camshaft gear should be securely bolted to the camshaft and the thrust plunger and spring inserted in the hollow end of the camshaft.

CAUTION: In order to have the gears properly in time the gears are marked and must be assembled in accordance with the timing diagram marks. It will be noticed upon inspection that a "C" is stamped on the camshaft gear and also on the crankshaft gear. When the camshaft gear is installed the gears must mesh so that the "C" on the camshaft gear lines up with the "C" on the crankshaft gear. This is also the case of the idler gear, and on this gear the "I" must line up with the "I" on the crankshaft gear. (Fig. 69)

INSTALLATION OF IDLER GEAR—The idler gear revolves on the idler gear stud and to reassemble, the gear should first be placed over the stud with the timing marks to the outside. With a babbitt hammer the idler stud should then be driven into the case, being careful that the oil groove is up.

Care should be taken that approximately .005" end clearance is allowed. Do not drive the idler stud too far into the case so that the idler gear would be pinned tightly to the case. This clearance of .005" must be allowed so that friction of the gears against the case is not present. The idler stud is locked in position with an Allen head setscrew from the outside of the crankcase. After the stud has been driven into the case, this setscrew should be replaced and tightened securely.

INSTALLATION OF OIL PUMP GEAR—The oil pump gear is not a factor of the timing of the engine and can, therefore, be mounted in any position in so far as the meshing of the gear teeth is concerned.

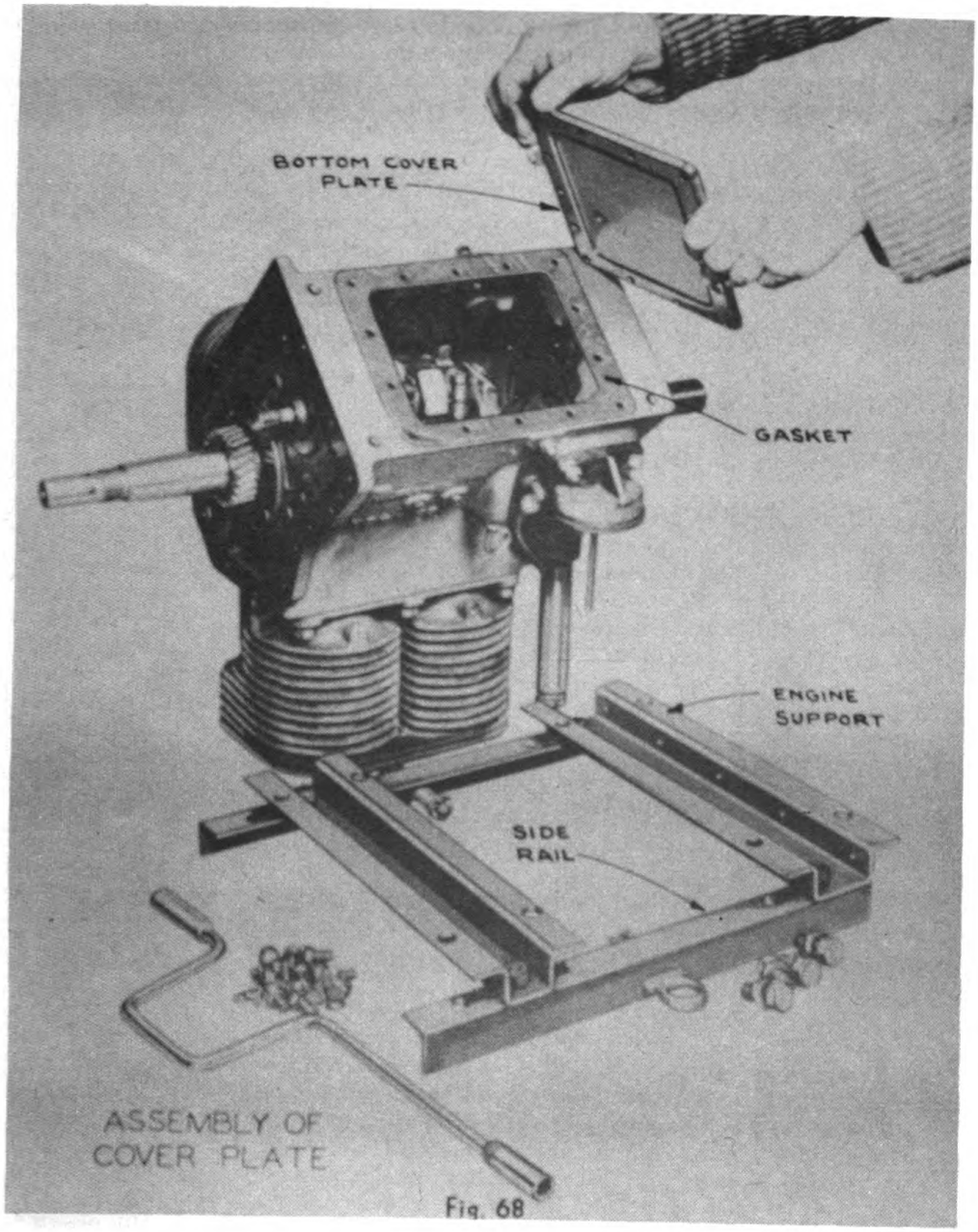


Fig. 68

To install the gear it should be driven on to the oil pump shaft, being sure that the woodruff key is in proper position. The slotted nut and cotter pin which lock the oil pump gear to the shaft should then be installed. (Fig. 69).

INSTALLATION OF GEAR COVER—The 2 dowel pins which dowel the gear cover spacer and crankcase should first be pounded into the spacer and case until they are flush with the crankcase on the opposite side. At this point they will protrude about ¾". A new gasket should be used and the gear cover should be placed against the gear cover spacer and lined up with the dowels. Using a babbitt or fibre hammer the gear cover should then be tapped gently against the gear cover spacer, and should be tightened to the spacer with the capscrews and lockwashers provided. The screws which hold the gear cover to the spacer should be tightened alternately and securely.

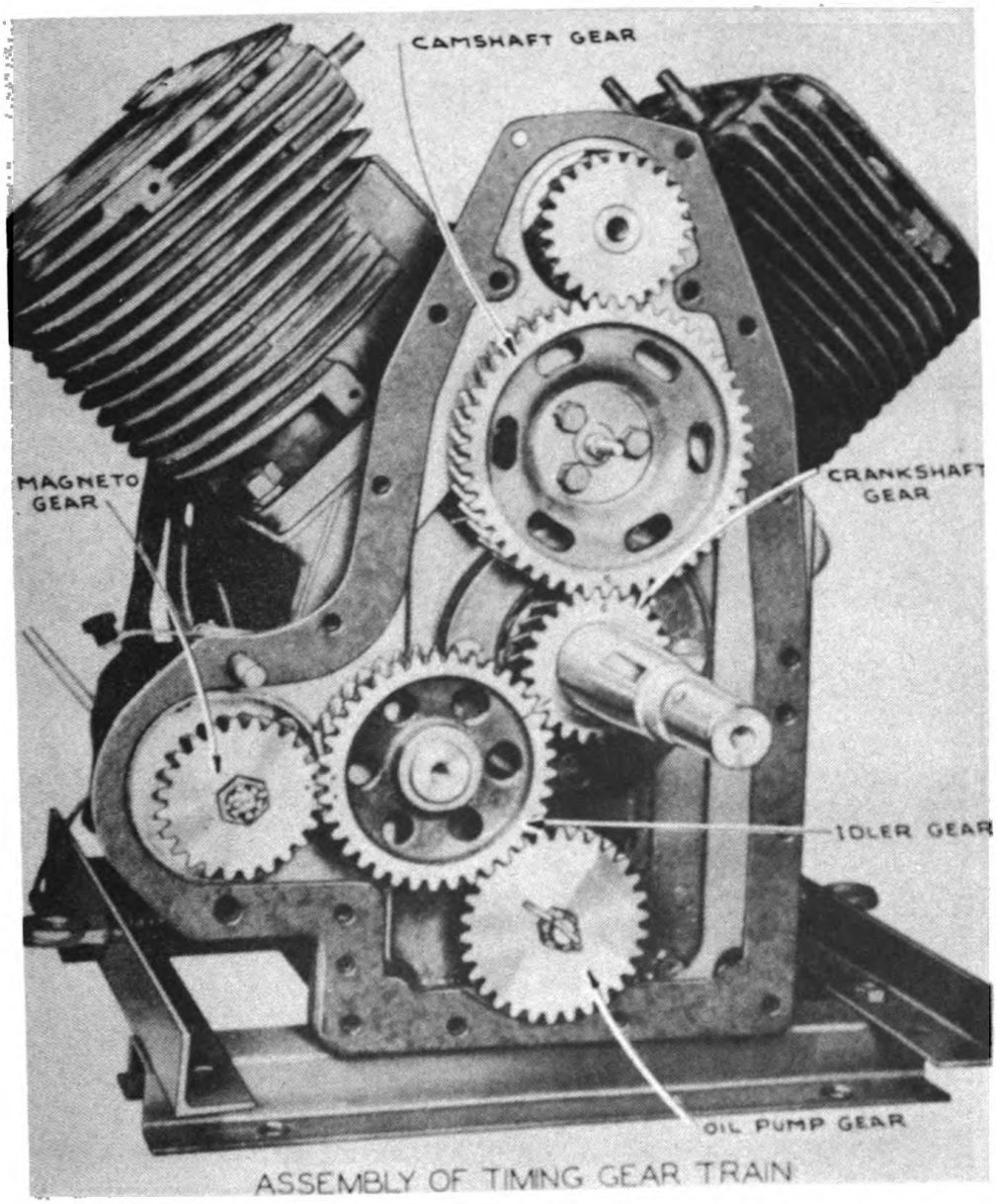
★ ★ ★

INSTALLATION OF MAGNETO—The magneto must be installed so that it is properly timed to the gear train of the engine. The magneto gear is marked with an "X" on the outer edge of one tooth. (Fig. 70)

INSTALLATION OF GOVERNOR—The governor on this engine is so constructed that the governor weights and thrust pins are assembled directly to the governor gear. Care should be taken when installing the governor thrust sleeve that the sleeve bears directly on the thrust pins of the governor weights. To install the thrust sleeve in the proper manner the gear with the weights assembled should be held firmly in one hand and the weights spread outward to a position where the flange on the governor gear sleeve will clear the outer parts of the weights. The sleeve should then be installed in such a manner that the bottom flange rides directly on the thrust pin. (Fig. 71). The entire assembly of the governor gear, governor weights, and governor gear thrust sleeve should then be installed over the governor shaft which is tightened into the gear cover. The governor house should then be installed using a new gasket, and should be secured in place with the capscrews and lockwashers provided. The oil line to the governor should then be connected.

The linkage between the governor and the carburetor must be properly connected. The governor lever has just sufficient travel to give the full movement to the carburetor throttle lever from open to closed position. When the engine is at rest, the governor lever position corresponds to the wide open position of the carburetor throttle lever.

The governor lever is furnished with 12 holes for attaching the governor spring. It is very important that the spring is hooked into the proper hole to suit the speed at which the engine is operated. A table is given herewith showing the full load and no load speeds of the engine and the hole corresponding thereto. The full load speed will be from 150 to 125 revolutions less than the no load speed. As an example, if the engine is to be operated at 2150 revolutions per minute without load, the spring should be hooked into the 8th hole in the governor lever and the spring tension adjusted by means of the adjusting screw to run 2150 revolutions per minute. The speed at full load will then be approximately 2000 R.P.M. The No. 1 hole is closest to the governor shaft.



ASSEMBLY OF TIMING GEAR TRAIN

Fig. 69

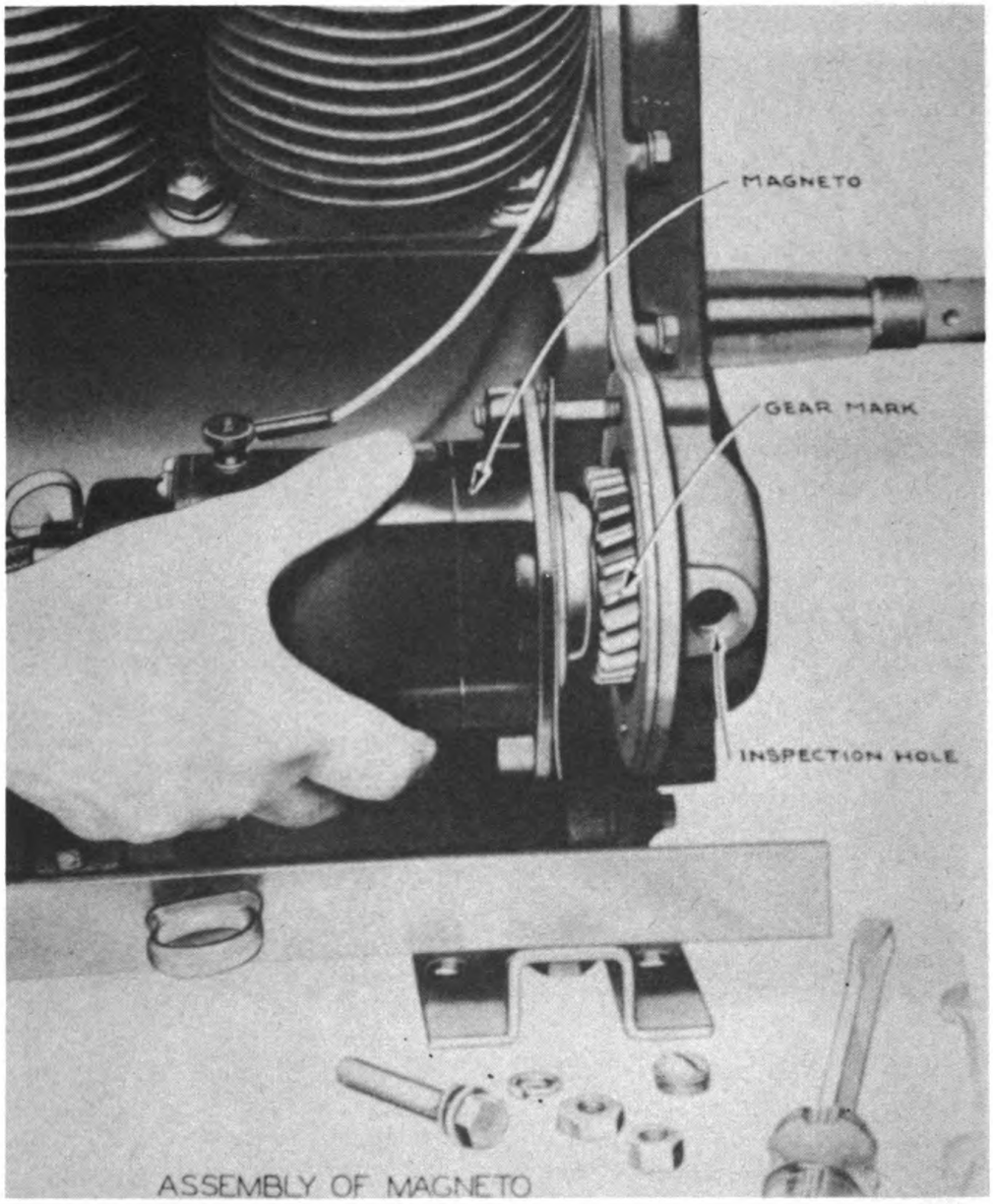


Fig. 70

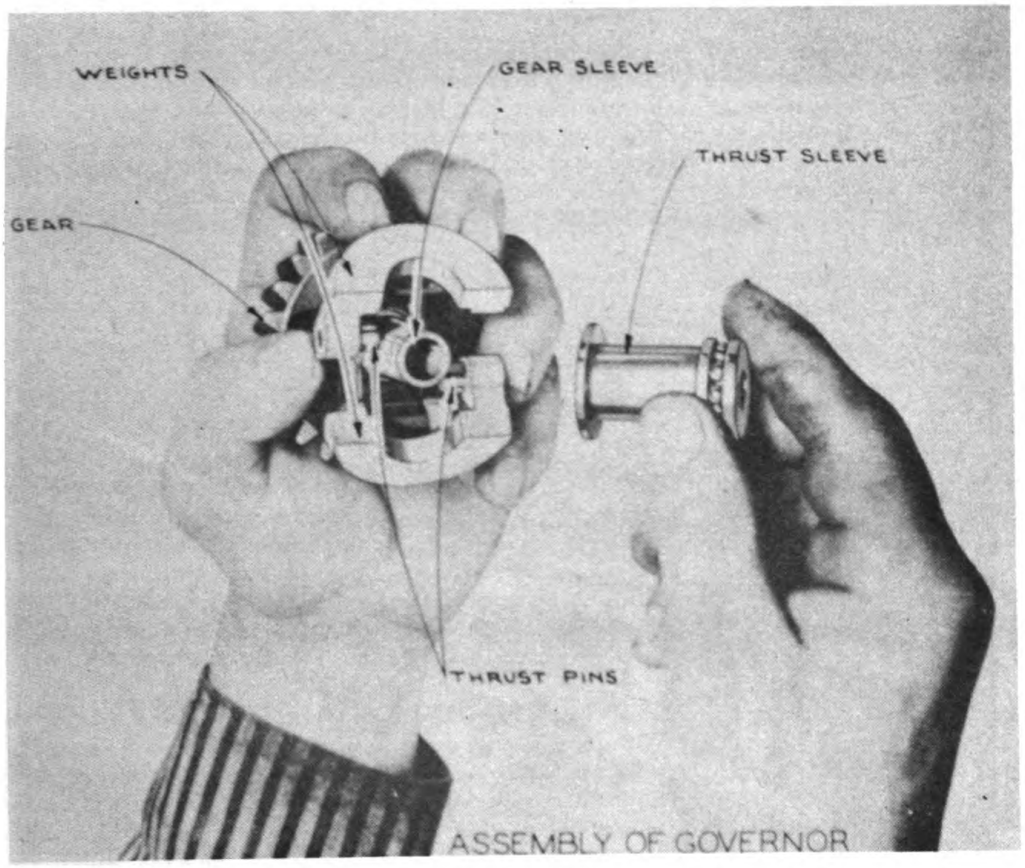


Fig. 71

GOVERNOR ADJUSTMENT TABLE

Load R.P.M.	No Load R.P.M.	Hole No.
1200	1350	3
1300	1450	4
1400	1525	4
1500	1650	5
1600	1725	5
1700	1850	6
1800	1950	7
1900	2025	7
2000	2150	8
2100	2225	8
2200	2350	9
2300	2425	9
2400	2550	10
2500	2625	10
2600	2750	11

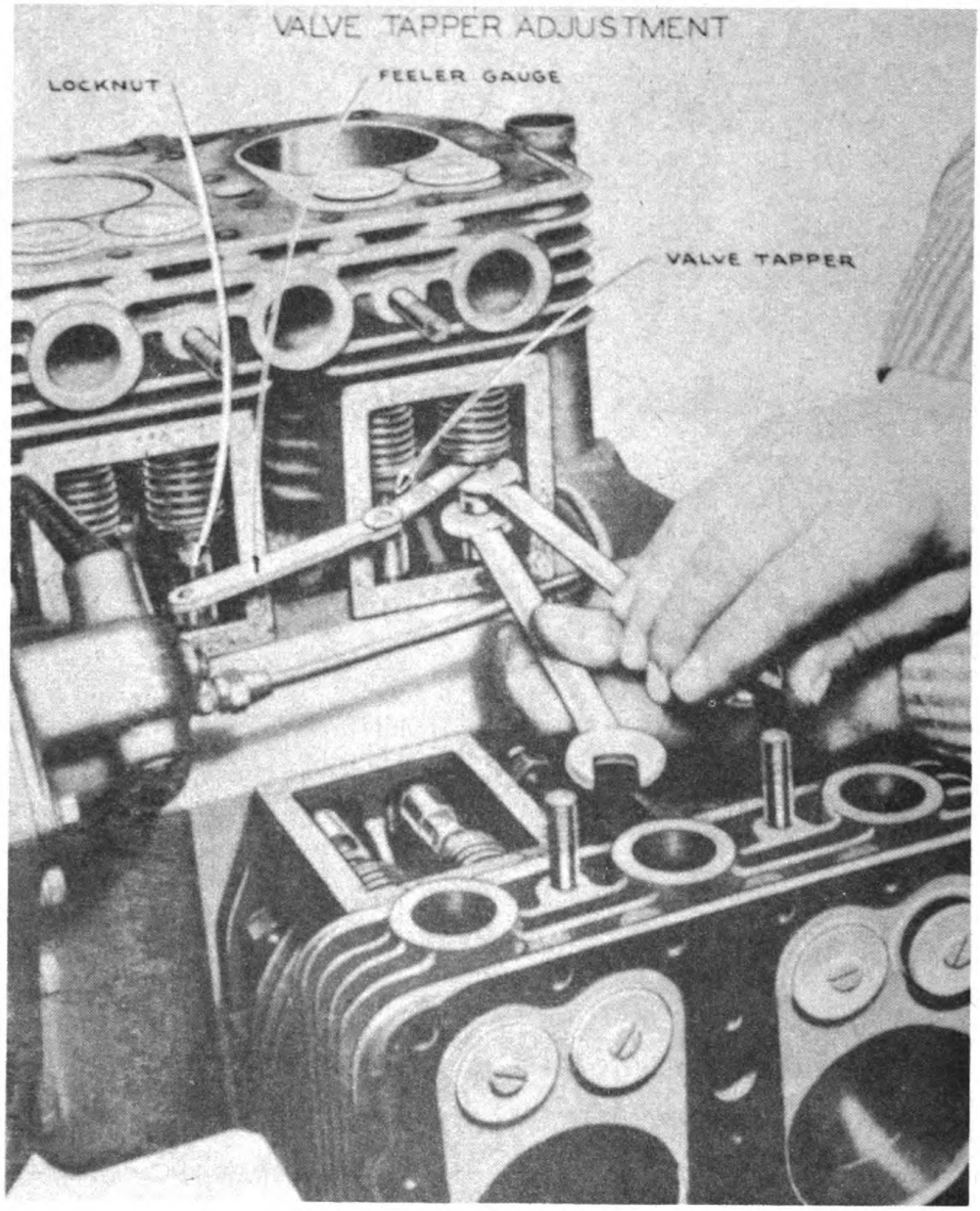


Fig. 72

There are 3 timing marks stamped on the edge of the air shroud opening for the flywheel, one on the vertical center line of the engine, and the other 2 in line with the cylinders. The flywheel is marked with the letters "DC" near one of the air circulating vanes. This vane is further identified by a mark cast on the end by an "X" (see diagram). When the air blows out of the No. 1 spark plug hole, continue turning the starting crank until the edge of the marked vane on the flywheel is in line with the vertical mark on the shroud as shown on the timing diagram.

The keyway or crankshaft will also be up at this time. The magneto gear work is visible through the opening in the timing gear housing as shown on the Timing Diagram. The distributor cap on the magneto is numbered 1 to 4. The leads of the magneto should be connected to spark plugs of like numbers.

ADJUSTING TAPPERS—Adjusting screws are provided in the tappers, and these should be adjusted to give a clearance of ten thousandths (.010") of an inch at the inlet valve stems, and twelve thousandths (.012") of an inch at the exhaust valve stems, when the engine is cold. To adjust, turn the engine over with the crank until the valve is closed, then continue turning about ½ turn to be sure that the tapper is no longer riding the high side of the cam. Then using a standard feeler gauge, check the clearance (Fig. 72) and make the necessary adjustments with the use of standard tapper wrenches. After adjustment has been made be sure the tapper adjusting screw lock nut is locked so as to hold the proper adjustment.

INSTALLATION OF MANIFOLDS—To install the lower branch of the manifold to the cylinder the following steps should be taken. New gaskets should be installed. The flange on the gasket should be toward the cylinder. The lower branch of the manifold should then be pressed over the studs against the cylinder and with the nuts and lockwashers provided, tighten firmly to the cylinder. The upper branch of the manifold with the carburetor already assembled to it, may then be installed. New gaskets should be employed and the upper branch placed over the studs and firmly bolted to the 2 lower branches of the manifold with the nuts and lockwashers provided. CAUTION: The brass nuts should be installed on the outer or exhaust manifold flanges and the steel nuts on the inner or intake flanges.

REASSEMBLY OF CYLINDER HEADS—Refer to (Fig. 52). The cylinder heads may now be installed. New gaskets should be used and the head should be placed over the new gaskets and tightened down to the cylinder with the plain washers and capscrews provided. In tightening down the heads it is always advisable to tighten the capscrews uniformly. This is necessary so that the gaskets will receive even pressure. At the factory a torsion wrench is used and the bolts are pulled down to a tensile stress of 70,000 pounds per square inch.

The spark plugs may now be installed. Before reinstallation of the spark plugs they should be carefully cleaned, and all carbon or gum deposit removed by scraping and washing in alcohol. The points of the spark plugs should be reset to .025", using a spark plug wrench or similar tool to set the gap. (Fig. 45)

The spark wires can now be reconnected. The shrouding and house parts may now be reassembled and this particular phase of reassembly can be accomplished in exactly the opposite way the engine was disassembled. There are no clearances or tolerances in connection with the engine housing or shrouding that must be adhered to.

PREVENTATIVE MAINTENANCE OPERATIONS TO BE PERFORMED WHEN USING LEADED FUELS

I **GENERAL.** These Preventive Maintenance Services are designed to insure maximum efficiency in the operation of Wisconsin Model VE-4 air-cooled engines WHEN LEADED GASOLINE IS USED AS A FUEL.

II **DAILY SERVICES.** The following Preventive Maintenance Services are to be performed daily:

A. BEFORE OPERATION SERVICES

1. **TAMPERING AND DAMAGE.** Check for damage from fallen debris, shell fire, sabotage, or other causes.
2. **FUEL AND OIL.** Check fuel in tank, see that it is full. Check crankcase oil. Level should be at filler hole in engine base.
3. **LEAKS, GENERAL.** Check for fuel or oil leaks. Trace to source and correct.
4. **EQUIPMENT SETTING.** Check equipment setting. It should be level and on a firm foundation.
5. **STARTING ENGINE.** (a) Open shut-off valve on gasoline line. (b) If carburetor is equipped with adjustable needle valve open ¾ to 1¼ turns depending on weather condition. (The colder the weather the more the needle valve should be opened). (c) Place ignition switch in "on" or running position. (Push-button type switch is "on" except when depressed for stopping.) (d) Close choke. (e) Start engine.
6. **CHOKE.** When starting a cold engine, keep choke fully closed for first 3 or 4 turns. If engine fails to start, open choke and continue cranking for several turns. Repeat procedure. By following this method, over-choking will be avoided. When engine starts, adjust choke so that engine runs without missing. Gradually open choke as engine warms up. Never operate with partly closed choke.

B. DURING OPERATION SERVICES

1. **ENGINE OPERATION.** Check engine for normal operation. Note unusual sounds or unsatisfactory characteristics which would indicate trouble. If carburetor is equipped with adjustable needle valve, set adjustment to the position where engine runs smoothest. If exhaust shows excess smoke, the needle valve is open too wide. If the engine shows signs of surging under load or over-heating, needle valve is closed too much.
2. **ENGINE AND CONTROLS.** Never race engine or hold governor open. If carburetor has adjustable needle valve, see that exhaust smoke is kept at a minimum by proper adjustment. If engine over-heats excessively, stop engine, locate and correct trouble.

C. AT HALT SERVICES

1. **FUEL AND OIL.** Check for adequate supply of fuel. Check engine crankcase oil level. Add oil, engine (OE) of correct grade, (See Note in paragraph 2, D, (2) O, if necessary to bring level to filler plug hole.
2. **LEAKS.** Check for fuel and oil leaks. Make sure all pipe connections are tight.
3. **AIR CLEANER.** If operating in extremely dusty conditions, remove and clean oil bowl. Refill bowl with same grade oil, engine (OE) as used in crankcase, except between 0° F. and −40° F. use oil, hydraulic (OH) and replace.

D. AFTER OPERATION SERVICES

The following After Operation Services are to be performed after each 8 hour work interval:

1. **STOPPING ENGINE.** Reduce engine operation to half speed for 1 to 2 minutes by regulating governor by hand before stopping. Stop engine by turning magneto switch to "off" position or by depressing button (if equipped with button-type switch). Close shut-off valve on gasoline line.
2. **FUEL AND OIL.** Fill fuel tank. Fuel must be clean. Clean filler cap.

Be sure air vent hole is open before replacing. Check crankcase oil level. Add oil, engine of correct grade if necessary to bring oil level to filler plug hole. NOTE: For correct grade oil, see paragraph IV, A, 1.

3. **ACCESSORIES.** Carburetor, magneto, and air cleaner must be in good condition and securely mounted.

4. **SEDIMENT BOWL.** Remove and clean bowl and screen. Check for leaks after unit is reassembled.

5. **AIR CLEANER.** Remove and clean oil bowl. Refill bowl with same grade oil, engine (OE) as used in crankcase except between 0° F. and −40° F. use oil, hydraulic (OH) and replace.

6. **SPARK PLUGS AND IGNITION WIRING.** Clean wiring and exposed surface of the plugs with a dry cloth. Be sure wires are in good condition and connections tight. If engine has shown signs of hard starting, mis-firing, or runs irregularly during operation, remove and clean plugs. Adjust points to .025". Renew if broken or damaged with Champion C-26A, or equivalent.

7. **LEAKS, GENERAL.** Check for fuel and oil leaks. Trace any to their source and correct.

8. **MOUNTINGS.** Engine mounting bolts must be tight and in good condition. NOTE: If machine is idle for any length of time, be sure it is properly protected from heavy rains, flash floods, freezing weather, etc.

SPECIAL PRECAUTIONS

DON'T over-choke engine.
DON'T operate engine with choke partly closed.
DON'T race engine or hold governor open.
DON'T fail to service air cleaner daily.
DON'T fail to keep engine clean.
DON'T fail to check crankcase oil level every 4 hours of operation.
DON'T fail to keep ignition wire clean and free of grease or oil.

NOTE: Report all operation failures and deficiencies to proper authority.

IV ADDITION SERVICES FOR ENGINE MODEL VE-4 AND VF-4

A. EVERY 48 HOURS OF OPERATION

1. **CRANKCASE AND BREATHERS.** Drain crankcase and refill with oil, engine (OE) of correct grade. Wash filler cap and breather before replacing. On models where breather is in separate unit from the filler plug, and not removable, clean with a dry cloth. NOTE: Use oil, engine (OE-SAE 30) above 32° F. Use oil engine (OE-SAE 10) between 32° F. Between 0° and −40° F. keep crankcase oil fluid. (OF SB 6-11 dated 1 November 1944, Section IV quoted below.)

"(a.) Keep the vehicle in a heated inclosure when it is not being operated.

(b.) When the engine is stopped, drain the crankcase oil while it is still hot and store in a warm place until the vehicle is to be operated again. If warm storage is not available, heat the oil before reinstalling. NOTE: Do not get the oil too hot; heat only to the point where the bare hand can be inserted without burning. Tag the vehicle in a conspicuous place in the cab to warn personnel that the crankcase is empty.

(c.) Dilute the crankcase oil. Crankcase oils may be diluted with gasoline or Diesel fuel according to their availability, with preference given to gasoline. One of the two following procedures will be used to provide the engine with properly diluted engine oil for cold starting:

(1.) When gasoline is available for diluent.

(a) Fill engine crankcase to the "FULL" mark with the grade of engine oil prescribed for use at temperatures from −32° F. to 0° F. Add 1½ quarts of gasoline for each 5 quarts of crankcase oil capacity. EXAMPLE: Crankcase with capacity of 10 quarts will require 3 quarts of gasoline as an oil diluent.

(b) Run the engine 5 to 10 minutes to mix the lubricant and diluent thoroughly.

(c) Stop the engine and note that the level of the diluted oil is above the normal "FULL" mark on the oil gage. This level should be marked on the gage for future reference.

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

Use the grade of engine oil prescribed for use between +32° F. to 0° F. to maintain the oil level to manufacturer's "FULL" mark on the gage during operation.

(e) If the vehicle is operated 4 hours or more at operating temperature, redilution will be necessary if it is anticipated that the vehicle will be left standing unprotected for 5 hours or more. This can be accomplished by adding engine oil prescribed for use between +32° F. to 0° F. to the manufacturer's "FULL" mark; then adding gasoline to the dilution mark on the gage described in subparagraph (C)1 .

(2) If Diesel fuel is used as diluent, drain the crankcase while the engine is still warm and refill using engine oil prescribed for temperatures between −32° F. to 0° F. diluted with grade X Diesel fuel oil in the proportion of 1½ quarts of Diesel fuel to 5 quarts of engine oil. The presence of a large percentage of diluent will increase oil consumption and therefore, the oil level will be checked frequently during operation and maintained with the diluted oil to manufacturer's "FULL" mark on gage.

(d) If the vehicle is to be kept outdoors, and if the crankcase cannot be drained, cover the engine with a tarpaulin. About 3 hours before the engine is to be started, place fire pots under the tarpaulin. A Van Prag, Primus-TYPE, or other type blowtorch and ordinary kerosene lantern may be used. With due consideration for the fire hazard involved, the flame may be applied directly to the oil pan."

2. **SHROUD.** Examine air shroud for damage and alignment and see that mounting bolts are tight. Clean any dirt, oil, or grease that may have accumulated on shroud screen, cooling fins on flywheel, cylinders, and head by use of brush and solvent.

3. **FUEL TANK AND CAP.** See that tank is in good condition and securely mounted Make certain that cap fits tightly and that gasket is in good condition. Blow through air vent hole in cap to see that it is open.

4. **CARBURETOR AND LINKAGE.** See that unit is securely mounted. Check for leaks and see that piping is in good condition and all connections tight. Examine linkage on throttle and choke, and lubricate connections with a few drops of same grade oil, engine (OE) as used in crankcase, except between 0° F. and −40° F. use oil, lubricating, preservative, special (PS).

5. **SEDIMENT BOWL.** Remove and clean bowl and screen. Examine gasket and replace if damaged. Reassembly and check for leaks. See that piping is in good condition and all connections tight.

6. **AIR CLEANER.** Remove and wash cleaner in fuel oil or solvent. Refill oil bowl with same grade oil used in crankcase, except between 0° F. and −40° F. use oil, hydraulic (OH). Reassemble unit, see that it is securely mounted and connections tight.

B. EVERY 96 HOURS OF OPERATION

1. **SPARK PLUGS.** Remove plugs and clean thoroughly. Examine closely for damaged points and cracked or broken porcelain. If defects are found, replace with new plugs (Champion C-26A, or equivalent). Adjust points to .025" and be sure copper gasket is in place before installing.

2. **MAGNETO.** Clean breaker points of any foreign matter, check gap adjustment. Proper clearance is .015" to .018". Be sure surface of both contacts meet squarely. If points are burned or damaged, replace both fixed point and breaker arm. Lubricate one of two oilers to overflow with same grade oil, engine (OE) as used in crankcase, except 0° F. and −40° F. use oil, lubricating, preservative, special (PS).

C. EVERY 240 HOURS OF OPERATION

1. **CYLINDER HEAD AND VALVE MECHANISM.** (a) Remove cylinder heads and thoroughly clean all lead and carbon deposits from heads and combustion chambers. The valve face (area in contact with valve seat) **must be clean.** Clean valve seats in cylinder block. Adjust valve tappet clearance to .012" for intake, and .020" for exhaust. (b) When installing cylinder heads, make sure that the gaskets are in good condition and properly installed. Any damaged gaskets must be replaced.

NOTES. Preventive Maintenance Services are so important that they should be performed as a matter of regular routine, and never entirely omitted, even in extreme tactical situations.

Storage of Engineer Equipment. Process according to TM5-9715.

The responsibility for performance of preventive maintenance services rests not only with the operators, but with the entire chain of command from the section chief to the commanding officer.

(AR 850-15).

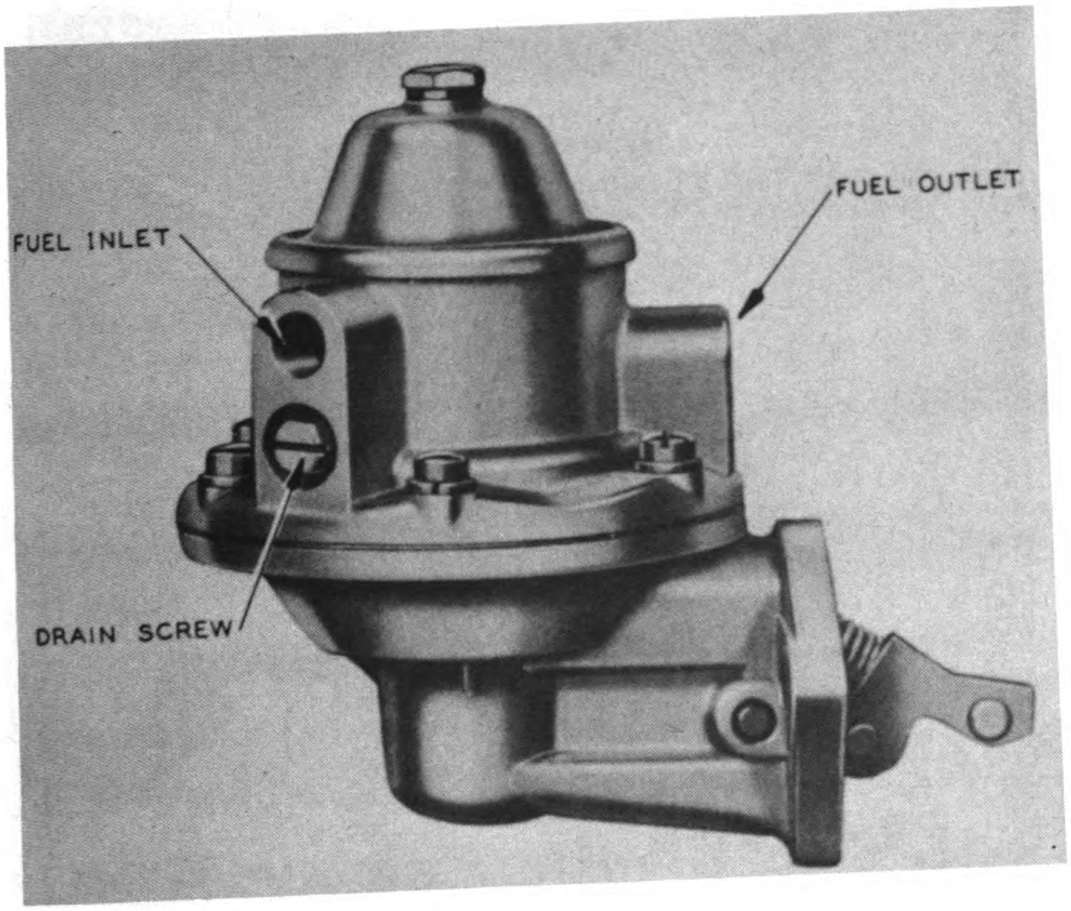
TROUBLE CHART (*Engine Only*)

TROUBLE	PROBABLE CAUSE	REMEDY
Engine will not start	No gasoline in tank	Fill gas tank
	Ignition wires connected to wrong spark plugs	Check wiring diagrams and reconnect
	Defective or worn out magneto	Check for spark and if necessary replace or repair magneto
	No compression due to sticky valves, leaky valves	Regrind and clean valves
	Plugged fuel line or carburetor	Clean and blow out fuel lines and carburetor
	Carburetor choke not used enough to obtain a rich mixture for starting	Choke sufficiently to start
	Carburetor flooded	Let engine stand idle until gas dries out or crank with open throttle
	Defective fuel pump	Repair or replace
Engine missing at low speeds	Spark plug gap too small	Reset to .025"
	Leaking inlet manifold gaskets	Replace gaskets
	Leaky valves or piston rings	Grind valves and replace piston rings
	Poor Compression	Grind valve or replace piston rings
	Low speed carburetor adjustment wrong	Reset low speed adjustment
Individual cylinders not firing	Defective or dirty spark plugs	Clean or replace
	Spark plug wire disconnected or broken	Connect wires or replace defective wires
	One or two spark plug wires connected to wrong spark plugs	Check firing order and reconnect wires to right spark plugs
	Short circuit due to punctured ignition wires	Replace wires
	Poor compression due to worn parts	Repair or replace all worn parts
	Valves stick or are open, or compression leaking past rings or pistons	Clean and grind valves and replace piston rings
	Valve springs broken	Replace all broken springs
	Defective magneto	Repair or replace
	Incorrect carburetor adjustment	Readjust carburetor
	Engine too cold	Allow to run until engine warms up
	Air leaks in intake manifold or gasket	Check and seal manifold with new gasket
	Valve stem adjustment too close	Reset tappers to recommended clearance

TROUBLE	PROBABLE CAUSE	REMEDY
Engine suddenly stops after having run satisfactorily	Gasoline tank empty	Fill gas tank
	Fuel pump failed	Repair or replace
	Water or dirt in carburetor or fuel lines	Clean carburetor and fuel lines
	Excessive heat causes gasoline to vaporize, in fuel lines stopping gasoline flow	Stop engine, and if possible insulate fuel lines
	No vent hole in gasoline tank cover	Drill gasoline cap for vent hole
	Broken gasoline line	Replace gas line
	Carburetor throttle closed due to loose connection	Check all control rod connections and replace all worn parts
	Ignition wire disconnected or broken	Reconnect or replace
	Breaker points in magneto or timer stuck, burnt, or loose	Repair or replace magneto points
	Engine scored or stuck due to lack of oil	Disassemble engine and hone cylinder walls and replace with new pistons and rings
Back firing through carburetor	Dirt or water in carburetor or fuel lines	Clean carburetor and fuel lines
	Low grade gasoline	Use gasoline with an octane rating of at least 67
	Loose or defective ignition wires	Check all connections and if necessary replace wires
	Dirty or pitted ignition breaker points	Replace breaker points
	Sticky valve stems	Remove valves and clean and grind
	Valve stem adjustment too close	Reset valve tappers to recommended clearance
Engine over heating	Dirty fins	Remove shroud and clean all cooling fins
	Ignition timed too late or too early	Retime engine
	Wrong carburetor adjustment	Readjust carburetor
	Parts of shrouding removed	All shrouding must remain on engine to insure proper cooling
	Restricted exhaust pipe	Exhaust pipe should not have bends or curves that will restrict flow of exhaust gases

TROUBLE	PROBABLE CAUSE	REMEDY
Engine knocking	Ignition advanced too far	Retime engine
	Low grade of gasoline, or gasoline of low octane rating, or anti-knock gasoline	Use gasoline with an octane rating of at least 67
	Carbon deposits in combustion chamber causing premature ignition	Remove heads and clean carbon
	Worn pistons or piston rings	Replace
	Loose connecting rod or main bearing	Tighten and line up connecting rod or main bearing
	Too much valve stem clearance	Reset to recommended clearance
	Engine too hot due to removal of air shrouds or restriction of air flow	Replace air shrouding
	Loose coupling to machine being driven	Check, and if necessary, replace coupling
Power Low	Ignition retarded too much	Retime engine
	Low grade fuel	Use gasoline with an octane rating of at least 67
	Engine too hot, due to removal of air shrouds or restriction of air flow	Replace shrouding
	Air to carburetor too hot	Check air intake to see that cool air is being drawn into carburetor
	Cylinders and pistons worn	Hone cylinders and fit with oversize pistons
	Weak spark	Repair or replace magneto
	Leaking valves	Grind or replace valves
	Leaking piston rings	Replace
	Carburetor adjusted too rich	Readjust carburetor
	Carburetor choke not fully open	Check linkage of carburetor to see that choke opens fully
	Carburetor throttle not fully open	Check linkage of carburetor to see that choke opens fully
	Carbon deposits on piston or in combustion chamber	Remove heads and clean carbon
	Governor set for too low speed	Reset
	Governor action sluggish due to sticky joints in governor linkage	Free linkage
	Air cleaner clogged restricting air flow	Remove restriction
High oil Consumption or bluish white smoke in exhaust	Too much oil in crankcase, so rod slips	Drain to proper level
	Cylinders and pistons worn	Replace
	Piston rings weak	Replace
	Piston rings stuck in grooves	Remove old rings and replace
	Oil control rings filled with carbon	Replace

TROUBLE	PROBABLE CAUSE	REMEDY
	Oil diluted with gasoline	Drain diluted oil and refill with fresh
Black smoke in exhaust	Carburetor adjustment toorich	Readjust
	Engine too cold, causing poor combustion	Allow sufficient running time to warm engine
	Faulty and irregular ignition	Check magneto and wires
	Poor combustion, due to dirty or leaky valves, carbon in combustion chambers and ring grooves	Remove carbon and regrind valves
	Air cleaner clogged causing rich mixture	Remove restriction
Excessive Dilution of Crankcase oil by fuel	Carburetor adjustment too rich	Readjust
	Cylinders, pistons and rings worn	Replace
	Low grade gasoline	Use gasoline with an octane rating of at least 67
No Compression or poor compression	Valves stuck open	Remove valves and clean and regrind
	Valves dirty or warped	Clean or replace
	Valve held open by too close a valve tapper adjustment	Adjust to recommended clearance
	Piston rings stuck in grooves by carbon	Replace rings
	Piston rings worn	Replace
	Leak at cylinder head gasket	Replace gasket



FUEL PUMP
AC SPARK PLUG CO. 1537421
WIS. MOTOR Nº LP-38

Fig. 73

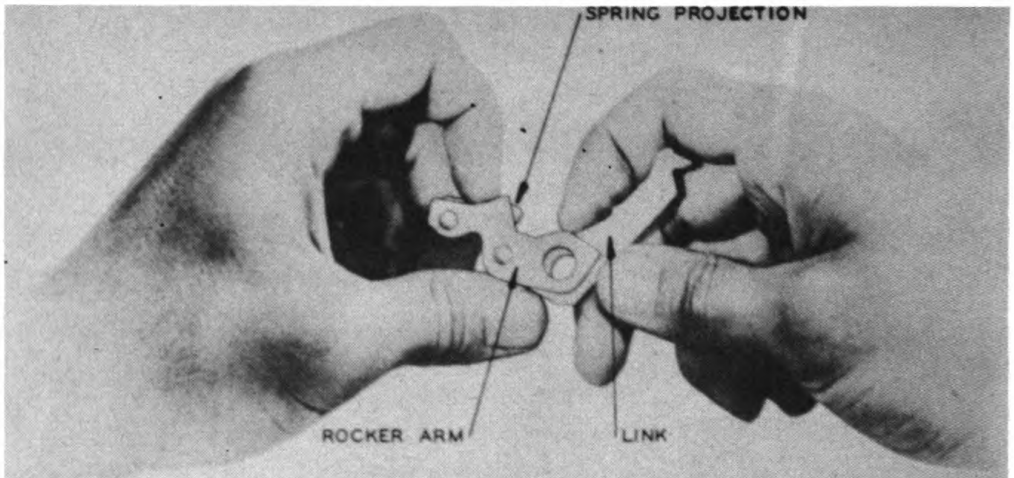


Fig. 74

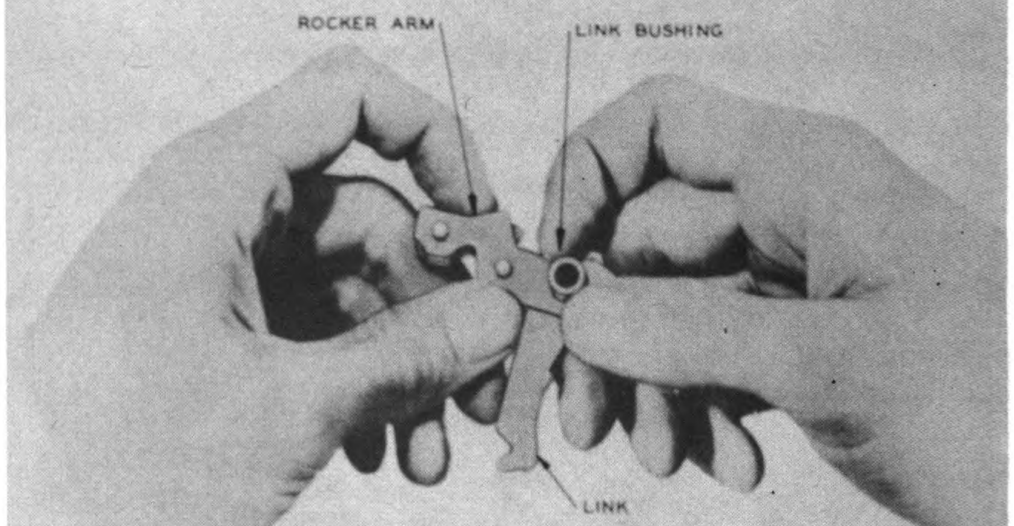


Fig. 75

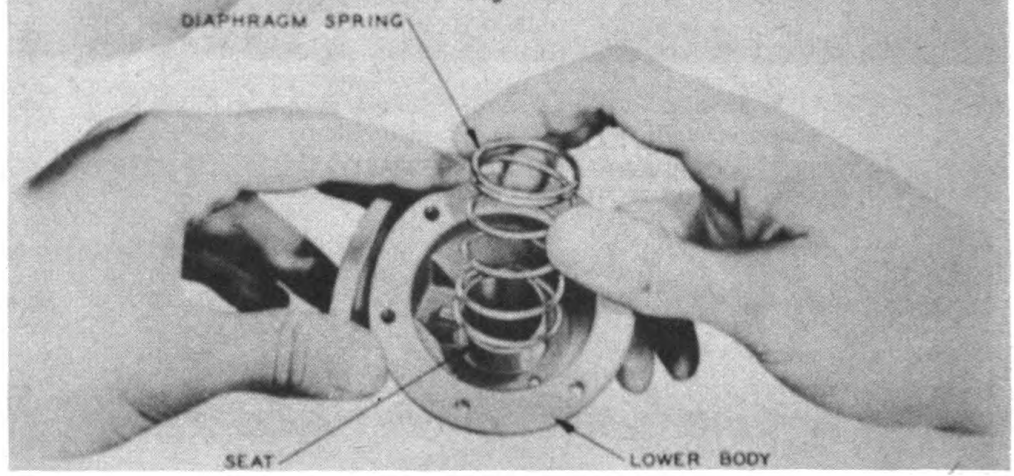


Fig. 76

AC FUEL PUMP NO. 1537421
WISCONSIN NO. LP-38

SERVICE INSTRUCTIONS

Slide the rocker arm link between the jaws of the rocker arm.

The correct position of rocker arm can usually be determined by matching the rocker arm spring projections on both the rocker arm and body. (Fig. 74)

Slip the link bushing (the hollow steel cylinder) through the large hole in both the rocker arm and the line. This will join them. (Fig. 75)

Set the large coil spring (diaphragm spring) over the seat in the lower body casting. (Fig. 76)

Place the diaphragm assembly over this coil spring so that the pull rod points down through this spring. (Fig. 77)

Hold the body casting and diaphragm assembly in one hand, and pinch the knob on the rocker arm link with your thumb. This will bring the link hook up where the pull rod can reach it easily. (Fig. 78)

Push the diaphragm down while you hold the link with your thumb. The pull rod will slip over the link easily. Release your pinching pressure.

Set the rocker arm coil spring in position. One end fits over the small cone cast into the lower body casting. The other end can be snapped over the small projection of the rocker arm. (Fig. 79)

Lay the body casting on its side and insert the rocker arm pin in the hole in the casting. (Fig. 80)

NOTE A: This pin will pass through the bushing which holds the link and rocker arm together. Be careful to line this bushing up by moving the rocker arm. Tap the pin into position with a hammer.

For bullet type pins "Peen" (stake) the edge of the pinhole in at least two places over the end of the pin with a prick punch. Do this at both ends of the pin. (Fig. 81)

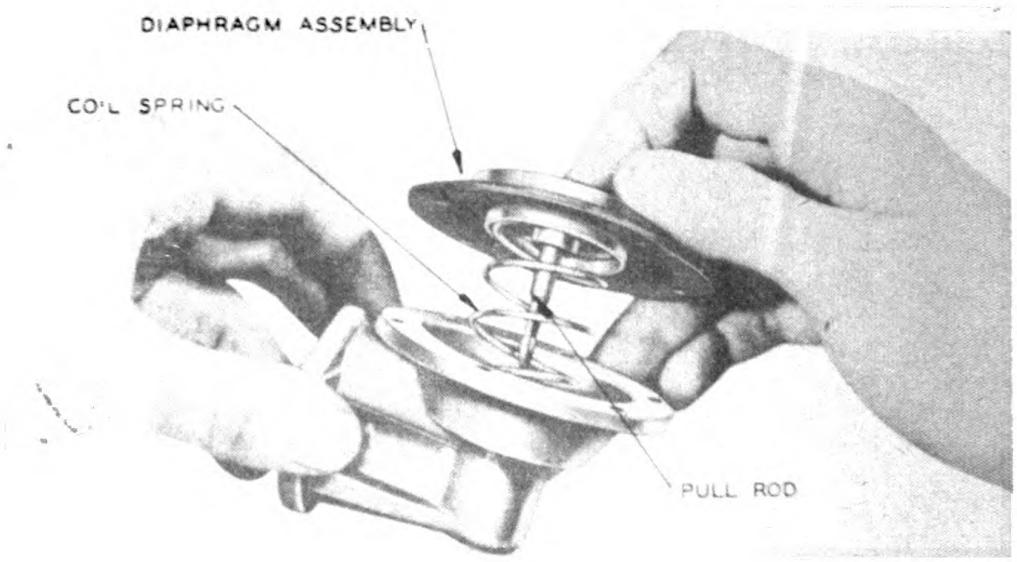


Fig. 77

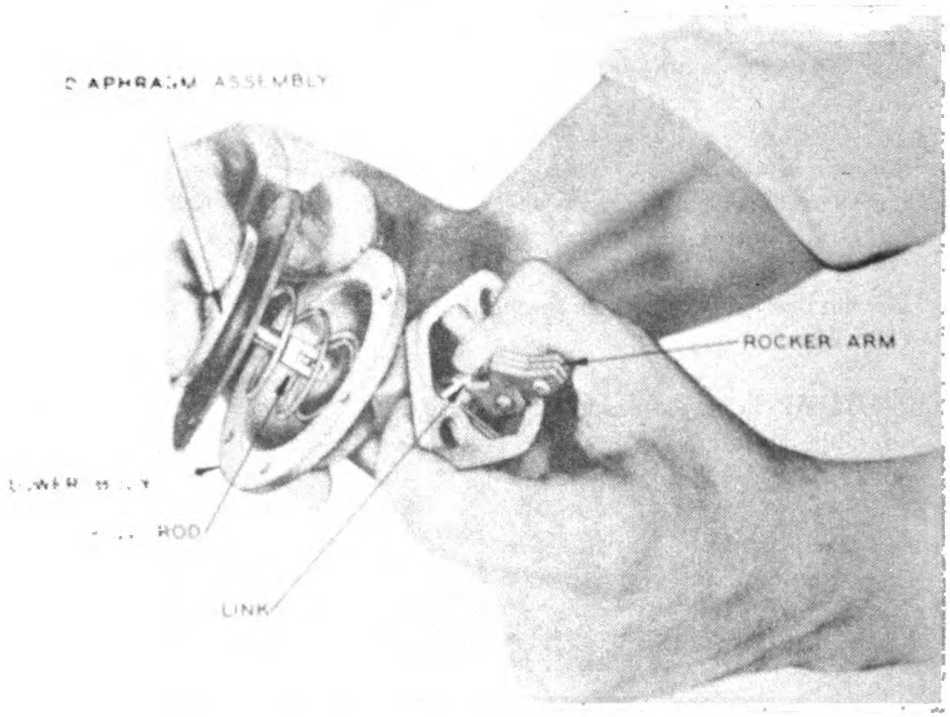


Fig. 78

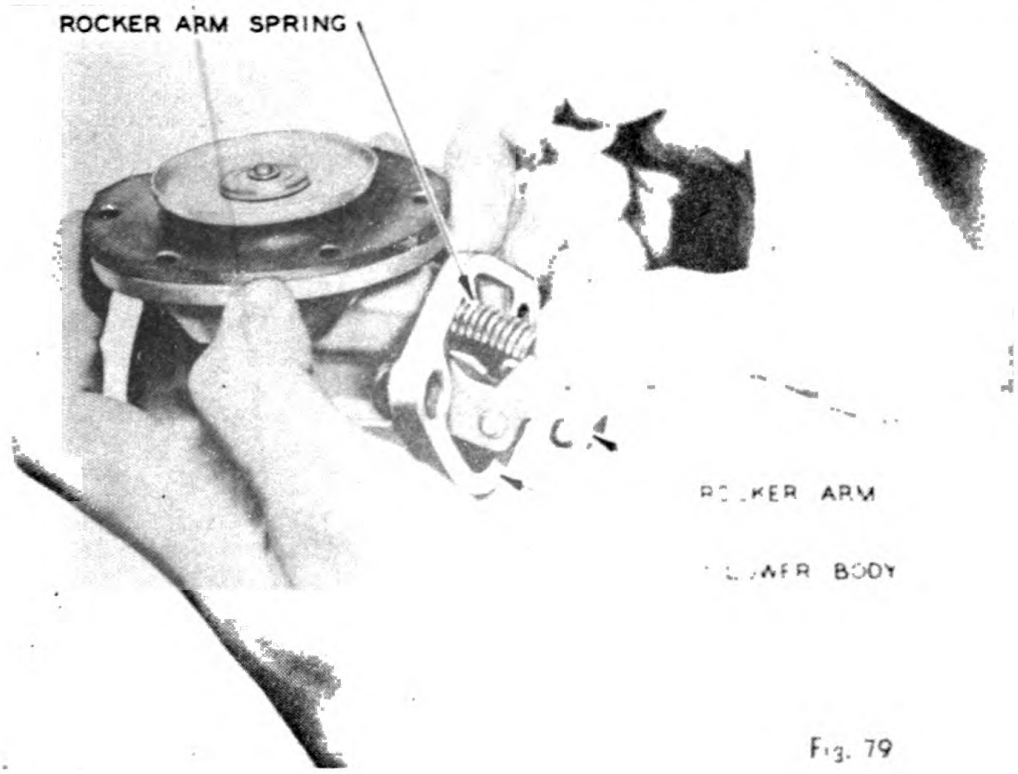


Fig. 79

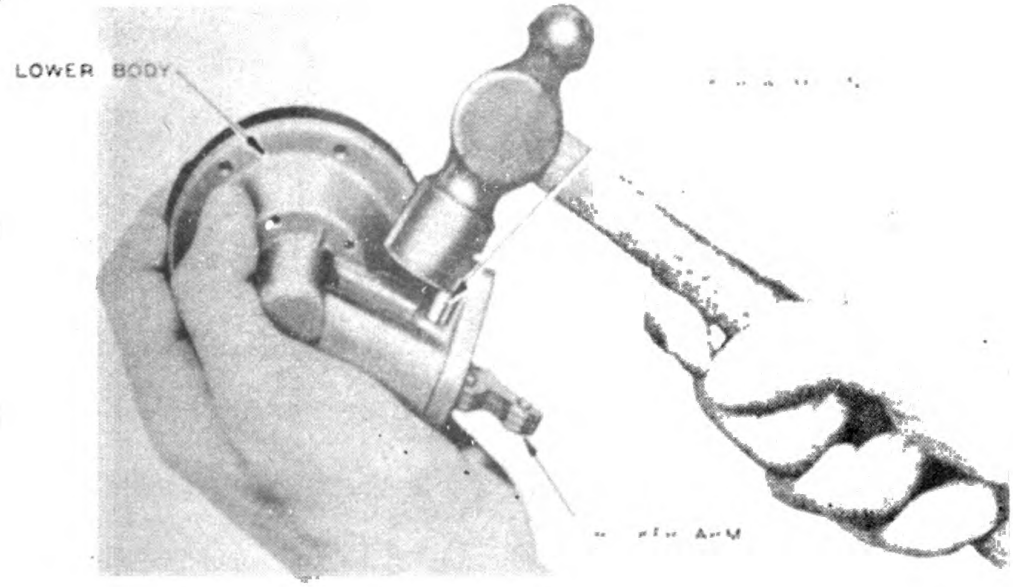


Fig 80

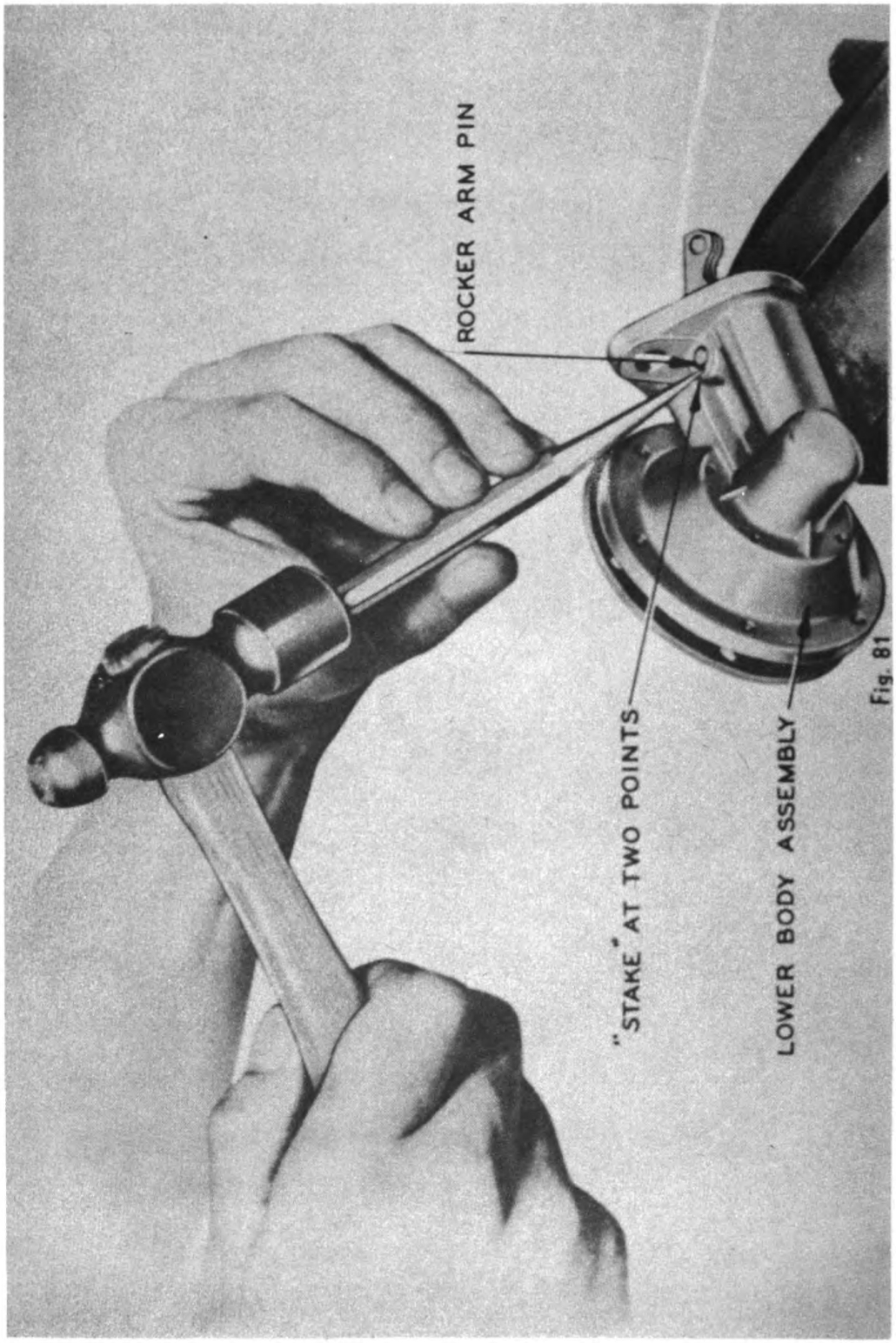


Fig. 81

Drop the fiber valve seat down into the inlet valve pocket. Then place one of the valve springs over it.

Drop the outlet valve retainer down into the valve hole. Then place the spring over the retainer and the outlet valve on top of the spring. Put retainer gasket in place and place the valve retainer down on the valves, so the small holes in the retainer line up with the screw holes in the casting.

NOTE B: This retainer is slightly curved, or "bowed." Install it so the hump of the curve is toward you. This will give the retainer some spring pressure when the screws are tightened.

Tighten the retainer screws securely. (Fig. 82)

Clean the fine mesh wire screen thoroughly in gasoline and wipe it dry. Be careful not to bend or damage it. (Fig. 83)

Set the bowl cover gasket (cork) on edge of the body casting. Place the screen over the gasket in such a way that the rim of the screen lies close against it. The two small metal projections near the center of the screen should **be on your side** of the screen.

Replace the bowl cover. WARNING: Be sure to thoroughly clean inside of bowl and cover. (Fig. 84)

Lay the cover over the casting and screen and replace the cap screw through the hole in the center of the cover. Tighten this screw securely. Be sure the fiber gasket is in place on the cap screw. (Fig. 85)

The fuel cover is now fully assembled.

Put the body in a vise. Line up the scratch on the edge of the body with the scratch on the edge of the top cover. (Fig. 86)

Get the diaphragm level by moving the rocker arm. Hold it while you put in all the screws and lockwashers. Be sure they pass through the holes in the diaphragm easily without chewing the fabric. Tighten these screws only enough so that they just touch the lockwashers.

Push rocker arm back and forth several strokes, releasing with a snap.

Tighten cover screws. Do this alternately—first a screw on one side, then a screw on the opposite side. Tighten all screws securely. (Fig. 87)

The Pump is now fully Assembled and Ready for Service.

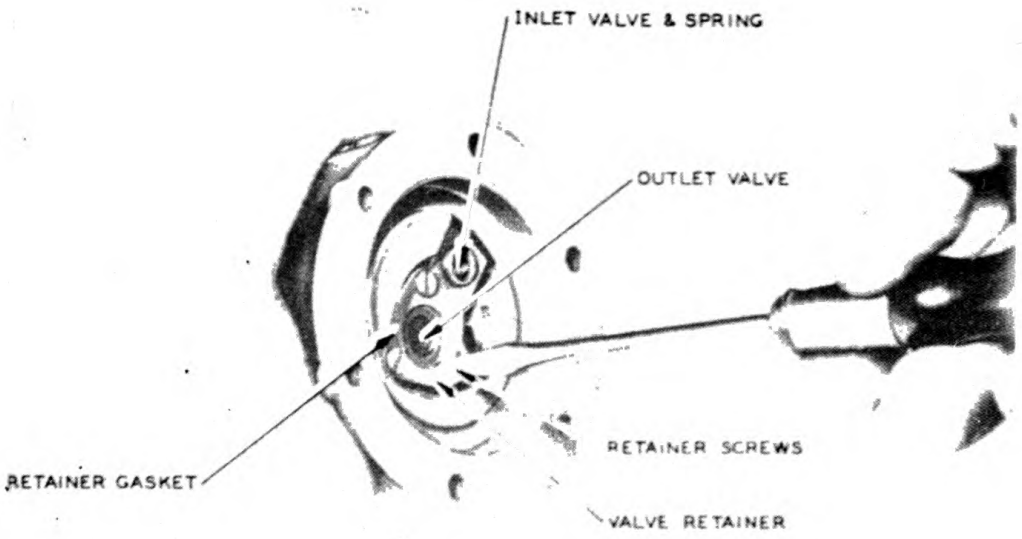


Fig. 82

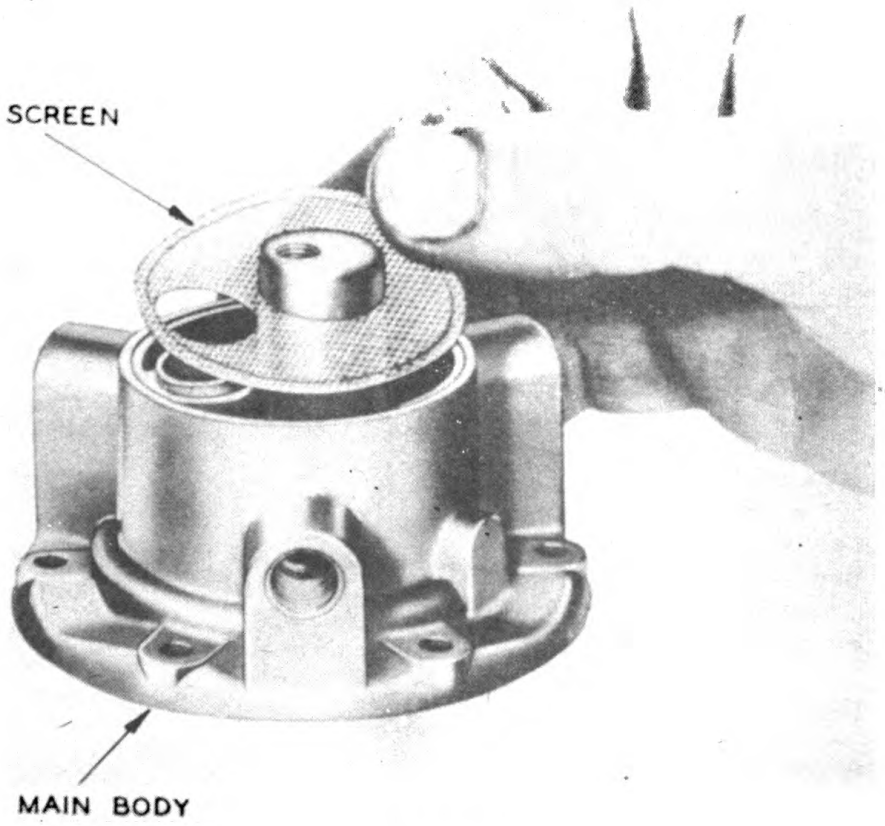


Fig. 83

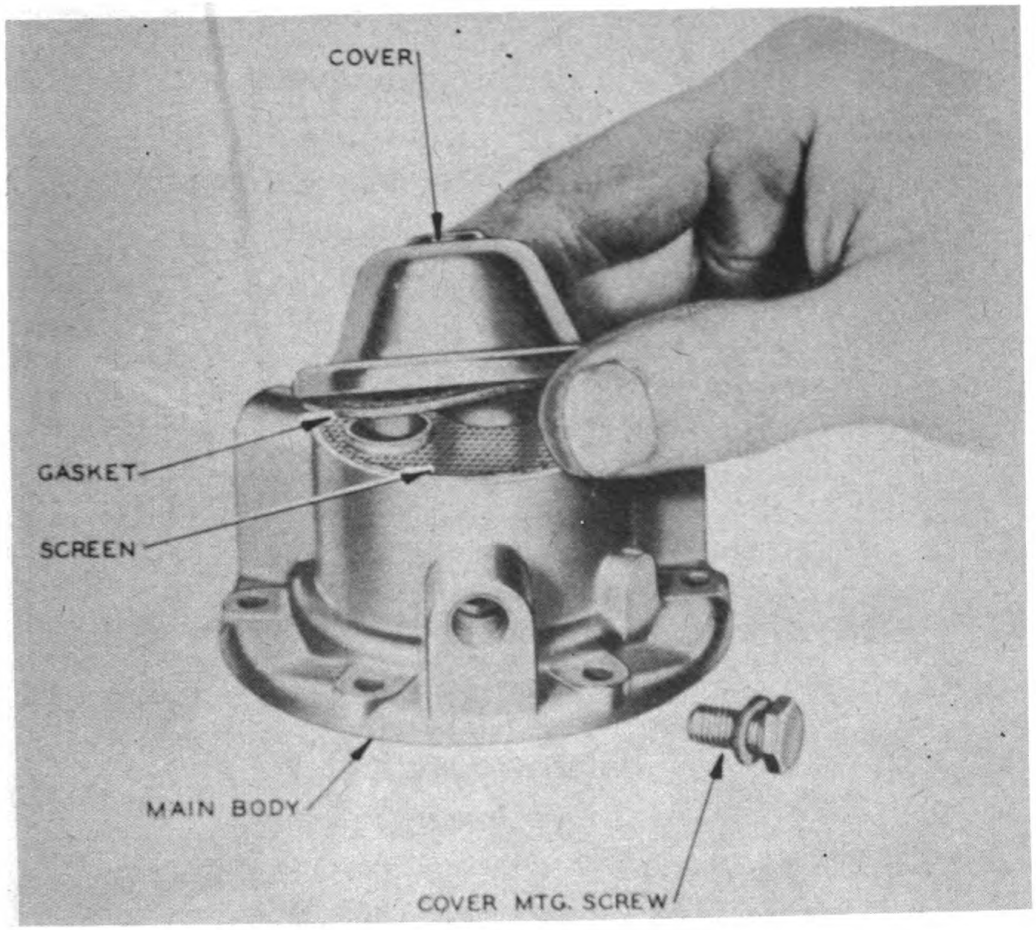


Fig. 84

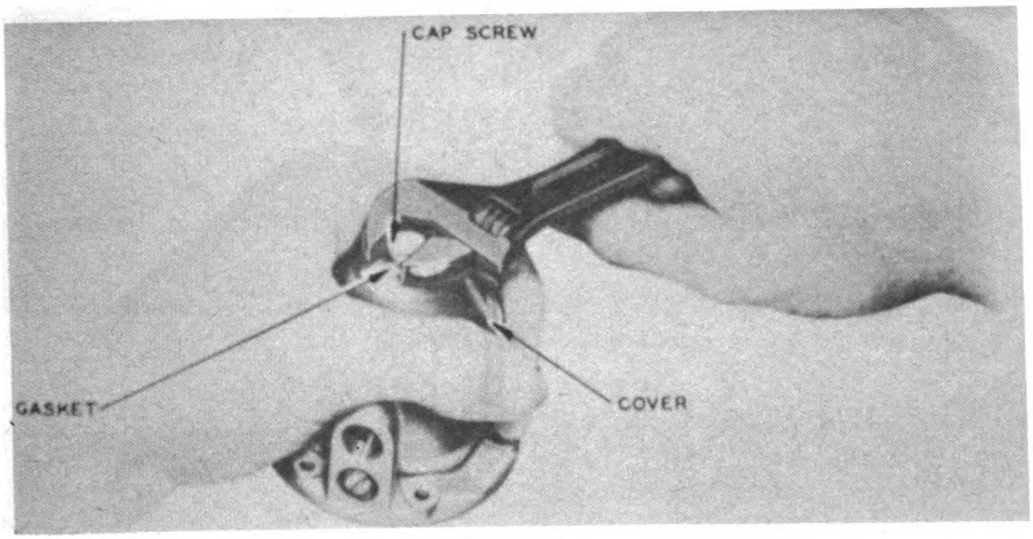


Fig. 85

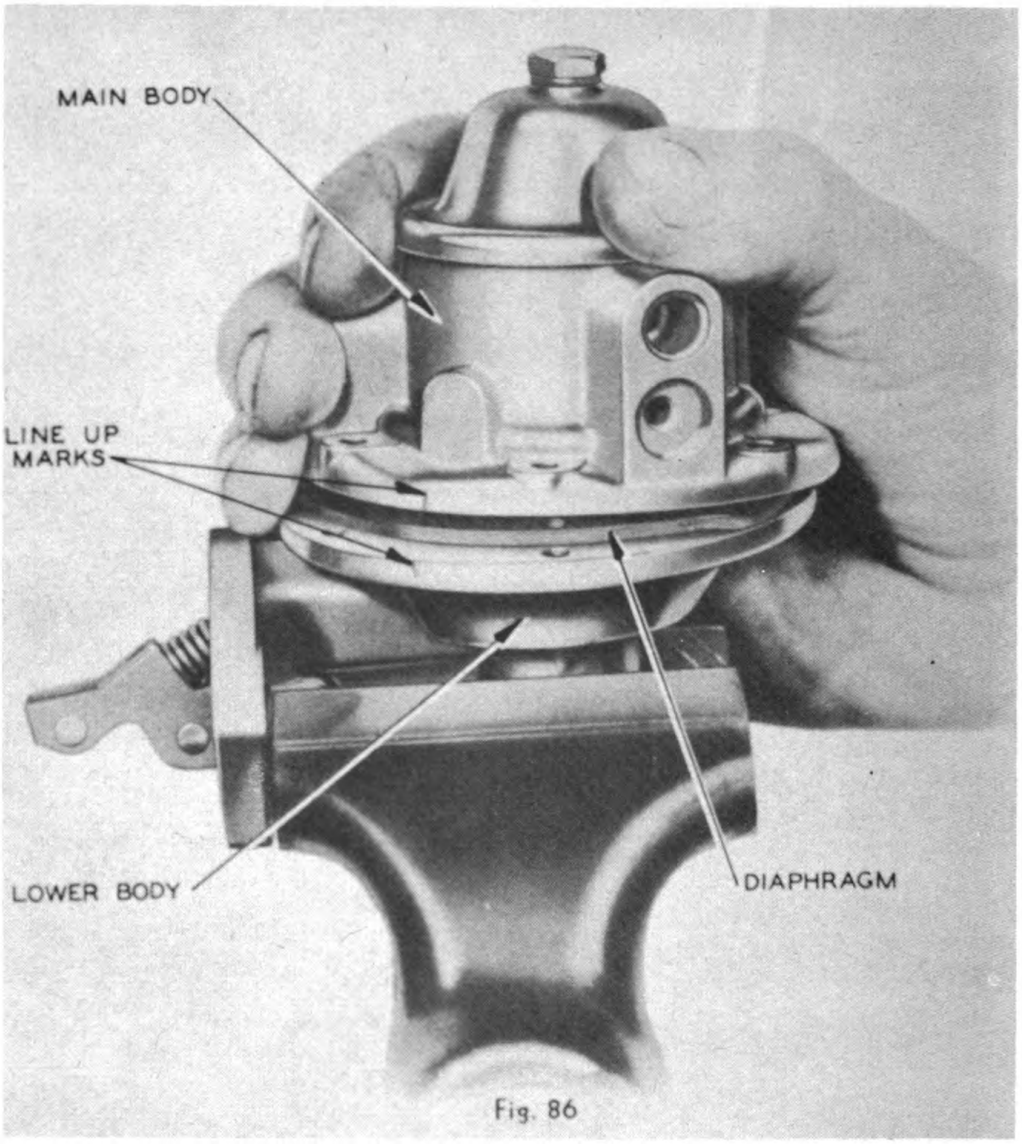


Fig. 86

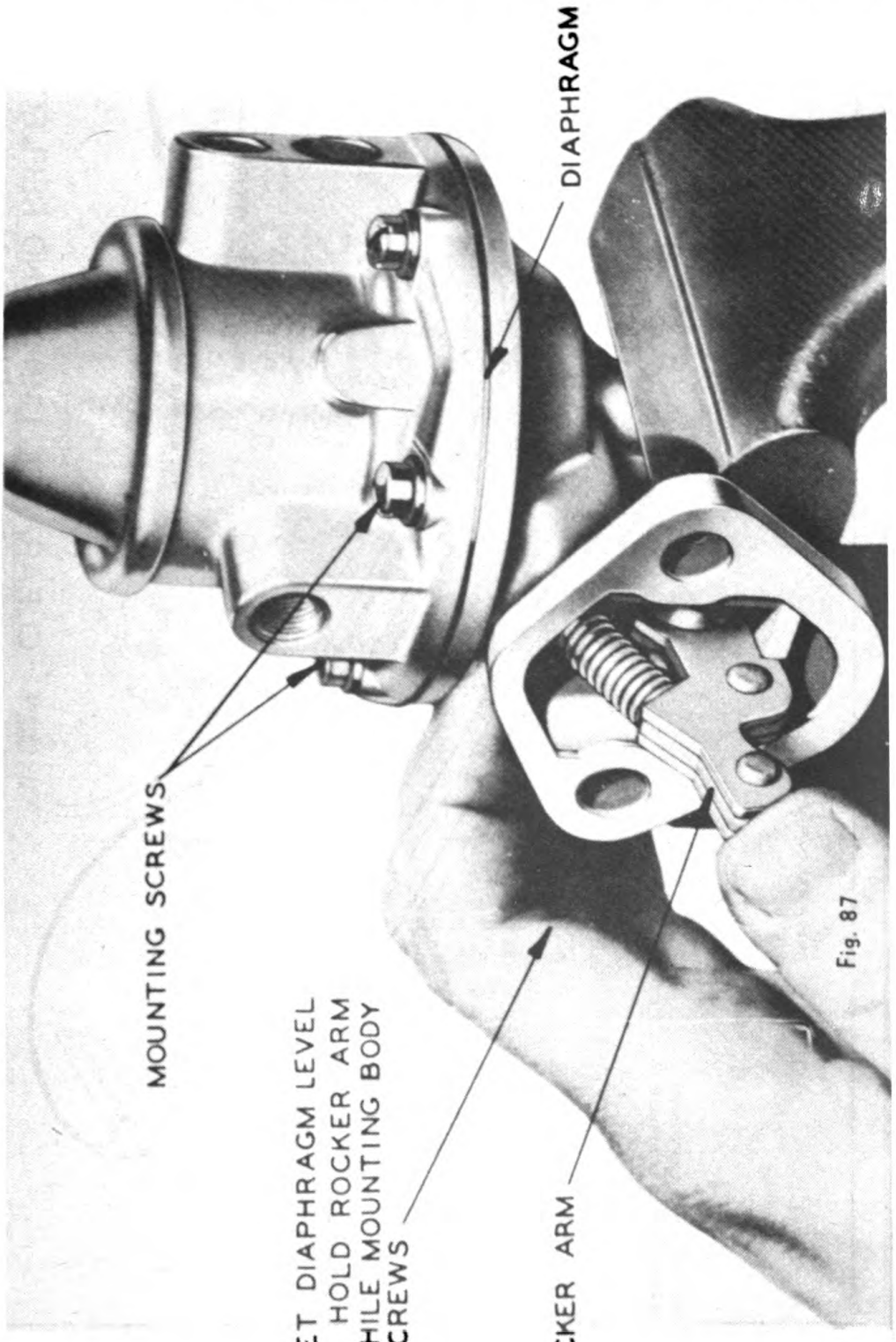
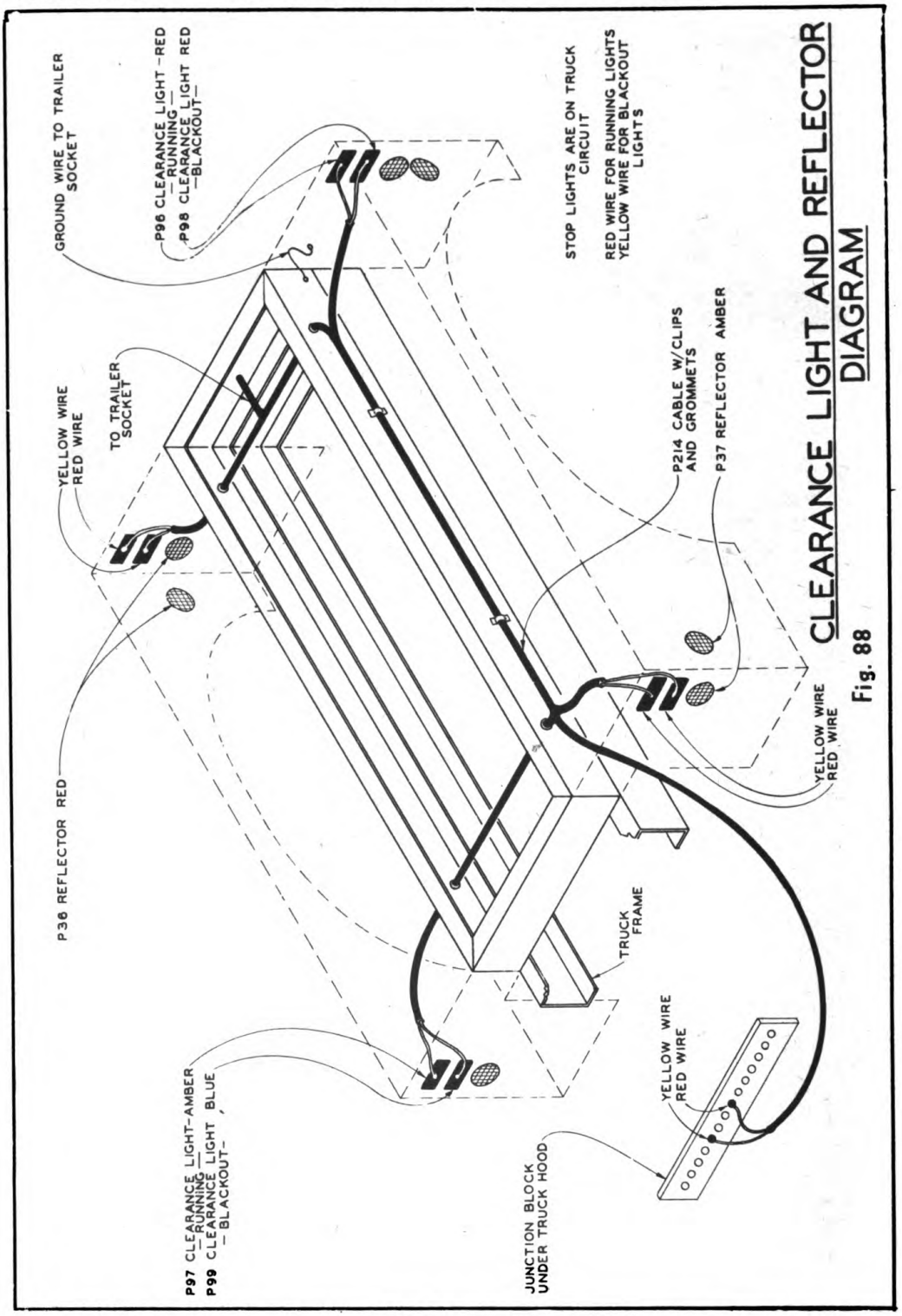


Fig. 87

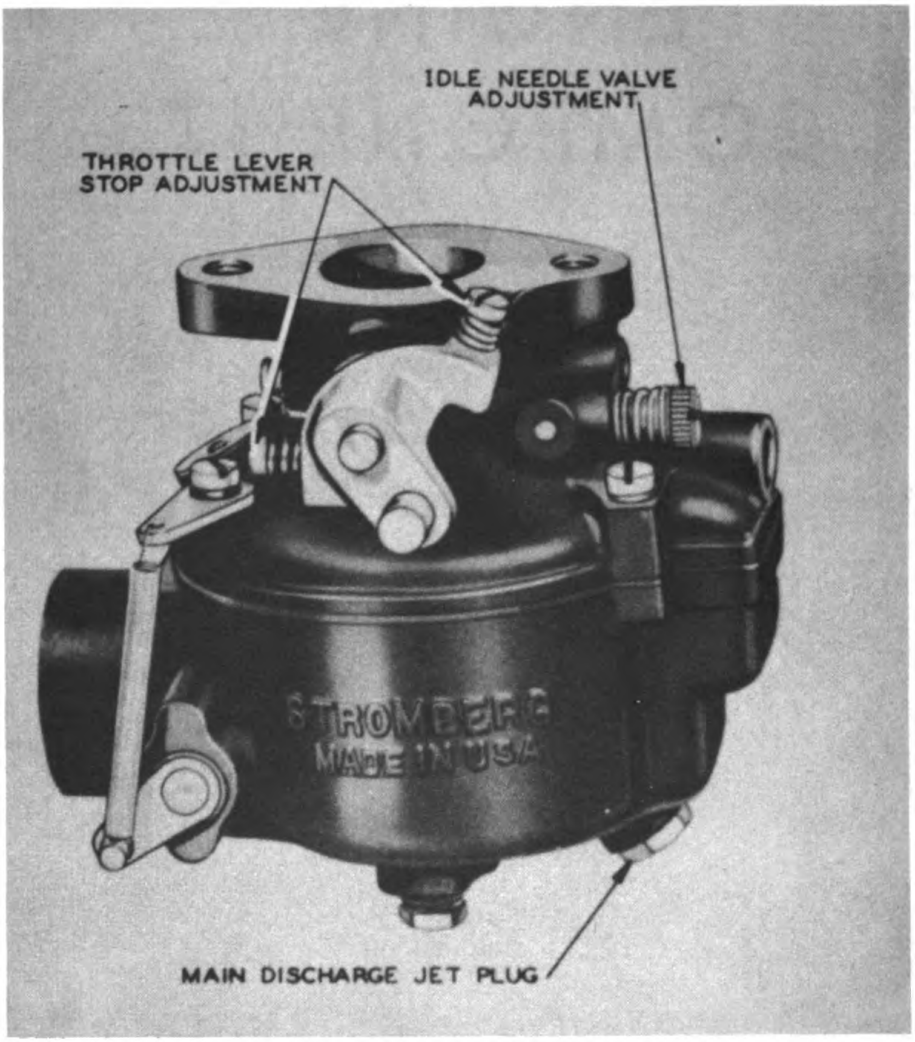


CLEARANCE LIGHT AND REFLECTOR DIAGRAM (Fig. 88). The diagram shown on (Fig. 88) is for the Diamond 'T' 4-ton 6x6 Truck. The tail and stop light and blackout tail and stop light are hooked onto the standard 6-volt truck circuit and need not be touched except to bolt to the rear frame. The running lights and reflectors are installed in the manner shown on the diagram.

ENGINE COMPONENT

Type UC-7/8 Stromberg Carburetor
Wisconsin Motor Number L-45-11

This Carburetor is used on machines having Serial Numbers 41 to 299 incl.



STROMBERG "UC-7/8" CARBURETOR

Fig. 89

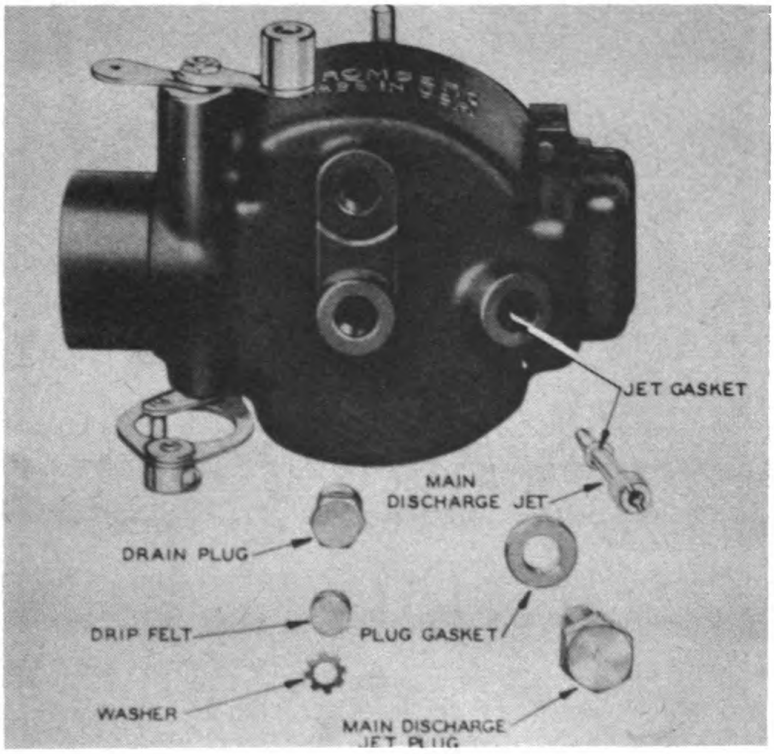


Fig. 90

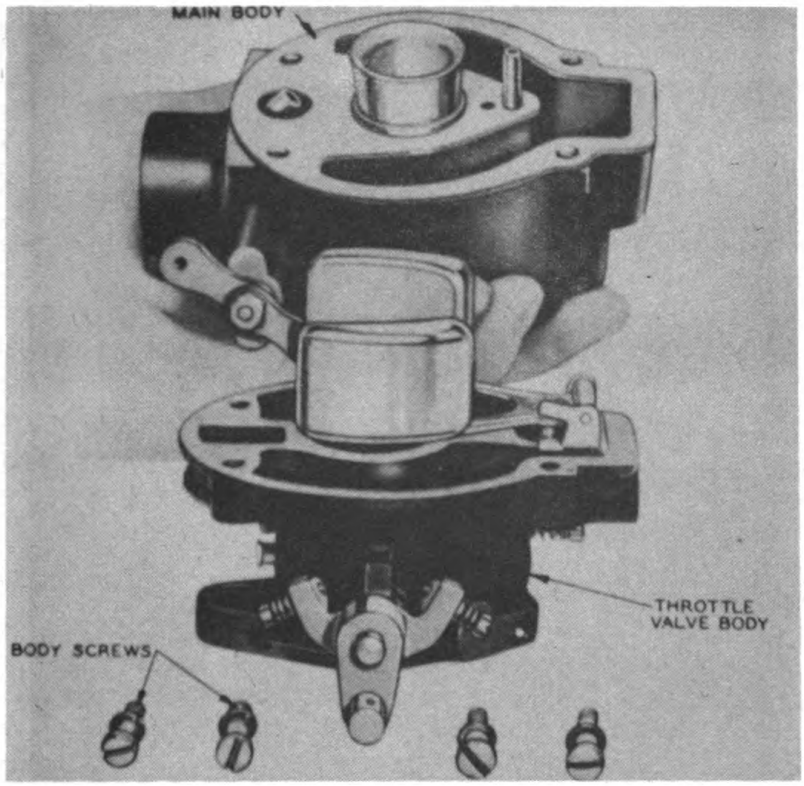


Fig. 91

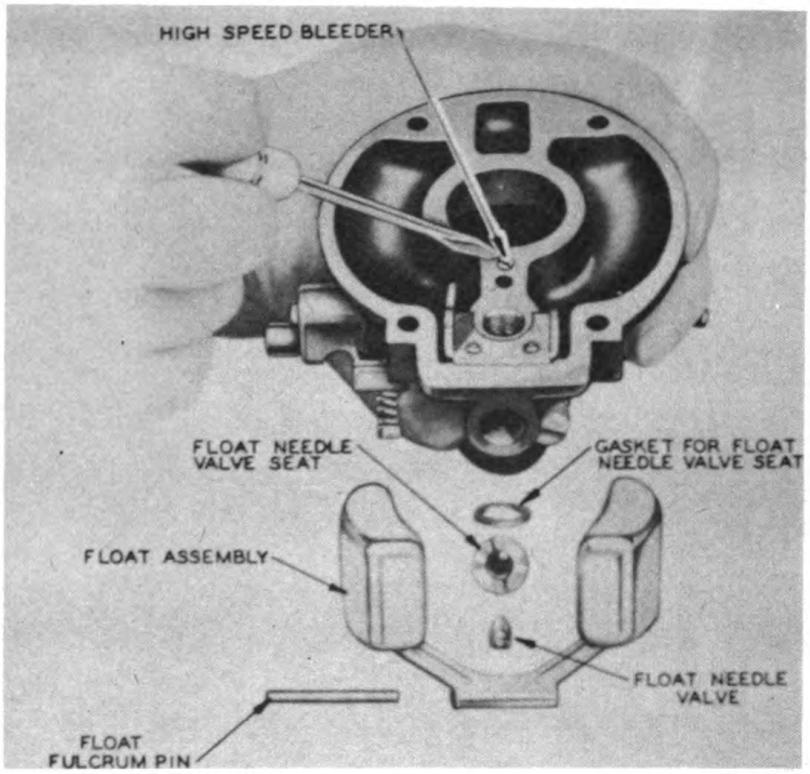


Fig. 92

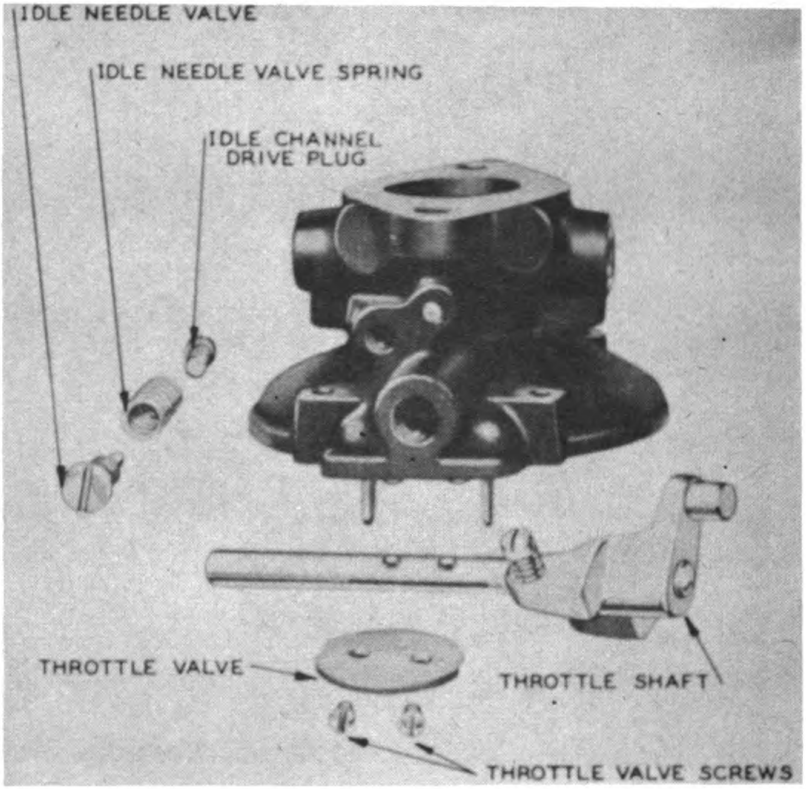


Fig. 93

STROMBERG CARBURETOR UC-⅞ SERIES
WISCONSIN L-45-11

DISASSEMBLY

Stromberg Model UC-⅞ complete unit showing main discharge jet plug, idle needle valve adjustment and throttle stop adjustment. (Fig. 89).

1. Remove main discharge jet plug and gasket using a ½" open end wrench. Remove main discharge jet using a screw driver of the proper size to avoid damaging part. Remove main discharge jet gasket.

   (NOTE: This gasket is used at the top shoulder of the main discharge jet and may stick in the main body when jet is removed.)

   Remove drain plug, drip felt and washer. (Fig. 90).

2. Remove four body screws and separate throttle valve body assembly from main body. (Fig. 91).

3. Remove float fulcrum pin by pressing a screw driver against the pin at the slotted side of the float hanger and force pin through hanger. Remove float and needle valve. Remove needle valve seat and gasket. Remove high speed bleeder from throttle valve body using a small screw driver. (Fig. 92).

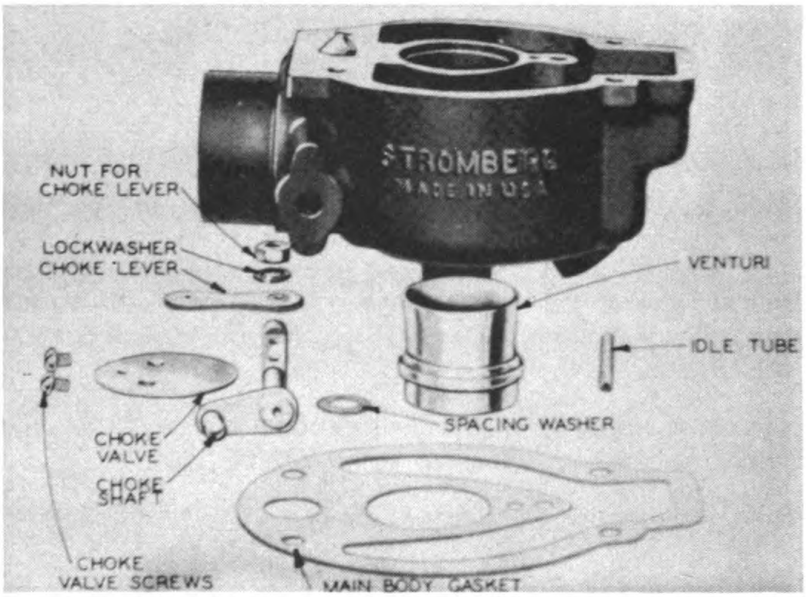
4. Remove idle needle valve adjustment and spring. With a scriber, mark lines in the throttle valve along both edges of the throttle shaft. These lines will help to position the throttle valve accurately when it is again assembled. Remove throttle valve screws, throttle valve and throttle shaft. Remove idle channel drive plug. (Fig. 93).

5. Remove main body gasket and venturi. Remove idle tube. Hold choke valve in closed position and on the air horn mark the position of the choke lever. Remove choke lever and nut, lockwasher and lever. Remove choke valve screws, lockwashers, and choke shaft with spacer washer. (Fig. 94).

REASSEMBLY

1. Install throttle shaft and valve leaving the screws loose at first. Line the valve up carefully with the scriber marks which were made along the edges of the shaft. With the valve held in closed position, hold the throttle body to the light and check the amount of clearance between the edges of the valve and body.

   If the clearance is excessive at any particular section of the valve, shift the valve in the shaft until it fits the barrel with the least amount of light showing around the entire edge. While holding the valve closed, tighten the screws securely. Install the stop collar on the shaft allowing only enough of clearance between the collar and the body so that the valve can operate freely. Tighten the set screws securely. (Fig. 95).



LINE UP VALVE CAREFULLY AND CHECK WITH SCRIBER MARK MADE IN DISASSEMBLY.

Fig. 94

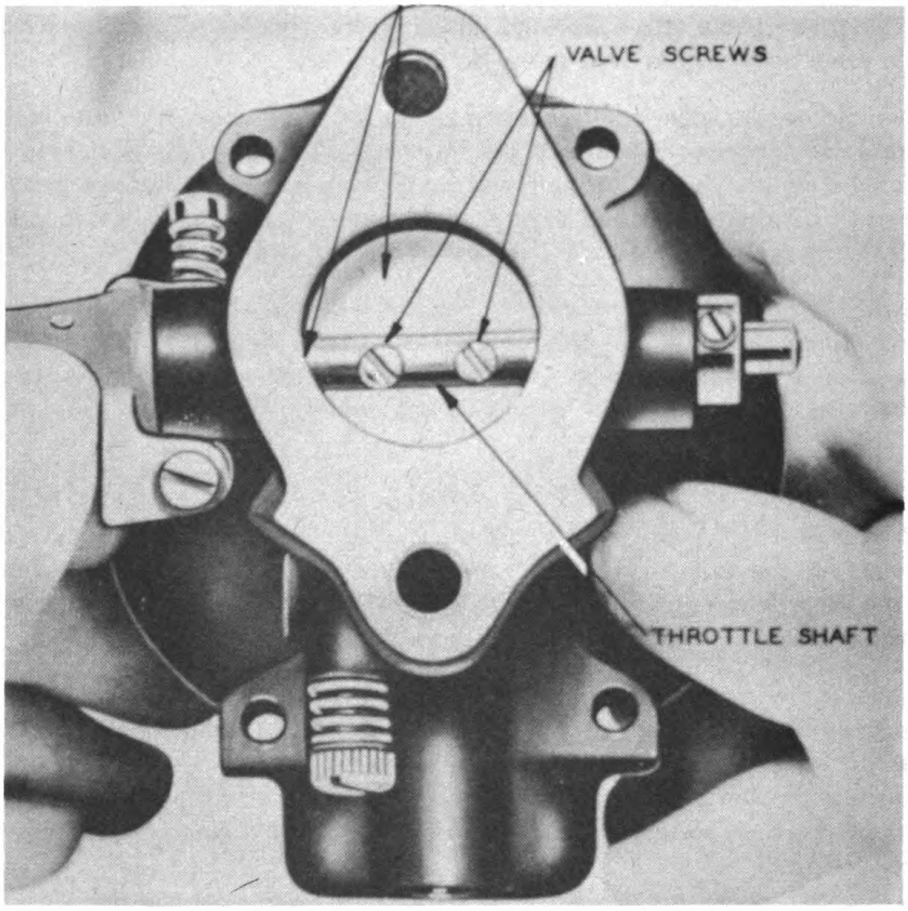


Fig. 95

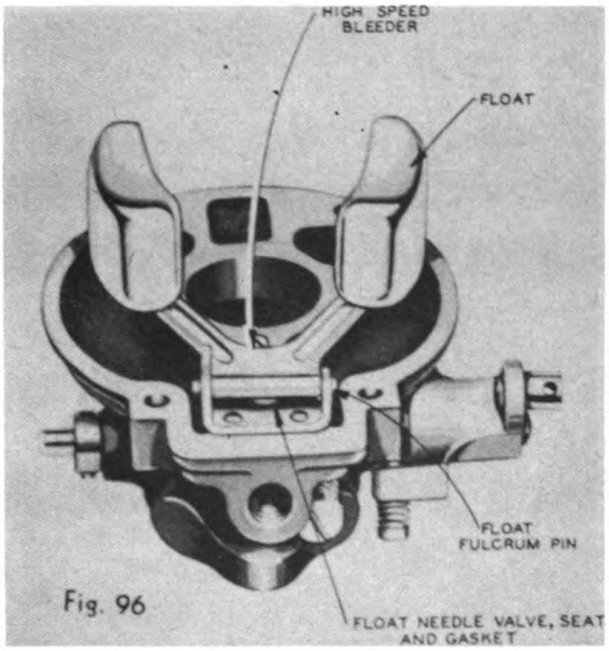


Fig. 96

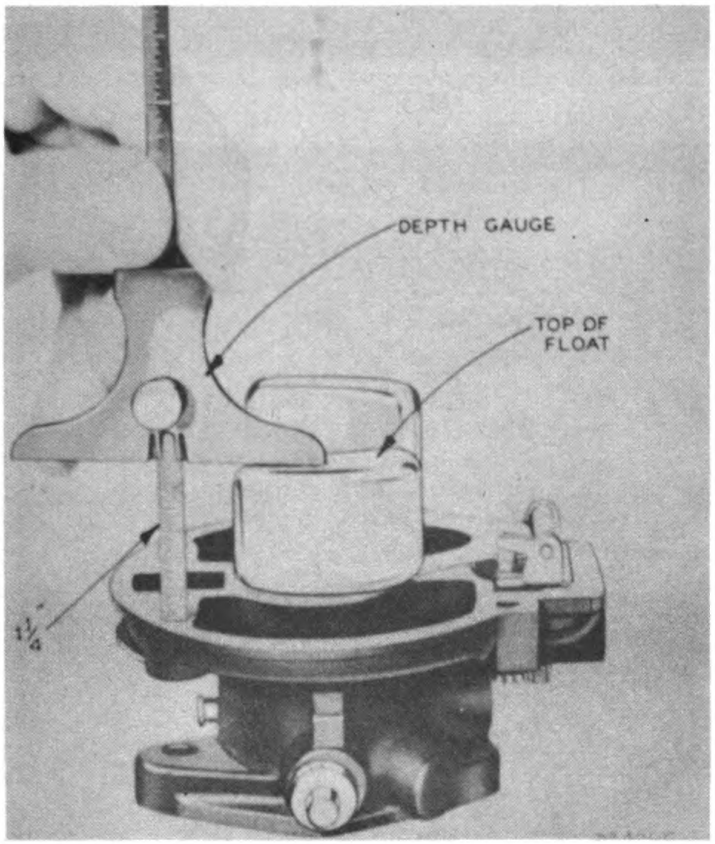


Fig. 97

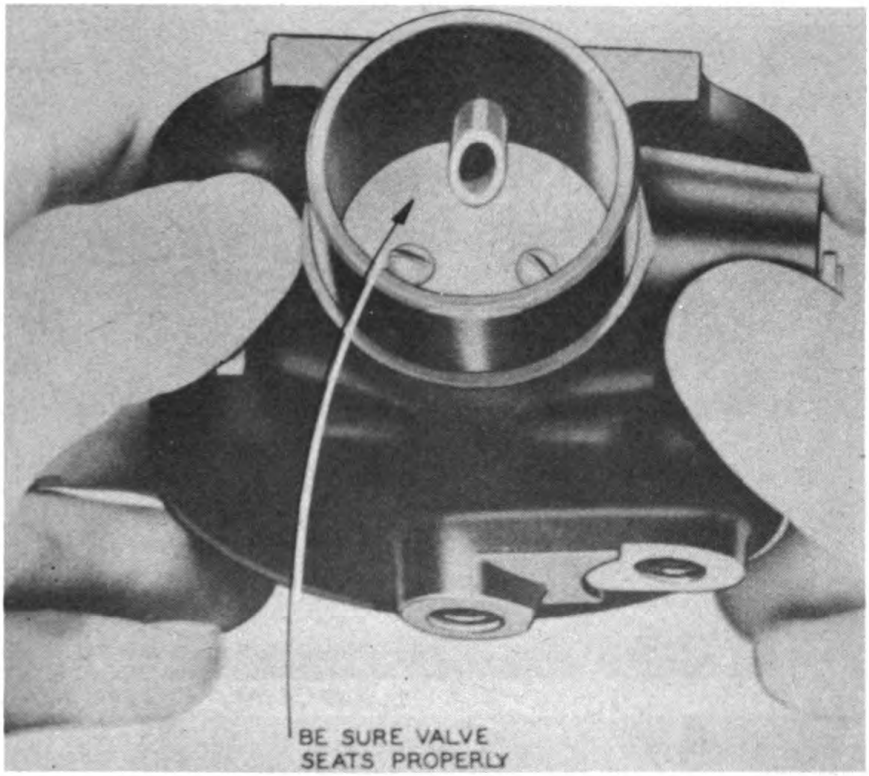


Fig. 98

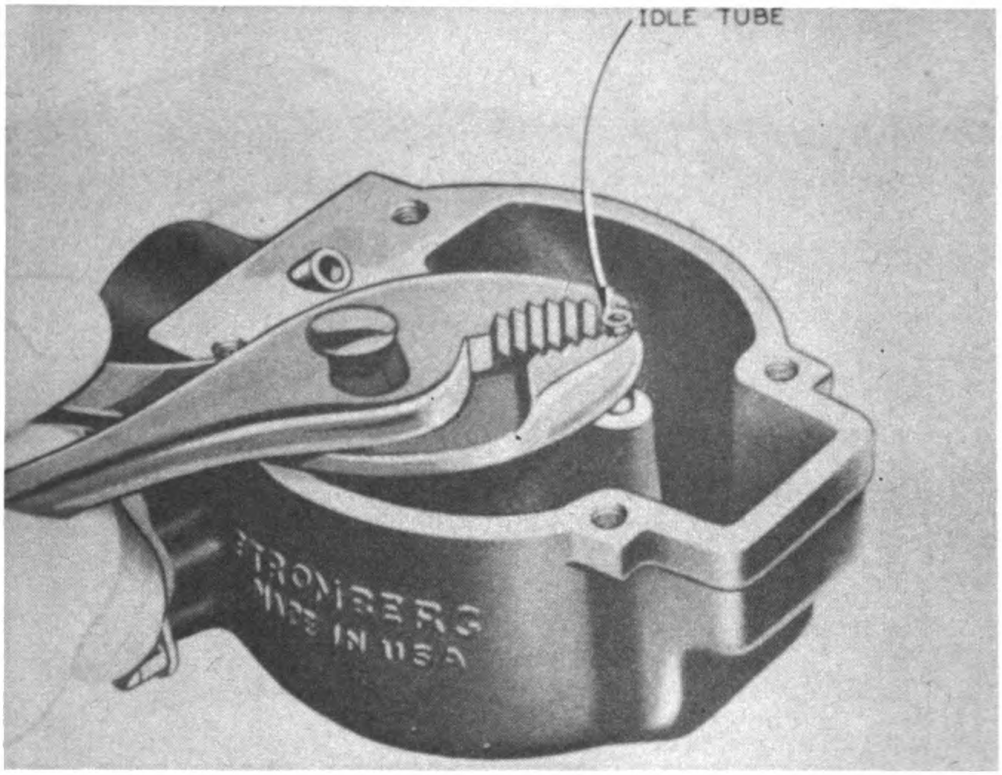


Fig. 99

REASSEMBLY (Continued)

2. Install the high speed bleeder. Install float needle valve seat and gasket. Install float needle valve and seat followed by float and float fulcrum pin. Insert the tapered end of the fulcrum pin into the float hanger on side opposite of slot and push through the other side. Press fulcrum pin into slotted side until the pin is centered in the hanger. (Fig. 96).

3. Float Setting and Fuel Level: In order to obtain the most efficient operation from a carburetor, it is necessary that the fuel level be maintained at the correct height in the float chamber. The correct fuel level in the float chamber of the UC-7/8 carburetor is from $^{15}/_{32}$" to $^{17}/_{32}$" from the top of the main body. The preliminary step in obtaining the correct fuel level is to place the throttle valve body in an inverted position as illustrated so that the float will keep the needle valve closed. While in this position the top of the floats should measure 1¼" from the gasket surface of the throttle valve body. Both floats should be set to the same height. If it is necessary to change the position of either float use a pair of long nose pliers and bend the arm close to the section where both arms meet.

   CAUTION: Do not bend, twist, or apply pressure on the float body.

   It is good practice to check the fuel level before the throttle body is assembled upon the main body. This can be done by providing a flat top vessel and resting the throttle body assembly upon the top of the vessel. Connect the gasoline line to the gas inlet in the throttle body and allow gasoline to flow into the vessel under normal pressure until the flow is shut off by the action of the float. Measure the distance from the top of the vessel to the gasoline level. Be sure the vessel is perfectly level and that the top edges are smooth and flat. (Fig. 97).

4. Place choke shaft spacer washer on shaft. Insert choke shaft into body and assembly choke valve with screws and lockwashers, making certain that the valve fits around the entire edge when it is in closed position. Make certain that the choke shaft operates freely. Install choke lever on end of shaft in the position as previously marked. (Fig. 98).

5. Install idle tube securely. (Fig. 99).

6. Install main discharge jet with fibre gasket on top shoulder. Install main discharge jet plug and gasket securely. Install drain plug. (Fig. 100).

7. Place venturi in main body. Place main body gasket over venturi and idle tube. Install throttle valve body into main body with screws and lockwashers. (Fig. 101).

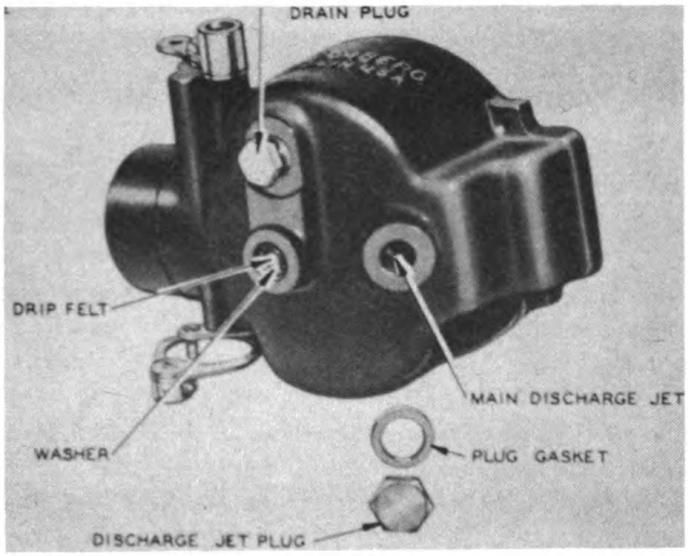


Fig. 100

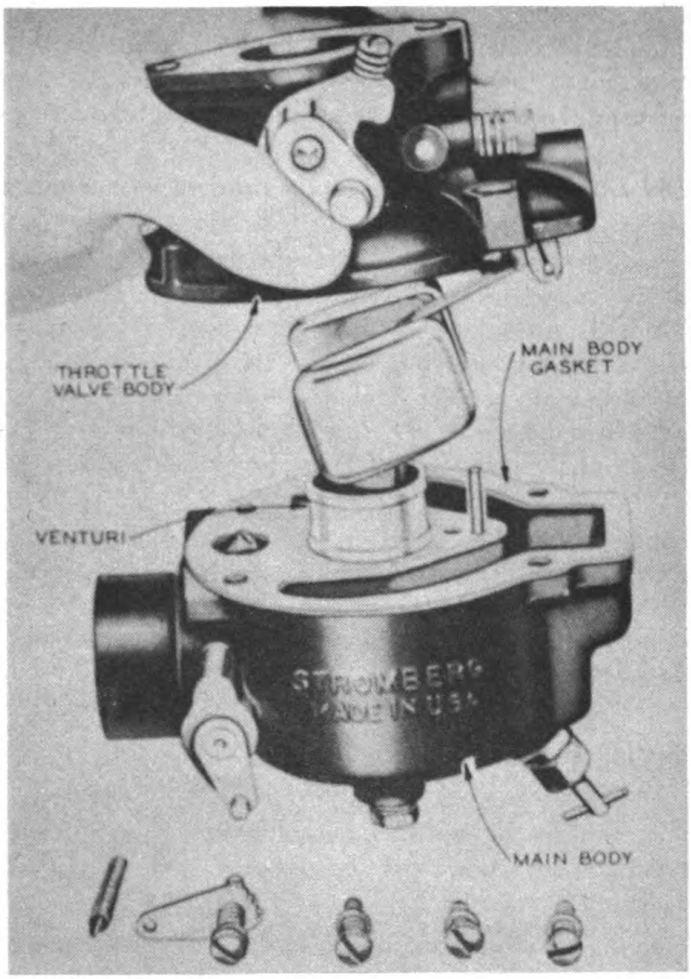


Fig. 101

ENGINE COMPONENT

Type No. 161 Zenith Carburetor
Wisconsin Motor Company, Number L-48

This carburetor is used on machines having serial numbers 480 and up.

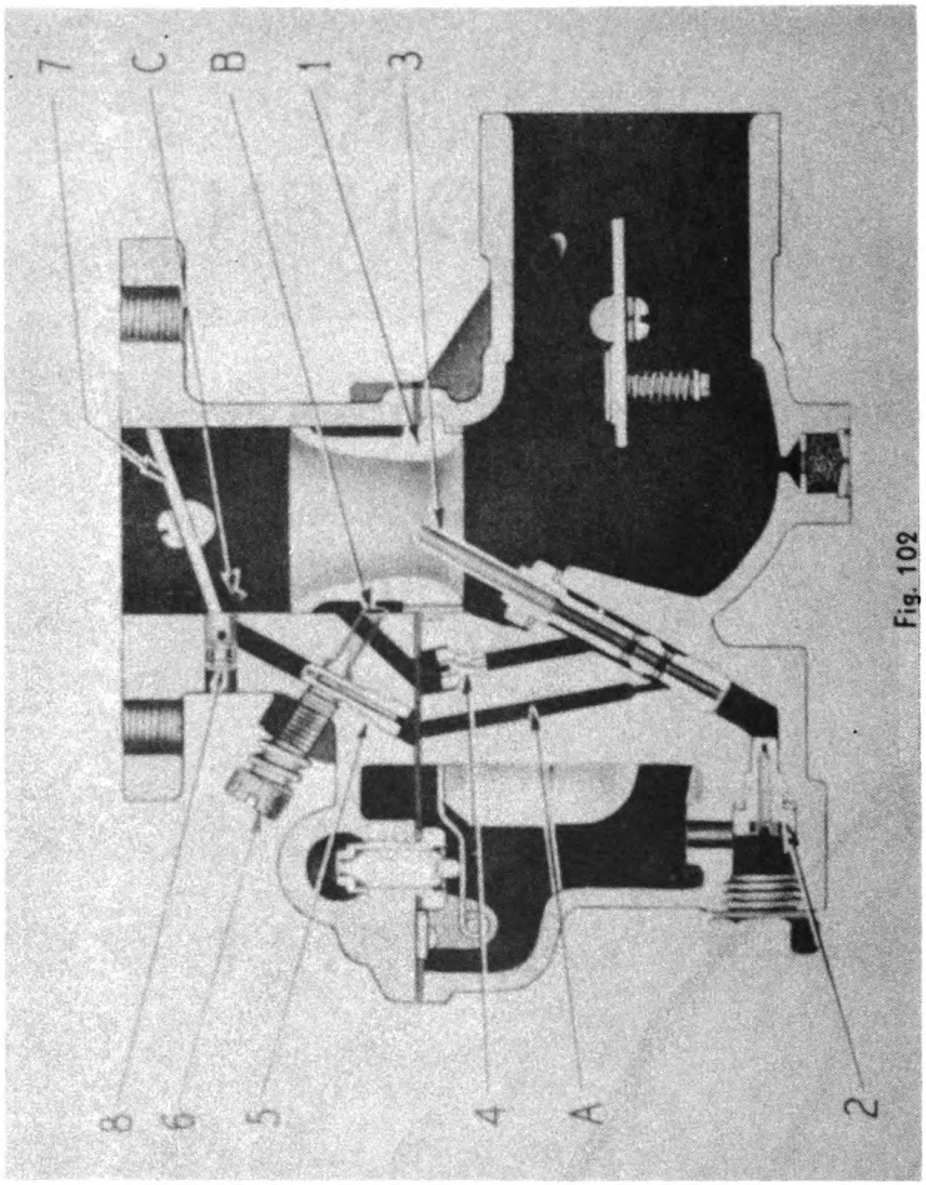


Fig. 102 Sectional View of Carburetor

ZENITH 161 SERIES CARBURETOR

GENERAL DESCRIPTION—(Fig. 102) shows the construction of the Zenith 161 Series carburetor.

The removable venturi (1) * measures the volume of air which passes through the carburetor. In selecting the venturi, it is best to use the smallest size which will permit full power development.

MAIN JET SYSTEM: The Main jet (2), often referred to as the "high speed jet," exerts its principal influence at the higher engine speeds. Fuel from the bowl is metered through the Main jet (2) and discharged into the air stream through the Main Discharge Jet (3).

COMPENSATING SYSTEM: The compensating system consists of the Main Discharge Jet (3) and the Well Vent (4). The flow of fuel from the Main Jet (2) is controlled by the size of the Well Vent (4) and the size of the Main Discharge Jet (3). The mixture delivered through the Main Discharge Jet may be made richer by either increasing the size of the Main Discharge Jet or by decreasing the well vent. Conversely the mixture may be made leaner by either decreasing the size of the Main Discharge Jet or by increasing the size of the well vent.

IDLING SYSTEM: The idling system consists of the Idling Jet (5) and the Idle Adjusting Needle (6). The Idling Jet (5) receives its fuel from the Main Discharge Jet (3) through Channel (A). The fuel is metered through the Idling Jet (5) and is mixed with air which is admitted from behind the venturi (1), through Channel (B). The Idle adjusting needle (6) controls the amount of air which is admitted to the Idling System. The Idling System functions only at Idling and Low Speeds. At these speeds, the Throttle Plate (7) is almost closed and there is a very strong suction past the edge of the Throttle Plate. This suction draws the mixture of fuel and air from the Idling Jet (5) which discharges into the air stream through the Priming Plug (8).

DISASSEMBLY

To properly repair Zenith 161 Series Carburetors we suggest the following routine: (Fig. 102)

1. Loosen lever clamp screw and remove lever.
2. Remove idling adjusting screw (6) and spring.
3. Remove throttle body to bowl assembly screws with a screwdriver. (There are four assembly screws and lockwashers.)
4. Raise the throttle body slightly and loosen the gasket from the bowl assembly.
5. Lift the throttle body and gasket clear of the bowl assembly being careful to avoid damaging the float. (Fig. 103)
6. Remove the venturi (1).

*Reference numbers apply only to the sectional view of carburetor.

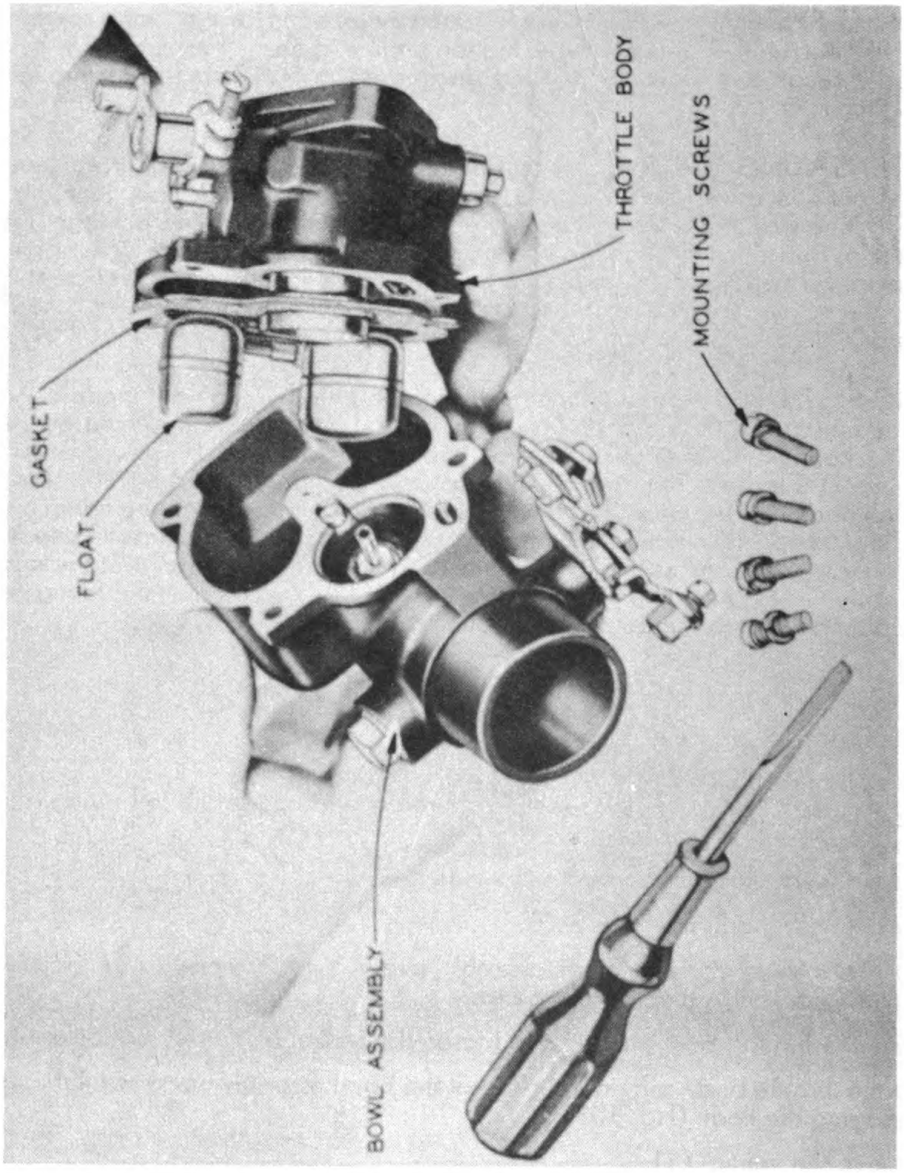


Fig. 103

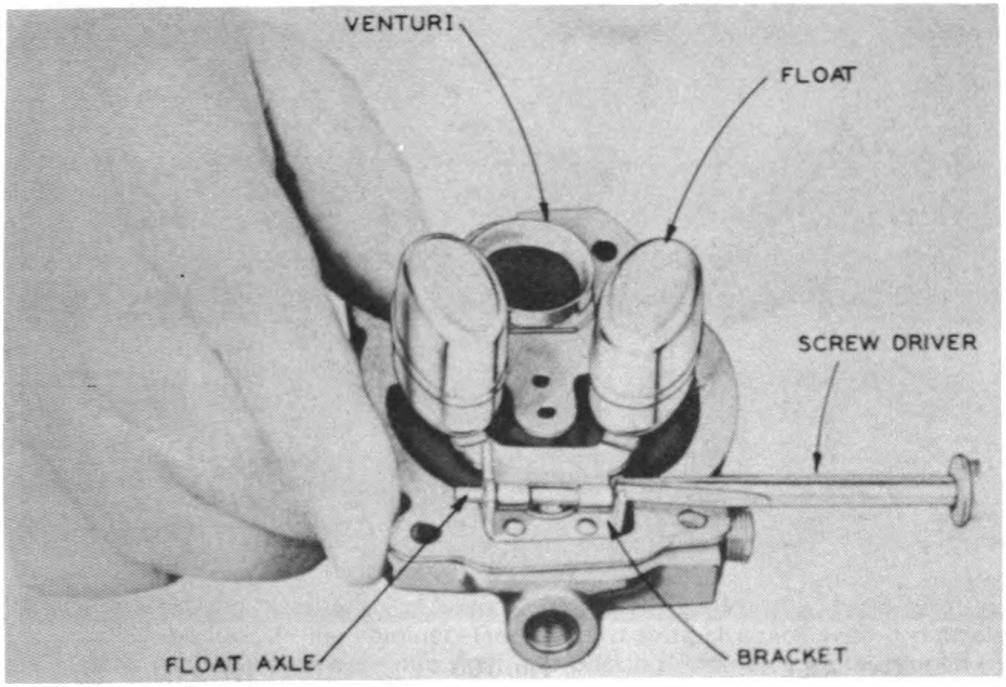


Fig. 104

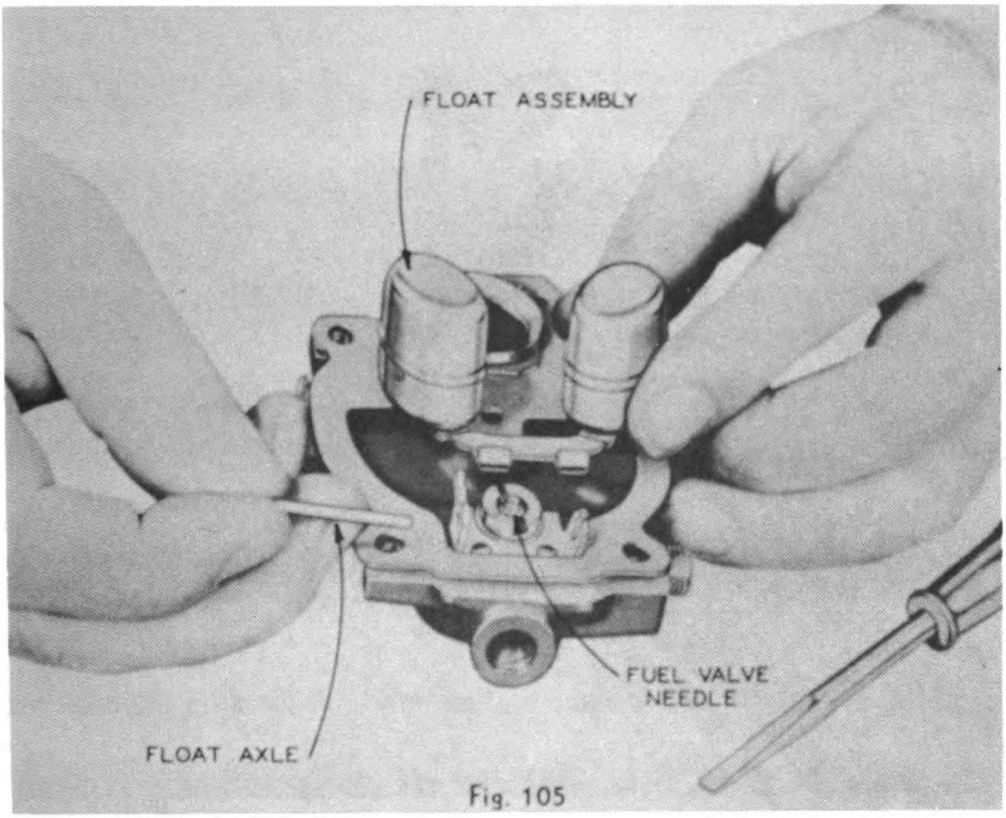
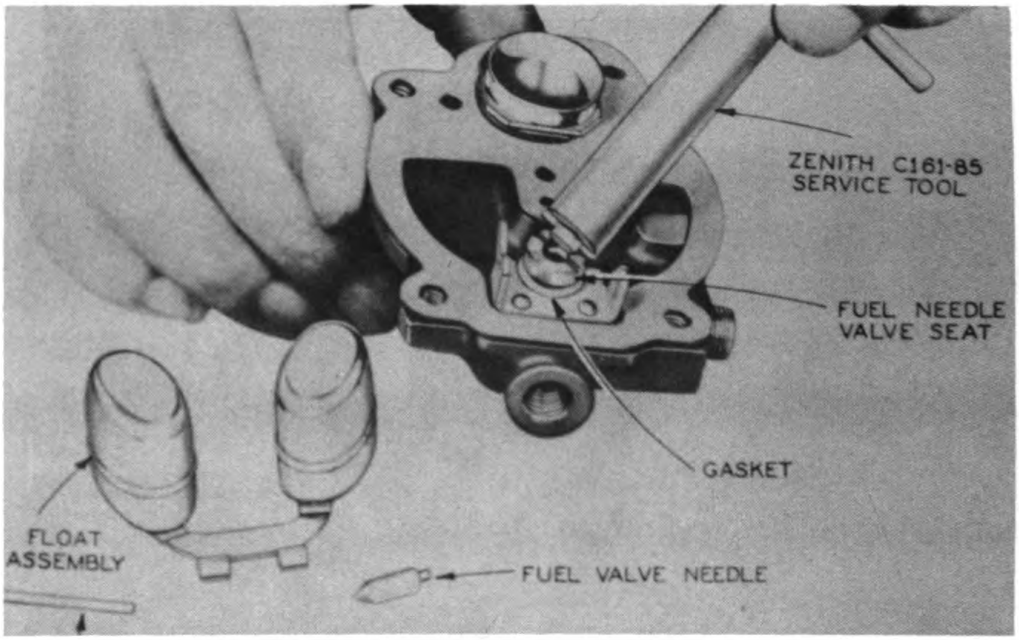


Fig. 105



FLOAT AXLE

Fig. 106

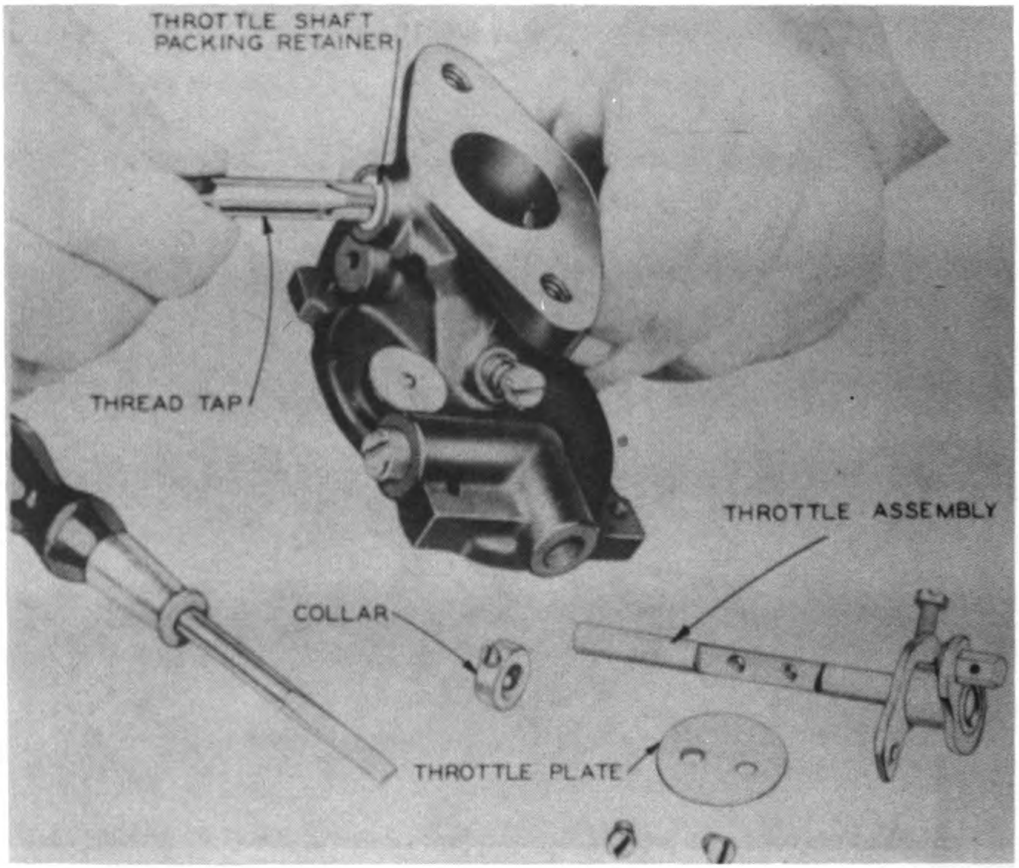


Fig. 107

7. Remove the float axle using a screwdriver to push the axle from the slotted end of the bracket, and the fingers to remove it the rest of the way. (Fig. 104)

8. Remove the float assembly and the fuel valve needle. (Fig. 105)

9. Remove the throttle body to bowl gasket.

10. Remove the fuel valve seat and gasket using C161-85 Service Tool or screwdriver. (Fig. 106)

11. Remove idling jet (5) using a small screwdriver ($\frac{3}{16}$" blade).

12. **BEFORE** removing the throttle plate, READ NOTE "A" then proceed to remove throttle plate screws, plate and shaft assembly.

13. Remove stop lever taper pin using a small punch and a hammer.

14. Remove the throttle shaft packing retainers by threading a $\frac{5}{16}$" tap till it is securely imbedded in the retainer, then using a straight punch with a diameter slightly smaller than the throttle shaft, the packing retainers may be tapped out of the throttle body. (Fig. 107 and 108)

    NOTE: Do not remove the identification disc which is riveted to the bowl cover (SEE NOTE "B") the priming plug (8), the throttle stop pin, the float hinge bracket or the brass channel plugs.

15. Remove the well vent (4) using a small screwdriver. (Fig. 109)

16. Remove Main Discharge Jet (3) and gasket using C161-25 Service Tool (Fig. 110)

17. Remove main jet plug and gasket using a ½" open-end wrench.

18. Remove main jet (2) and gasket using a C161-1 Tool or a screwdriver. (Fig. 111)

19. Remove air shutter lever retainer nut and lockwasher using C161-25 Service Tool or a $\frac{5}{16}$" wrench.

20. Remove air shutter lever assembly. (Fig. 112)

21. Remove air shutter bracket retainer screw and bracket using a ½" wrench.

22. Remove air shutter shaft hole plug and gasket using a ½" wrench.

23. Remove air shutter screws and lockwashers.

24. Remove air shutter plate and shaft.

    NOTE: Do not remove air shutter stop pin, air shutter bracket locating pin or drip plug.

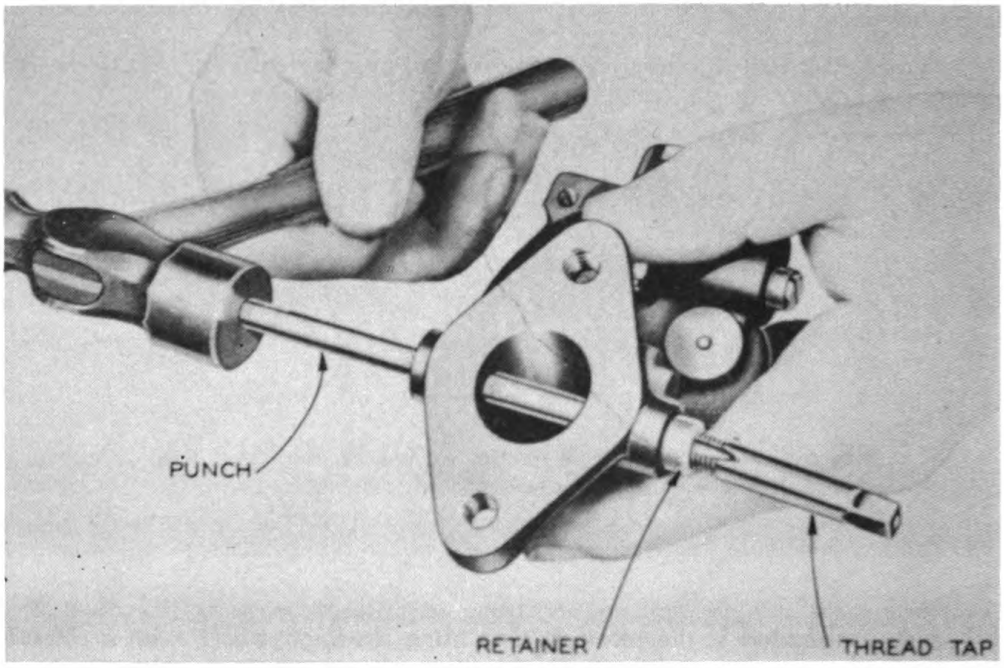


Fig. 108

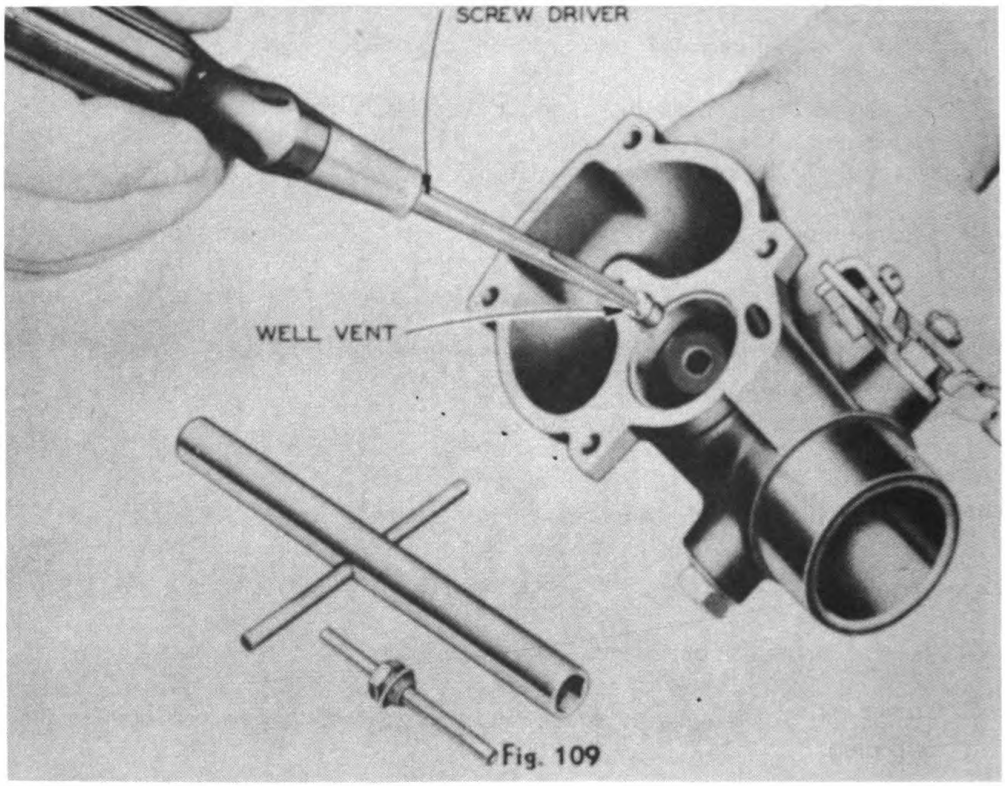


Fig. 109

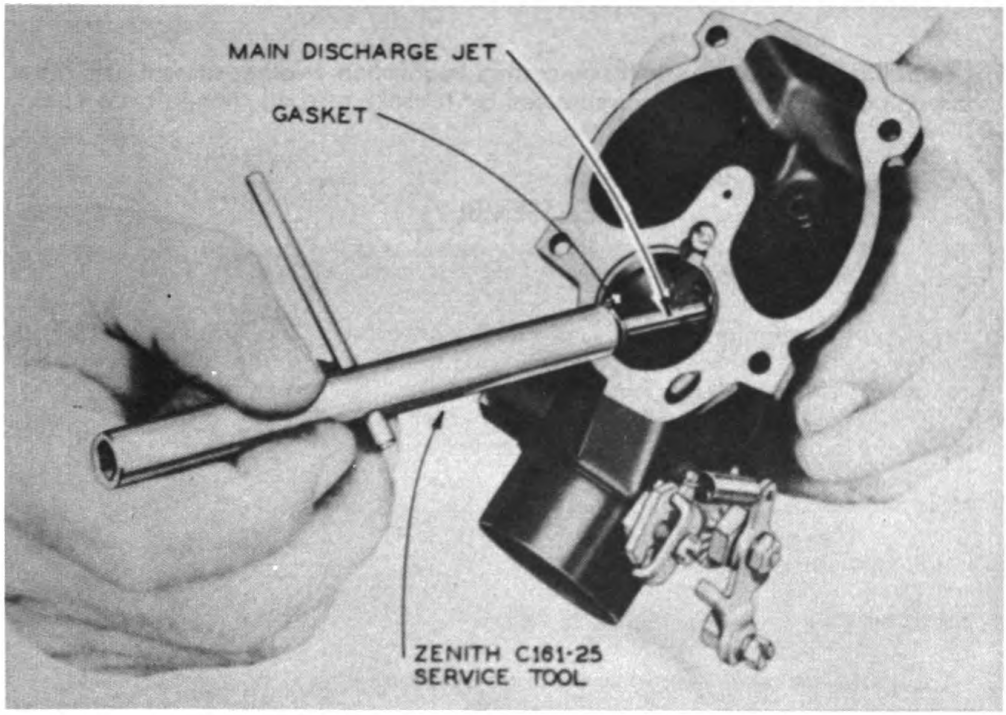


Fig. 110

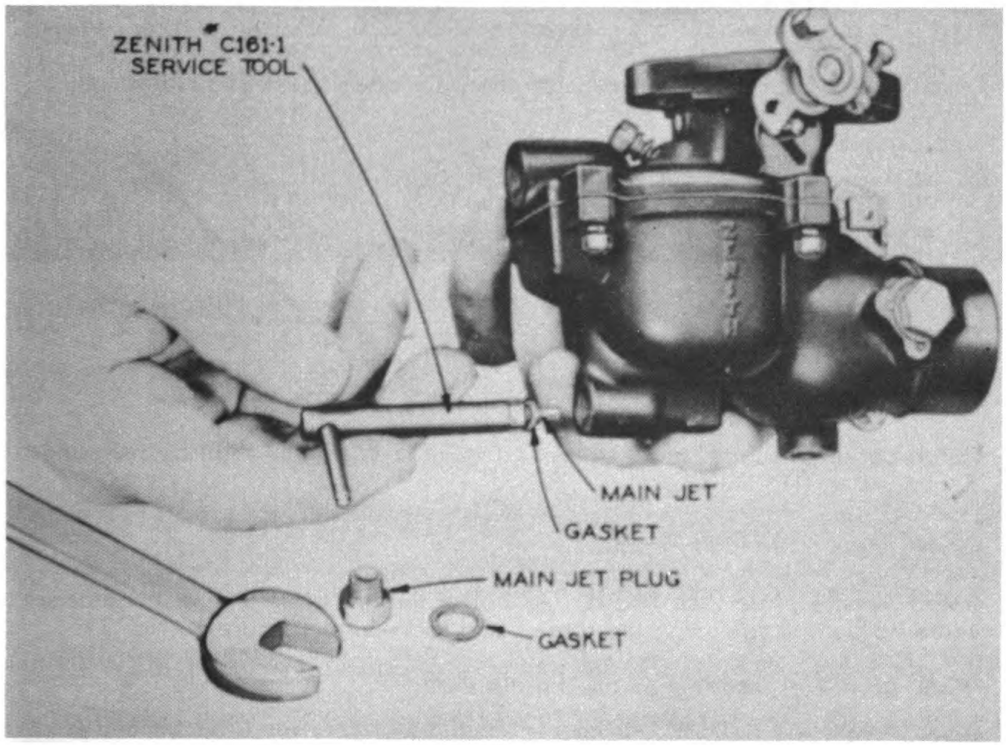


Fig. 111

25. Clean the bowl and throttle body casting in gasoline or other solvent and blow through each channel with compressed air to make sure all channels are clean.

REASSEMBLY

1. Place air shutter shaft in position.
2. Install air shutter plate screws and lockwashers. Be sure air shutter valve is in correct position as shown in (Fig .102) and that the air shutter plate is properly centered before tightening the screws securely.
3. Install air shutter shaft hole plug and gasket using a ½" wrench.
4. Hold air shutter bracket in position.
5. Install retainer screw using ½" wrench.
6. Install air shutter lever assembly as follows:
   (a) Hold the air shutter in wide-open position.
   (b) Place the lever on the shaft and against the stop pin in the direction to open.
   (c) Install retainer nut and lockwasher using C161-25 Tool or a $\frac{5}{16}$" wrench.
   (d) Check operations to make sure the air shutter opens and closes fully.
7. Replace main jet (2) and new gasket using C161-1 Service Tool. (Fig. 111)
8. Install main jet-plug and new gasket using a ½" open-end wrench. (Fig. 111)
9. Replace Main Discharge Jet (3) and new gasket using C161-25 Service Tool, or screwdriver. (Fig. 110)
10. Replace well vent (4) using a small screwdriver. (No gasket required). (Fig. 109)
11. Place new throttle shaft packing in new packing retainer ring.
12. Install packing retainer ring (with packing) in both throttle shaft bosses using a light hammer. (Fig. 113)
13. Place new throttle shaft in position.
14. Install throttle plate (SEE NOTE "A"). The throttle plate should be properly centered before tightening the screws and lockwashers securely. (Fig. 115)
15. Install stop lever assembly on the throttle shaft.

NOTE: When the throttle plate is straight up and down in the barrel (wide open) the stop lever should be against the stop pin.

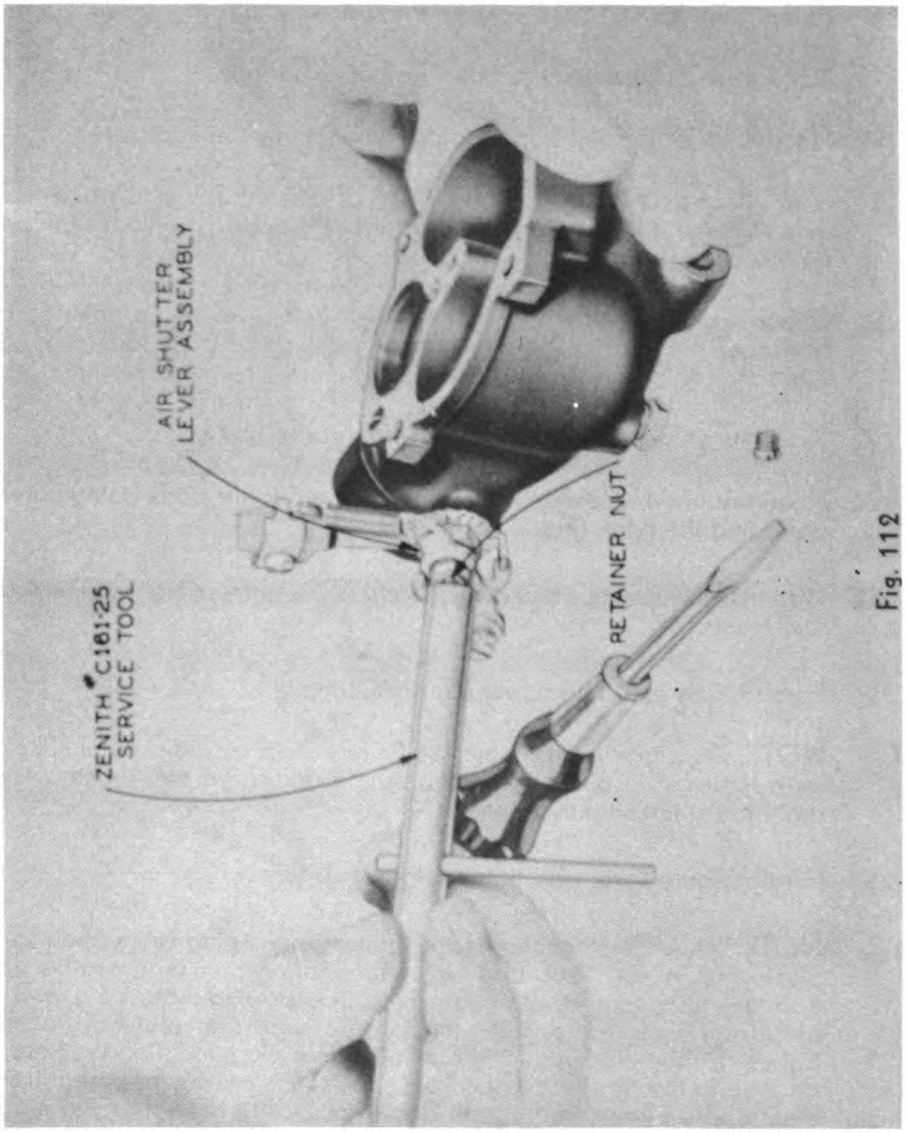


Fig. 112

16. Drill and pin the stop lever assembly and shaft using a No. 45 drill and CT63-9 taper pin.

17. Replace idling jet (5) using a small screwdriver. (No gasket required.)

18. Replace fuel valve seat and new gasket using C161-25 Service Tool or screwdriver. (Fig. 90)

19. Place new throttle body to bowl gasket in position.

20. Place fuel valve needle in position followed by the float assembly. (Fig. 105)

21. Install float axle using the handle end of a screwdriver to strike the end of the axle to force it into the slotted end of the bracket. The float should move freely on the axle. (Fig. 104)

22. Check position of float to obtain correct fuel level. In an inverted position the bottom of the float and the surface of the throttle body should be $1\frac{5}{32}$" plus or minus $\frac{3}{64}$". Move gasket to one side when making measurement. (Fig. 114)

23. Place the venturi (1) in position in the throttle body.

24. Place the bowl assembly in position on the throttle body being careful to avoid damaging the float. (Fig. 103)

25. Install assembly screws and lockwashers. Be sure to tighten the screws evenly and securely.

26. Install idling adjusting screw (6) and spring.

NOTE: As a preliminary adjustment, set the idling adjustment (6) and the main jet adjustment at one full turn open and adjust the throttle stop screw to hold the throttle just slightly open.

27. Install throttle lever and tighten the clamp screw.

NOTE "A": The location of the priming hole plug in relation to the throttle plate is extremely important for uniform idling and part throttle operation. To maintain a uniform relation between the priming hole plug and the throttle plate, our factory assembles the throttle shaft and plate in the throttle body before drilling the body for the priming hole plug, locating the hole in a definite relation to the throttle plate in each case. It is readily apparent from the above that throttle plates and throttle bodies cannot be interchanged indiscriminately. When it becomes necessary to replace the throttle shaft or throttle plate, we suggest the following routine:

1. Unscrew the throttle stop screw to permit complete closing of the throttle plate.

2. Hold throttle in tightly closed position and mark the inside of the throttle body close to the throttle plate with a steel scriber.

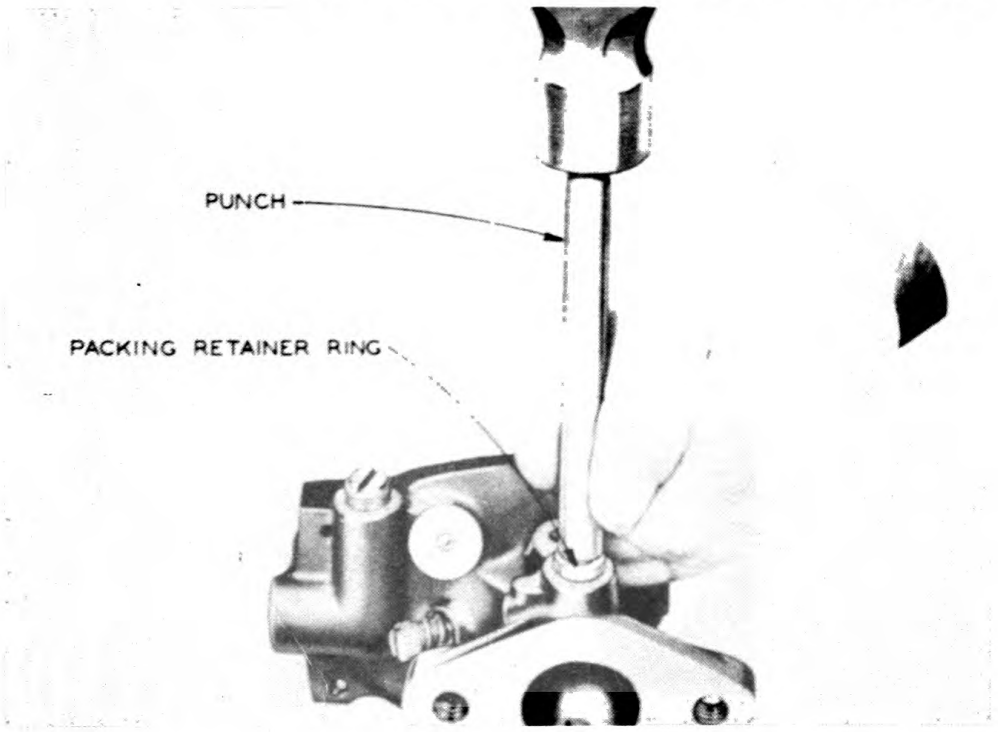


Fig. 113

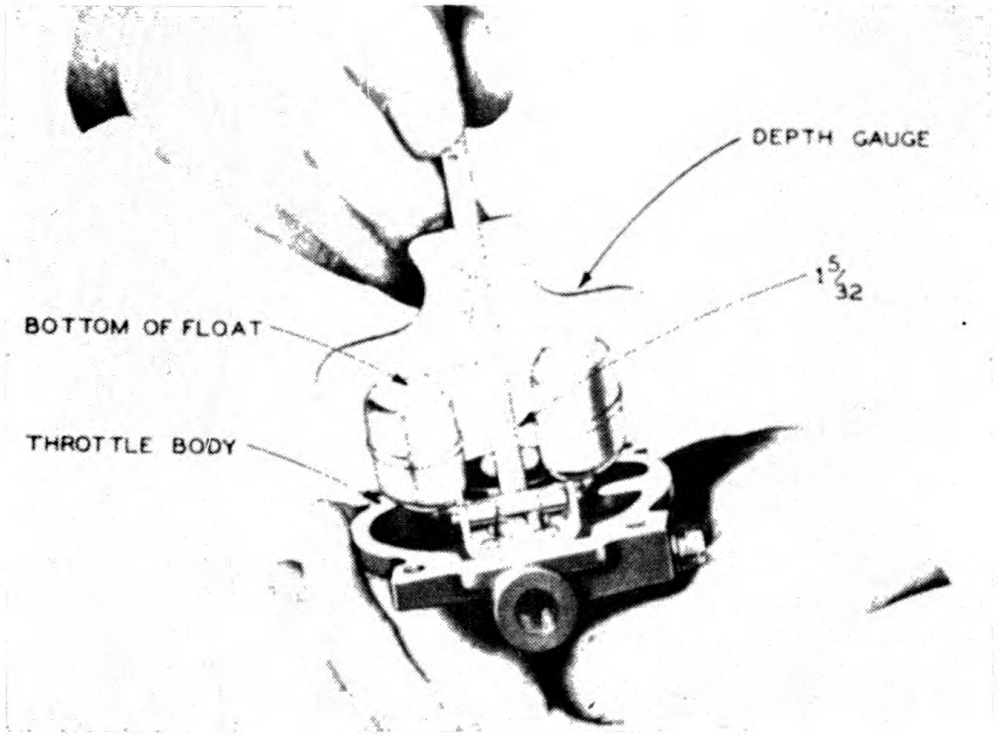


Fig. 114

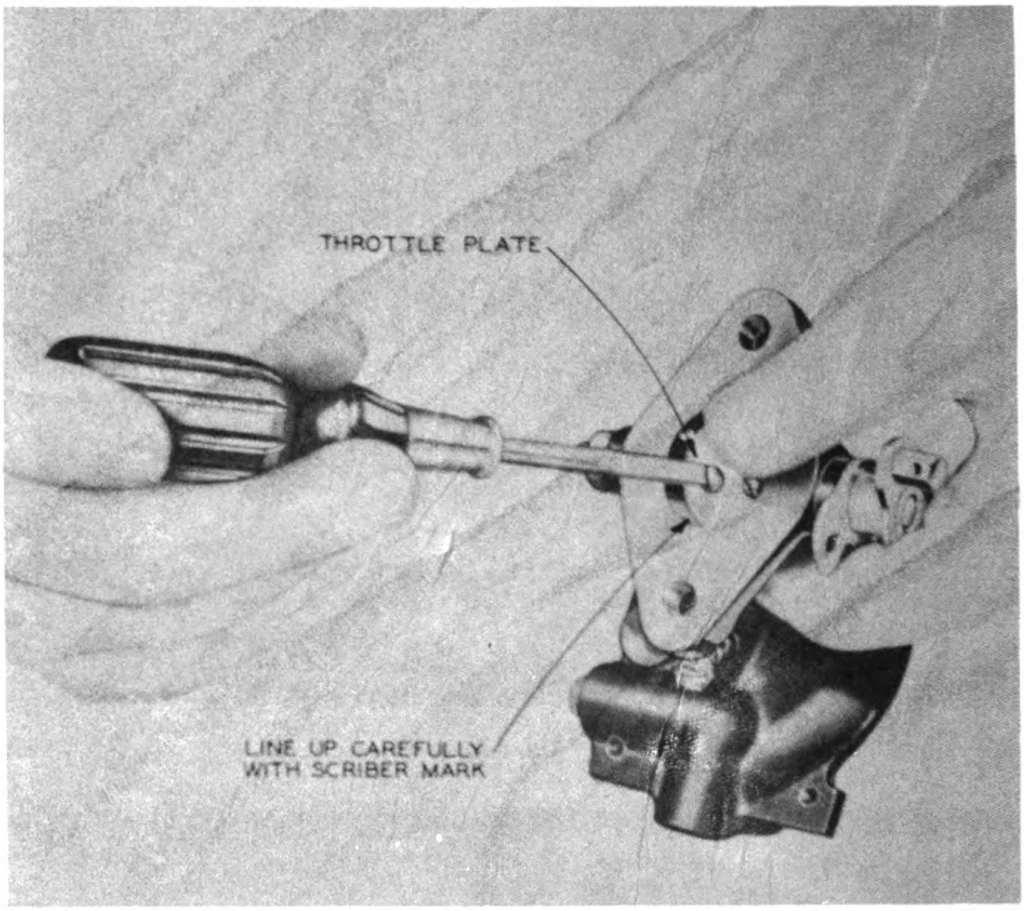


Fig. 115

3. Using this scribed line as a guide, replace the throttle shaft or plate. If new plate used shows a noticeable variation from old one, select another new plate to get one that fits very close to the scribed line when installed. (Fig. 115)

4. If throttle body has to be replaced, we recommend obtaining a complete throttle body assembly including shaft, plate, priming hole plug, etc., built to the outline number which appears on the identification disc on the bowl cover.

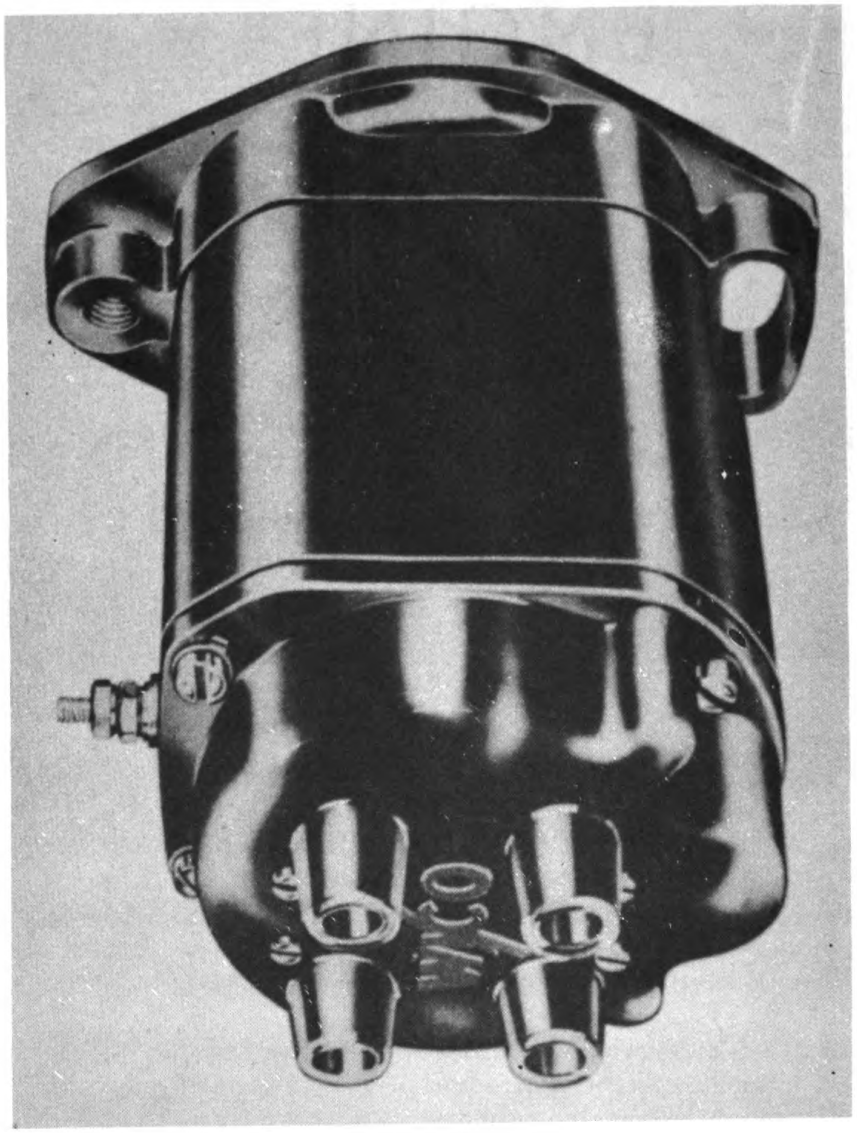
NOTE "B": A round aluminum identification disc riveted to the carburetor bowl cover specifies the assembly outline number to which the carburetor was originally built. When ordering special parts such as throttle bodies, throttle lever and stop lever assemblies, etc., be sure to specify outline number of the carburetor to prevent errors in selecting parts required.

NOTE "C": REBUSHING THE THROTTLE SHAFT BEARINGS is an operation that should not be attempted unless the shop is properly equipped for such work.

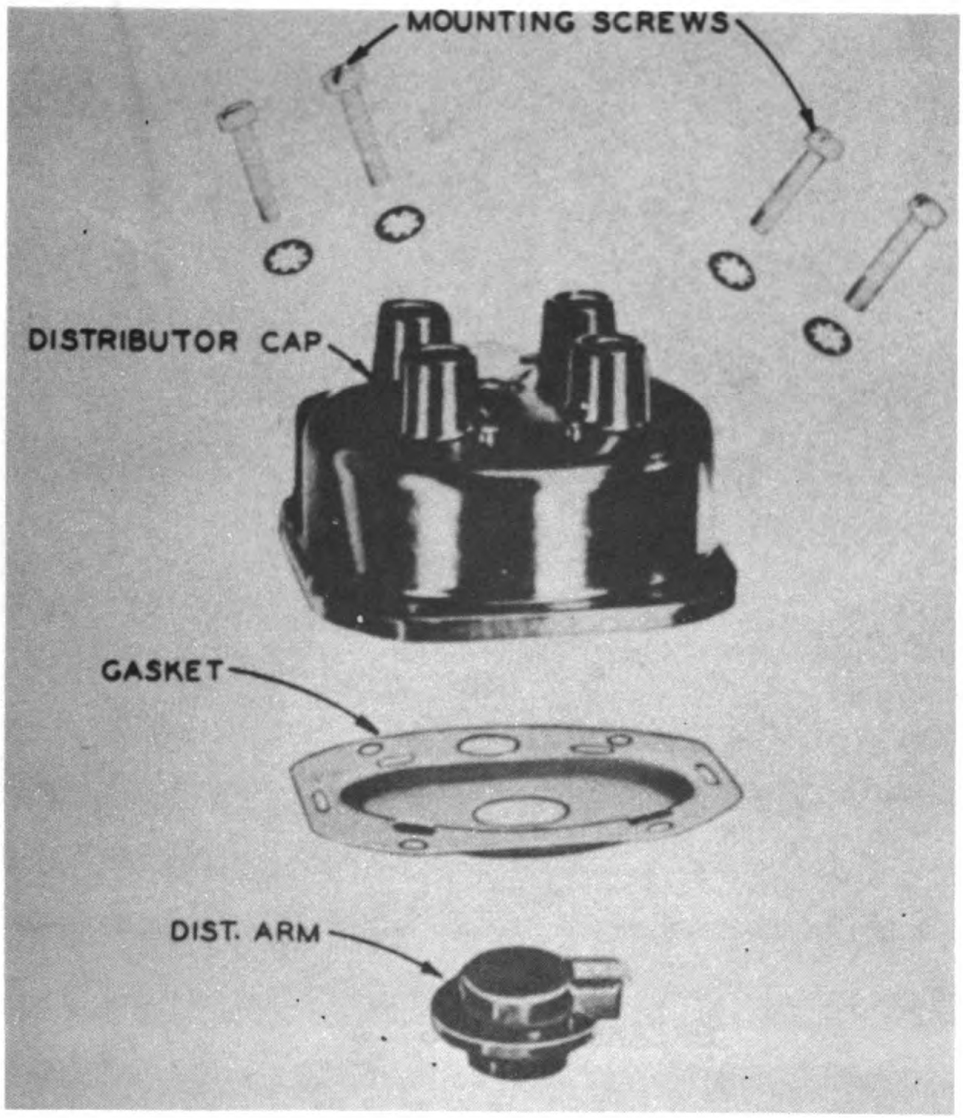
ENGINE COMPONENT

Type J1343 Wico Magneto
Wisconsin Motor Company, Number Y-37-C

This Magneto is used on machines having Serial Numbers 41 to 299 incl.

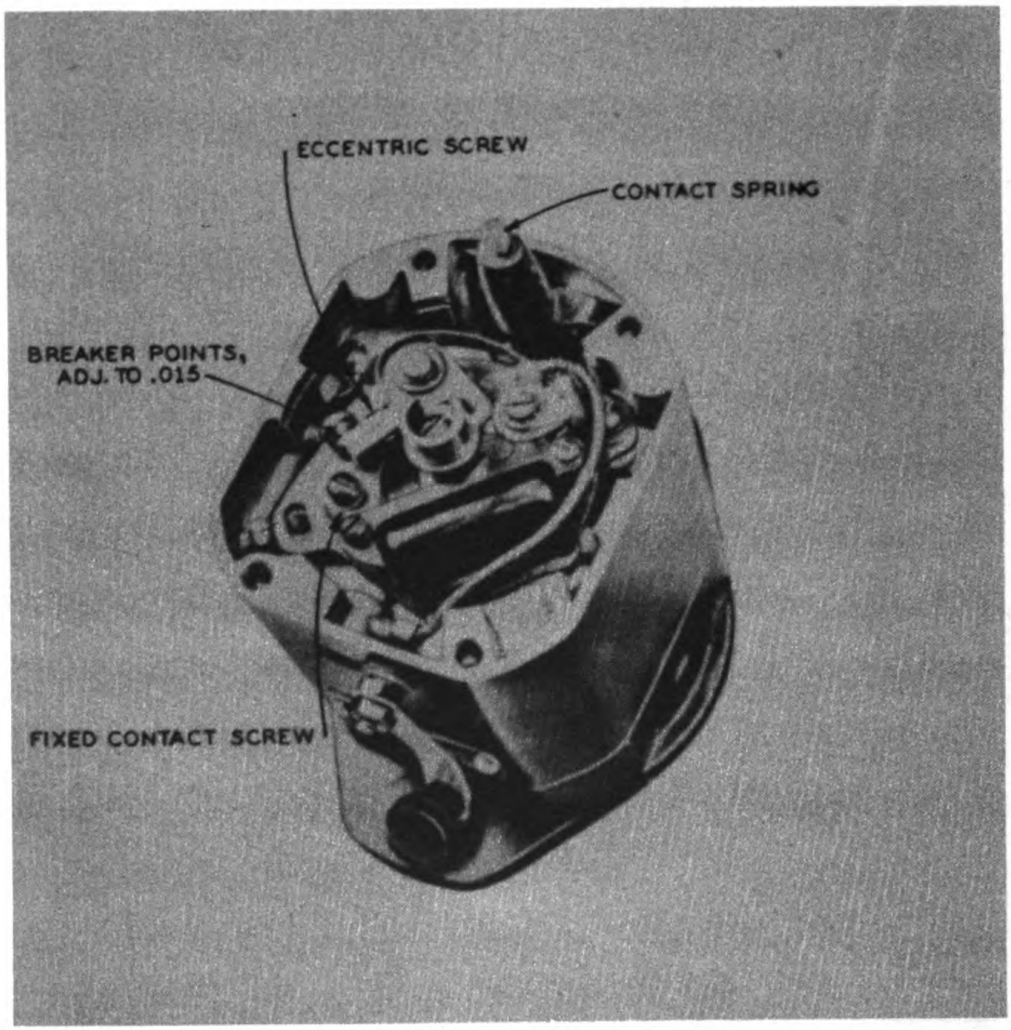


COMPLETE "WICO" J-1343 MAGNETO
Fig. 116



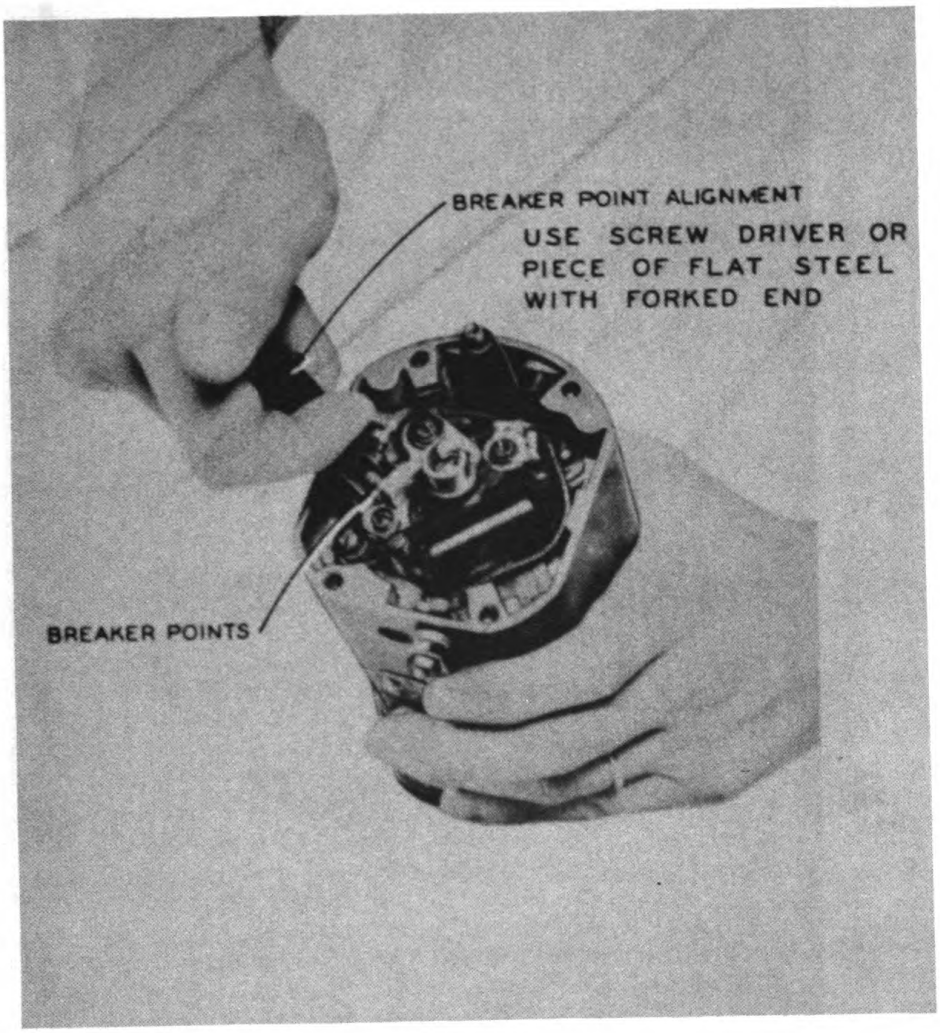
DISTRIBUTOR CAP & ARM

Fig. 117



BREAKER POINTS

Fig. 118



Breaker Point Alignment

Fig. 119

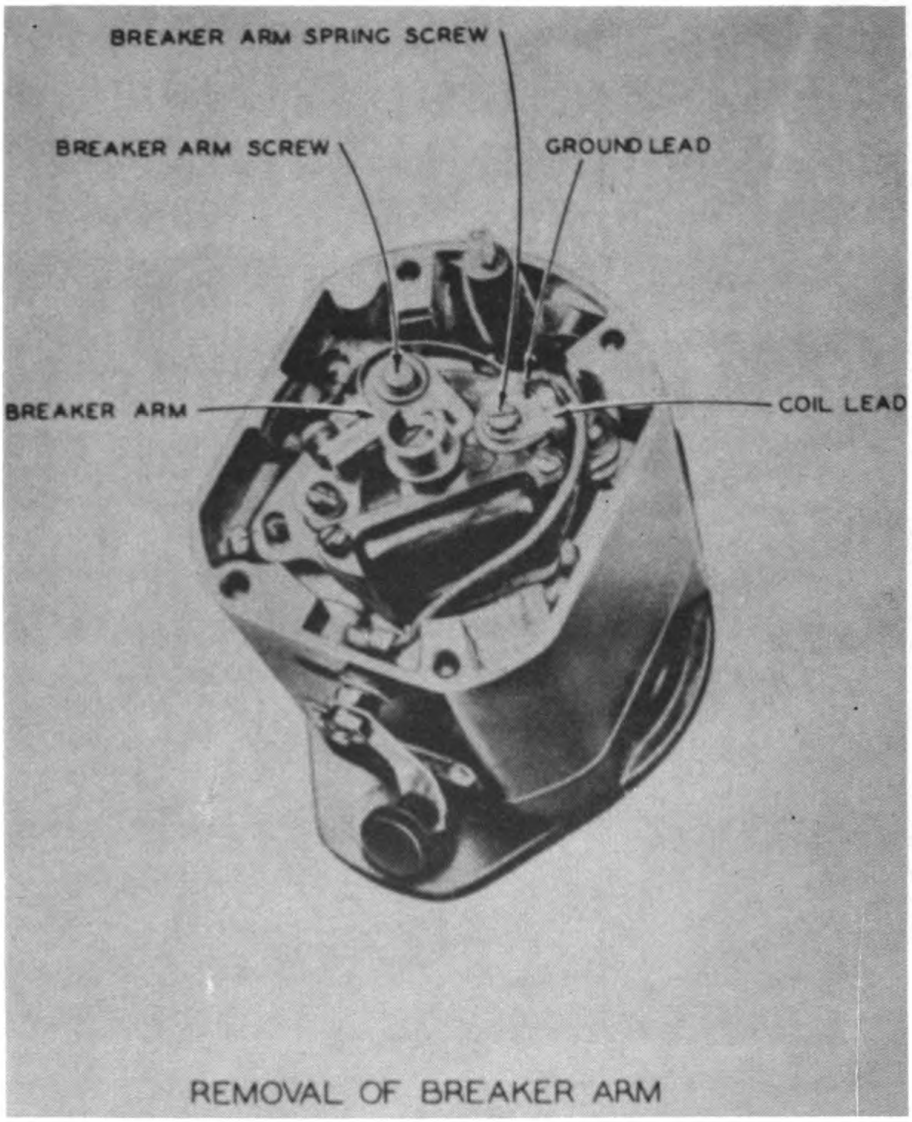


Fig. 120

WICO J-1343 MAGNETO
WISCONSIN NO. Y-37-C

DISTRIBUTOR CAP AND ARM—After removing the distributor cap by loosening the 4 screws which hold it in place, the distributor arm may be pulled off the breaker cam. Before replacing the distributor arm, set the breaker cover sealing washer, on to the 4 prongs provided on the breaker cover (Fig. 117). Line up the inside of the distributor arm with the slot in the cam and press the distributor arm down. When replacing the distributor cap make certain the gasket is in place, and the secondary pencil contact spring is in place on the end of the secondary pencil (Fig. 118).

BREAKER POINTS—To reach the breaker compartment, it is first necessary to remove the distributor cap, distributor arm, sealing washer and breaker cover.

The breaker points should be adjusted to .015" when fully open. Adjustment is made by shifting the fixed contact by means of a small eccentric screw. After adjustment, tighten the fixed contact screw. (Fig. 118)

The breaker points should be free of foreign matter. Adjust the alignment of the points so that the full surfaces of both contacts meet squarely (Fig. 119).

To remove the breaker arm, take out the breaker spring clamp screw and washer. Next remove the breaker arm clamp screw, lockwasher and breaker arm clamp washer. Then the breaker arm may be pulled off the pivot. When replacing the breaker arm, make certain that the coil leads and ground lead are placed under the breaker arm spring screw washer (Fig. 120).

To remove the fixed contact the breaker arm must first be removed as outlined above. Then pull off the breaker arm spacer, and spacing washer, after removing the fixed contact screw, lockwasher and washer, the fixed contact may be pulled off the breaker pivot.

If the points need replacing, it is recommended that both the fixed contact and breaker arm be replaced at the same time (Fig. 121). After assembly the points should be adjusted as described in the beginning of this section.

If it is desired to remove the breaker assembly as a complete unit disconnect the ground lead and insulated primary coil lead from the breaker spring screw. Remove the two breaker assembly screws, lockwashers, and plain washers which hold the breaker plate to the housing and lift out the complete breaker assembly. When replacing the breaker plate make certain that the witness marks line up as shown in (Fig. 121).

CONDENSER—The condenser should have a capacity of .16 to .18 microfarad. If when tested the condenser shows to be below capacity, it should be replaced.

To remove the condenser remove the breaker arm spring screw, and the two leads under it. Then take out the two condenser screws, and lockwashers, after which the condenser may be lifted off the breaker plate. When replacing the condenser, make certain that the condenser case gasket is in place (Fig. 121).

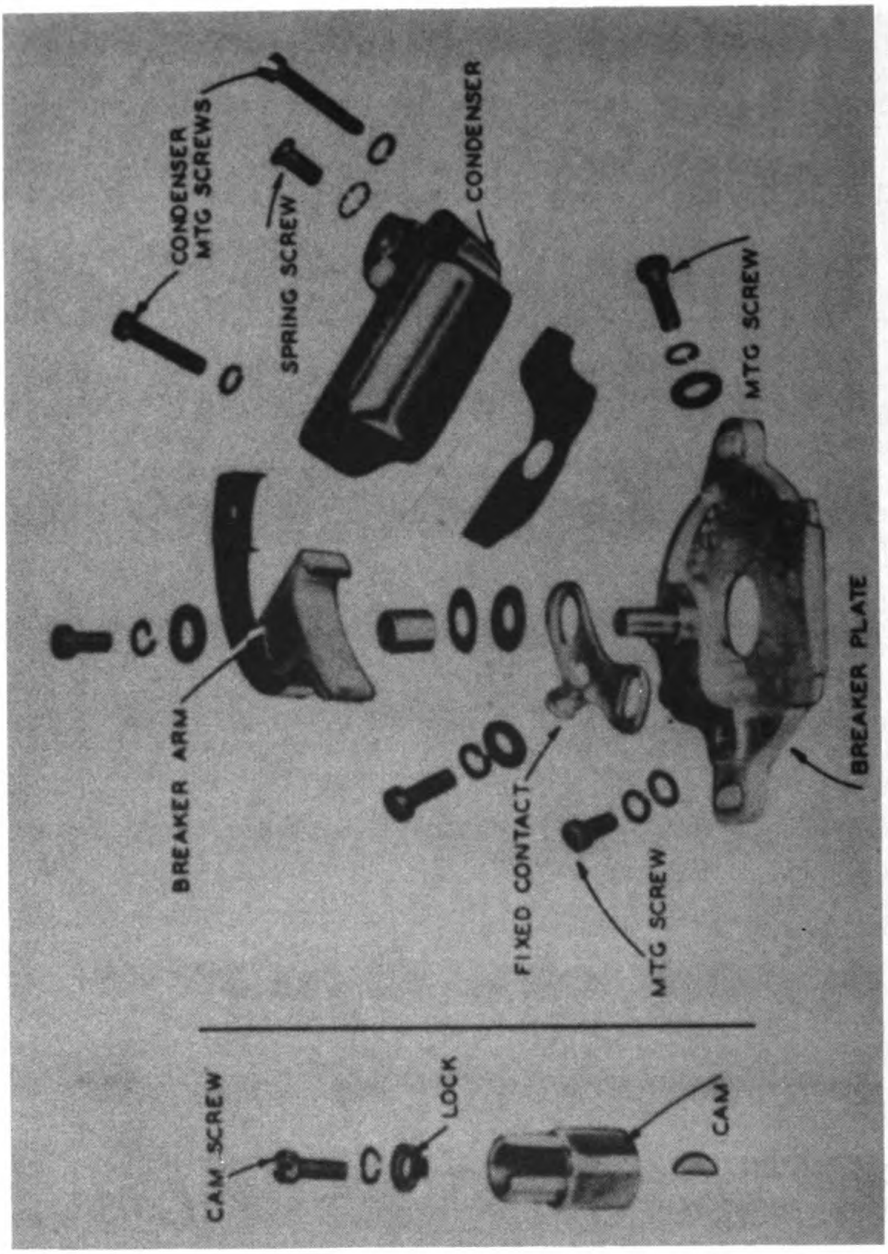


Fig. 121
CAM & CONDENSER ASSEMBLIES

CAM—The cam is held to the end of the rotor shaft by cam screw, (Fig. 121) lockwasher, and cam screw lock plate. In removing the cam loosen the cam screw as shown in (Fig. 122) then pry the cam off as shown in (Fig. 123).

To replace the cam, line up the key on the rotor shaft with the slot in the cam. Press the cam down firmly.

STOP SWITCH—The stop switch group X4104 is connected to the primary circuit of the magneto through the ground stud and the ground lead. The ground stud is insulated from the magneto housing by means of insulating washers. One end of the ground lead is connected to the ground stud on the inner side of the housing and the other end connected to the insulated side of the condenser and the primary lead from the coil under the washer and screw.

The stop switch parts are assembled in the order shown (Fig. 125). Before removing the ground stud from the housing the condenser will have to be taken out first.

IMPULSE COUPLING, END PLATE, AND ROTOR—To remove the rotor, end plate and impulse parts of the model J, as a unit, it is first necessary to remove the distributor cap, distributor arm, breaker cover and breaker cam (Fig. 126 and 127). Then remove the 2 end plate screws, and lockwashers. The end plate, rotor, and impulse parts may be now pulled off the main housing as a unit. In reassembling, make certain that the oil plug in the end plate is on the same side of the main housing as the name plate and ground stud and that the end plate screws are tightened as firmly as possible.

After having removed the end plate, rotor and impulse parts as a unit, complete disassembly may be accomplished in the following manner.

IMPULSE COUPLING—All parts of the impulse coupling can now be removed without disassembly of any part of the magneto but the impulse itself. It is first necessary to remove the impulse locknut cotter pin before removing the impulse lock nut. The impulse nut has a right hand thread and therefore, to prevent the rotor from turning while unscrewing the nut, it is necessary to insert screwdriver blade between one of the impulse stop pins in the end plate and one of the lugs on the driven flange (Fig. 128)

When reassembling, tighten the nut with the trip arm against the impulse stop. This prevents the rotor from turning.

DRIVE CUP AND DRIVE SPRING—To remove the drive cup with the drive spring, after having removed the impulse locknut as explained above, turn the drive cup in a clockwise direction until the trip arm latches against the impulse stop. Continue to turn the cup until the projection of the cup has cleared the projection on the driven flange, without the friction of these parts against each other, the cup can be pulled out far enough to allow it to unwind. A firm grip should be taken on the cup to prevent possible injury to the hand. Then, pull the cup with the spring still in it, off the shaft. (Fig. 129)

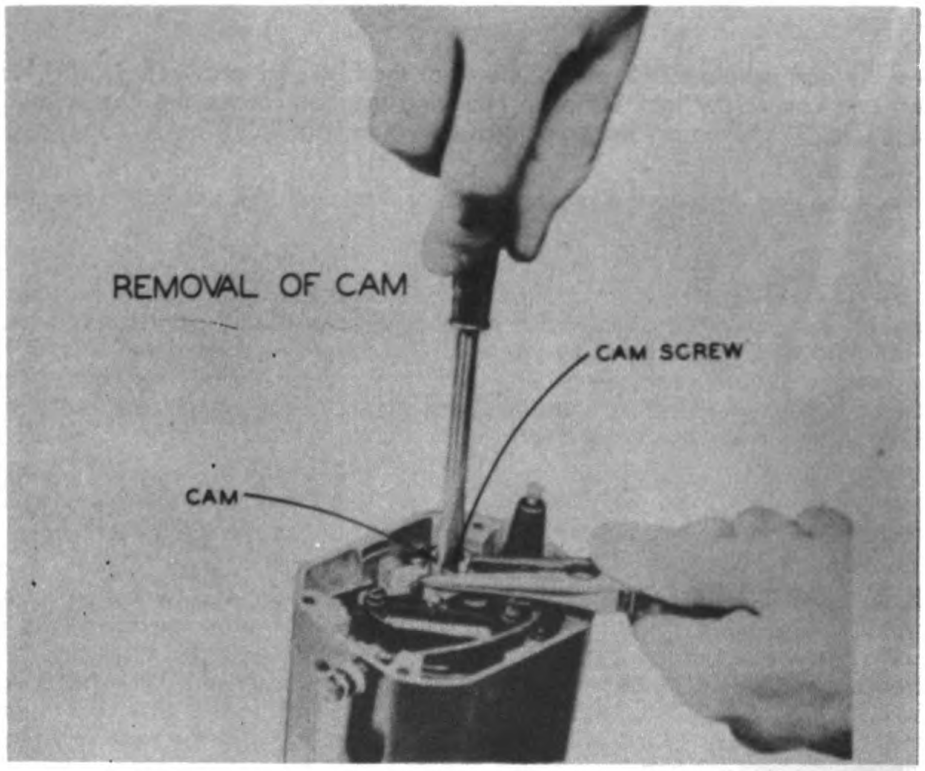


Fig. 122

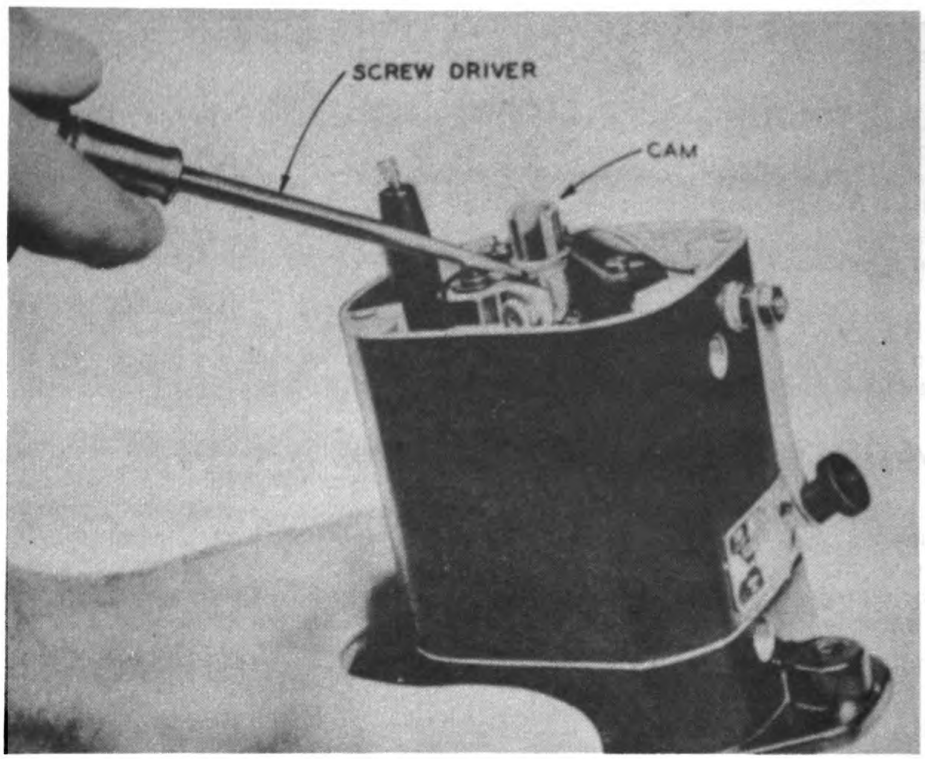
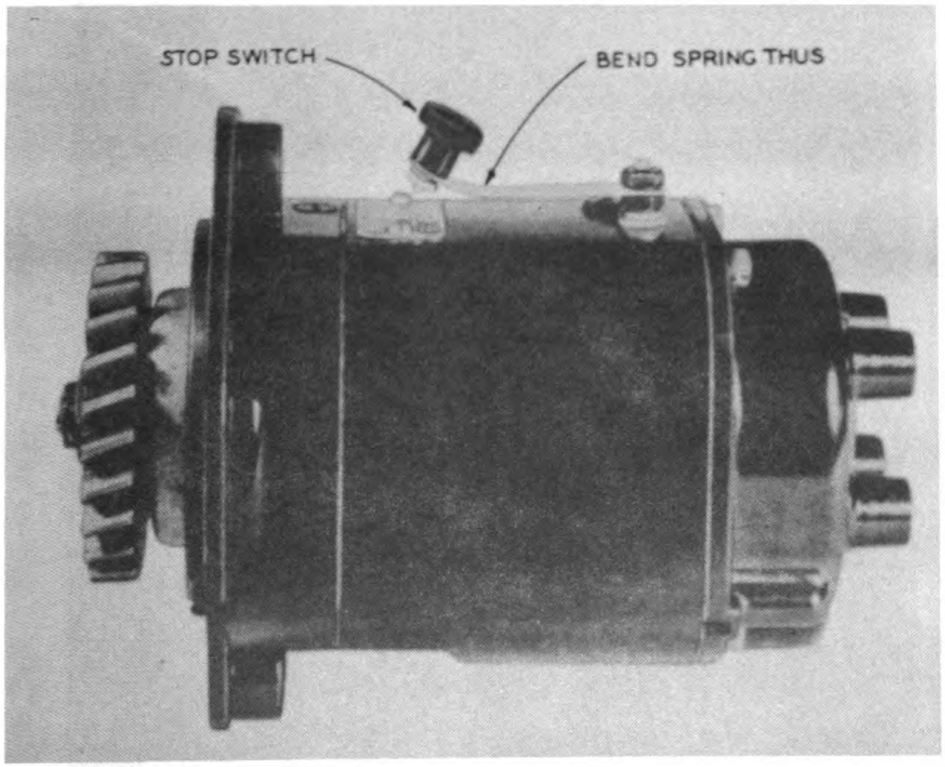
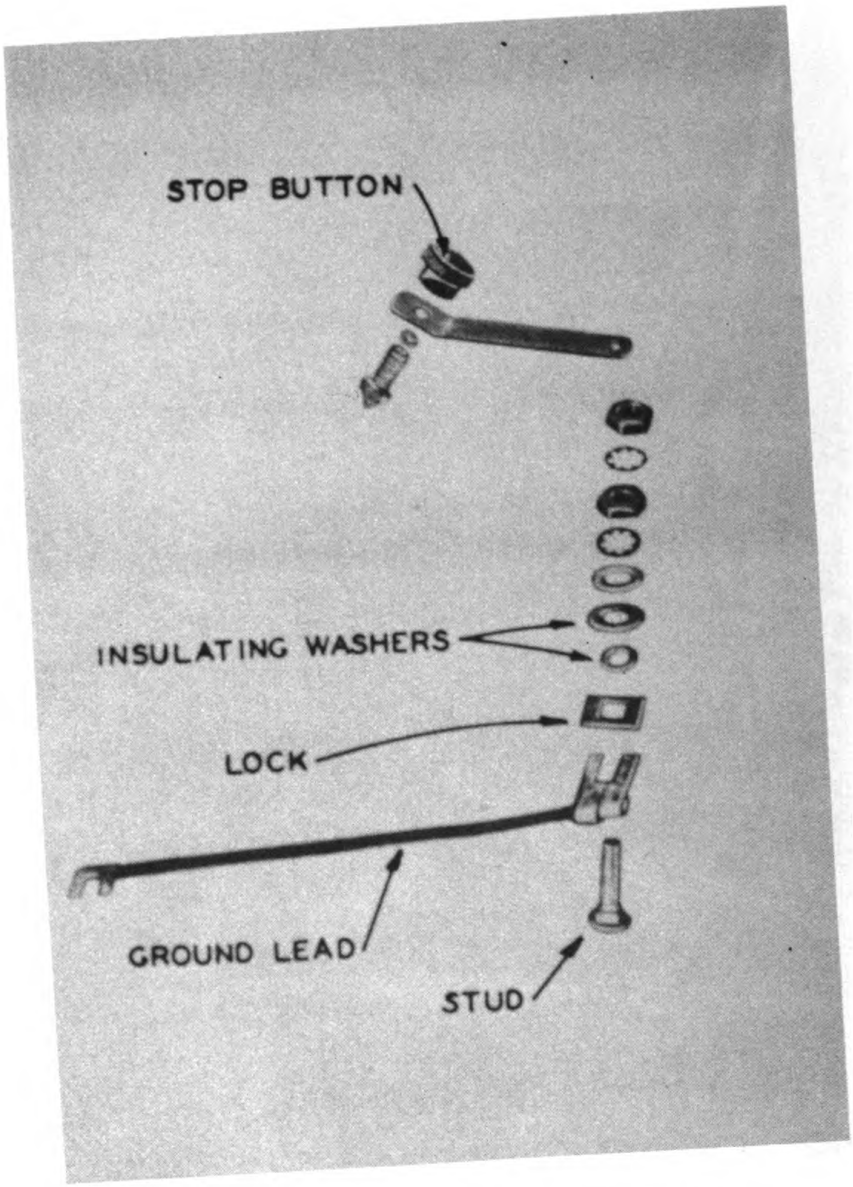


Fig. 123



STOP SWITCH ATTACHED TO MAGNETO HOUSING

Fig. 124



STOP SWITCH ASSEMBLY

Fig. 125

Fig. 126

Fig. 127

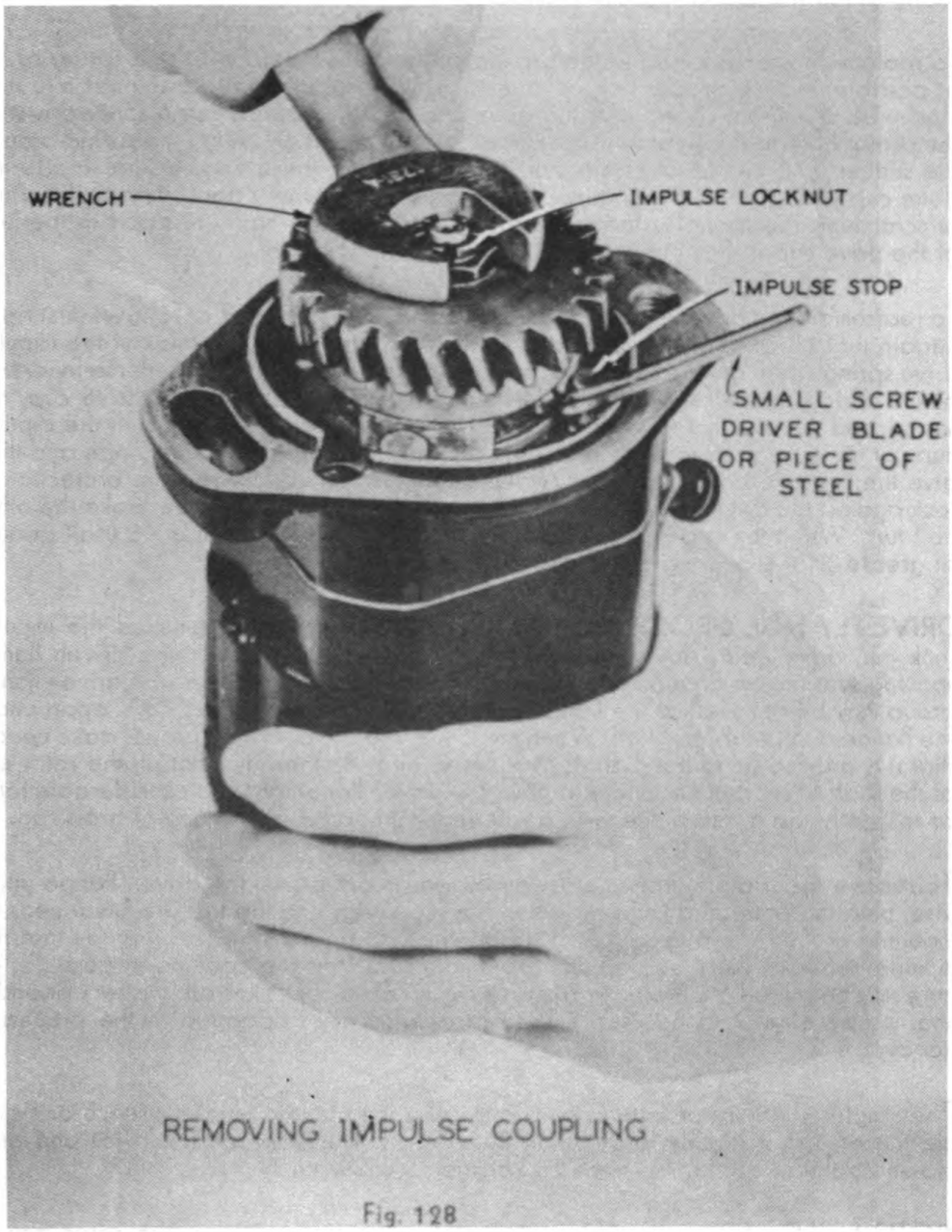


Fig. 128

To remove the impulse spring from the drive cup it is merely necessary to work the spring out of the cup with a screwdriver.

To replace the drive spring in the drive cup insert the outer eye of the spring as far as possible into the proper slot, so that it turns spiral in toward the inner eye in a clockwise direction. Next, take the drive cup spacer, insert a large screwdriver in the center hole so it will bind in the drive cup spacer slot and wind the spring around the spacer until the spiral closes sufficiently to allow the spring to slide inside the drive cup. This method of winding the spring eliminates any possibility of distorting or scratching the spring surface. The spring may be more easily inserted in the lugs of the drive cup if they are securely held in a vise. (Fig. 130)

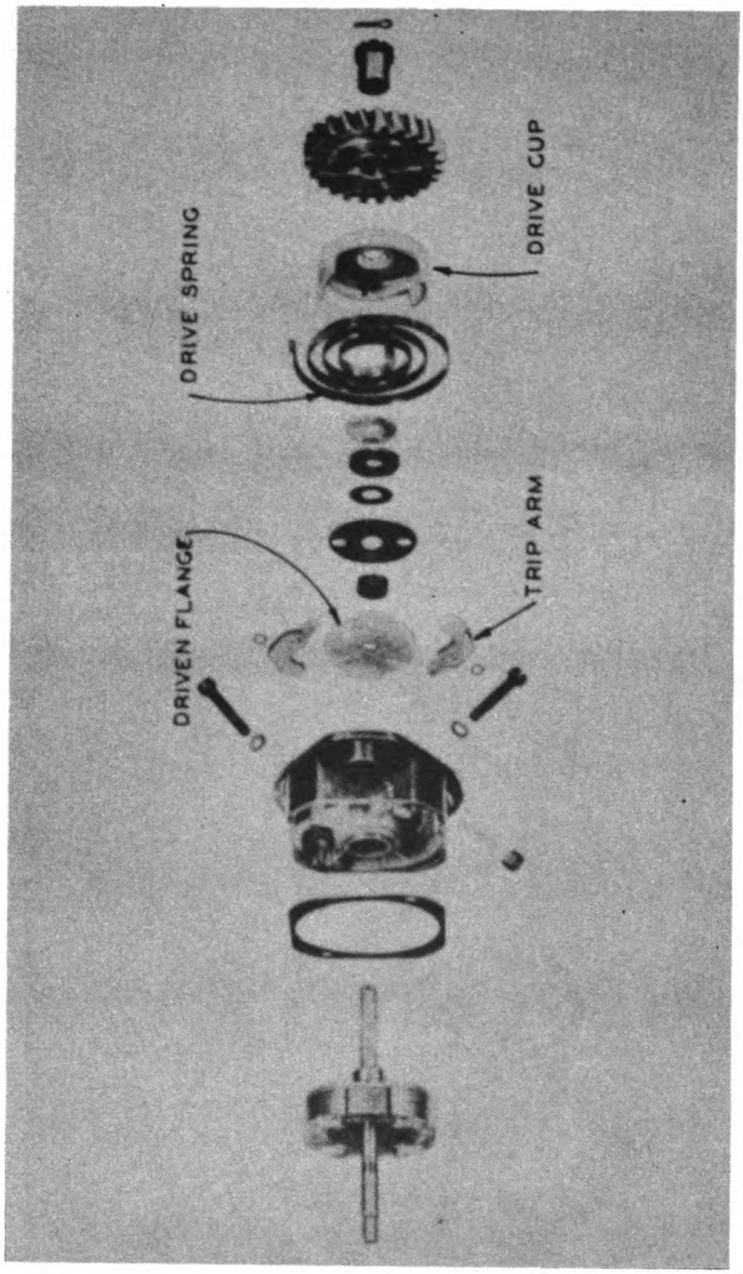
To reassemble the drive cup and spring to the magneto, proceed as follows: first make certain that all parts are clean and there is grease between the turns of the impulse drive spring. Then put the steel spacing washers into the drive cup, with the inner eye of the spring in the slot provided in the washers. Now, place the drive cup, the spring, and the spacing washers on the shaft. Press the parts together, pull the impulse cup out far enough so that the projection on the drive cup clears the flange and then give the cup a full turn as follows; make a half-turn and allow the cup projection to lock against the driven flange, then with a fresh hold on the drive cup, make the other half turn. When the cup is wound, press it firmly into place and apply a small amount of grease on the bearing surface of the impulse lock nut.

DRIVE FLANGE GROUP AND TRIP ARM—After having removed the impulse lock nut, drive gear, drive cup, drive spring, drive cup spacers, the driven flange spacing washer the drive spring retainer, and driven flange spacer, the driven flange group may be removed. If the flange sticks insert two screwdrivers 180° apart under the flange and gently pry it off. When replacing the driven flange group, make certain that it is pressed on to the shaft as far as it will go. As there is a flat on the rotor end of the shaft, it is often necessary to press the driven flange on with considerable force or to gently tap it into place with a soft-headed hammer or a piece of brass rod.

To remove the trip arm from the driven flange group, clamp the driven flange into a vise, push the point of a knife between the snap ring, and the trip arm pivot near the opening of the snap ring. This will spring the snap ring a little and then by inserting a knife between the snap ring and the pivot as far from the opening as possible, the ring may be pulled off. Now the trip arm (Fig. 129) may be taken off. It is recommended that a new snap ring be used if the old one becomes damaged in the process of removal.

The simplest method for putting on a snap ring is to take a socket wrench or similar device of a size slightly larger than the pivot Put the ring on the pivot and press down on the ring with the open end of the socket wrench.

ROTOR—After having removed all the above-mentioned parts the rotor may be pulled from the end plate. Care should be taken not to damage the bearing surfaces on the rotor shaft.



REMOVAL OF DRIVE CUP

Fig. 129

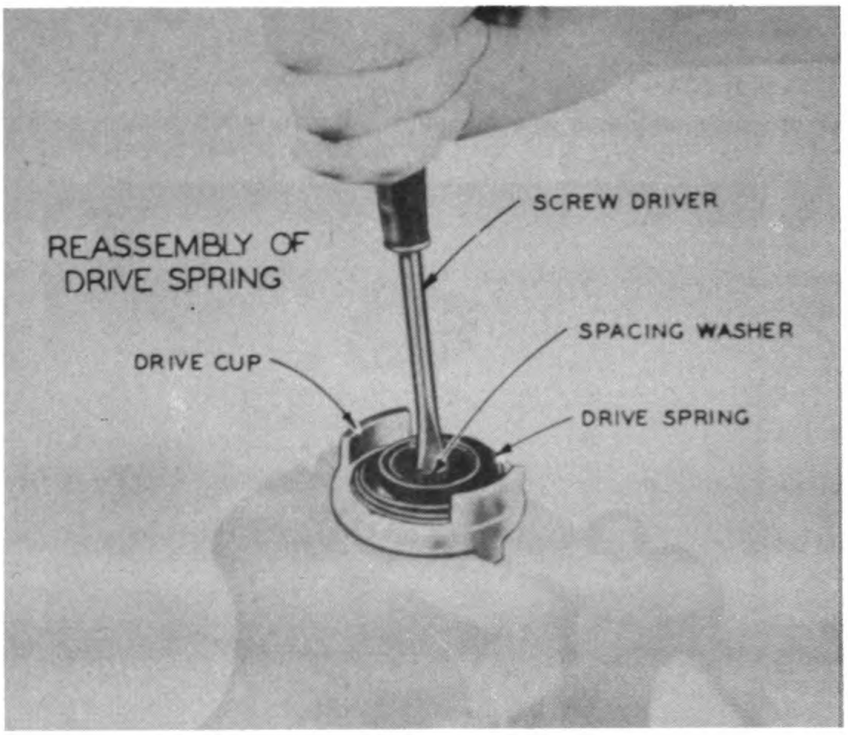


Fig. 130

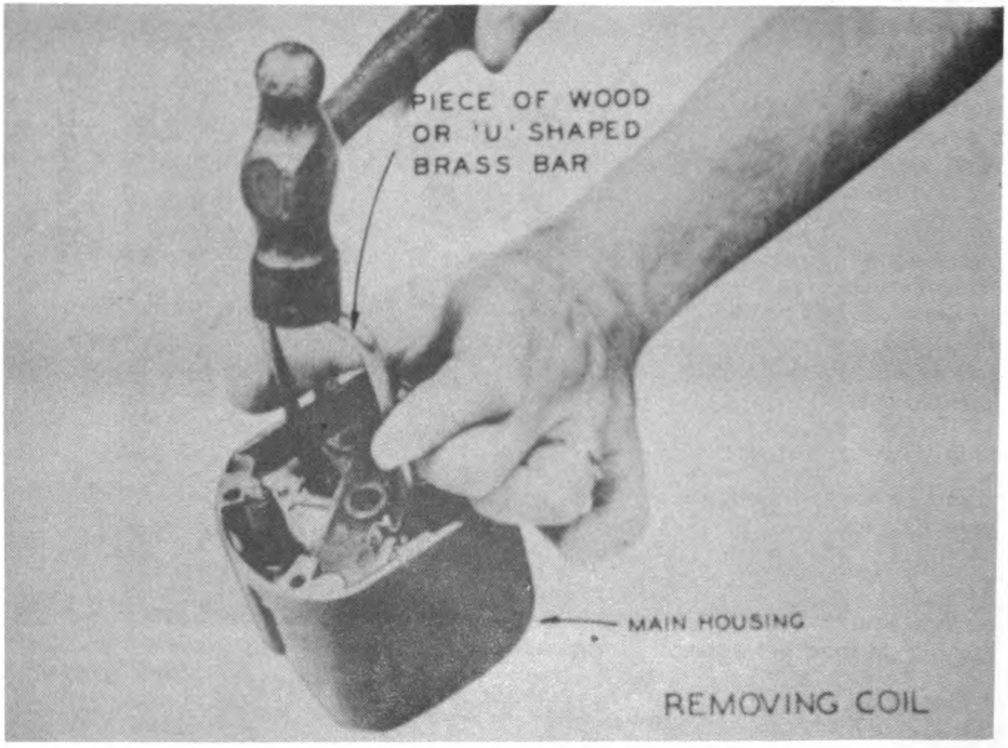


Fig. 131

The ability of magneto steel to retain its magnetism is known as its coercive property. The magnet steel used in the model J rotors has such extremely high coercive value that it is practically impossible for these rotors to lose any appreciable amount of magnetism under any condition. It is therefore unnecessary to recharge Model J rotors.

END PLATE—With the exception of the oil wick, and the oil plug, the end plate must be replaced as a complete unit.

INNER CORE—To remove the inner core, it is first necessary to remove all of the parts mentioned under "Impulse Coupling, End Plate, and Rotor." Then proceed as follows. Pry out the inner core snap ring. Place two screwdrivers 180° apart under the inner core and pry it out, being careful not to damage the coil or the inner core. When the inner core is replaced, press it down as far as it will go and insert a new snap ring so that the split of the snap ring is over the split in the inner core.

COIL—To test the coil, it is not necessary to remove it from the magneto. Remove the distributor cap, distributor arm and breaker cover. When using an Eiseman coil tester, connect the ground lead of the tester to the magneto main housing, connect the breaker lead of the tester to the high tension spring on the magneto secondary pencil; turn the cam until the breaker points are open. The coil must be replaced if it requires more than 1.5 amp. to give a steady spark on a 5 mm. gap.

If the coil is to be replaced, first remove the inner core, the breaker plate, and disconnect all coil leads. Turn the coil leads up so that when the coil is removed the lead terminals will not catch on the housing. Remove the coil by using a round bar formed as shown in the accompanying illustration (Fig. 131).

With the main housing right side up, place one leg of the tool in the ground hole in the housing gasket. Place the other leg in hole in the housing which is in line with the center of the housing and the first leg of the tool. With the legs of the tool against the coil, strike the top of the tool with a hammer and drive the coil out, being careful not to damage the coil insulation.

To replace the coil proceed in the following manner. Place two cambric coil shields over the coil lead wire and insert the coil and shields so that the secondary contact spring on the side of the coil makes contact with the secondary pencil. Press the coil down firmly and insert the two coil wedges so that they are on the same sides of the core as the split in the core. (Fig. 132)

SECONDARY PENCIL—The secondary pencil serves the purpose of conducting high tension current from the secondary terminal on the coil to the center terminal of the distributor cap, from which point the current is distributed in succession to each of the towers in the distributor cap.

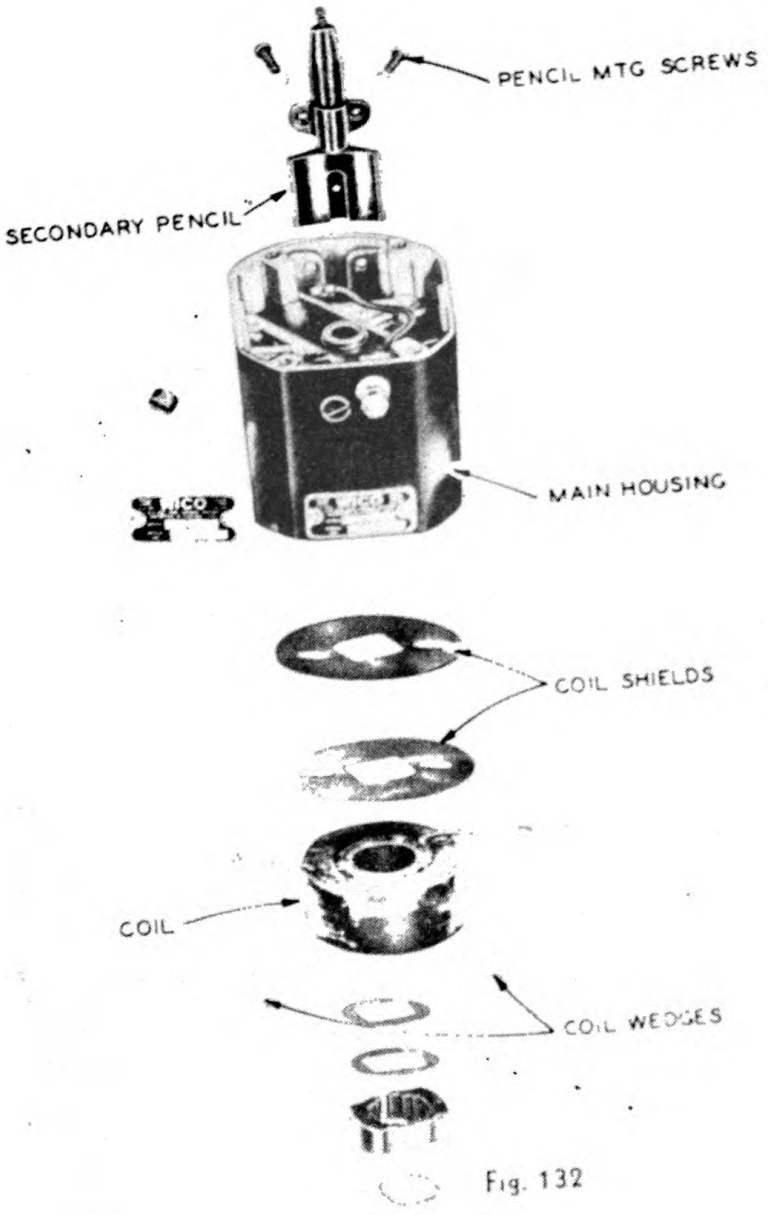


Fig. 132

In order to replace the secondary pencil, it is necessary to remove the distributor cap, distributor arm, breaker cover, cam, and breaker plate from the distributor end of the magneto. From the drive end of the magneto it is necessary to remove the drive shaft rotor and impulse parts as a unit, inner core and coil. After these parts have been removed, the secondary pencil may be removed from the main housing by taking out the two screws and lockwashers. (Fig. 132)

MAGNETO TROUBLES

The following are possible causes of trouble that might result from a faulty magneto:

Defect	Possible Causes	Effect
A. Small Contact Gap	1. Incorrect adjustment 2. Pitting of contacts 3. Wear of breaker shoe 4. Wear of cam	Retarding effect on magneto timing. Poor low speed operation. Arcing at contacts.
B. Large Contact Gap	1. Incorrect adjustment 2. Contacts worn, sometimes due to excess spring pressure 3. Breaker loose on pivot	Advancing effect upon magneto timing. If excessively large, will cause irregular firing of engine
C. Contacts pitted or blackened	1. Oil or foreign matter on contacts 2. Breaker arm movement sluggish 3. Breaker arm excessively loose on pivot 4. Primary connection to condenser not good 5. Condenser loose or defective 6. Contacts badly out of alignment or not parallel	Excessive arcing of contacts. Erratic or misfiring of engine.

ENGINE COMPONENT

Type FM-JV4B7 Fairbanks Morse Magneto
Wisconsin Motor Company, Number Y-41

This Magneto is used on machines having Serial Numbers 480 and up

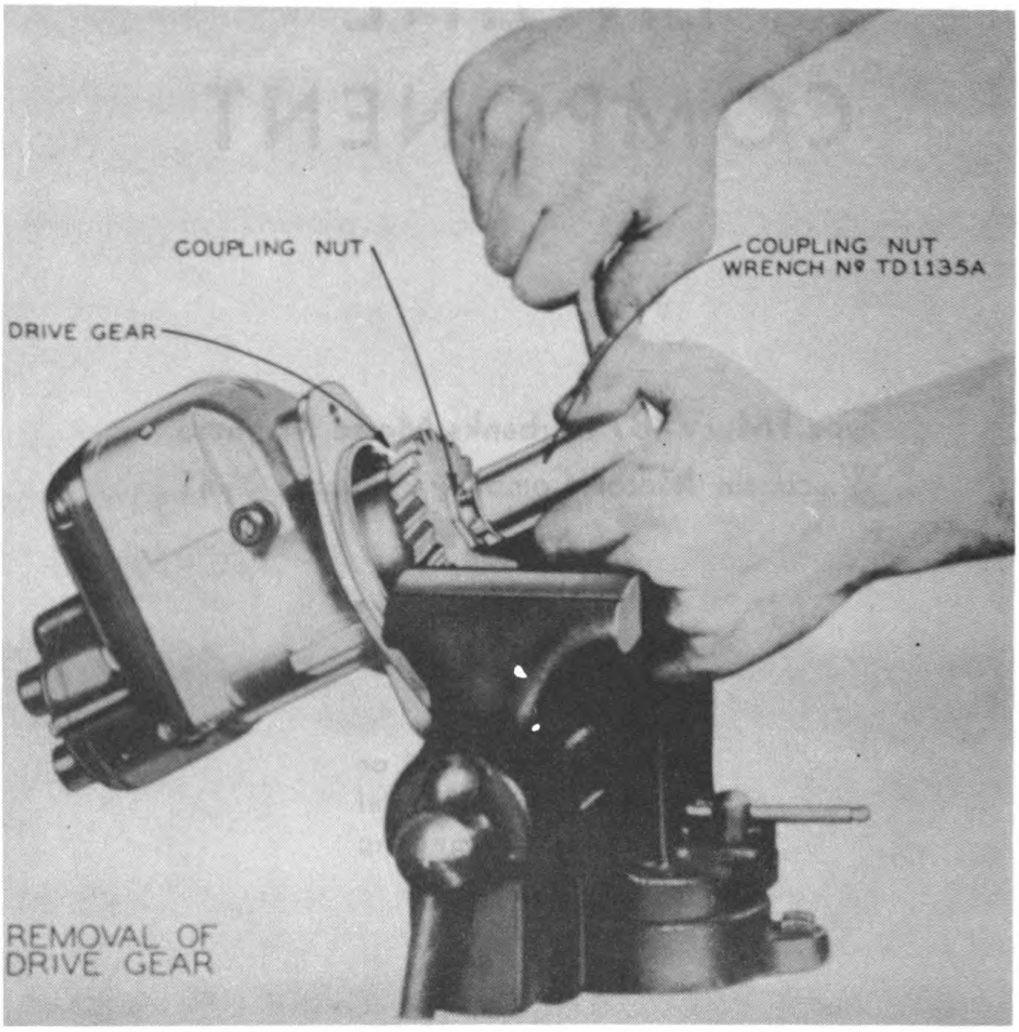


Fig. 133

FAIRBANKS-MORSE FM-JV4B7 MAGNETO
WISCONSIN Y-41

GENERAL DESCRIPTION—The Fairbanks-Morse Type FM-JV4B7 magneto is a clockwise rotation, flange mounting unit built especially for Model VE4 four cylinder engines made by the Wisconsin Motor Corporation. The basic design principle of the series in which this magneto is classified is that of the rotating magnet and stationary coil. By revolving the permanent magnet which forms the basis of the magnetic circuit the flux lines which link the induction coil are reversed, causing an induced current to flow in the primary circuit during the time the contact points are closed. When the points break, this primary current stops instantly and its field collapses with the result that a very high voltage is induced in the secondary of the coil to form the ignition spark discharge in completing the circuit to ground.

The type FM-JV4B7 magneto is built with a magnetic rotor having four poles; the magnetic field will consequently be completely reversed four times per revolution and four ignition sparks will be produced. Since the distributor rotor is mounted directly on the magnetic rotor shaft and therefore rotates at the same speed, the ignition sparks occur at intervals of 90° in order to fulfill the requirements of the Wisconsin Motor Corp.'s Model VE4 engines, which have a firing interval of 180-270-180-90°. In a complete engine cycle (two revolutions) four sparks are used for ignition and four fire in the exhaust.

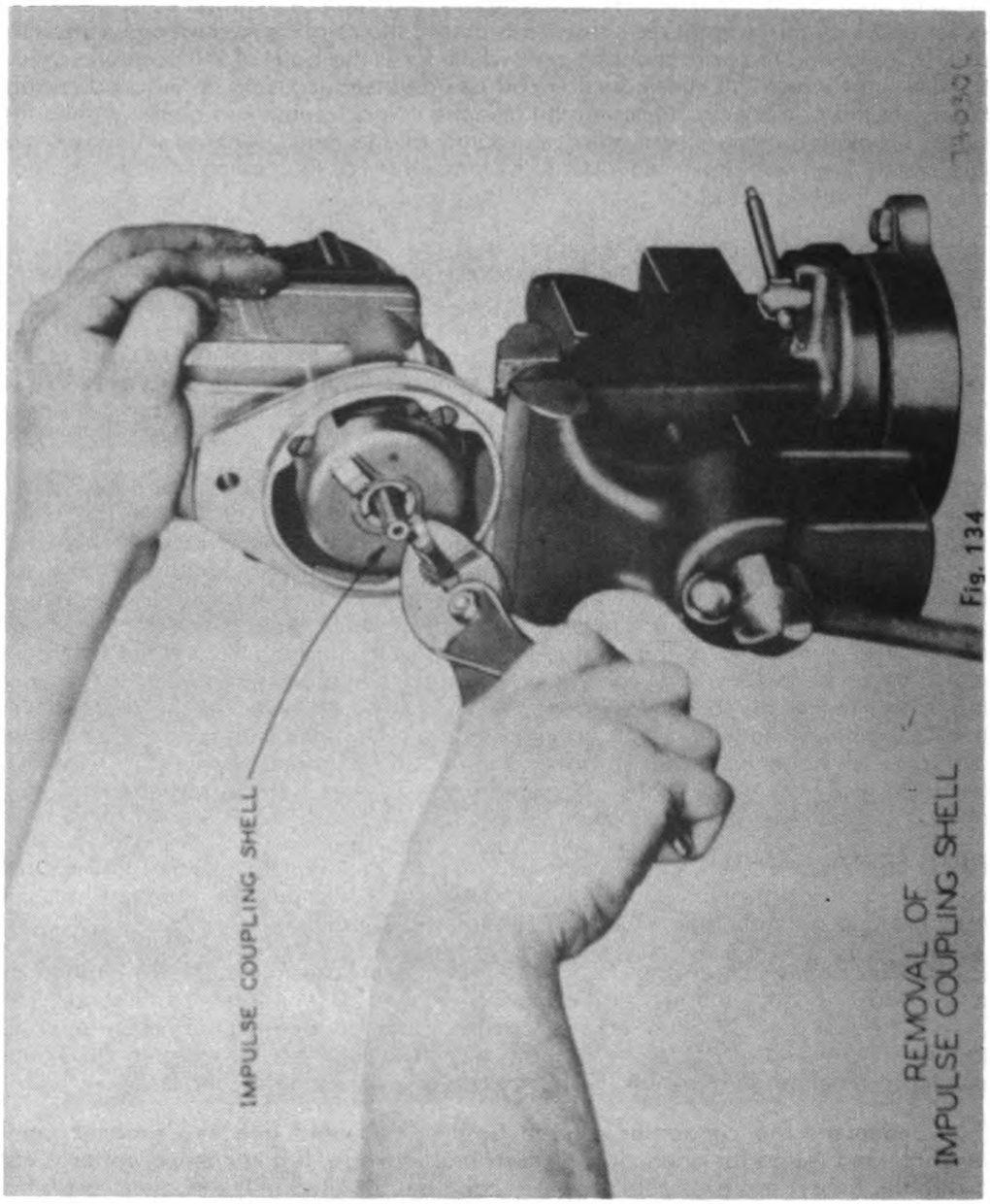
MAGNETO TESTS—With properly adjusted spark plugs in good condition the ignition spark should be strong enough to bridge a short gap in addition to the actual spark plug discharge; this can be determined by holding the ignition cable not more than $\frac{1}{16}$" away from the spark plug terminal. The engine should not miss fire when this is done. To test the magneto spark all of the ignition cables should first be pulled out of the end sockets and a short, stiff wire inserted in place of one of them. Bend this wire to within $\frac{1}{8}$" of the engine block and turn the engine over slowly while watching carefully for a spark discharge. This test should be repeated with the wire in each of remaining sockets. When strong sparks are observed as the result of this test, no further dismantling of the magneto should take place until spark plugs, cables and terminals have been thoroughly re-examined. If no spark is observed, the ignition switch should first be thoroughly inspected to be certain that it is not grounding the primary circuit.

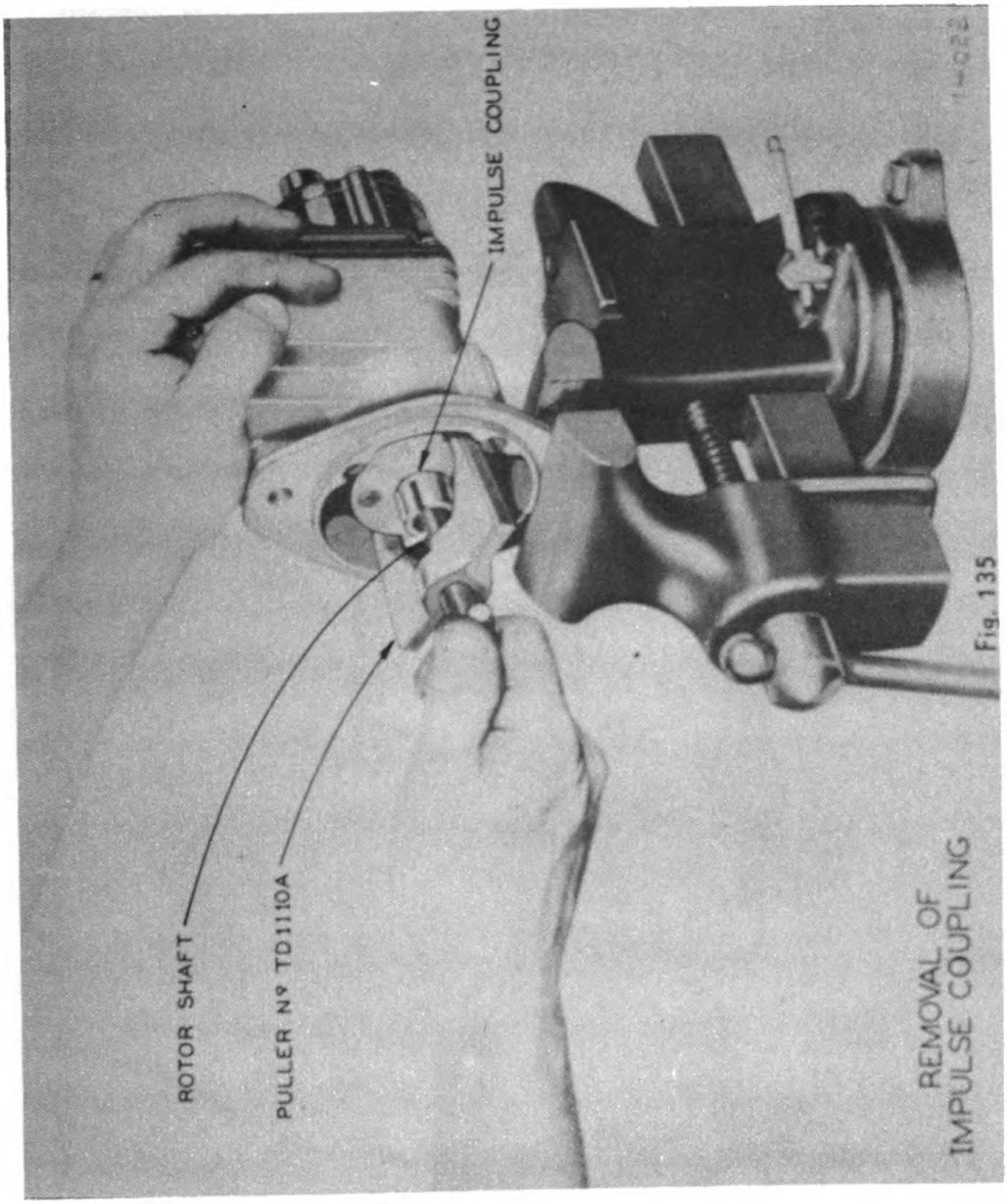
FIELD SERVICE—When spark tests indicate unsatisfactory magneto performance the end cap cover, distributor rotor and distributor end cap should be removed from the magneto and a careful check made of the following points:

(a) **Breaker Points**—Be certain that the contact points are not excessively pitted or pyramided and are adjusted to have an opening of 0.012 inch at full separation (when breaker arm rides high point of cam). Contact surfaces can often be returned to original condition by carefully resurfacing with a fine stone or tungsten file. Points should be cleaned with a small brush, moistened in carbon tetrachloride.

(b) **Condenser**—The condenser can be easily dismounted from the breaker point assembly and tested for open circuit, shorts and leakage. If a condenser tester is not available, a new replacement condenser can be substituted in the magneto assembly and operation of the unit re-checked.

(c) **Coil**—The coil can be removed from the magneto frame and tested on a reliable coil tester or may be replaced by a new, identical coil in which case the magneto operation must be re-checked.





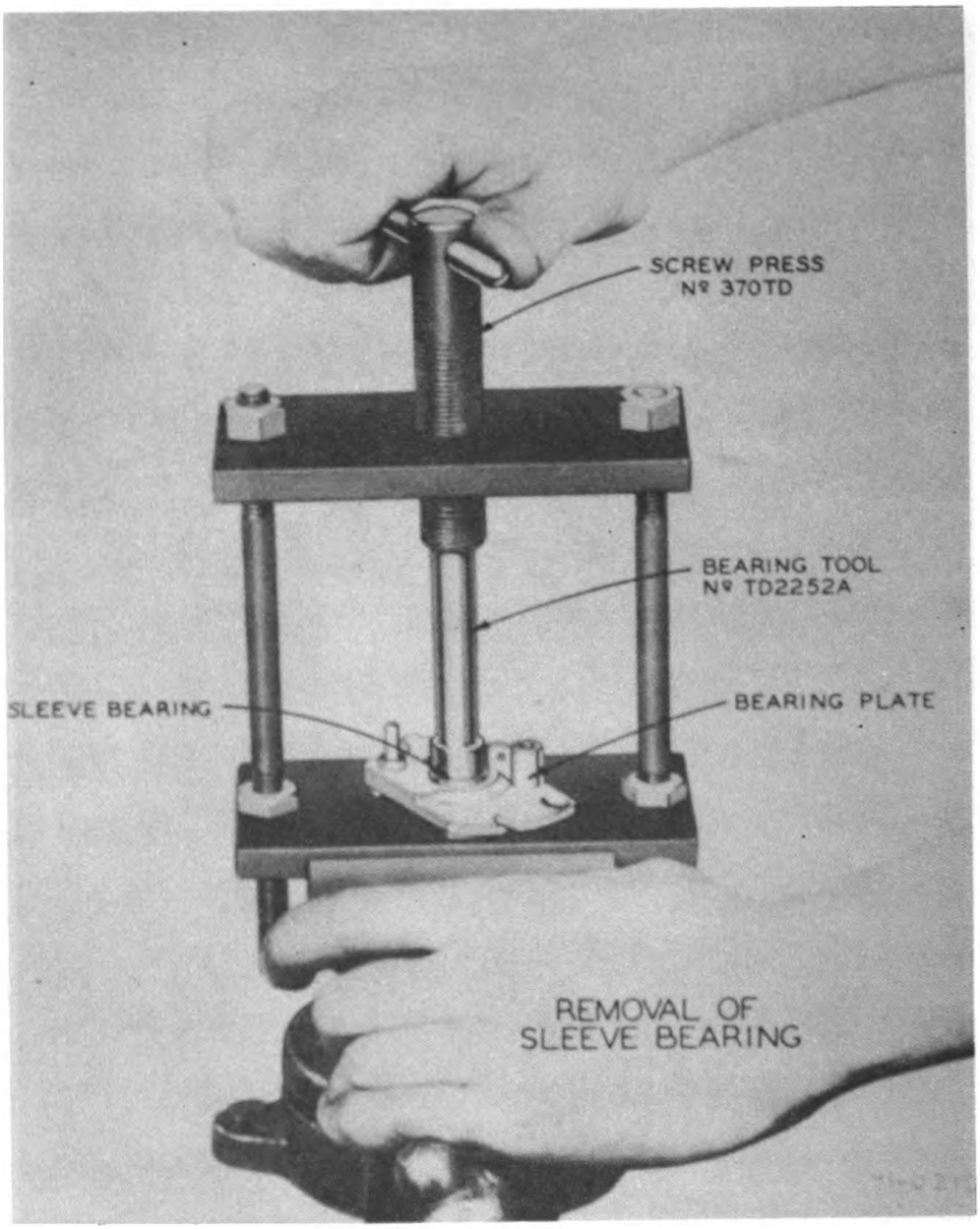


Fig. 136

REMOVAL OF THE DRIVE GEAR—The lockwire inserted in the end of the rotor shaft must first be driven out, after which the drive gear should be caught in a vise as shown in (Fig. 133). (Note that the vise jaws are copper-covered to prevent injury to the gear, although wooden jaws are equally suitable.) The coupling wrench TD1135A should then be fitted to the slots of the coupling nut and turned counter-clockwise, to remove. A standard ⅞" hex socket wrench can be used in place of the special TD1135A wrench for this operation. After the nut has been taken off the rotor shaft, the drive gear can be easily pulled away from the impulse coupling shell.

REMOVAL OF IMPULSE COUPLING—The magneto should be placed in a vise and one of the drive lugs of the impulse coupling shell grasped firmly in the jaws of a pair of pliers. The shell may then be removed from the assembly as shown in (Fig. 134) by a combination of pulling and turning motions. Be careful not to stretch the drive spring in this operation; if the spring does not free itself from the coupling hub, pry it loose from the slot in the hub with a screwdriver. The special puller TD1110A should now be used as shown in (Fig. 135) to separate the coupling hub from the rotor shaft. In using this puller it is wise not to try to force the hub off the shaft by turning down the puller screw, but rather to only tighten the puller on the assembly and then tap the end of the puller with a mallet until the hub is loosened.

REPLACEMENT OF SLEEVE BEARING—The end cap cover must first be removed from the magneto by taking out the two screws which hold it to the distributor end cap. The distributor rotor may now be pulled off the end of the rotor shaft, after which the distributor end cap can be separated from the frame by removing the four screws. The terminal screw of the breaker point assembly should first be removed in order to free the condenser, coil and switch lead wires, as well as permitting the removal of the breaker arm. The condenser can now be dismounted from the bearing plate by taking out its mounting screw, and other parts such as the cam felt wick and stationary point bracket removed by similar operations. The four screws which hold the bearing plate in the frame may now be withdrawn, and the plate removed from the magneto. Place the bearing plate in the small screw press 370TD as shown in (Fig. 136). Line up bearing tool TD2252A so that pressure can be applied perpendicularly to the plate, and so that the hole in the lower plate of the press provides clearance for the tool and the bearing as they are pushed through the plate. To remove the sleeve bearing from the plate, it is necessary only to press the tool TD2252A into the bearing and through the plate until the bearing drops out on the opposite side. To replace the bearing, the bearing should first be pushed on the end of the tool TD2252A and then into the plate until flush with the plate's surface. It should be noted that the bearing plate should be thoroughly cleaned with gasoline before inserting a new sleeve bearing, with a special effort made to remove any old grease remaining in the sleeve bearing grease reservoir which is in the form of an annular groove inside the bearing recess. Before inserting a new bearing, fill this reservoir with grease; during operation this grease soaks into the porous Oilite bronze of the bearing to replenish lubricant lost. Before reassembling the plate into the magneto its surface should be wiped entirely free of the excess grease.

REPLACEMENT OF COIL—(Fig. 137). To remove the coil from the magneto frame it is necessary only to loosen the two setscrews which hold the coil bridge laminations. It is advisable to use a screwdriver in first class condition and of exactly the right size when releasing these setscrews. The coil should be tested on a reliable coil tester, be certain that complete and accurate information covering such tests is at hand. On the Eisemann coil tester the primary draw of the coil is 1.6 amperes, when tested according to directions.

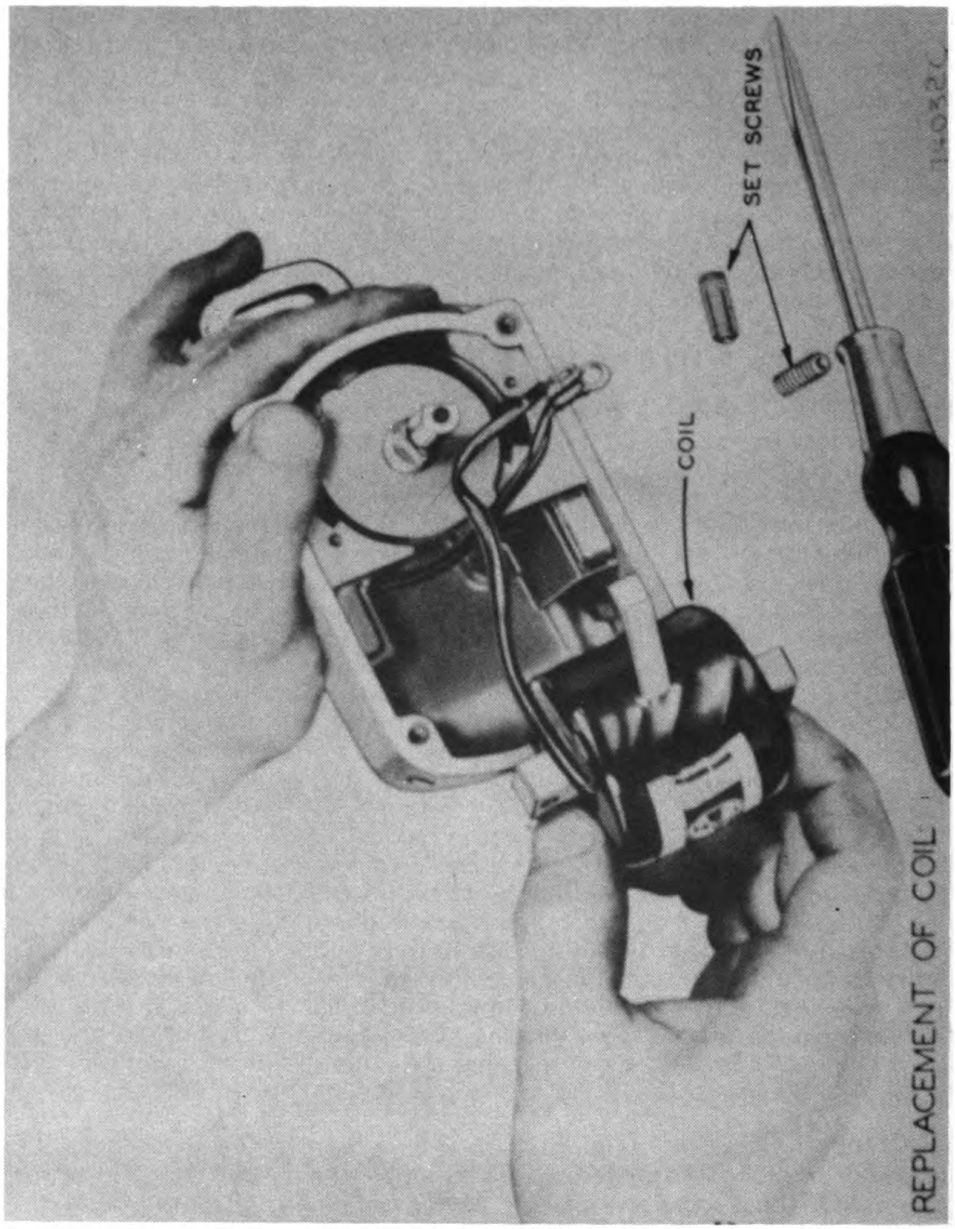


Fig. 137

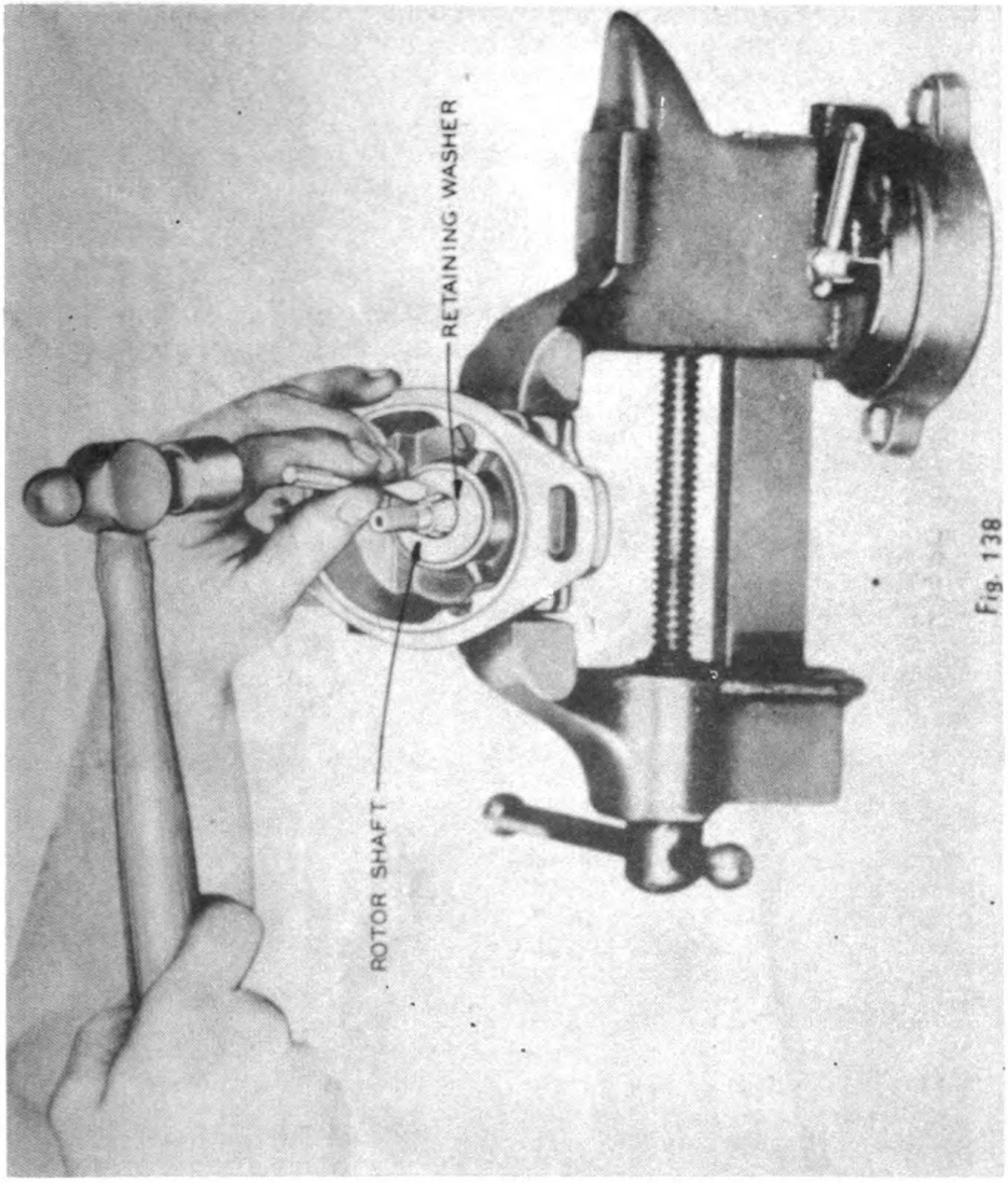
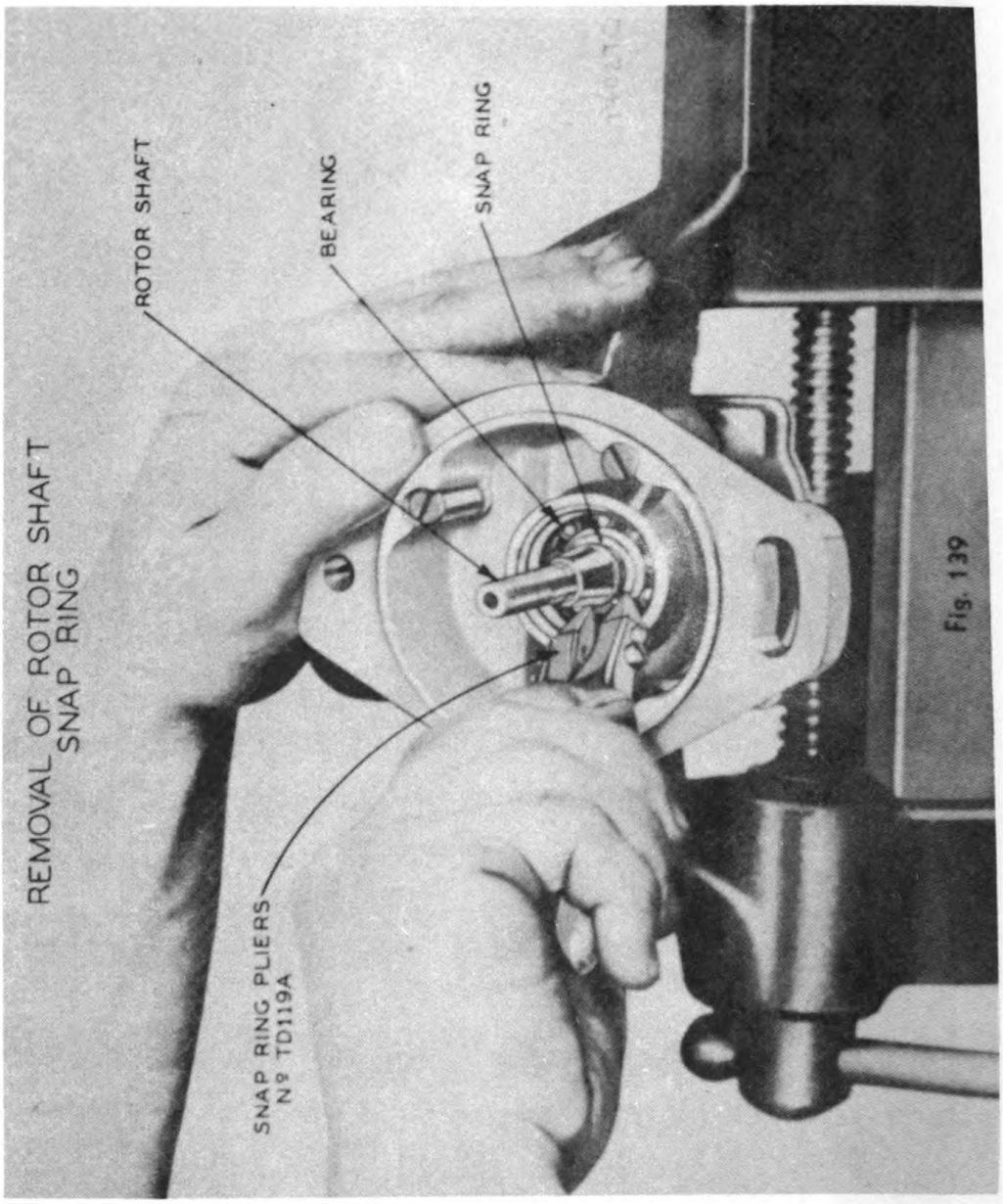


Fig. 138



REPLACEMENT OF CONDENSER—The condenser is removed from the magneto by taking out the terminal screw of the breaker assembly and the condenser mounting screw. The condenser should be tested on a reliable condenser tester for shorts, opens and leakage, and for capacitance, which for the condenser, lies between 0.17 and 0.21 mfd.

REPLACEMENT OF BREAKER POINTS—The breaker arm can be freed from the assembly by removing the terminal screw; the stationary contact point support can be dismounted by removing the round head locking screw. The eccentric head adjusting screw should be carefully examined, and replaced if necessary. Badly pitted or worn breaker contact points should be replaced, but it is often possible to resurface the points to their original condition. Resurfacing should be performed with a tungsten file or fine stone and should leave the center of each point very slightly higher than the edges. Points should be cleaned with a small brush, moistened in carbon tetrachloride.

REMOVING ROTOR FROM FRAME—The magnetic rotor of the Type FM-JV4B7 magneto is locked in the drive end thrust ball bearing and must be removed only according to the sequence of operations described below:

(a) Remove the outer retaining washer from the frame recess at the drive end of the rotor. The edge of this washer has been cut to facilitate removal. (Fig. 138)

(b) Remove the rubber sealing washer located immediately underneath the outer retaining washer; this may require the use of a sharp tool. If the rubber washer has hardened, it should be discarded and a new washer used in reassembly.

(c) Remove the inner retaining washer—this washer is a loose fit in the bearing recess but may have to be pried out due to adhesion of the bearing grease.

(d) Release the rotor shaft snap ring which locks the magnetic rotor in the ball bearing. This snap ring can best be removed by means of the snap ring pliers TD 119 A as shown in (Fig. 139).

(e) Remove any shims which are found between the snap ring and the ball bearings.

(f) The magneto assembly should now be placed in the screw press as shown in (Fig. 140). Center the distributor end of the rotor in the large hole of the lower plate of the press and place the brass protective cap over the threaded end of the rotor shaft. Apply an even pressure by turning down slowly the drive screw of the press. As soon as the rotor has been pressed out of the ball bearing, the magneto assembly can be removed from the press and the rotor lifted out of the frame.

REMOVING ROTOR BALL BEARING—After the magnetic rotor has been taken out of the frame, the snap ring holding the ball bearing in place can be reached and removed, together with the insulating washer. The magneto frame should then be placed in the screw press as shown in (Fig. 141) and the brass cap centered on the bearing. Turning the screw down will then push the ball bearing out of the frame recess, after which the insulating strip and washer adjacent to the bearing may also be removed. If the ball bearing is not worn or damaged, thorough cleaning in DY4 Cleaning Solvent and repacking with grease will place it in first-class condition.

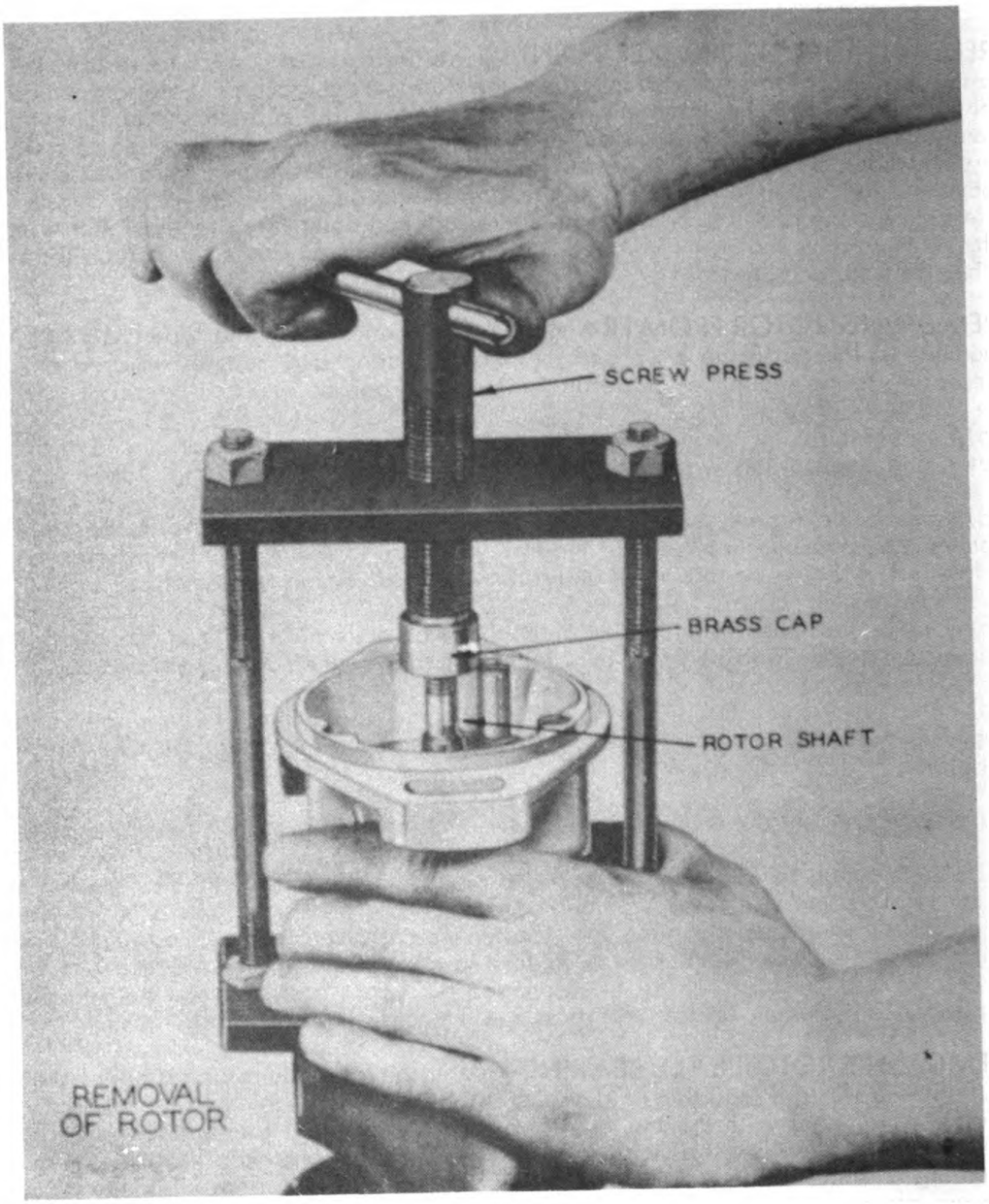


Fig. 140

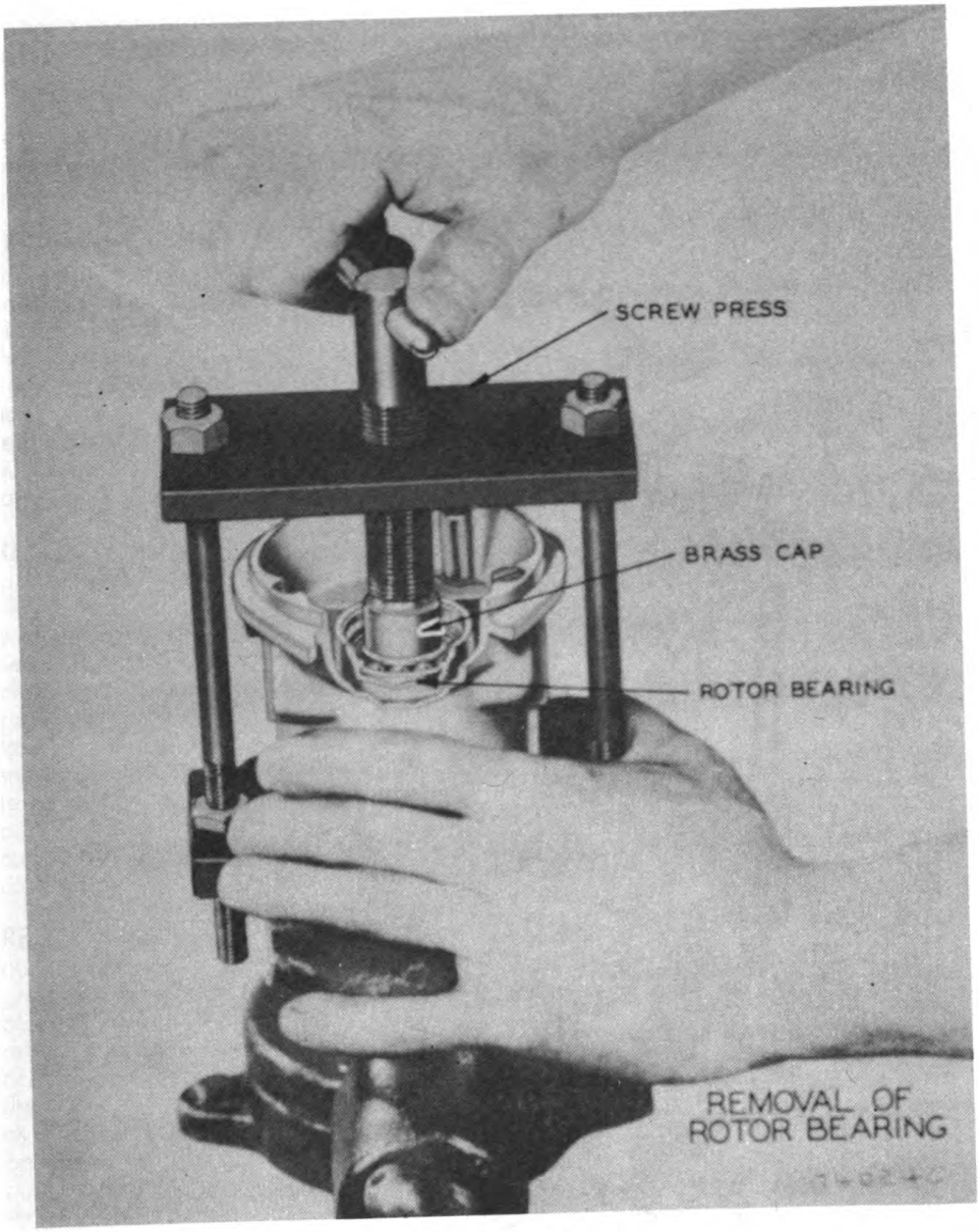


Fig. 141

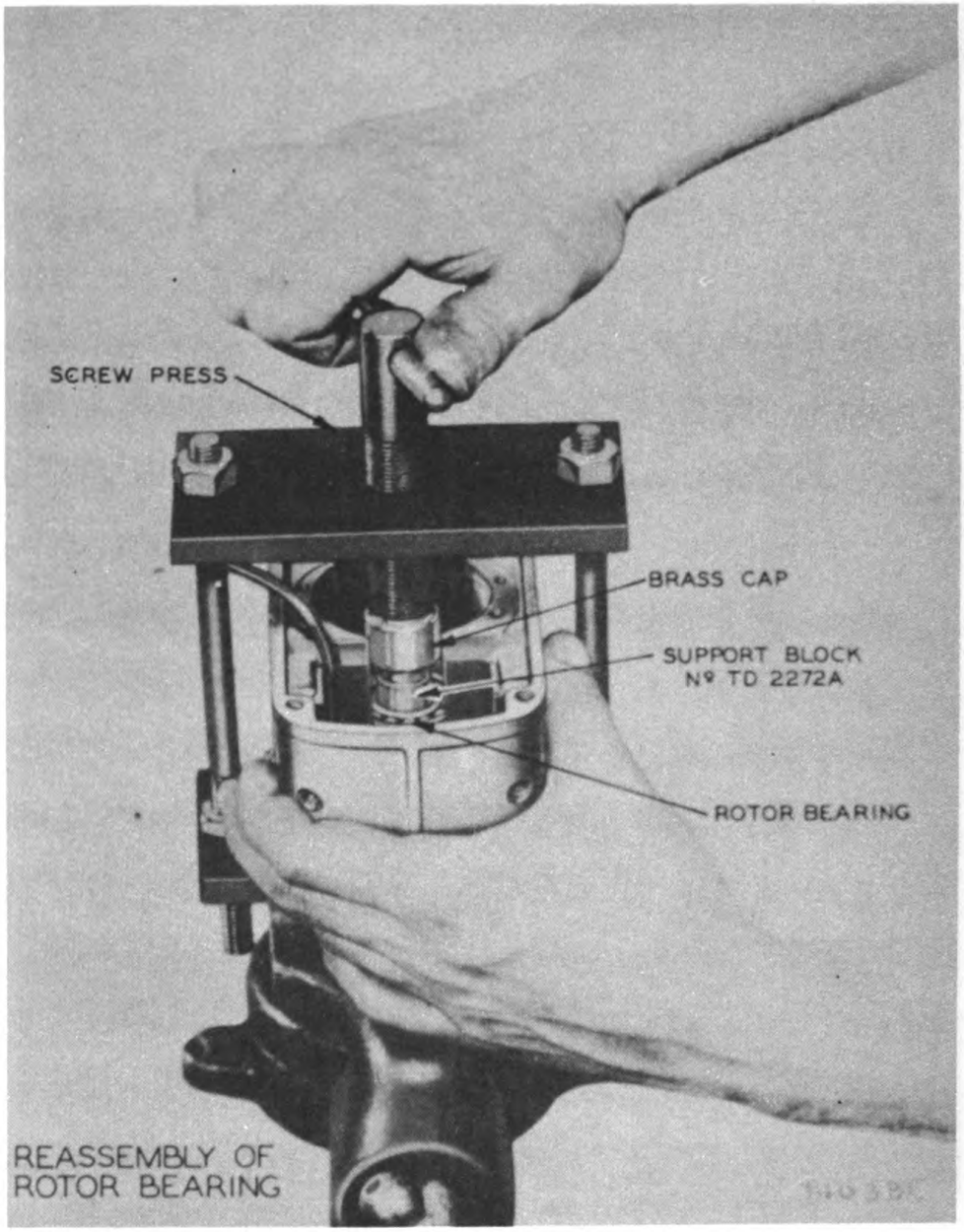


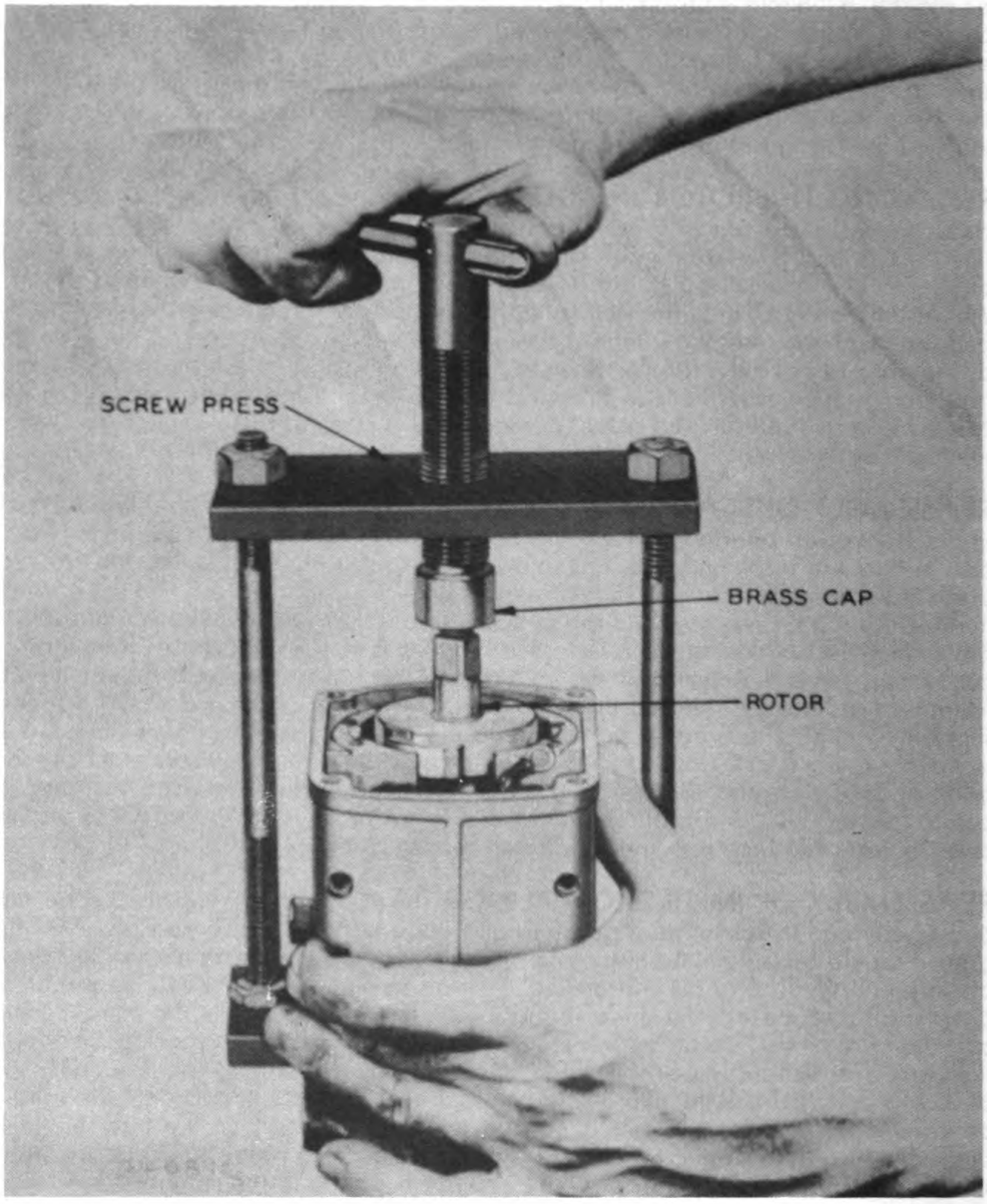
Fig. 142

REPLACING BALL BEARING—The inner insulating washer and insulating strip must first be placed in the frame recess and the ball bearing pushed as far as possible by hand in order to center it in respect to the insulating strip. The frame should then be placed in the screw press as shown in (Fig. 142), the small support block TD2272A centered on the ball bearing and the brass cap placed between the block and the screw of the press. Check the line up of parts to be certain that pressure exerted will be perpendicular, then turn down the screw until the bearing is completely within the frame recess. The outer insulating washer should then be placed next to the bearing and the large snap ring sprung into place.

REPLACING THE ROTOR IN FRAME—The magnetic rotor should be pushed by hand partially into place; then the assembly should be put in the screw press and lined up so that pressure can be applied perpendicularly. The brass cap should be placed over the end of the rotor shaft and the screw of the press turned down as shown in (Fig. 143), until the snap ring groove appears on the drive side of the ball bearing. One or more of the thrust bearing shims should be slipped on the rotor shaft as required to make the rotor shaft snap ring fit tightly against the bearing. The inner retaining washer may then be dropped into place and the rubber sealing washer pushed into its position. The assembly can then be completed by fixing the outer retaining washer in place by upsetting the frame metal at several points along its edge.

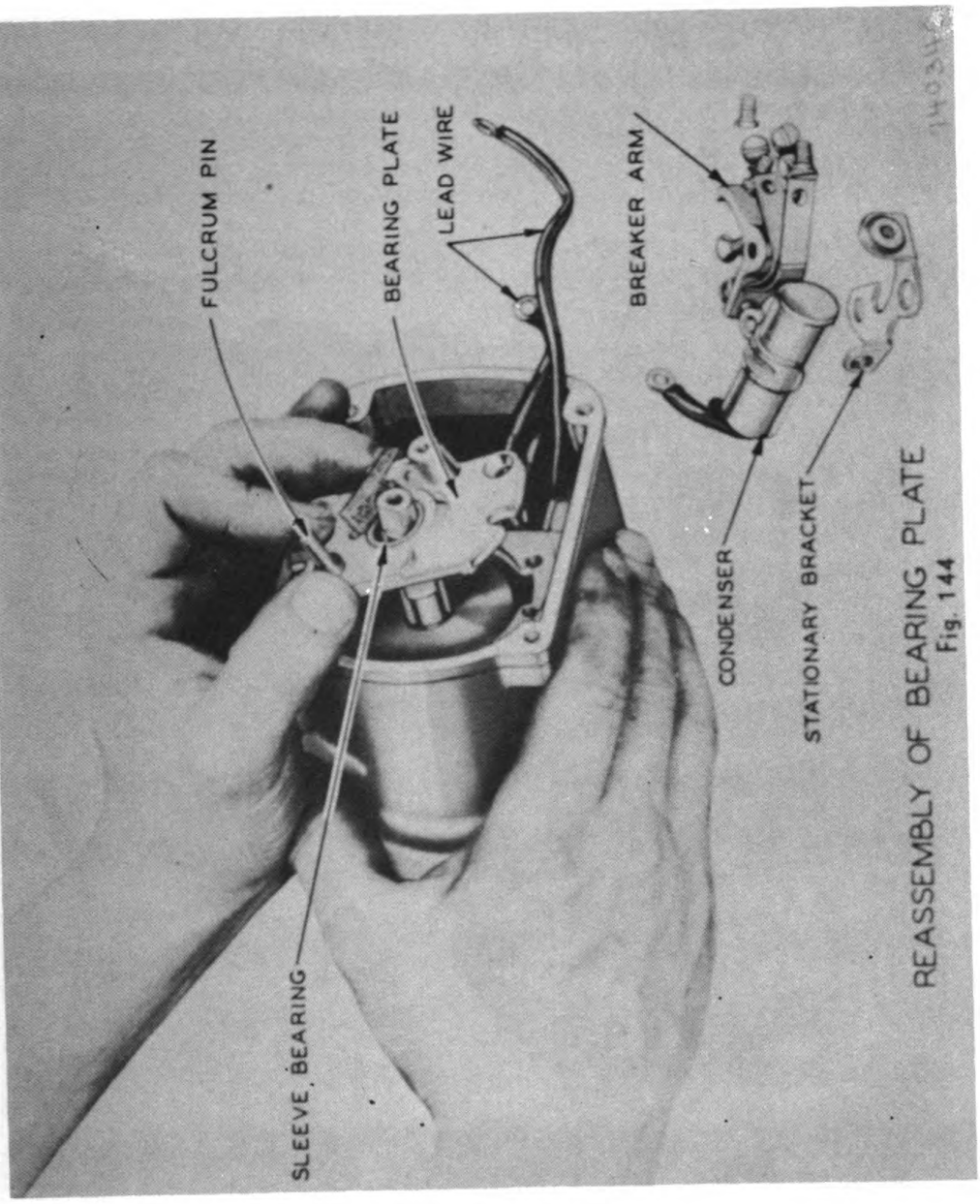
REASSEMBLY OF BEARING PLATE—(Fig. 144). After the coil has been replaced in the frame, the bearing plate with its sleeve bearing should be slipped over the cam end of the rotor and screwed into place in the magneto frame. The stationary breaker point support bracket should then be assembled to the plate and the eccentric head adjusting screw inserted. The condenser can then be mounted on the bearing plate and the breaker arm slipped on its fulcrum pin. The lead wires from the coil, condenser, ground switch and the spring lead of the breaker arm should then be fastened together by inserting the terminal screw at the lower end of the stationary support bracket. The breaker points should then be adjusted as shown in (Fig. 145) to have exactly 0.012 inch opening at full separation (when breaker arm rides high point of cam). The end cap can now be reassembled to the frame, using a new end cap to frame gasket and coating the entire joint with varnish. The distributor end cap cover is assembled to close the distributor compartment.

REASSEMBLY OF IMPULSE COUPLING—The impulse coupling should be thoroughly cleaned in kerosene or gasoline and wiped dry before reassembly. No oil or grease should be put on the hub plate or its pawls, and the inside of the shell should also be entirely free of oil and grease. A small amount of grease may be put on the drive spring, however. The drive spring should first be inserted in the coupling shell and the outside end anchored in the round socket (be certain the spring is coiled in the correct direction—clockwise from the outer end). Then using tool No. TD1109A as shown in (Fig. 146), the hub assembly and the inside end of the drive spring should be connected and the spring wound one full turn, after which the hub should be pushed into place. Check to be sure that both coupling pawl stop pins are tightly screwed into the frame. Assemble the complete coupling to the magnetic rotor shaft, keying it in position.



REASSEMBLY OF ROTOR

Fig. 143



REASSEMBLY OF BEARING PLATE
Fig. 144

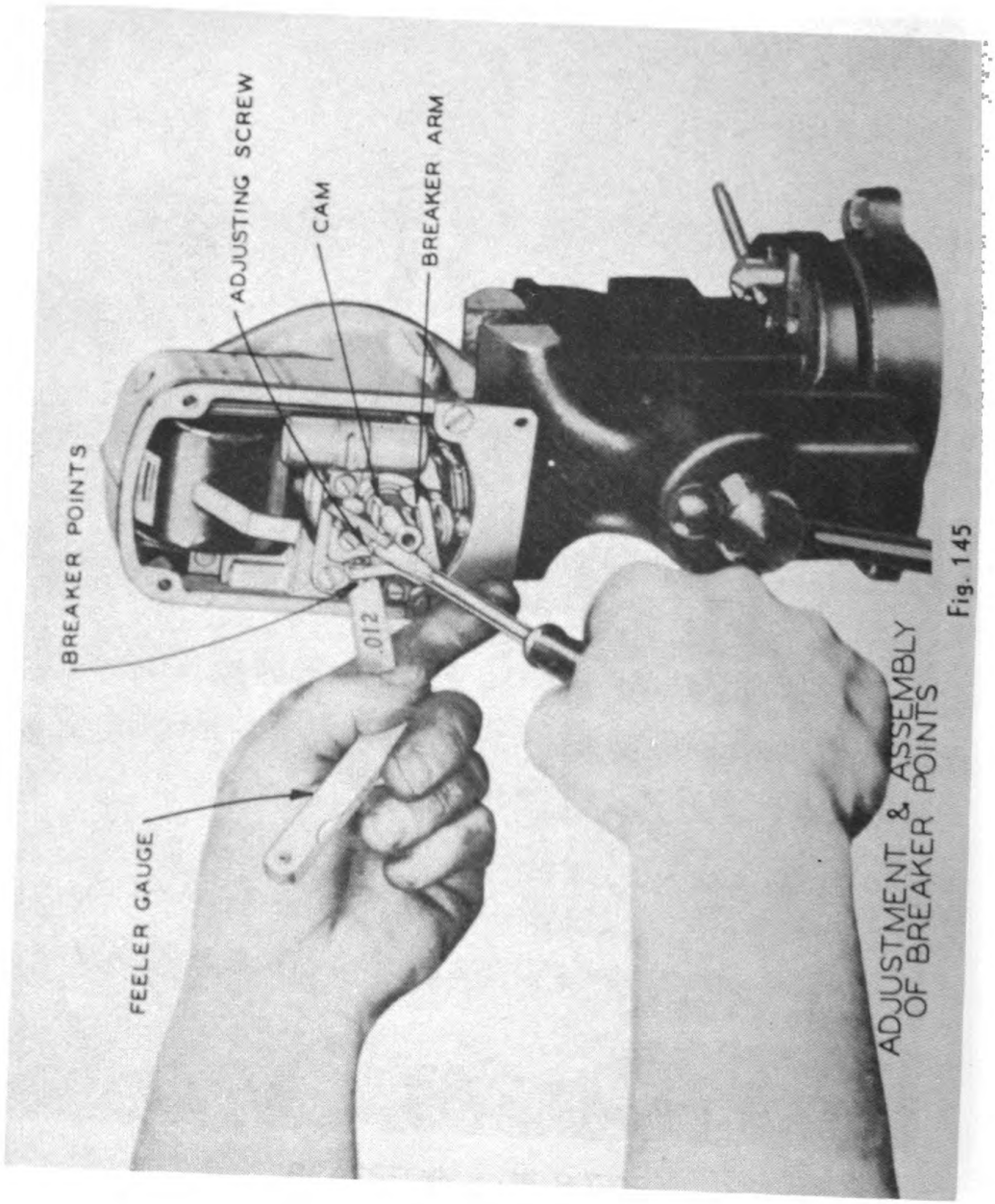
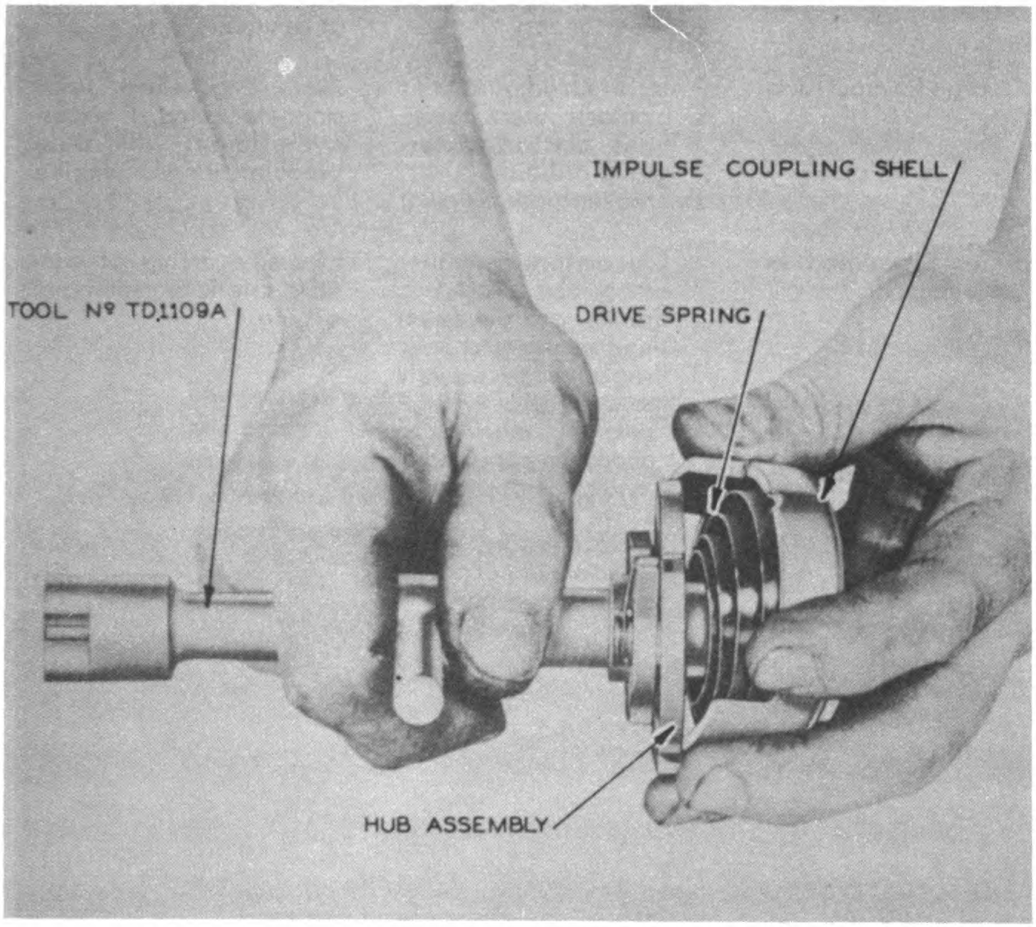


Fig. 145

Place the gear bushing on the shaft and assemble the magneto drive gear to the coupling lugs so that when the distributor rotor is in firing position for No. 1 cylinder, the prick punch mark on the face of the gear is adjacent to the upper pawl stop pin. The coupling nut may now be tightened down on the assembly and the lockwire inserted through the rotor shaft slots of the coupling nut.

CHECK IMPULSE COUPLING OPERATION—During the starting period of the engine the coupling pawls engage the pawl stop pins four times per revolution in order to provide the impulse action which intensifies the ignition sparks. The operation of the coupling can be checked by slowly turning the drive gear by hand in clockwise direction and noting the engagement, windup and release for each pawl and stop pin. The impulse feature continues to function until an engine speed of 500 rpm is reached after which centrifugal force is sufficient to keep the pawls from engaging the stop pins with the result that the coupling serves as an individual drive member.



REASSEMBLY OF COUPLING DRIVE SPRING

Fig. 146

MAGNETO TROUBLES

The following are possible causes of trouble that might result from a faulty magneto:

Defect	Possible Causes	Effect
A. Small Contact Gap	1. Incorrect adjustment 2. Pitting of contacts 3. Wear of breaker shoe 4. Wear of cam	Retarding effect on magneto timing. Poor low speed operation. Arcing at contacts.
B. Large Contact Gap	1. Incorrect adjustment 2. Contacts worn, sometimes due to excess spring pressure 3. Breaker loose on pivot	Advancing effect upon magneto timing. If excessively large, will cause irregular firing of engine
C. Contacts pitted or blackened	1. Oil or foreign matter on contacts 2. Breaker arm movement sluggish 3. Breaker arm excessively loose on pivot 4. Primary connection to condenser not good 5. Condenser loose or defective 6. Contacts badly out of alignment or not parallel	Excessive arcing of contacts. Erratic or misfiring of engine.

LIFT ATTACHMENT

M 175

The purpose of the Rosco Lift Attachment, as installed on and being a part of the Rosco RMU or MME with truck chassis, is to provide a convenient means for quickly hoisting the truck mounted unit including the fully loaded tank without the use of special sling equipment.

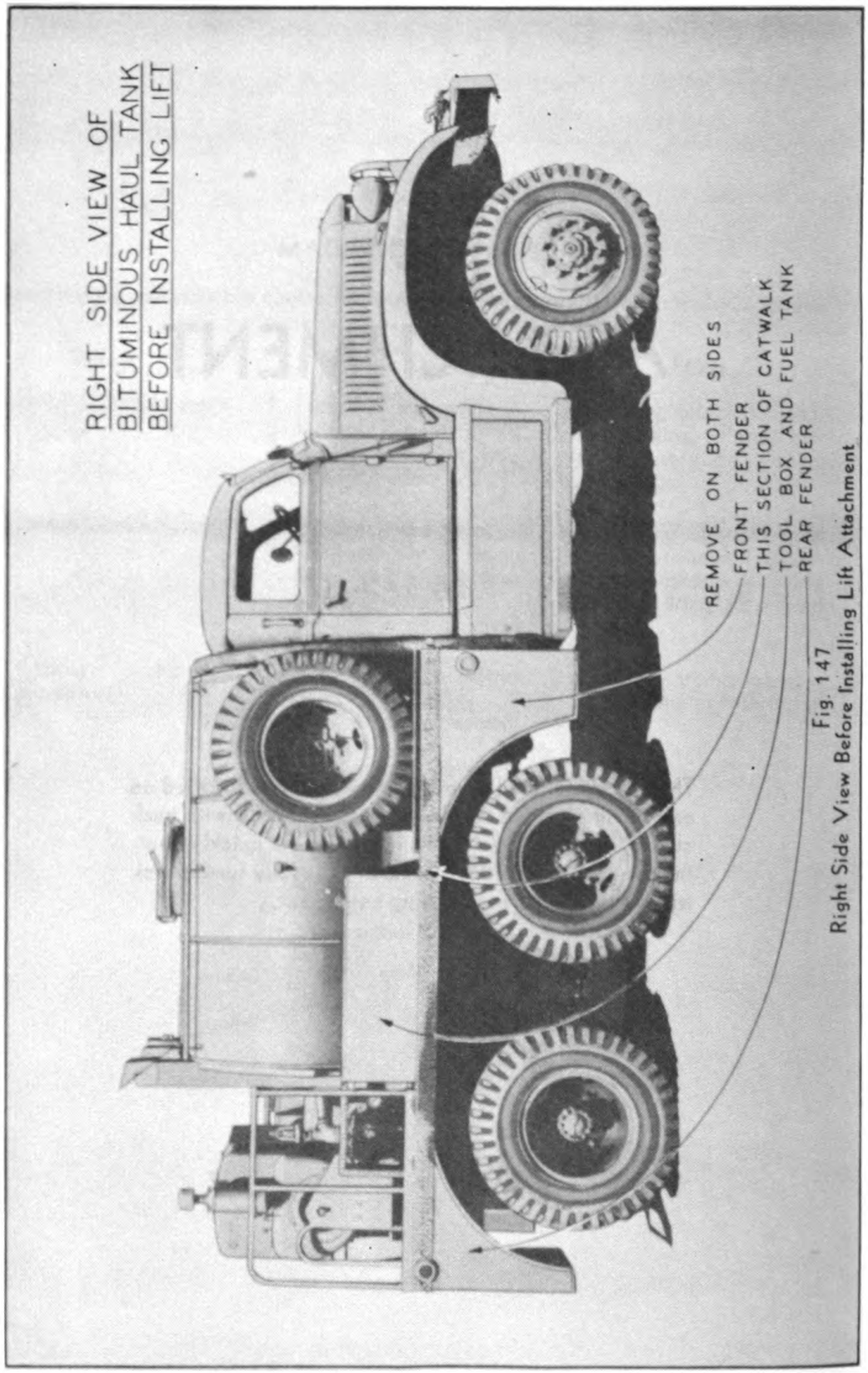


Fig. 147
Right Side View Before Installing Lift Attachment

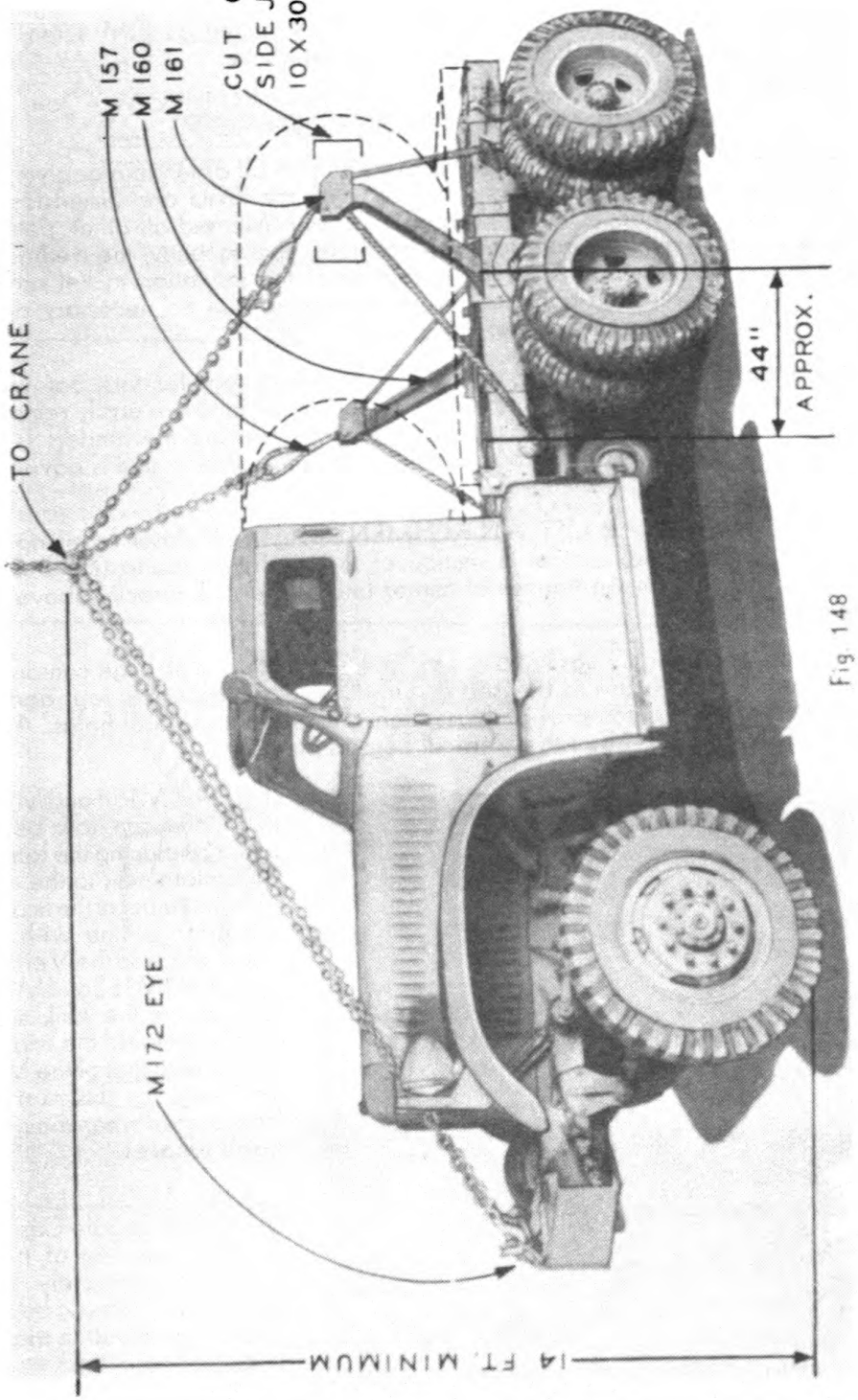


Fig. 148

METHOD OF LIFTING MACHINE FROM TRUCK CHASSIS

FIELD INSTALLATION OF M175 LIFT ATTACHMENT FOR

MODEL RMU—Tank, Bituminous Supply, 800 Gal., Mounted on QM 4 ton, 6x6 Diamond "T" Chassis, 151 inch Wheel Base.

MODEL MME—Distributor, Water, 1000 Gal., Mounted on QM 4 ton, 6x6 Diamond "T" Chassis, 151 inch Wheel Base

GENERAL: Both the models RMU and MME are similar in all dimensions applying to the lifting attachment. The tool box and fuel tank on the RMU are dimensionally identical to the two tool boxes furnished on the model MME and all other parts of the attachment are interchangeable for both machines; consequently, the method of installation is the same for both with the exception of the insulation jacket on the RMU, so no further distinction between the two machines will be necessary apart from removing the sections of the jacket.

DISMANTLING PROCEDURE: (Fig. 147) The front and rear fenders, cat walk, fuel tank and tool box are all bolted to the frame outriggers, and are easily removed by loosening the cap screws that hold them in place. Removing the fenders is not absolutely necessary; however, it greatly facilitates the installation and is advisable to do so.

INSTALLATION OF REAR LIFT ATTACHMENT: (Fig. 148) After removing the items previously mentioned, cut out a section of the insulation jacket (RMU only) approximately 10"x30" on the horizontal center line of the tank directly above the truck bogey.

The lower plate of Vertical Legs M161 L. H. and M160 R. H. match the contour of the truck bogey plate and are to be used as a drill template. Hold the legs against the truck frame in the position previously mentioned and mark and drill holes. After the holes have been drilled bolt the Vertical Legs in place.

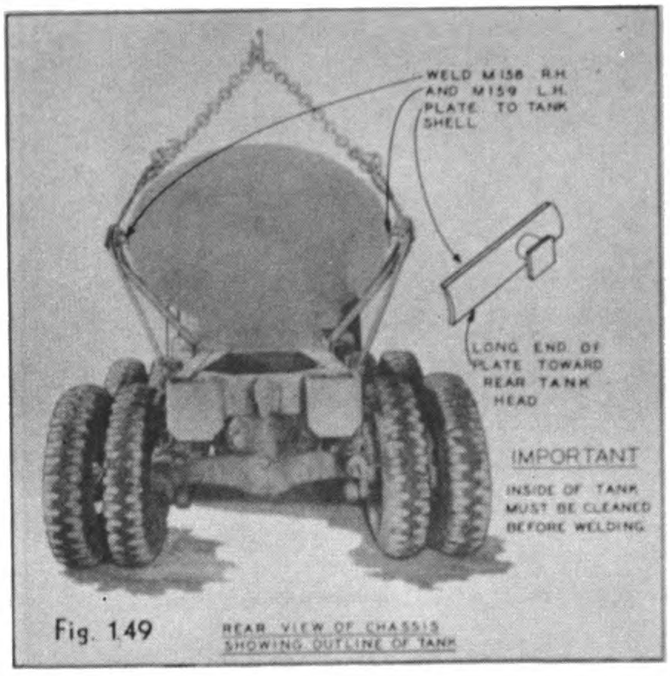
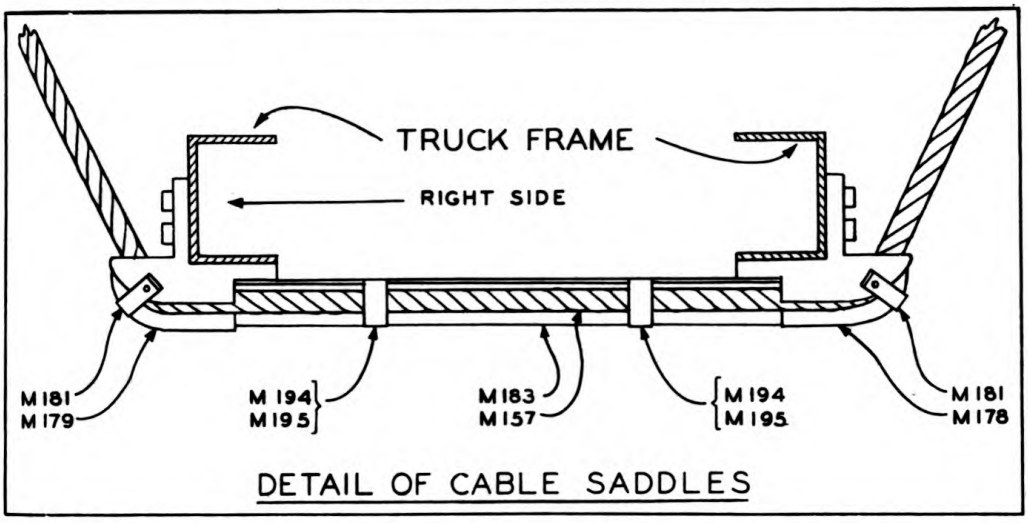


Fig. 149 REAR VIEW OF CHASSIS SHOWING OUTLINE OF TANK

(Fig. 149) M158 and M159 Rub Plates can now be located by placing the longer base plate next to the tank with the center of the smaller rub plate in line with the upper plate on the Vertical Leg. Weld M158 and M159 securely to the tank side, but do not weld the smaller rub plate to that of the Vertical Legs, as this must be free to move when the truck frame weaves.

Locate M178 L. H. and M179 R.H. Saddle Casting at the lower leg of truck frame approximately 44" ahead of the truck bogey and drill and bolt in place. (Figs. 150 and 152)



DETAIL OF CABLE SADDLES

Fig. 150

Bolt M183 Angle to M178 and M179 in the recesses provided for that purpose. (Fig. 151) Fasten M157 Cable to grooves in M178 and M179 by means of Cable Saddle Clips M181. The center of the cable is supported within the legs of M183 Angle by two pair of Angle Companion Clamps M194 and M195. The exact location of the clamps are relatively unimportant but should be fairly equidistant from the frame channels.

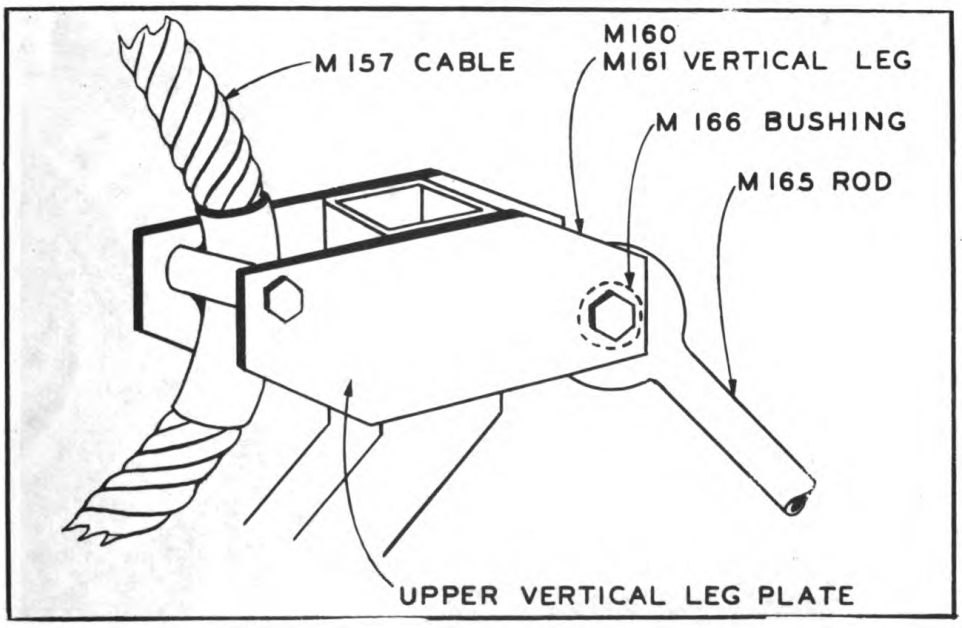
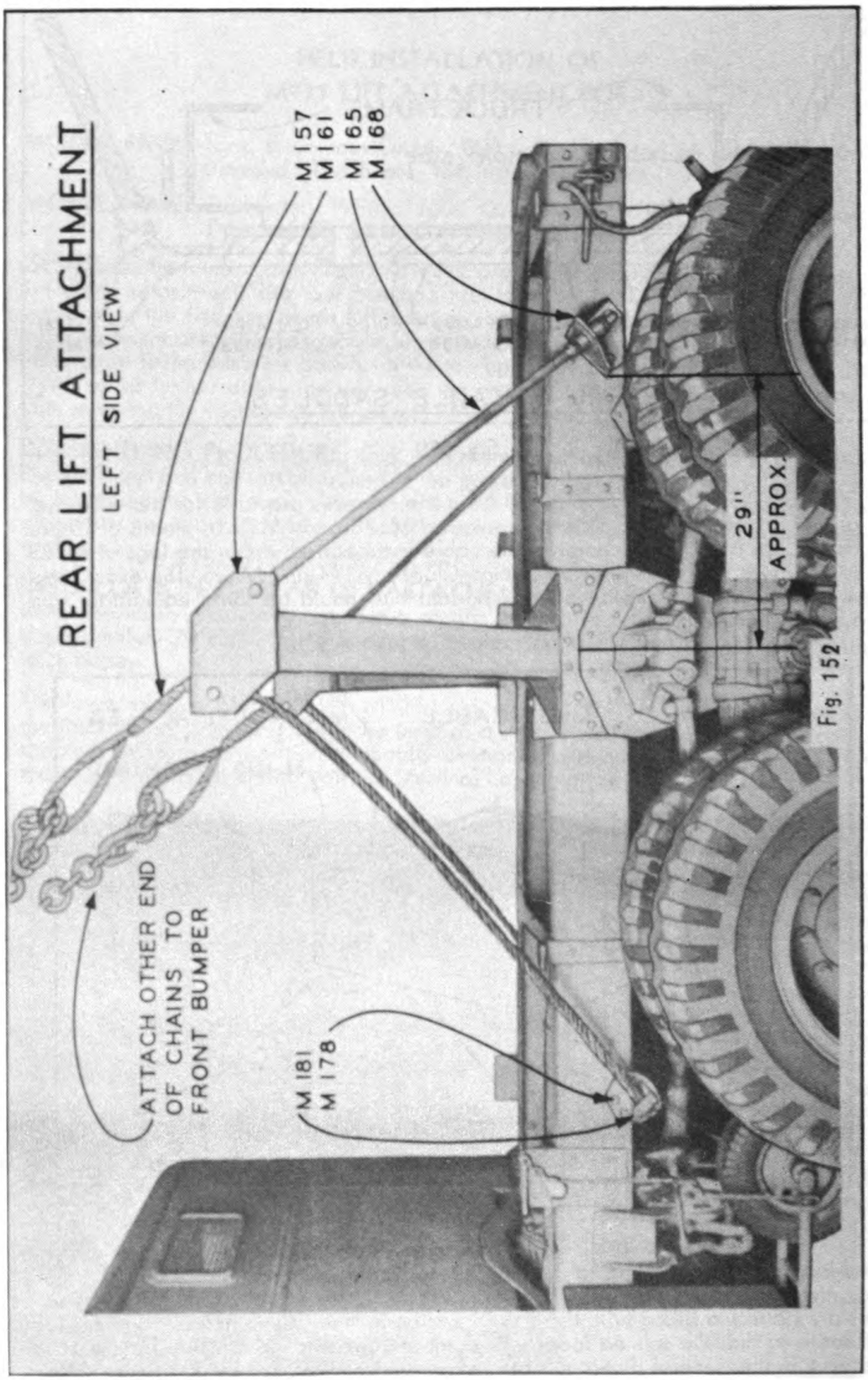


Fig. 151

The lifting cable is attached to the upper section of the M160 and M161 Vertical Legs, by means of the deadeyes which are a part of the cable assembly. The deadeyes are bolted in place with the curved sections of the sleeve acting as guides for the cable so that the spliced loops will point inward and towards the front end of the truck in the general direction of the strain which is exerted on the cable when the machine is lifted. (Fig. 152)



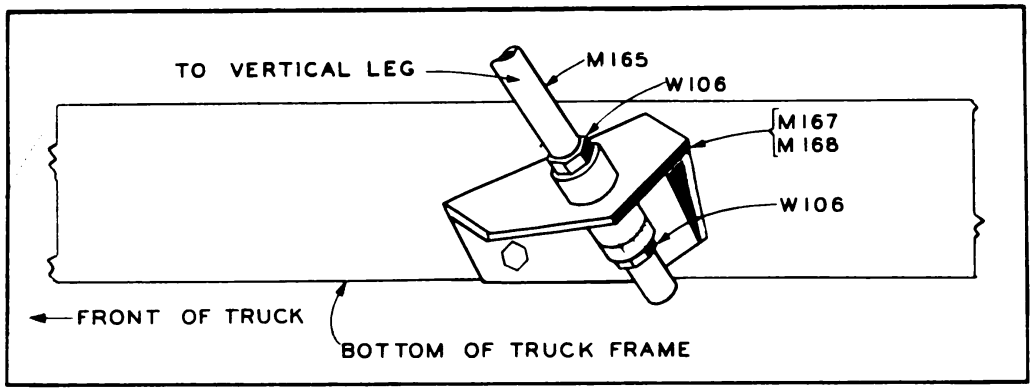


Fig. 153

After the cable is installed the next step is to locate the Tie Rod Brackets M167 R.H. and M168 L.H. The lower edges of the brackets are to be flush with the lower edges of the frame members and located 29" back from the center line of the truck bogey (Fig. 153 and 154). Use the brackets as templates and drill and bolt in place.

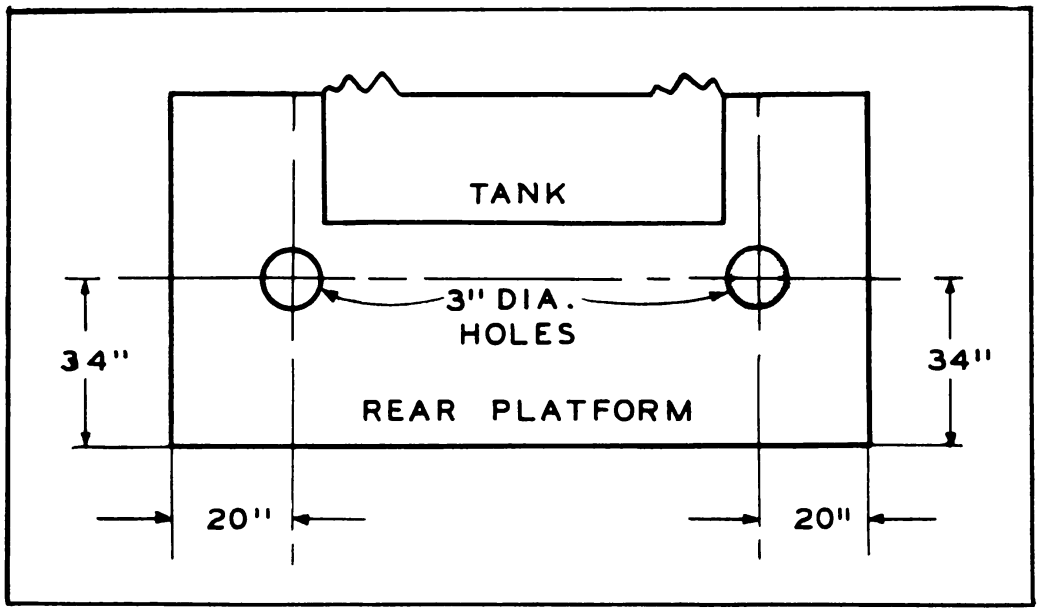


Fig. 154

One 3" diameter hole shall be cut on both the right and left sides of the rear platform to permit the connection of M165 Tie Rod to M160 and M161 Vertical Legs and M167 and M168 Tie Rod Brackets. These holes are located 34" from the rear of the machine and 20" from the outside edge of the platform as indicated in (Fig. 154). One M106 Nut shall be turned on to each of the M165 Tie Rods and the rods then passed through the holes in the rear platform and inserted in the sleeves of the Tie Rod Brackets. Place M166 Bushings through the eyes of the Tie Rods and bolt to the upper plates of the Vertical Legs. (Fig. 152) After the eye of the Tie Rod has been bolted in place turn on another M106 Nut until it butts snugly against the sleeve on the Tie Rod Brackets. The M106 Nut that was previously turned on shall then be drawn tight against the upper face of the sleeve.

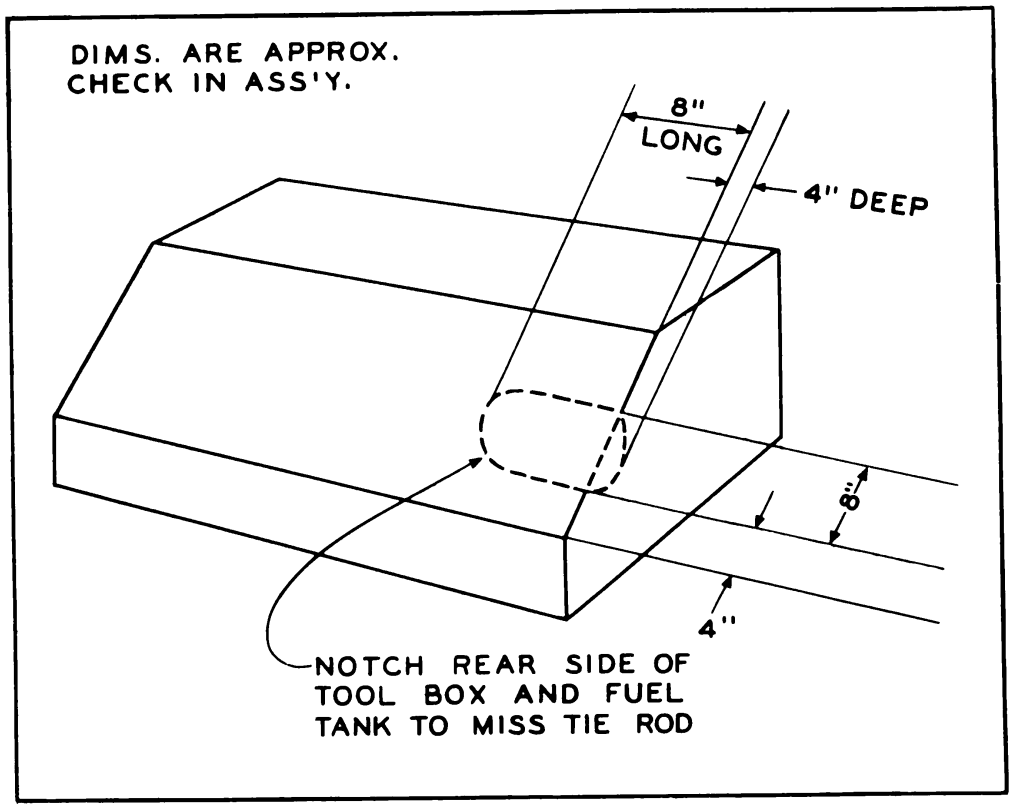


Fig. 155

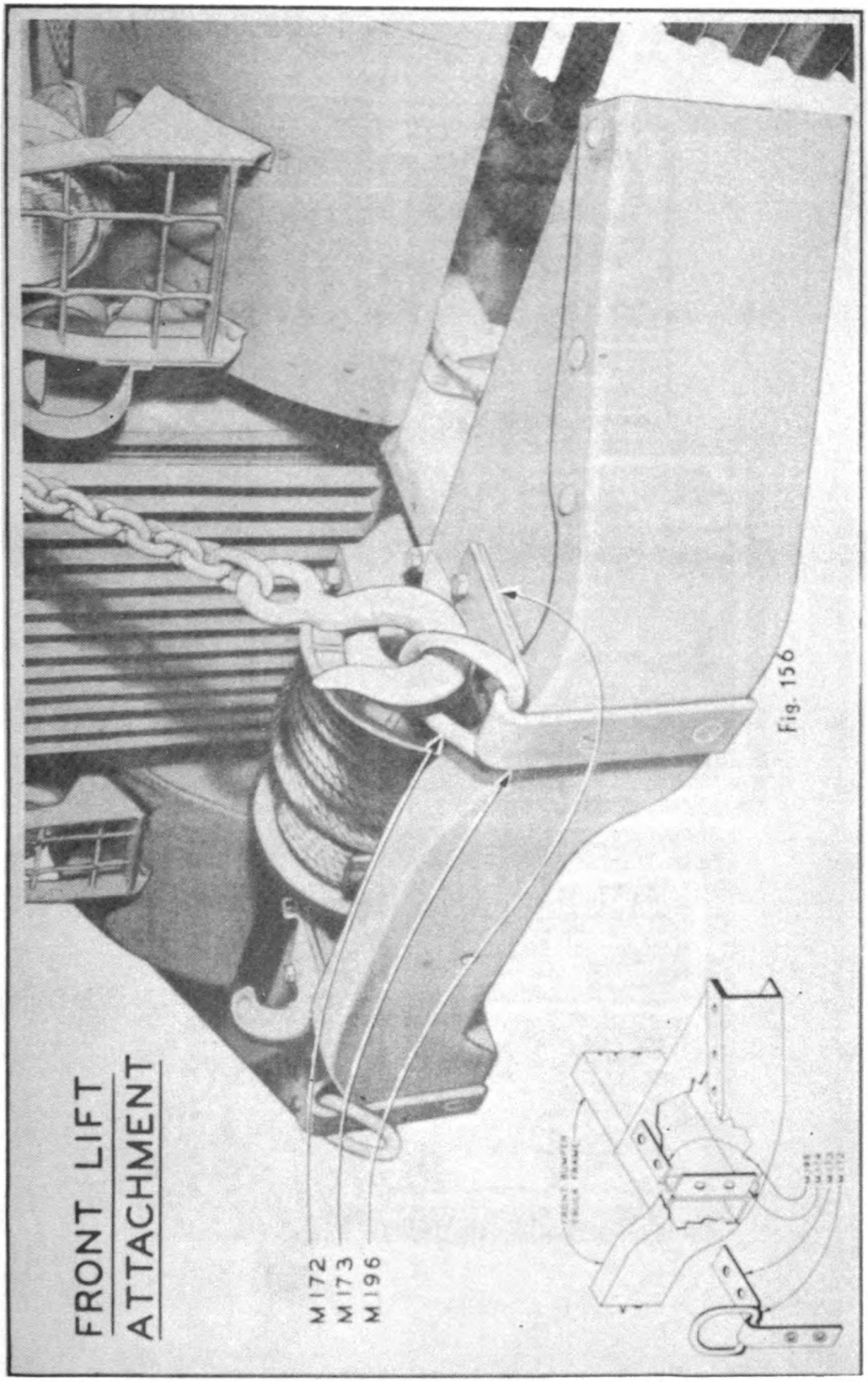
On machines built prior to 1943 having serial numbers No. 41 to No. 54 inclusive for Model MME and No. 661 to No. 690 inclusive for Model RMU it will be necessary to revamp the tool boxes and fuel tanks to provide sufficient clearance for the M165 Tie Rods.

This indentation for clearance is made by cutting out and bending at the rear side as indicated on (Fig. 155) and welding back in place with an additional filler strip of steel to fill the gap.

INSTALLATION OF FRONT LIFT ATTACHMENT—The front lifts are bolted to the truck front bumper as indicated on (Fig. 156). One leg of the M174 Angle is placed next to the truck frame and the other leg at the rear side of the front bumper. Mark and drill the holes on the frame and bumper to correspond with the hole spacing on the angles. M172 Eye is placed in the loop of M173 Support. M196 Shim is laid on the bumper web directly beneath M173 Support. Drill holes through the web and bolt the entire assembly together. Note that the flat head cap screws are used on the lower legs of M173 Support to provide a flat surface on the front bumper.

The most convenient method of attaching the crane hook is shown in (Fig. 148). There should be a minimum of 14 feet from the ground to the point where the crane hook is fastened to the lifting chains with the hook being slightly behind the truck cab; however, various other methods may be substituted depending upon the hoisting equipment available at the loading dock.

The replacement parts for the M175 lift attachment are laid out symmetrically so that the pieces required for the right side of the machine are on the right side of the sheet; and conversely for the left hand assembly. All bolts, screws, and washers are shown adjacent to the parts which they fit and the description and size are indicated in the numerical parts list.



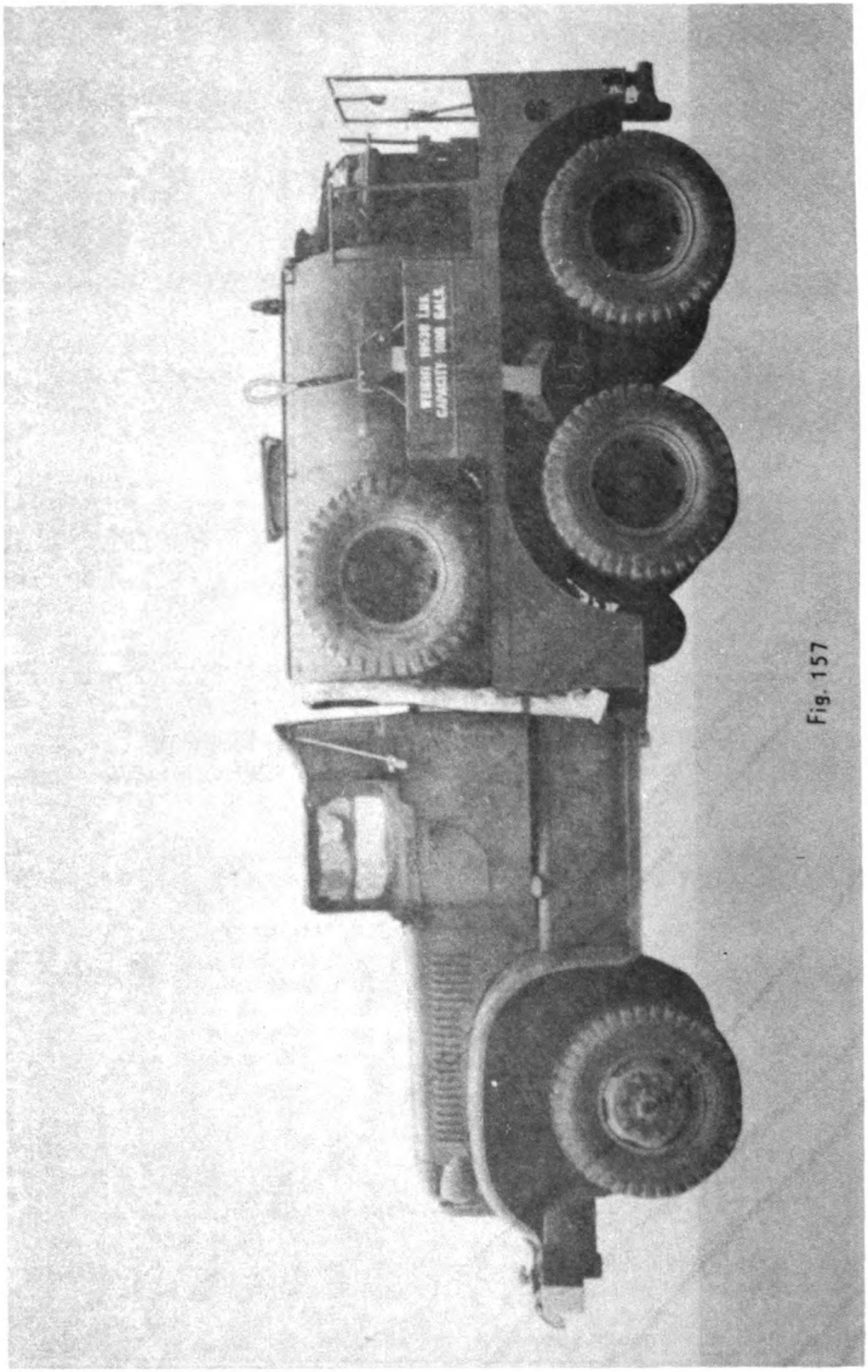


Fig. 157

PREPARATION OF REQUISITIONS

Sample Copy for Use in the Preparation of Requisitions

Revisions in QMC Form 400 for requisitioning spare parts are confined to new column headings. Until new forms are available all organizations are to continue using the present form and either type or write in corrections indicated in column headings.

Under revised heading "Nomenclature and Unit" list the article and the unit (ea for each; lb for pound, etc.). Under heading "Authorized or Maximum Level" list the authorized depot stock levels or organizational allowances given in Part III of the Corps of Engineers Supply Catalog. The total number on hand for each item is listed under "On Hand." In column headed "Due in" enter the total quantity previously requisitioned but not delivered. For "Initial" and "Replenishment" requisitions, the sum of "Required," "Due In," and "On Hand" should equal the "Authorized or Maximum Level."

On this page is shown a sample requisition on QMC Form No. 400 which conforms to the latest revisions. The marginal notes give instructions for preparing a requisition for spare parts for Engineer equipment. Additional information on this subject is contained in section AA-1 of Part III Engineer Supply Catalog, available from the Engineer Field Maintenance Office, P. O. Box 1679, Columbus, Ohio.

State PERIOD designation by use of one of the following terms:
(1) "INITIAL"—first requisition of authorized allowances.
(2) "REPLENISHMENT" — subsequent requisitions to maintain authorized allowances.
(3) "SPECIAL" — requisitions for necessary repairs not covered by allowances

Type "SPARE PARTS" in upper right hand corner of requisition.

Give complete shipping instructions. Special instructions for packing, marking, routing, etc., should be given at the end of the requisition

State proper nomenclature of machine, also make, model, machine serial number and U. S. A. registration number.

Prepare a separate requisition for each different machine.

State basis or authority and date delivery is required, immediately below description of machine.

Double space between items.

Group parts required under group headings as shown in manufacturers' parts catalogs (Technical Manuals).

State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.

SPARE PARTS

(SAMPLE)

REQUISITION

To: Engineer Field Maintenance Office, P. O. Box 1-74, Columbus, Ohio — No. of Sheets 1 — Sheet No. 1
Requisition No. E-551-3-44 — Date 6 October 1943 — Period Special
SHIP TO Engineer Property Officer, Pine Camp, New York
MARKED FOR: Supply Officer, 147th Engineer Regiment, Pine Camp, New York

Requisitioned by (Signature, Rank, Organization, Destination. If different from "ship to" include address)
Robert E. Roe
Robert E. Roe
Major, C. E.
Engineer Property Officer

Approved By
John D. Doe
John D. Doe
Colonel, C. E.
Executive Officer

STOCK NO	NOMENCLATURE	UNIT	MAX OR AUTH LEVEL	ON HAND	DUE IN	QUANTITY REQUIRED	REMARKS
	DISTRIBUTOR, WATER, TRUCK MOUNTED, 1,000 GAL., RO800 MODEL, MAK SERIAL NUMBER 327						
	Basis: Repair of disabled equipment						
	Delivery requested by 20 October 1944						
	DRAIN PIPING						
M198	WRENCH	ea.	-	0	0	2	
W276	NIPPLE	ea.	-	0	0	2	
	TRANSFER LINE						
W190	ELBOW	ea.	-	0	0	2	
	SPRAYBAR						
R852	GASKET	ea.	-	0	0	3	
R1503	EXTENSION	ea.	-	0	0	3	
R856	CAP	ea.	-	0	0	3	

*Nonexpendable items such as tools must be accounted for, when requisitioned, by a statement that they have been placed on REPORT OF SURVEY or STATEMENT OF CHARGES.

Emergency requisitions sent by telephone, telegraph or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."

PREPARATION OF REQUISITIONS

A sample requisition in the correct form for submission by the Engineer Property Officer is shown on the opposite page.

THIS SHALL BE FOLLOWED IN MAKING OUT REQUISITIONS

In order to eliminate duplication of work, Property Officers may authorize organizations to prepare requisitions in final form, leaving requisition number space blank for completion by Property Officer.

THE FOLLOWING RULES WILL BE OBSERVED CAREFULLY IN PREPARING REQUISITIONS FOR SPARE PARTS:

a. Prepare a separate requisition for each different machine.

b. Type "SPARE PARTS" in upper right hand corner of requisition form.

c. State PERIOD designation by use of one of the following terms:

(1) "INITIAL"—first requisition of authorized allowances.

(2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.

(3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.

d. Give complete shipping instructions.

e. State proper nomenclature of machine, and make, model, serial number and registration number.

f. State basis of authority, and date delivery is required, immediately below description of machine.

g. Group parts required under group headings as shown in manufacturer's parts catalogs.

h. State manufacturers parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.

i. Double space between items.

j. Emergency requisitions sent by telephone, telegraph, or radio must always be confirmed immediately with requisition marked: **"Confirming"** (state identifying data)."

k. Nonexpendable items must be accounted for.

INSTRUCTIONS FOR USE OF PARTS SECTION

Parts shown on Parts List illustrations are arranged in such a manner that each piece is in line with or adjacent to the part to which it is fitted, to facilitate parts identification of the complete assembly.

The Parts List illustrations are shown in major assemblies or functional groups such as the tachometer, suction piping, or spraybar, with each following in the sequence in which the machine would ordinarily be put together. A deviation of this arrangement is found only in the accessory section where parts of a general nature are grouped.

Morrison Hose Coupler fittings and Lift Attachment are furnished when specified on individual contracts and supplied in quantities as ordered.

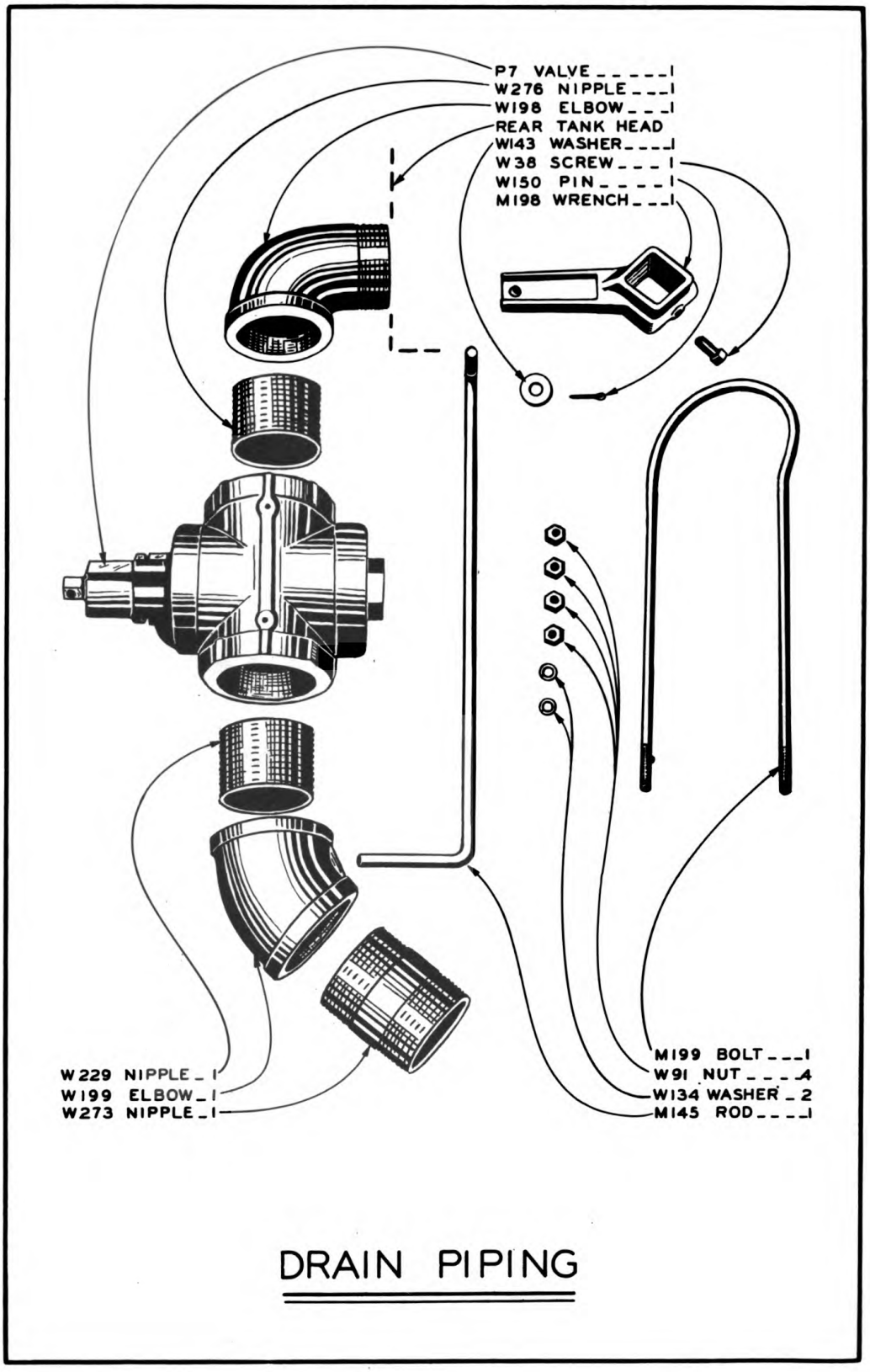
NOTE BEFORE ORDERING CARBURETOR OR MAGNETO PARTS—Due to conditions beyond the control of the manufacturer, it has been necessary to use several combinations of magnetos and carburetor. Carefully check the Rosco Serial Number with those in the magneto and carburetor parts lists to determine the proper component to fit the machine to be repaired.

Common Supplies—Items such as screws, nuts, and cotter pins that conform to American Standards appear on a number of different pages, so these common supply items are listed by part number, name, size, and price only.

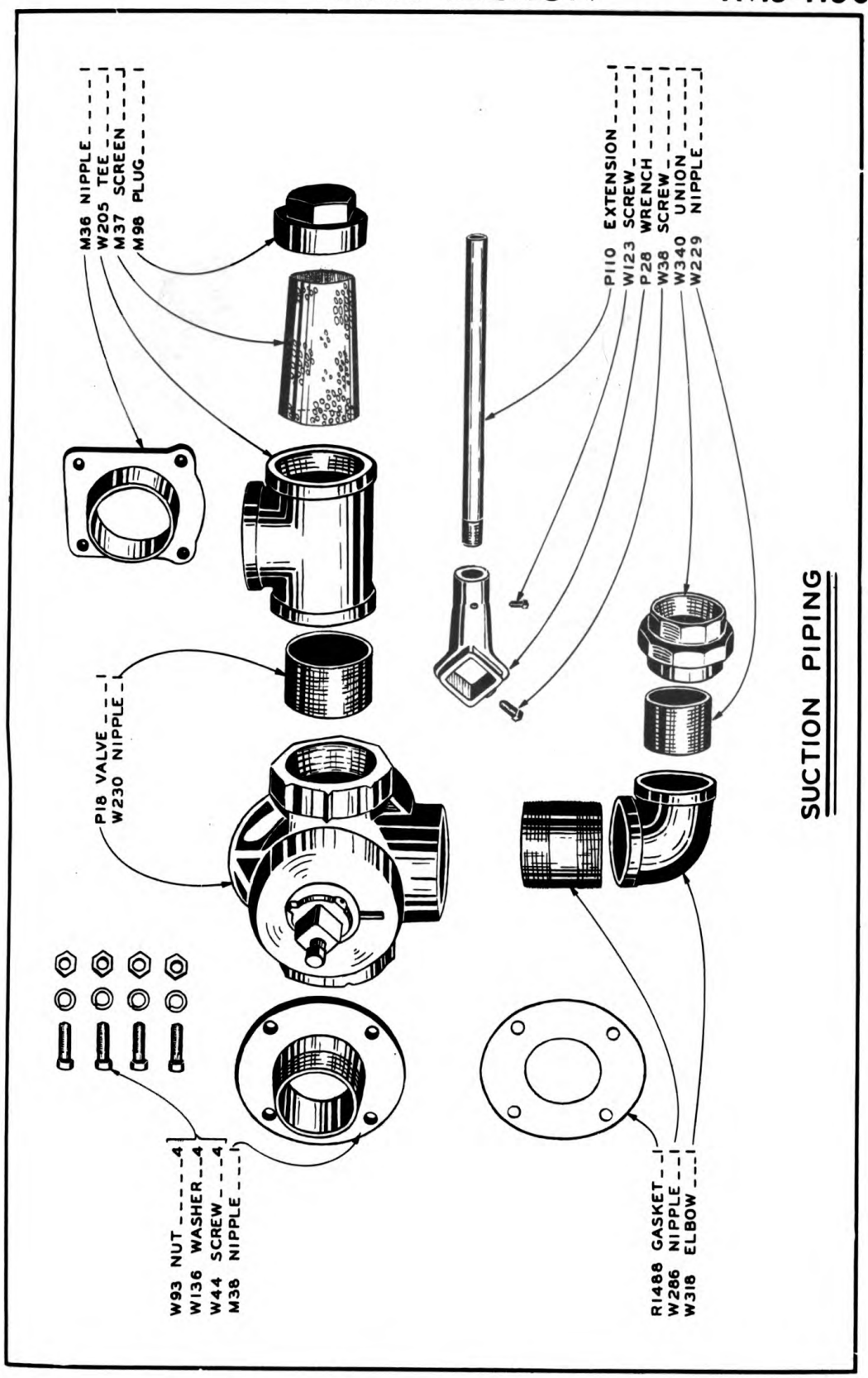
Special screws, washers and fittings are listed by part number, page location, and name with sizes omitted and should be ordered in the manner in which they are listed.

ILLUSTRATIONS

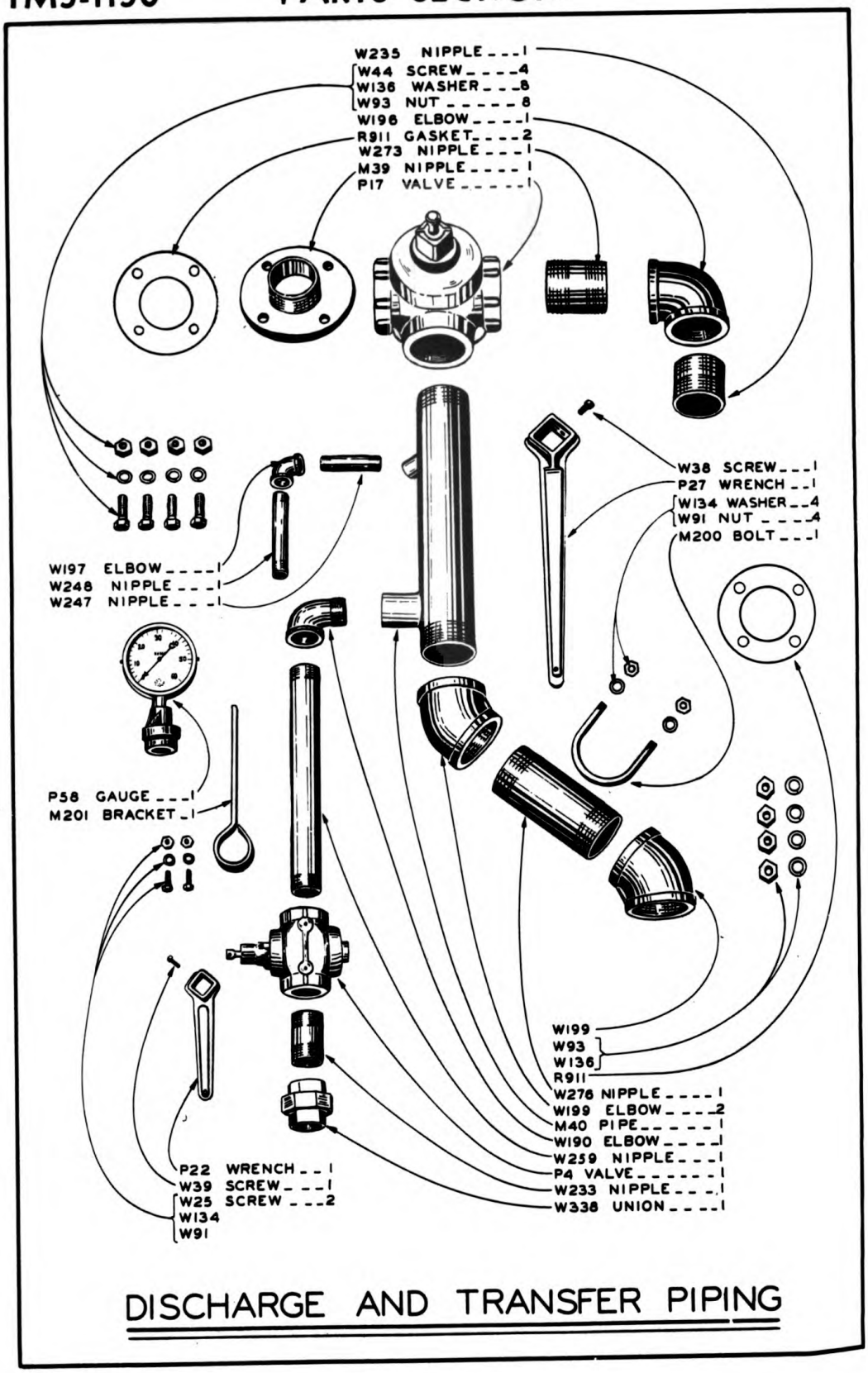
DISTRIBUTOR AND PUMP



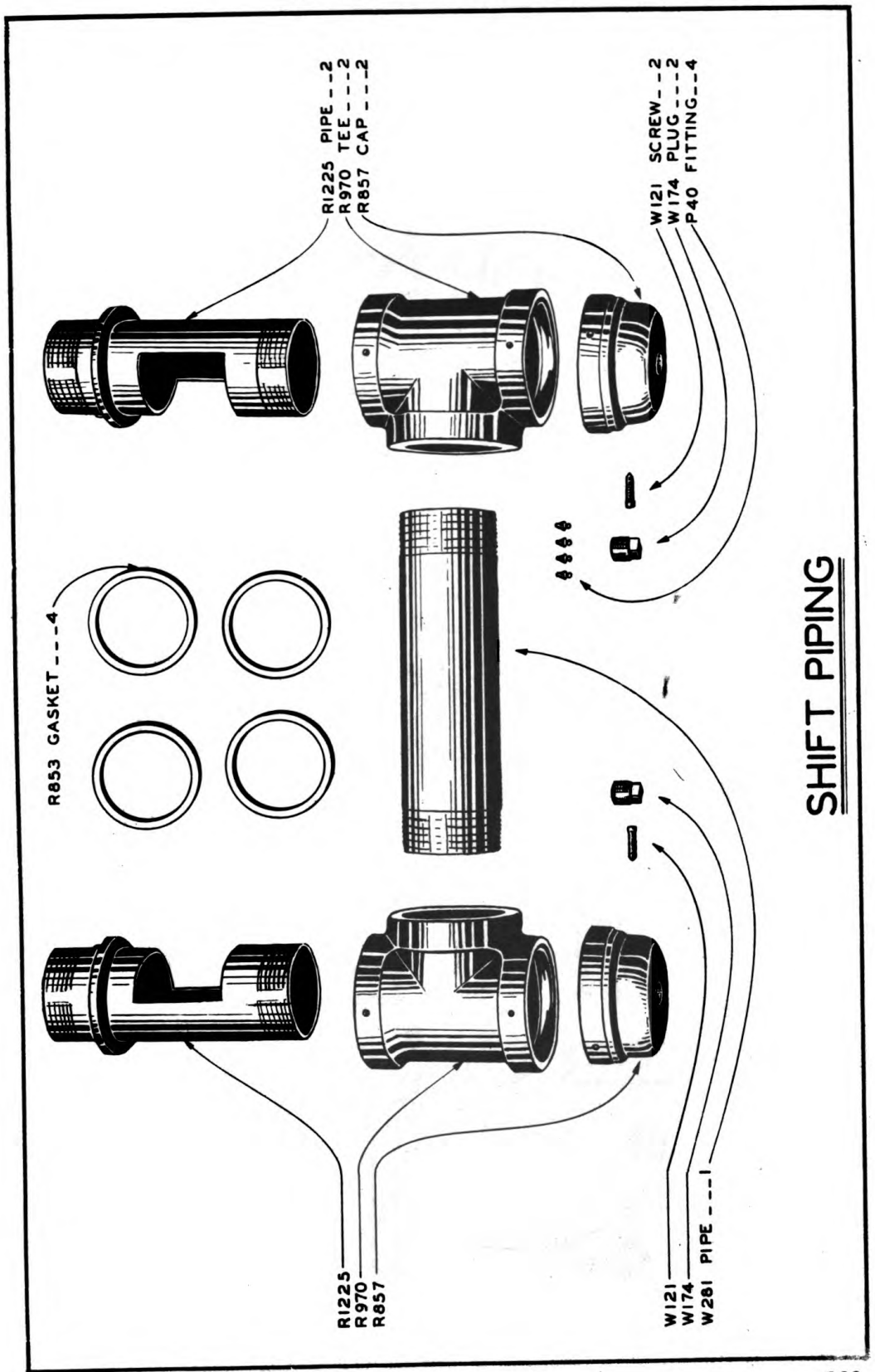
DRAIN PIPING

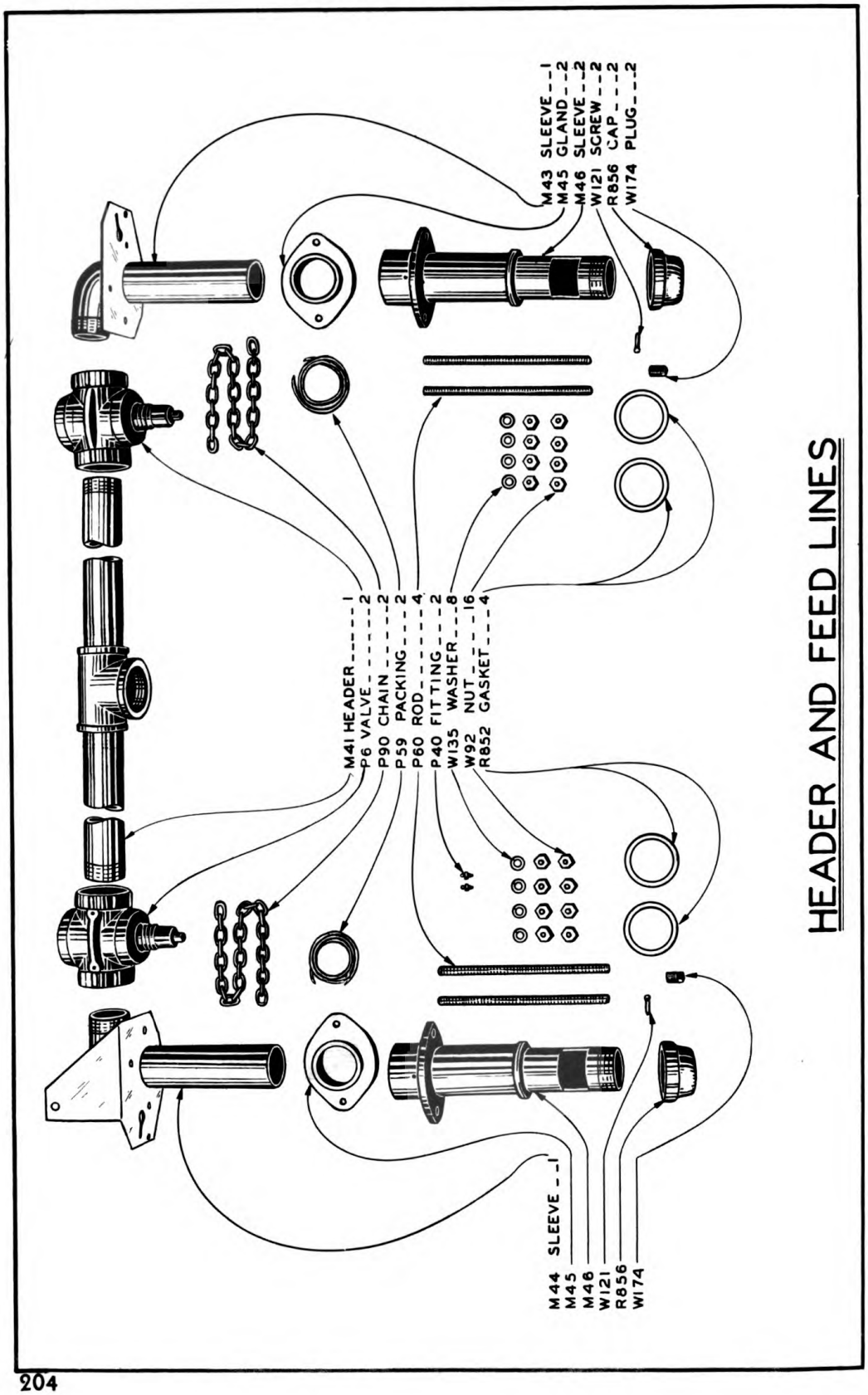


SUCTION PIPING

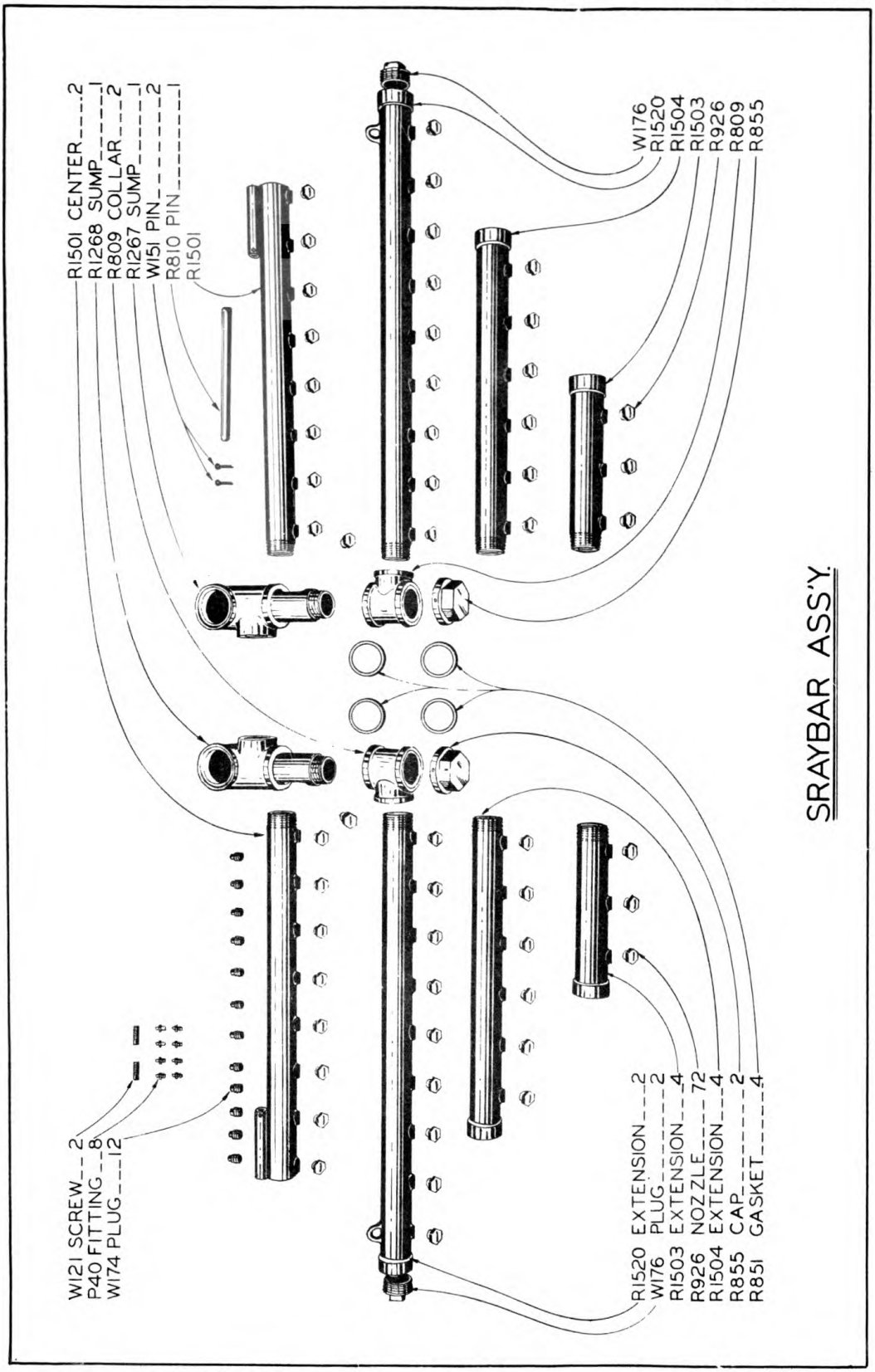


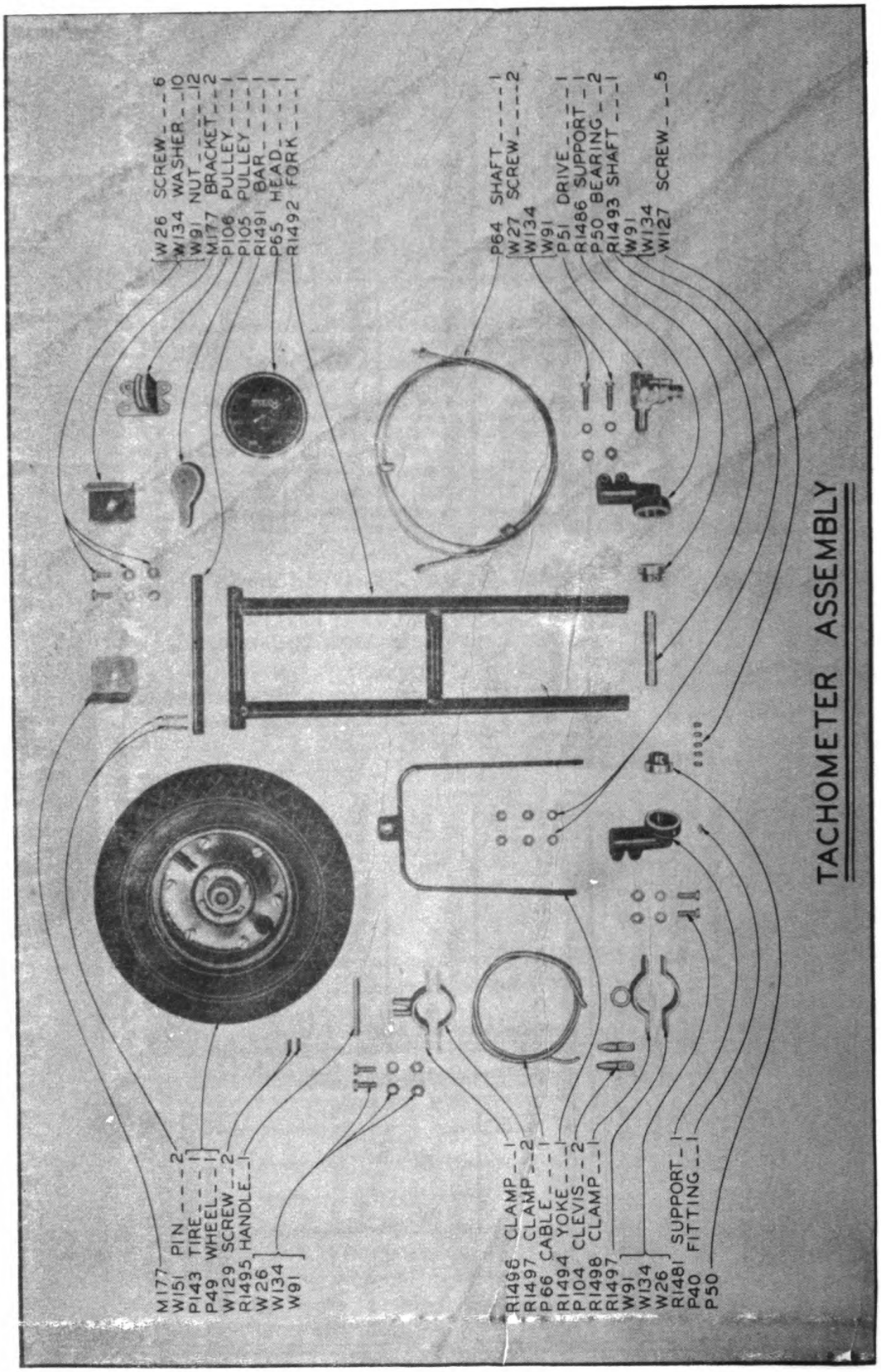
DISCHARGE AND TRANSFER PIPING

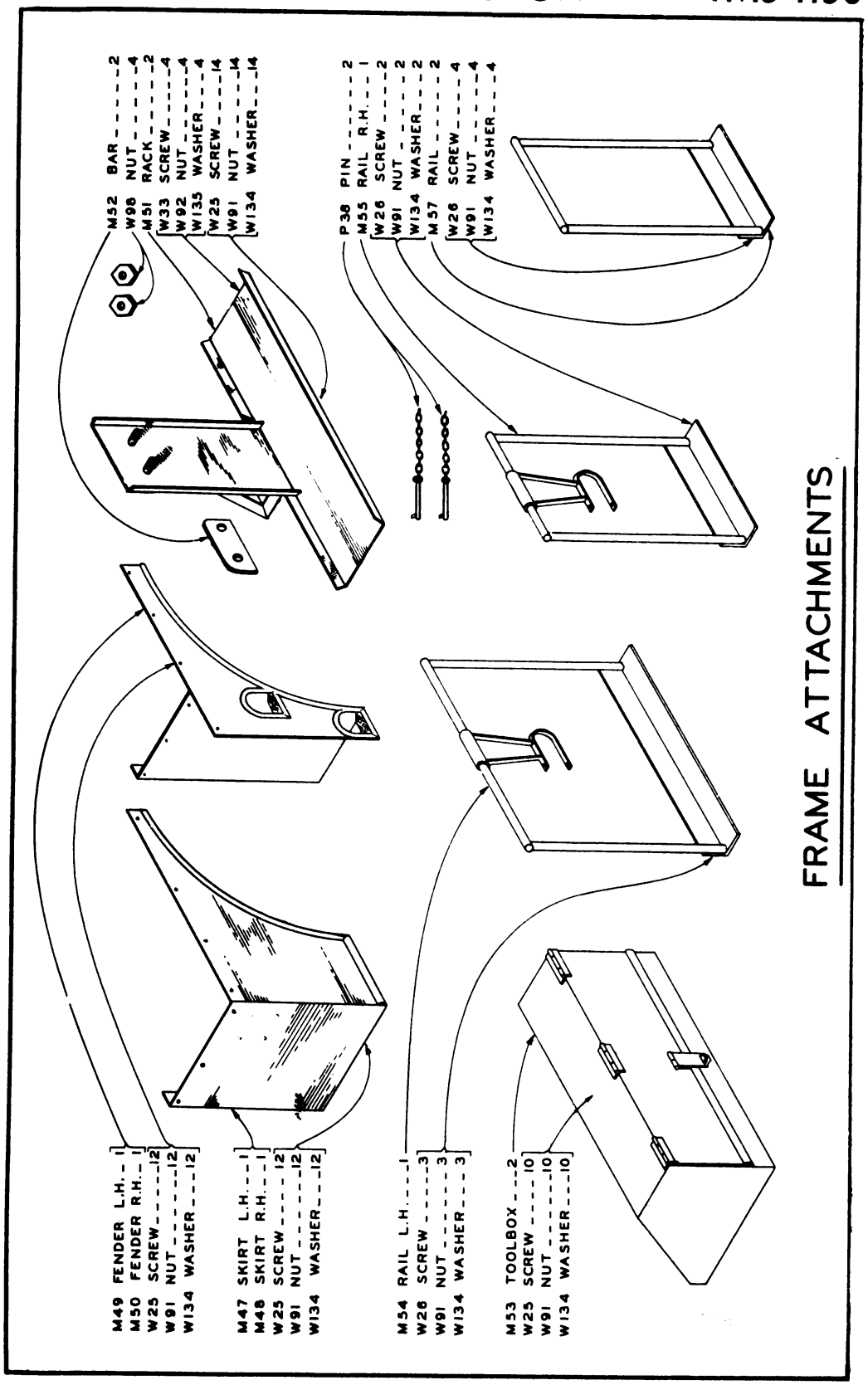


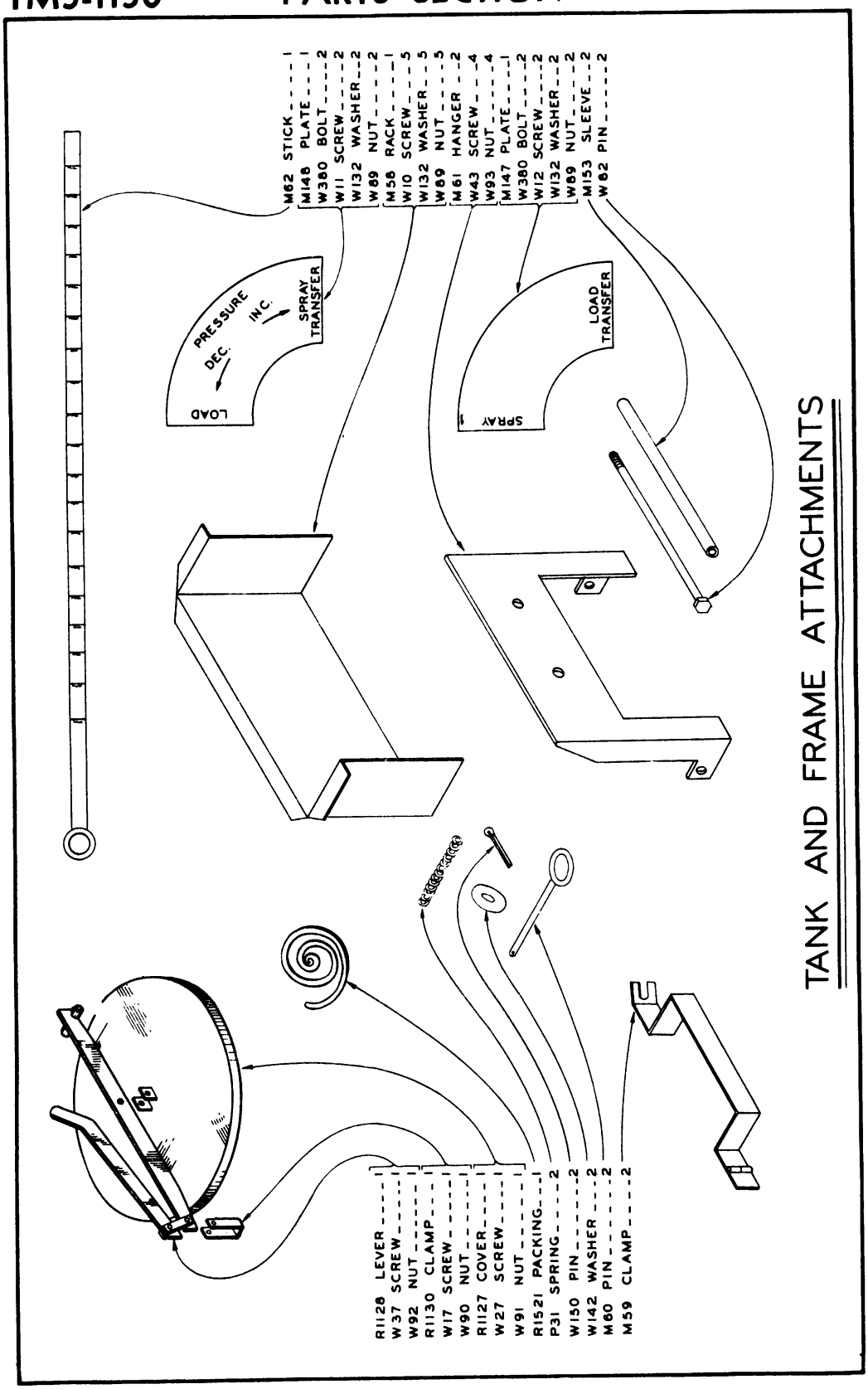


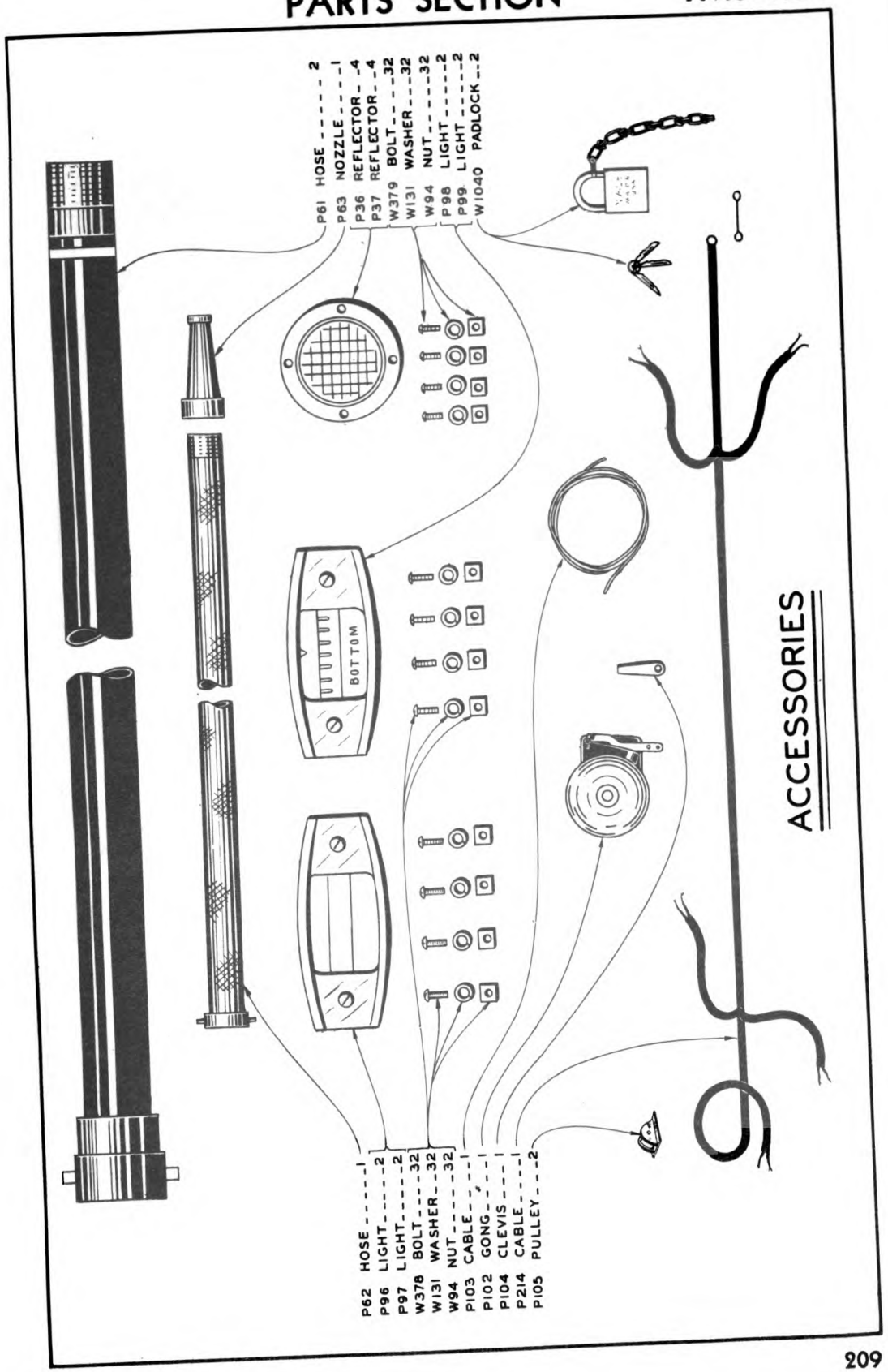
HEADER AND FEED LINES

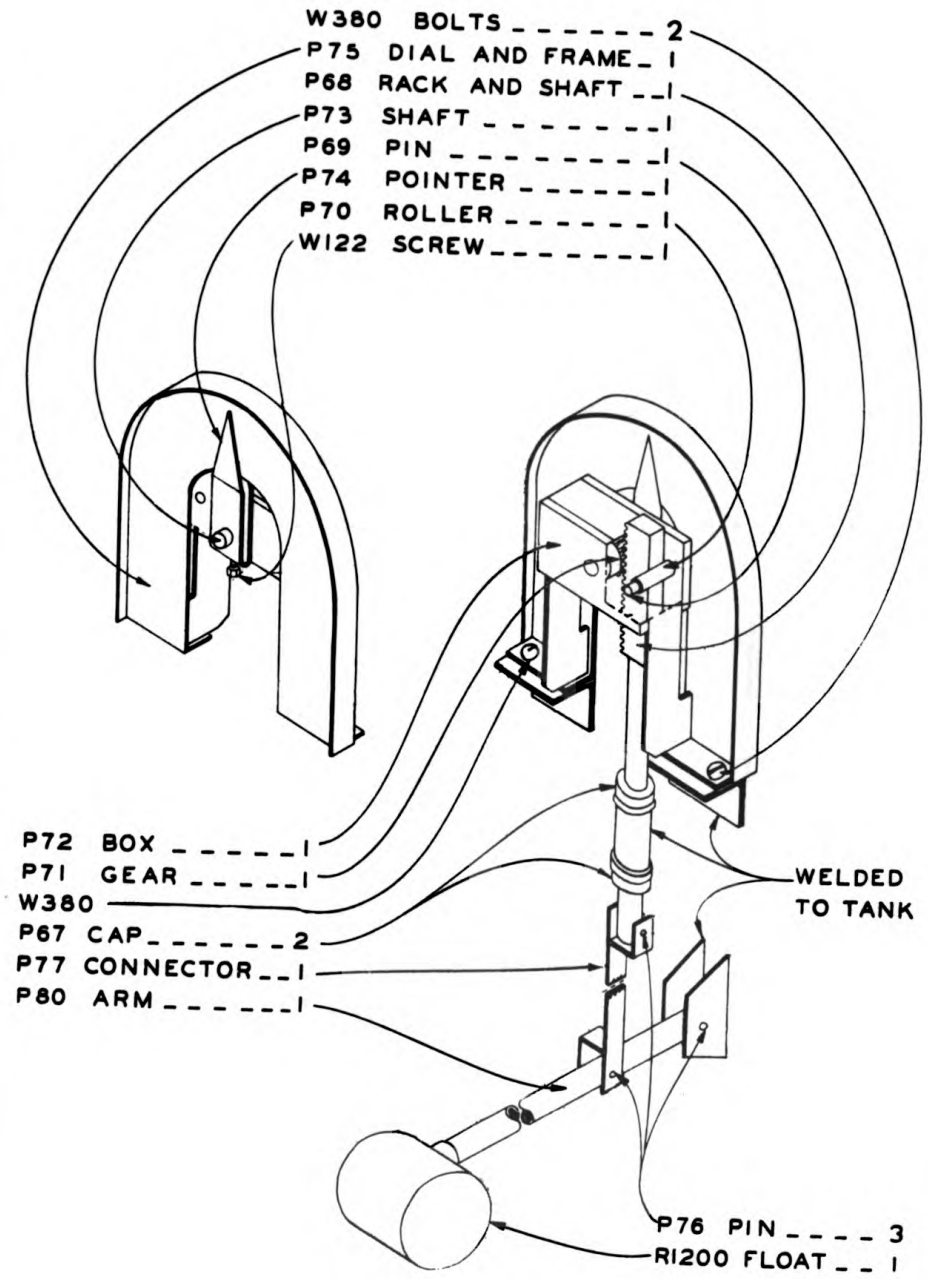




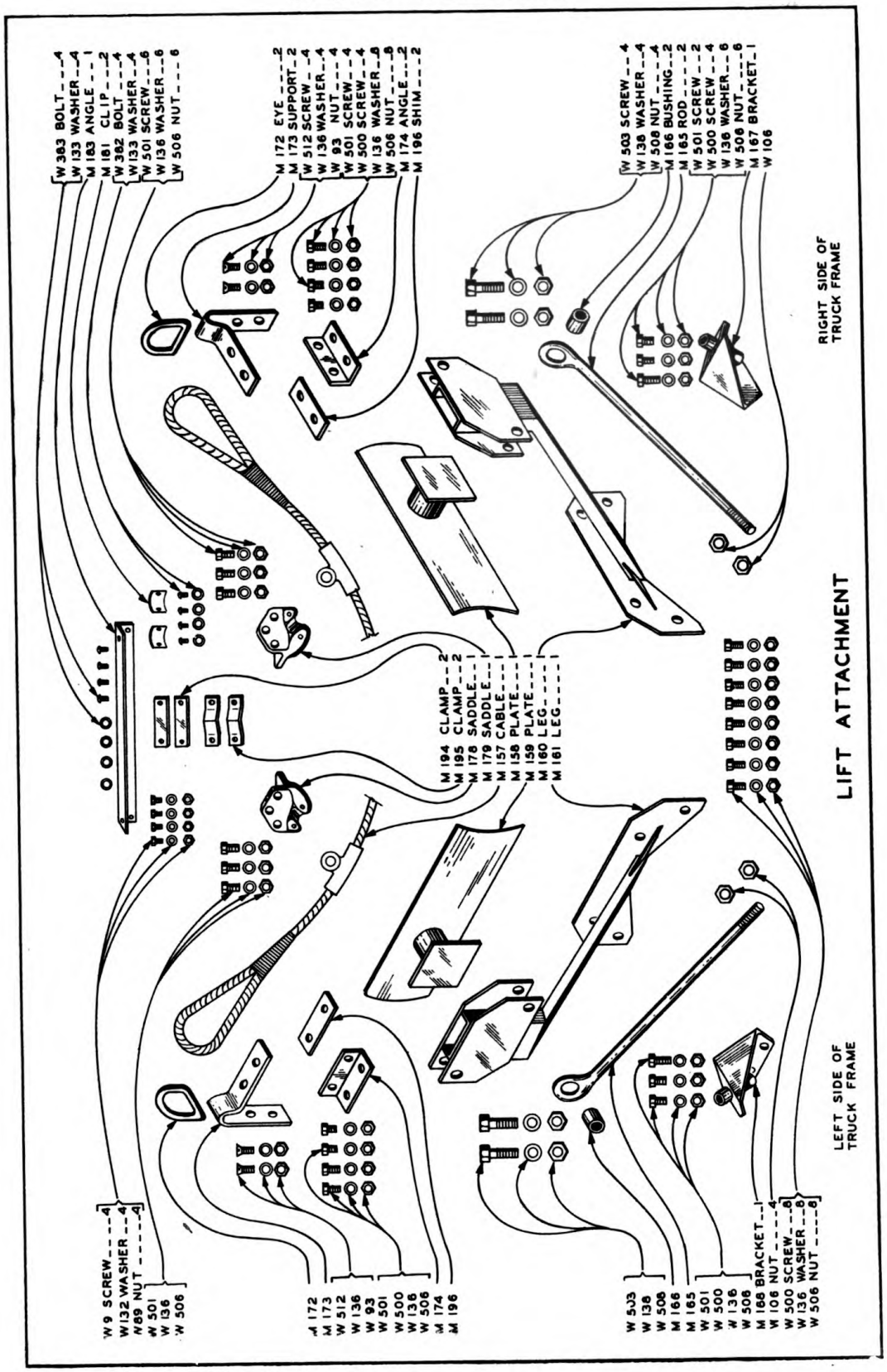


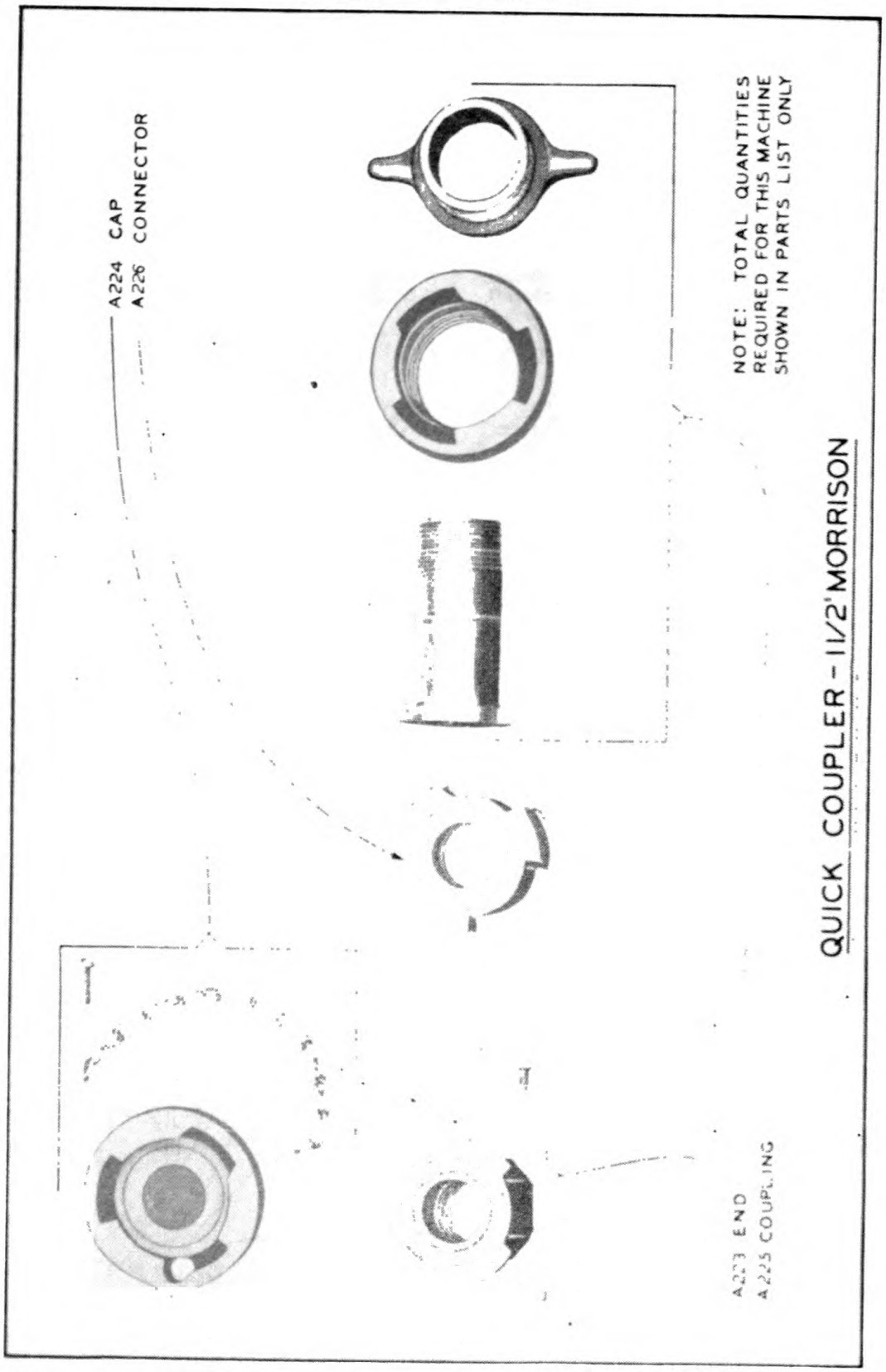


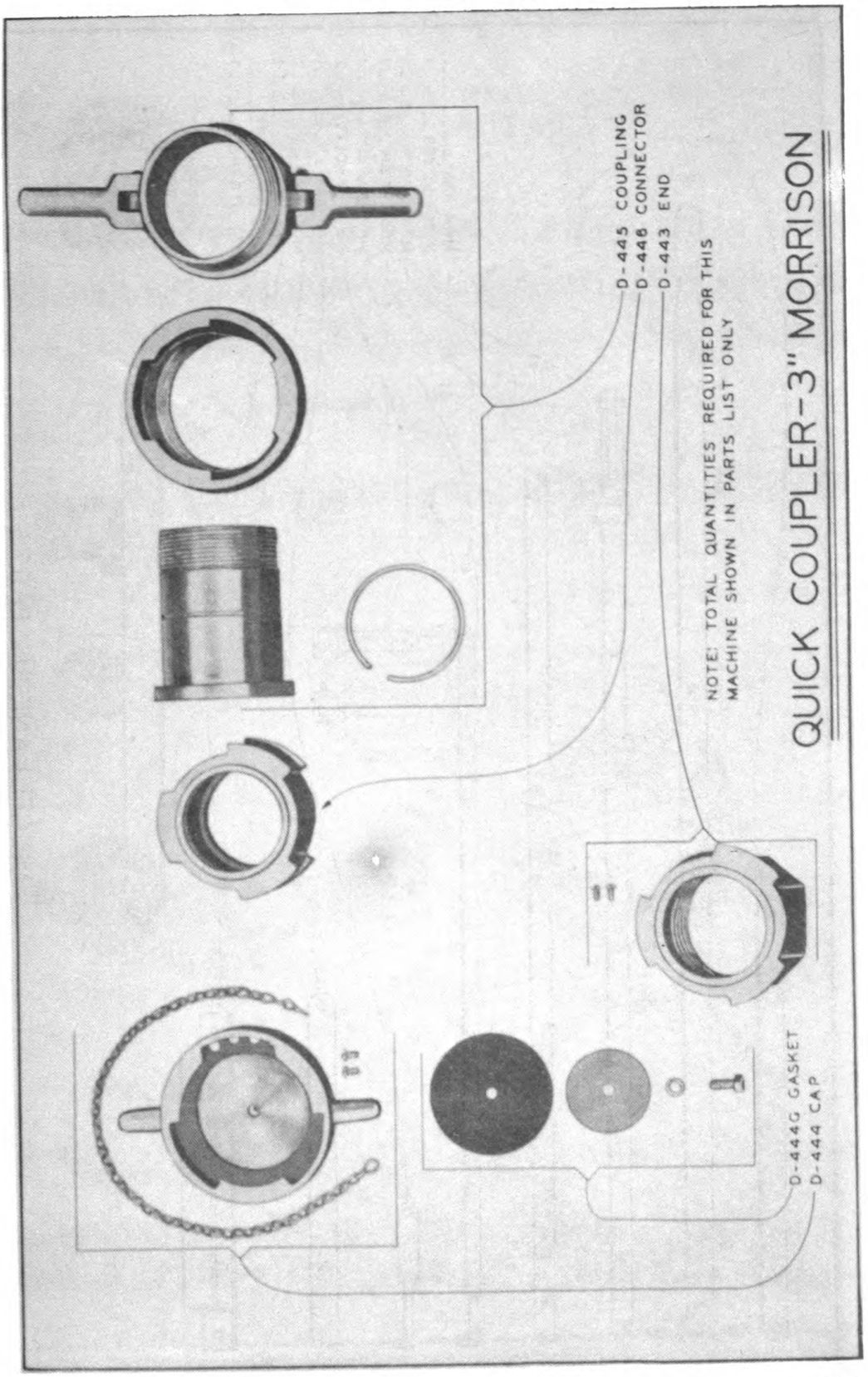


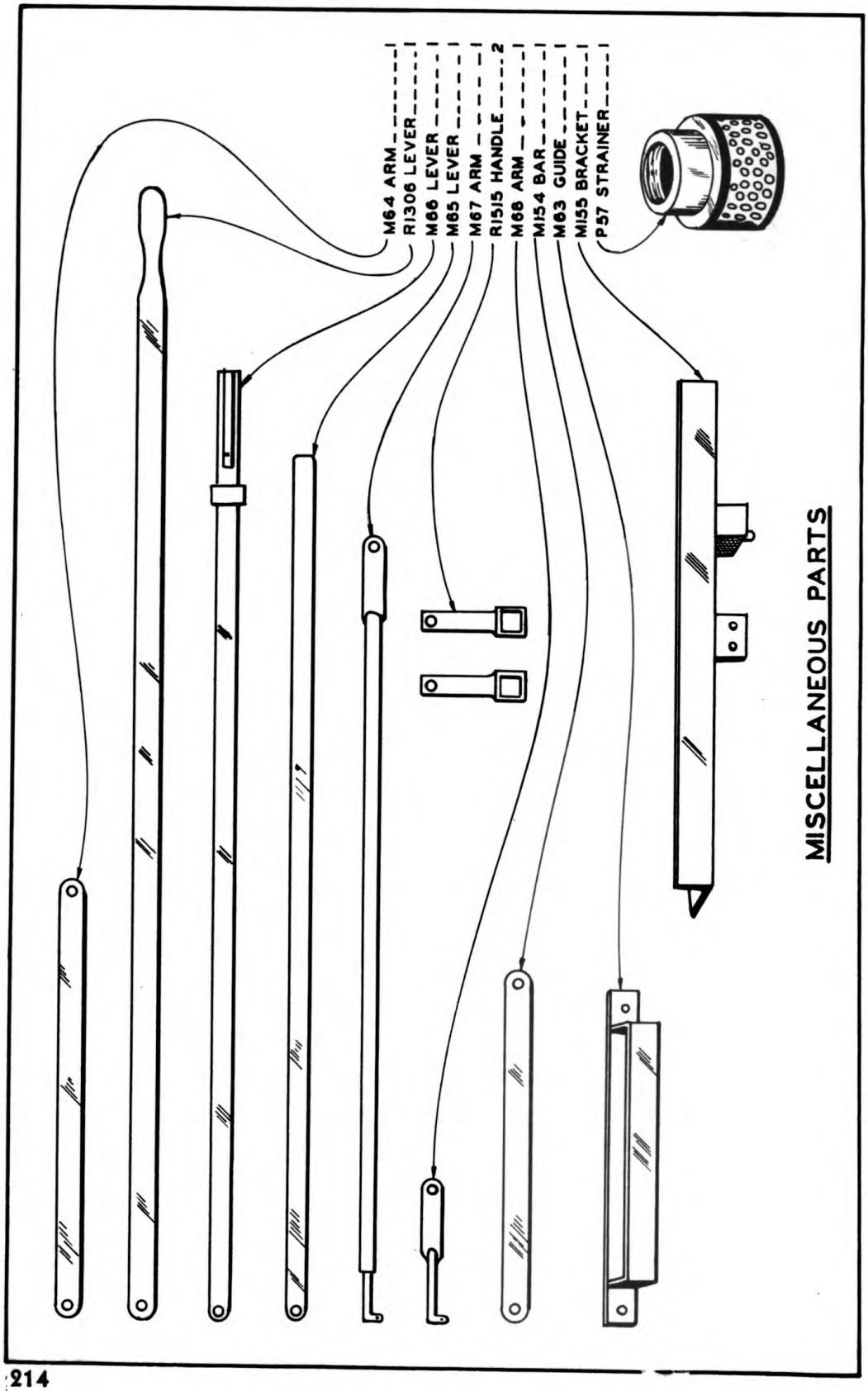


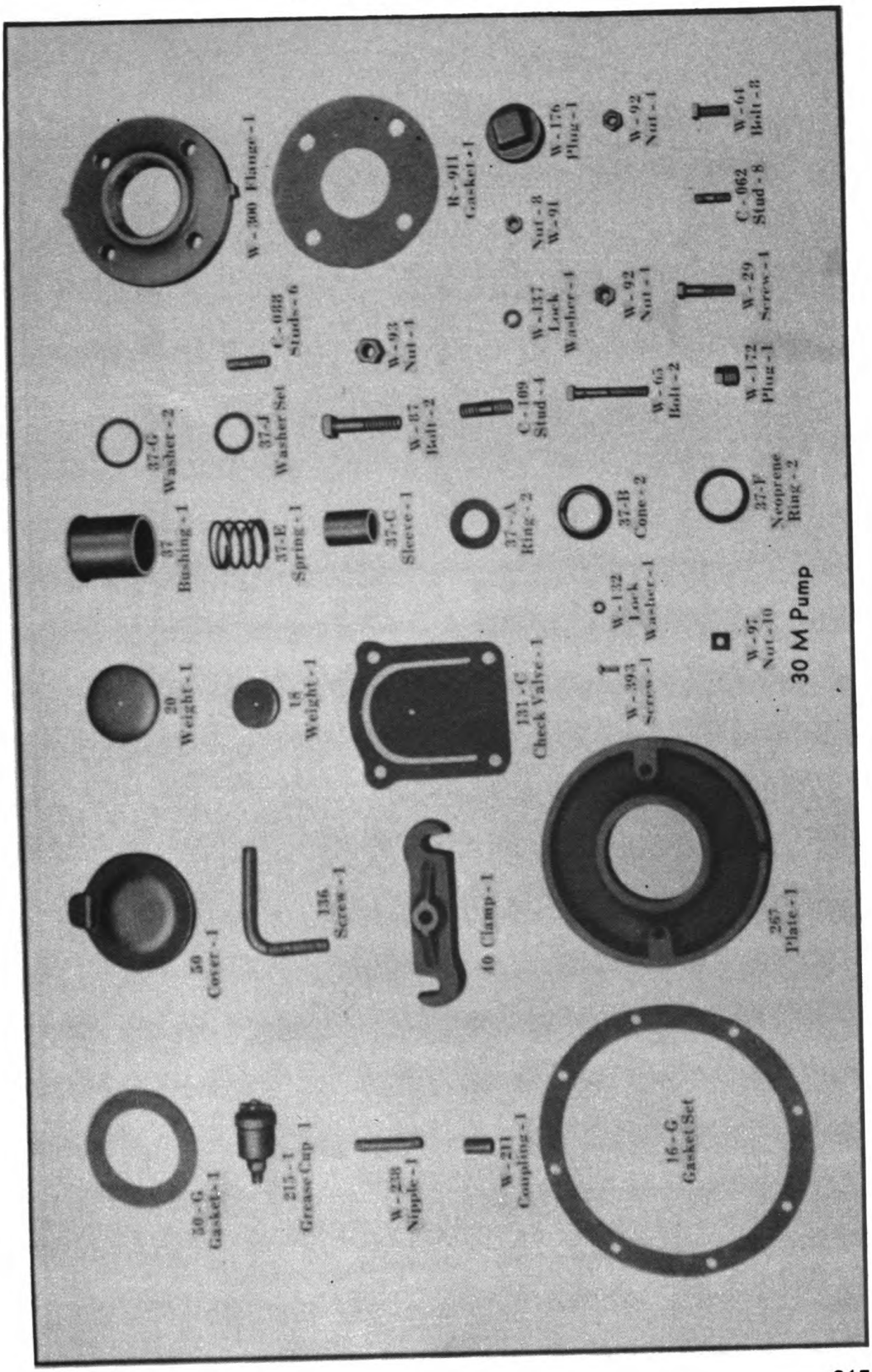
TANK CONTENTS GAGE

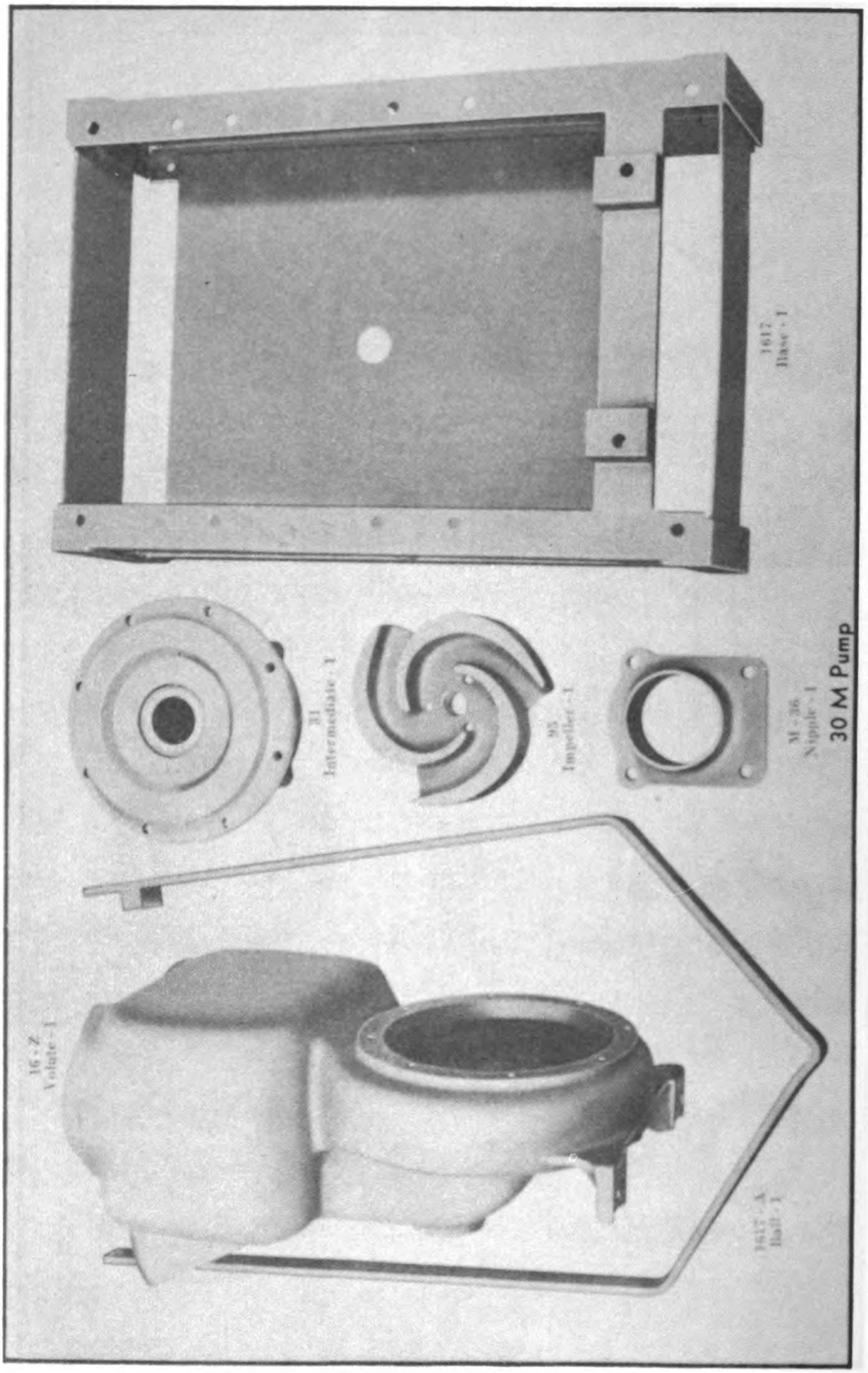






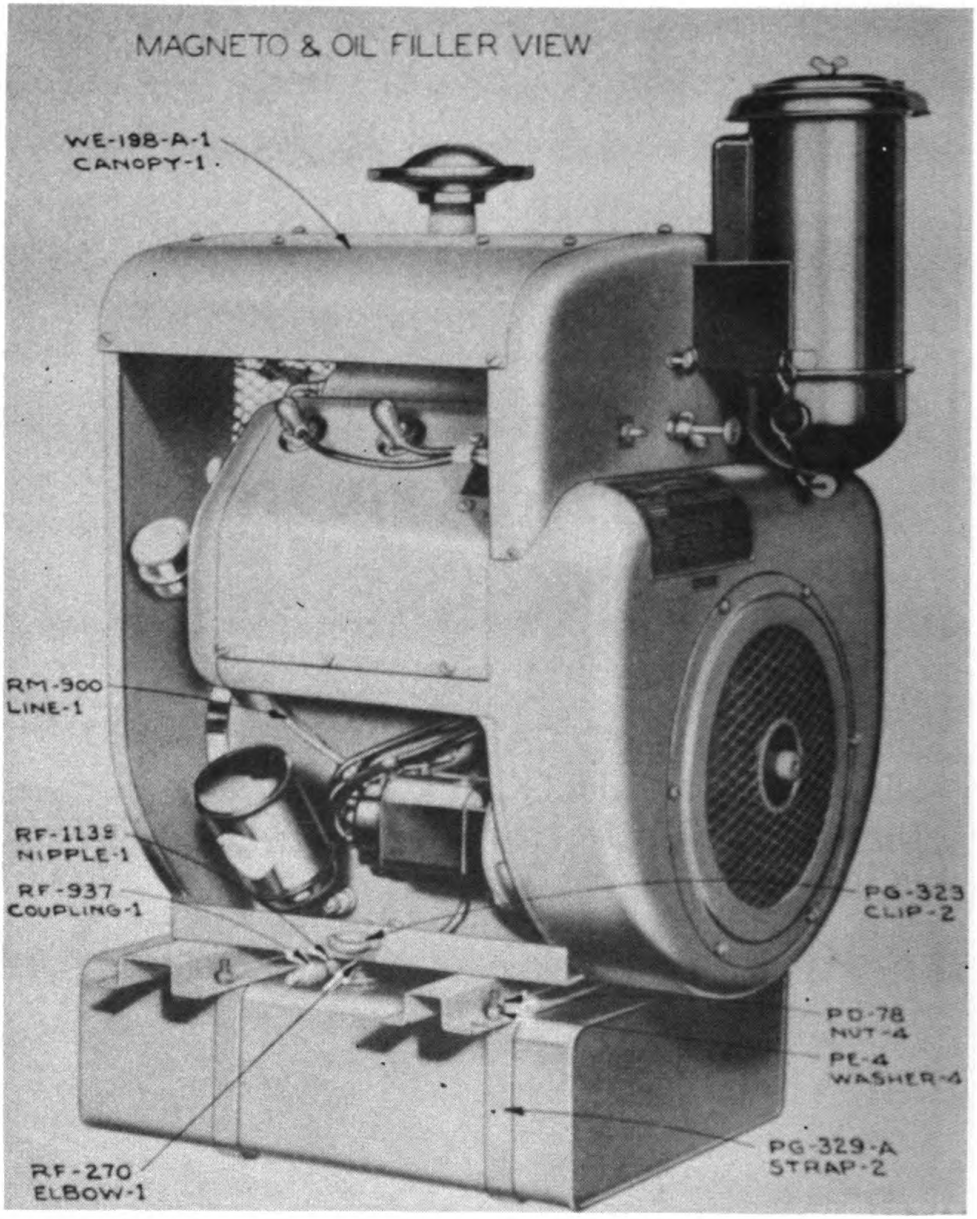


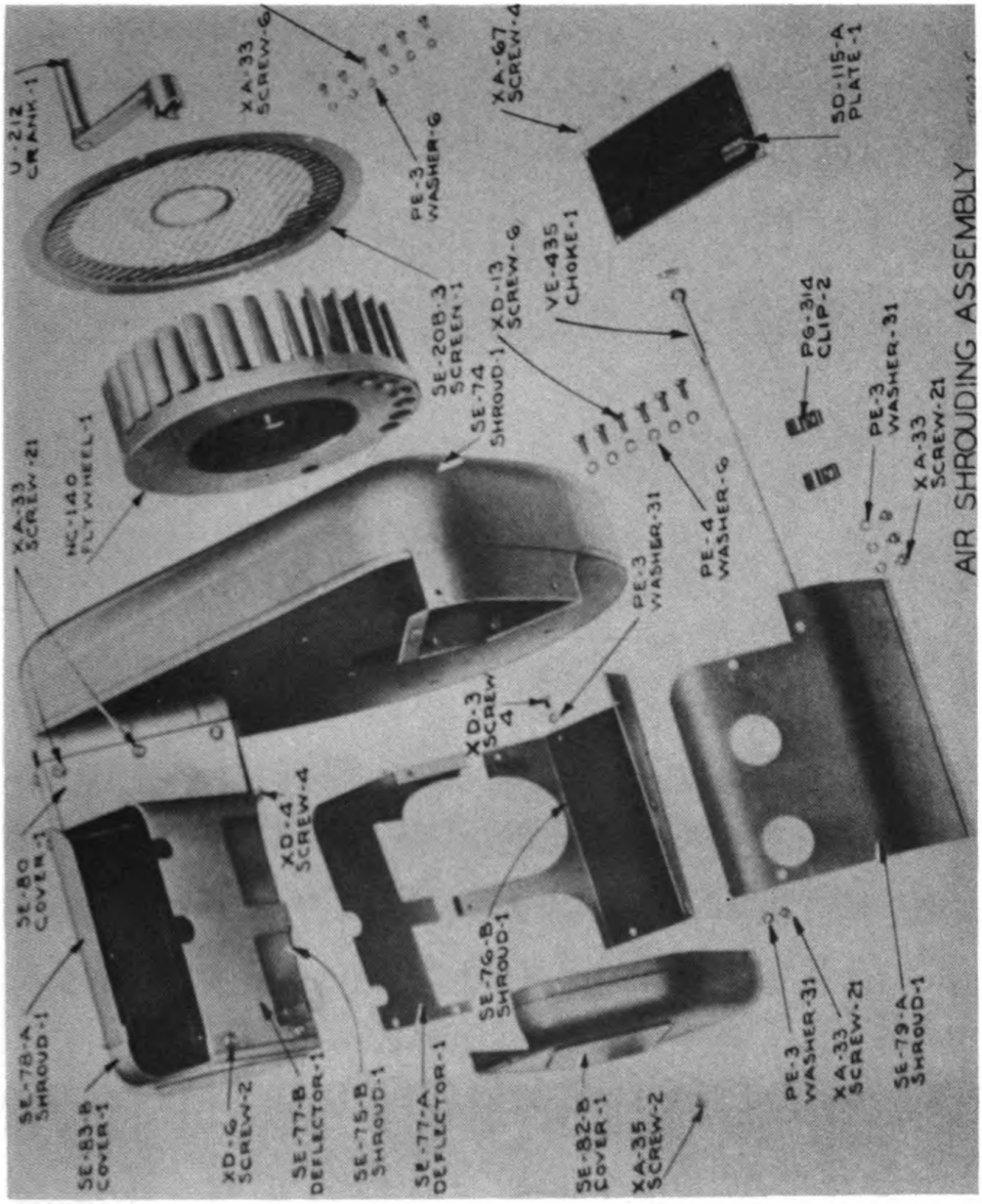


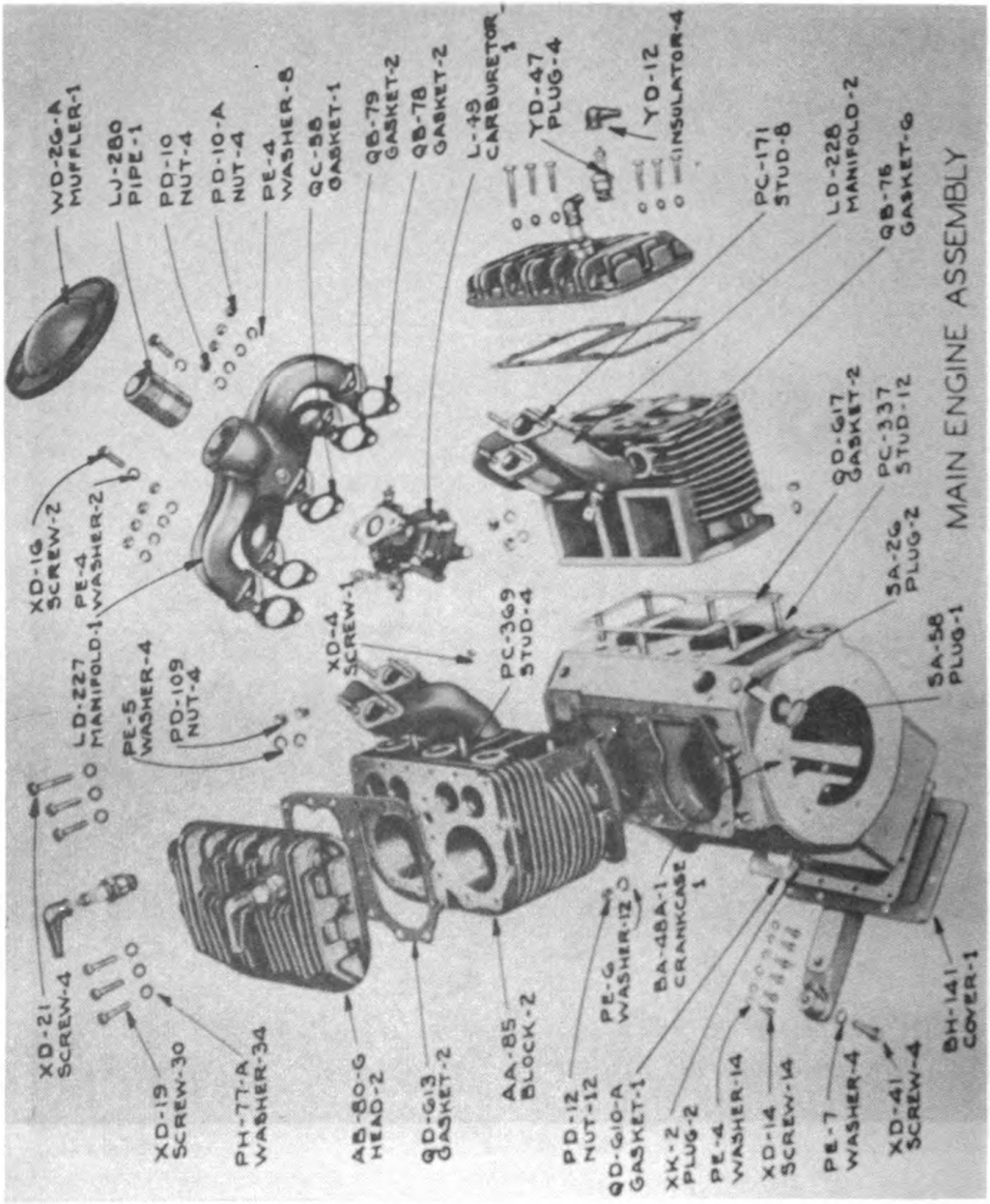


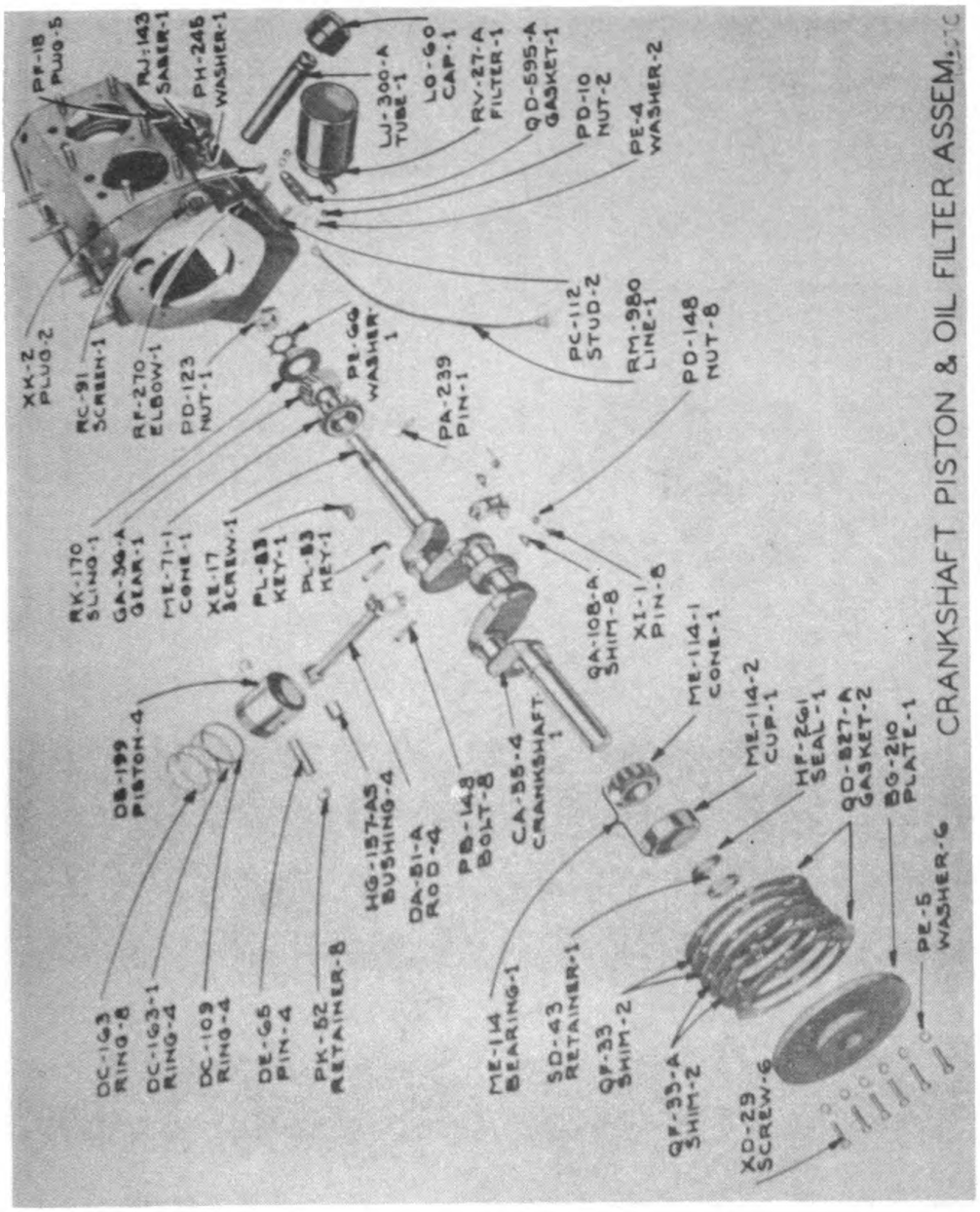
ILLUSTRATIONS ENGINE

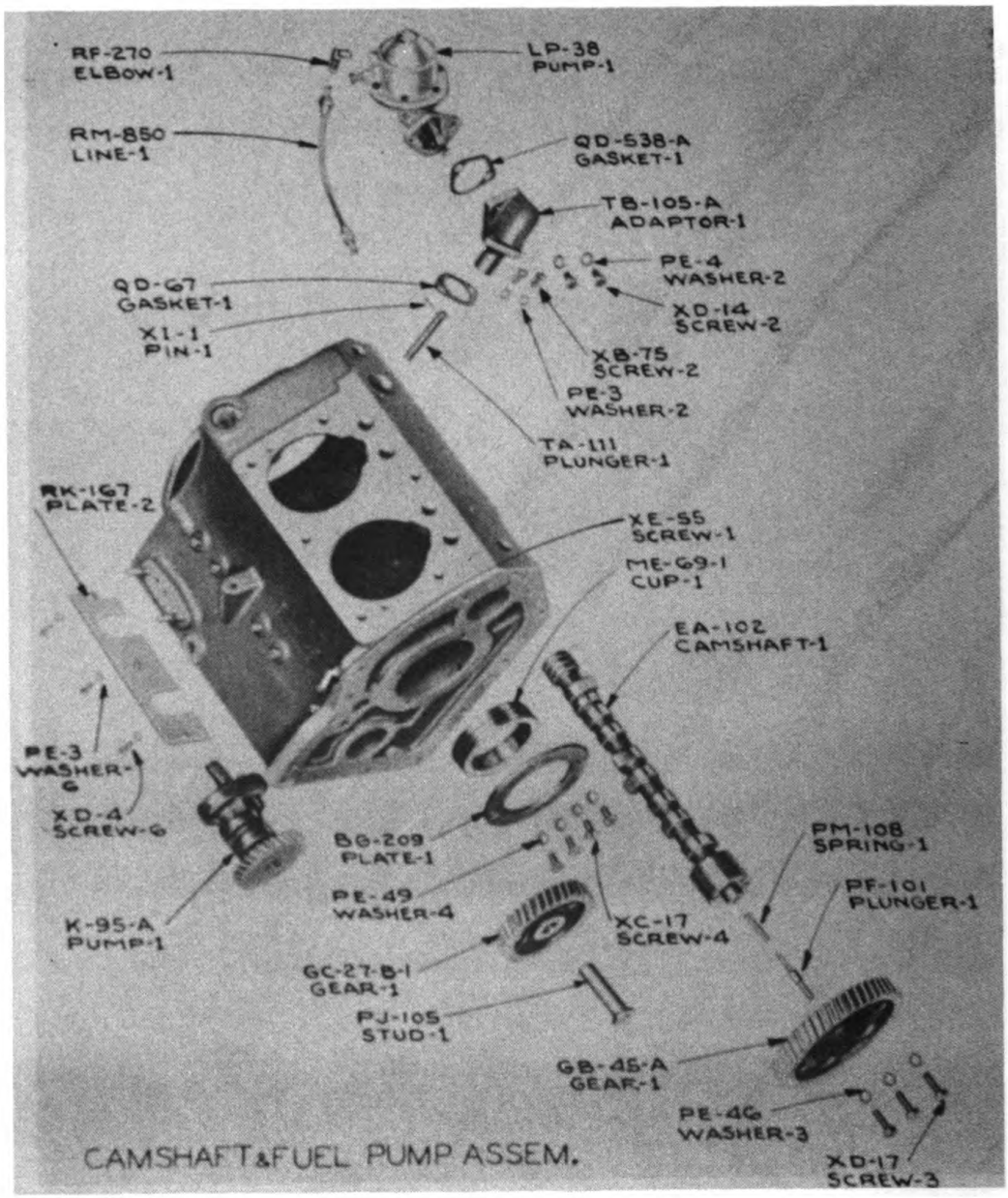
MAGNETOS AND CARBURETORS GROUPED SEPARATELY. CHECK SERIAL NUMBER OF MACHINE TO DETERMINE WHICH COMPONENT WAS USED.

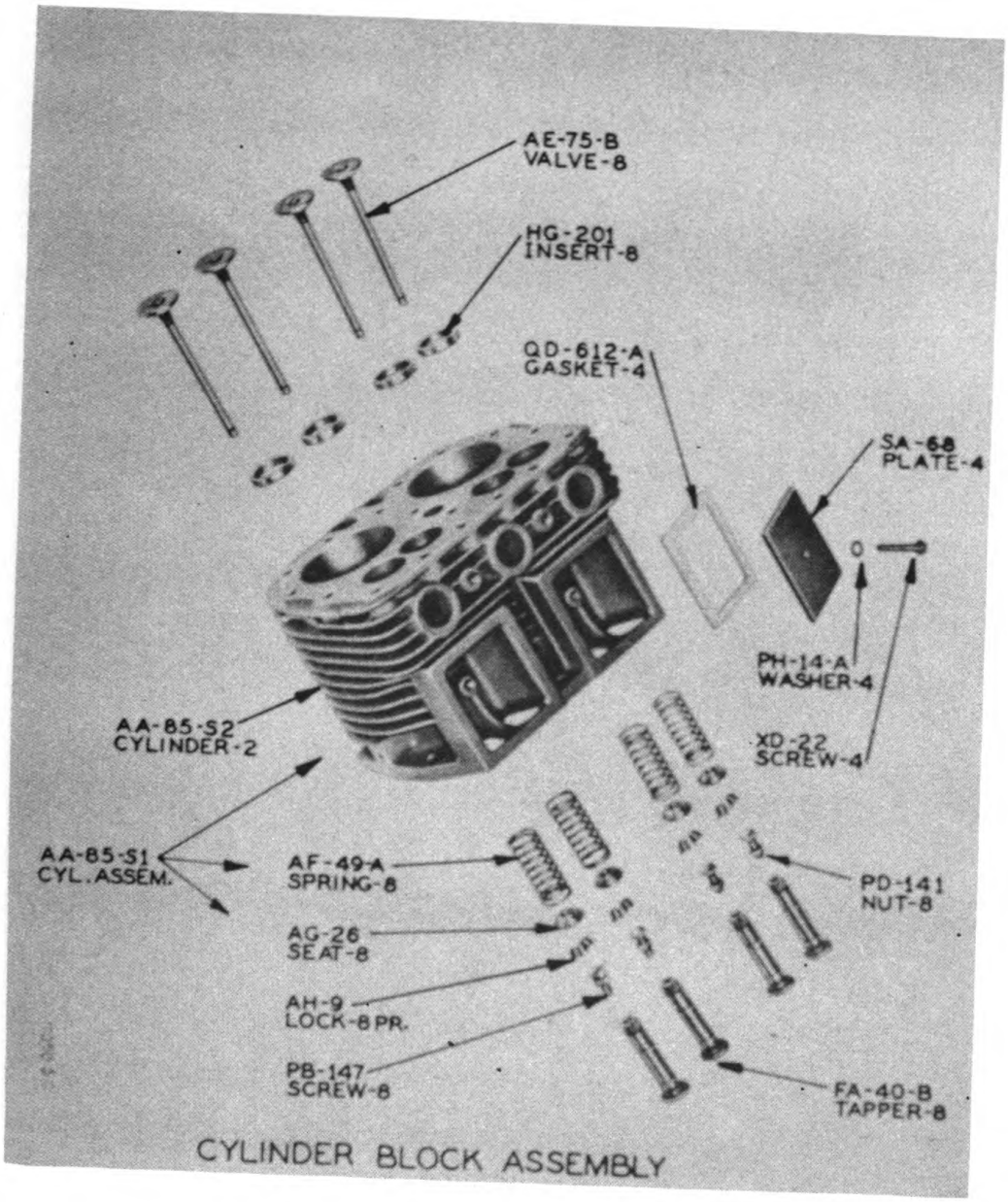




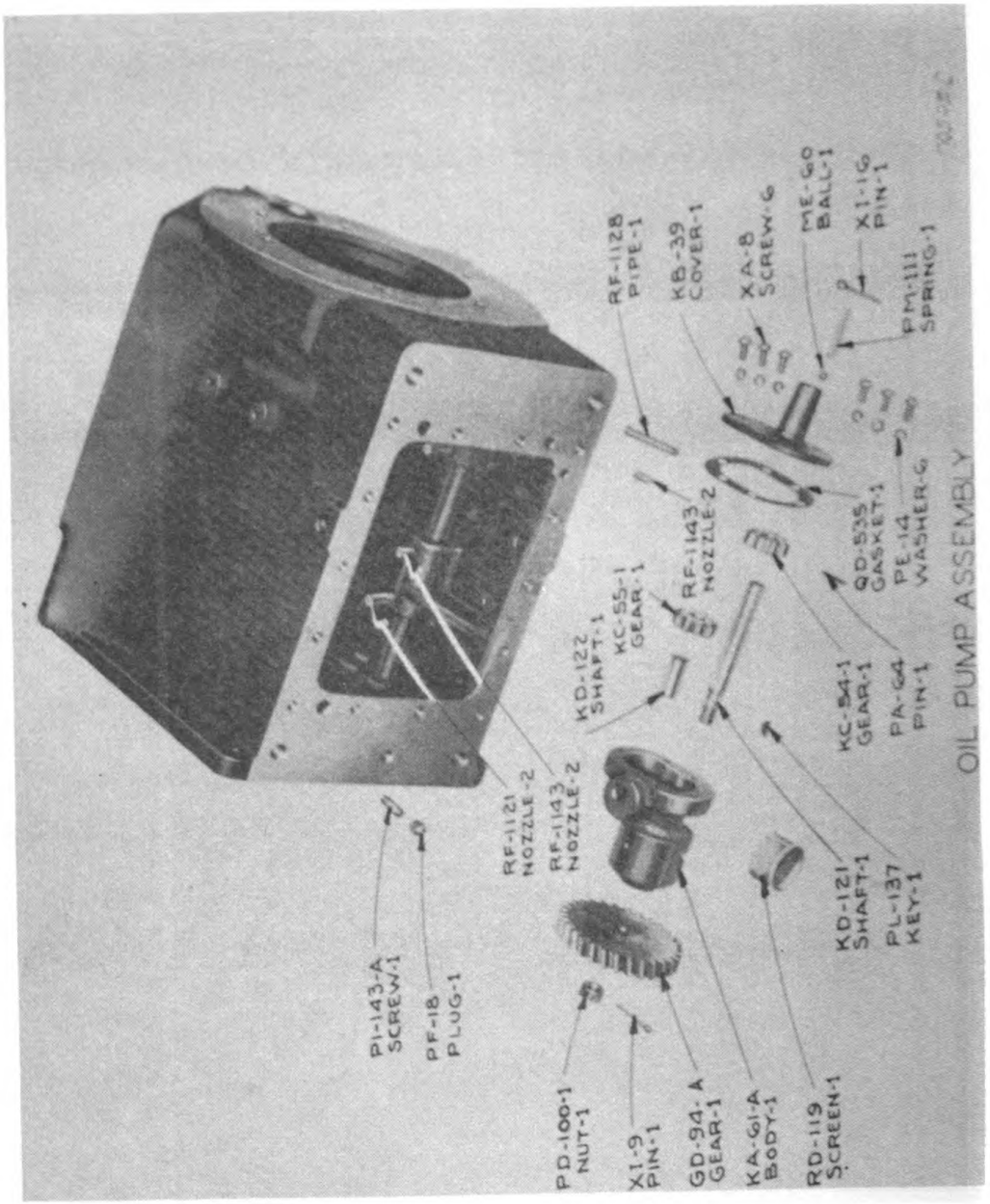


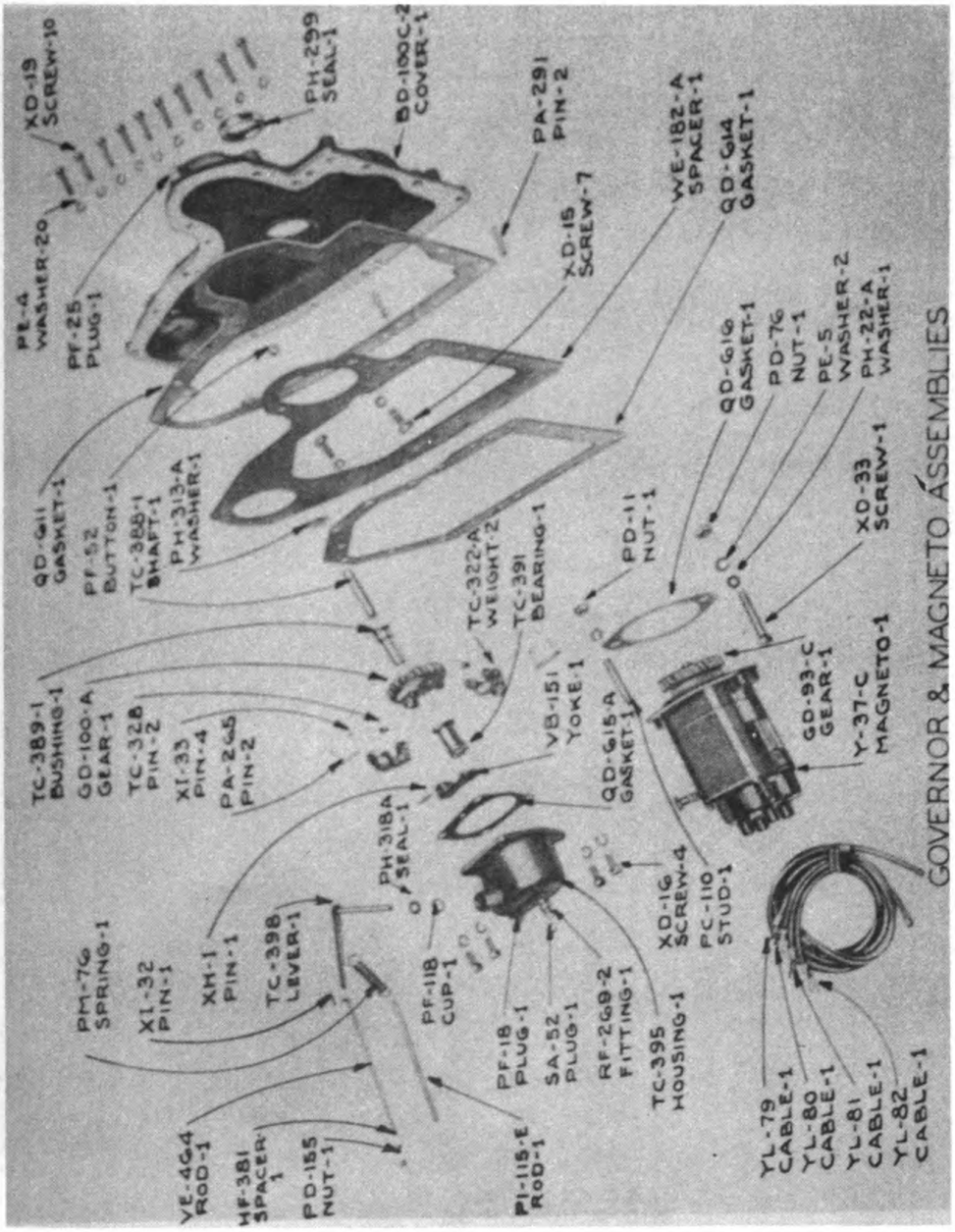


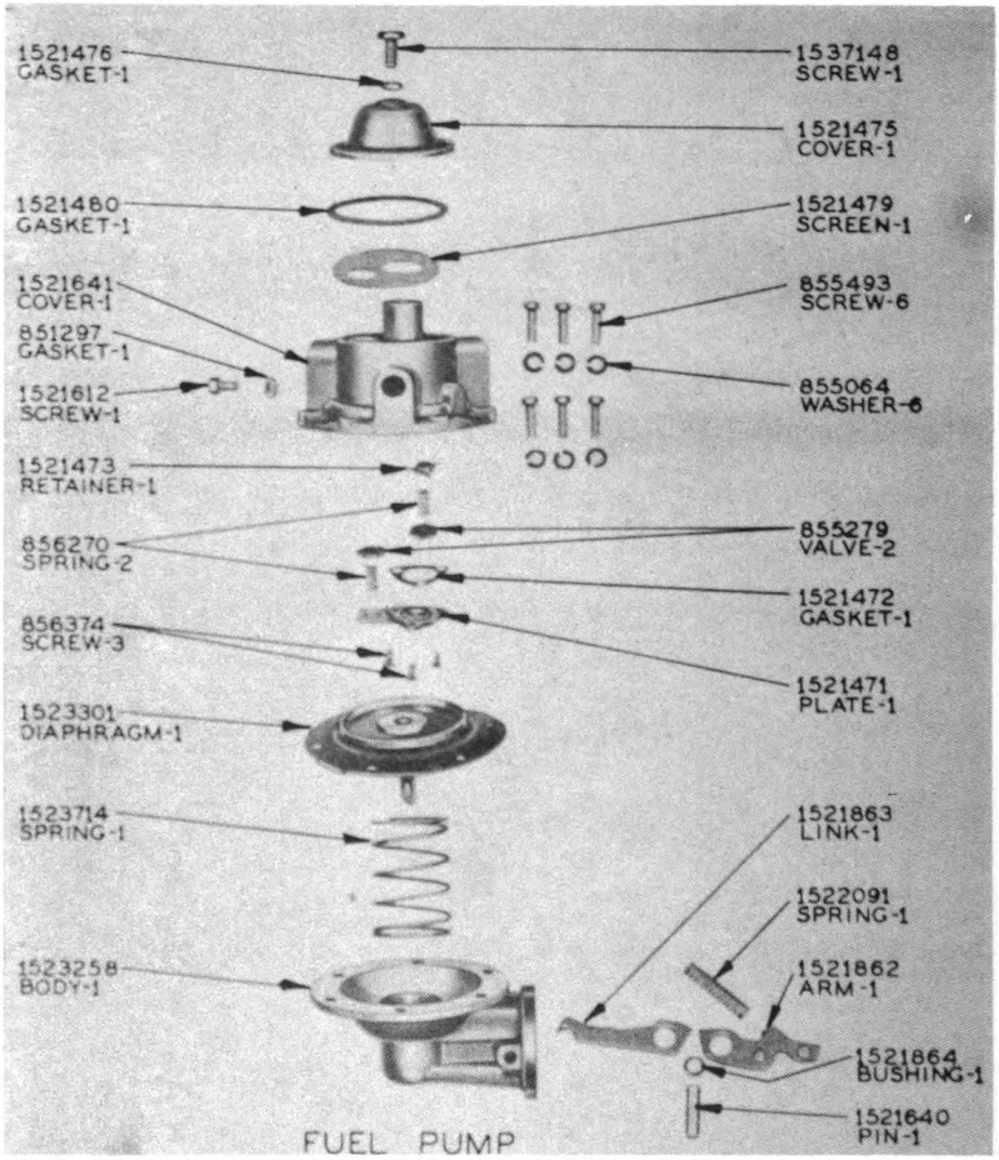




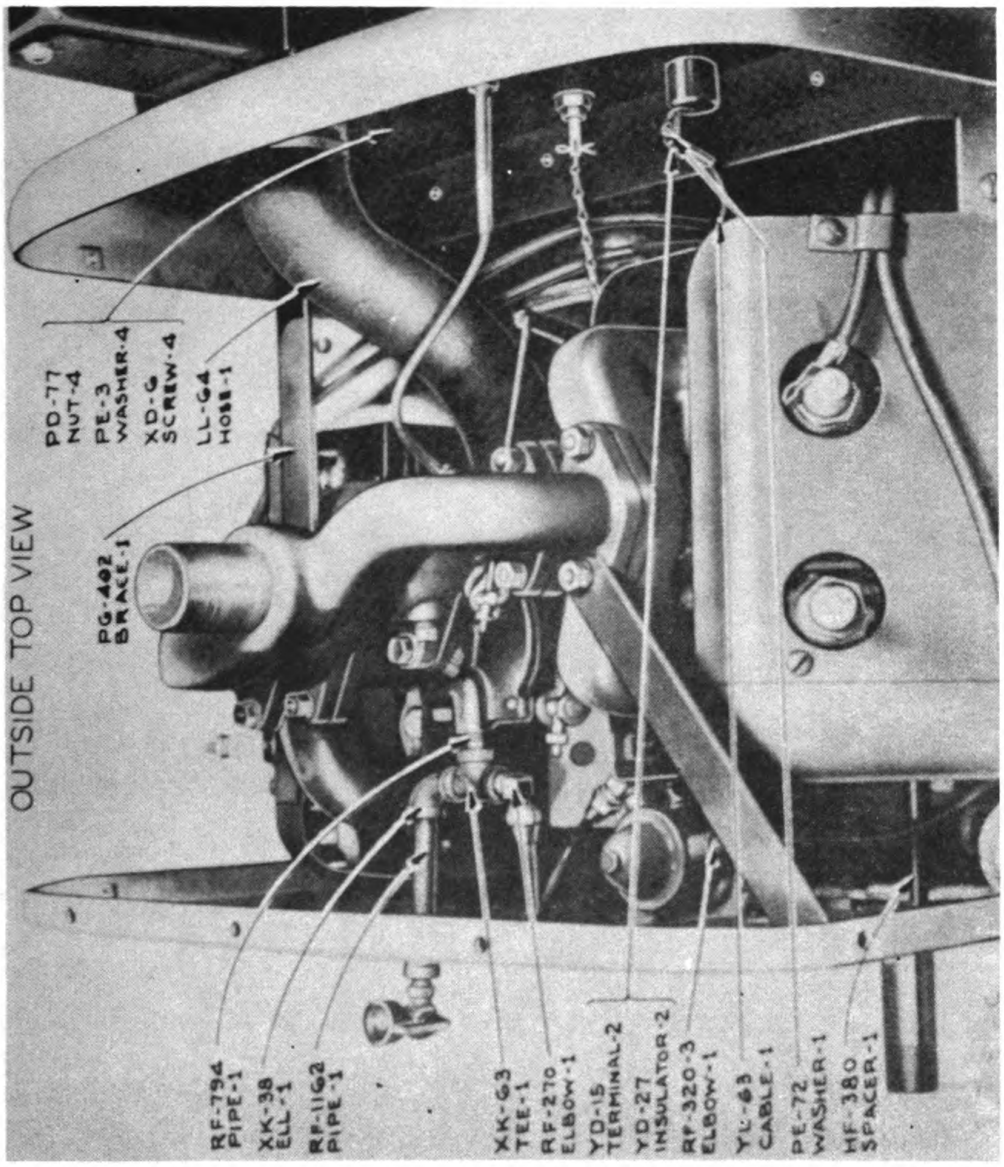
CYLINDER BLOCK ASSEMBLY

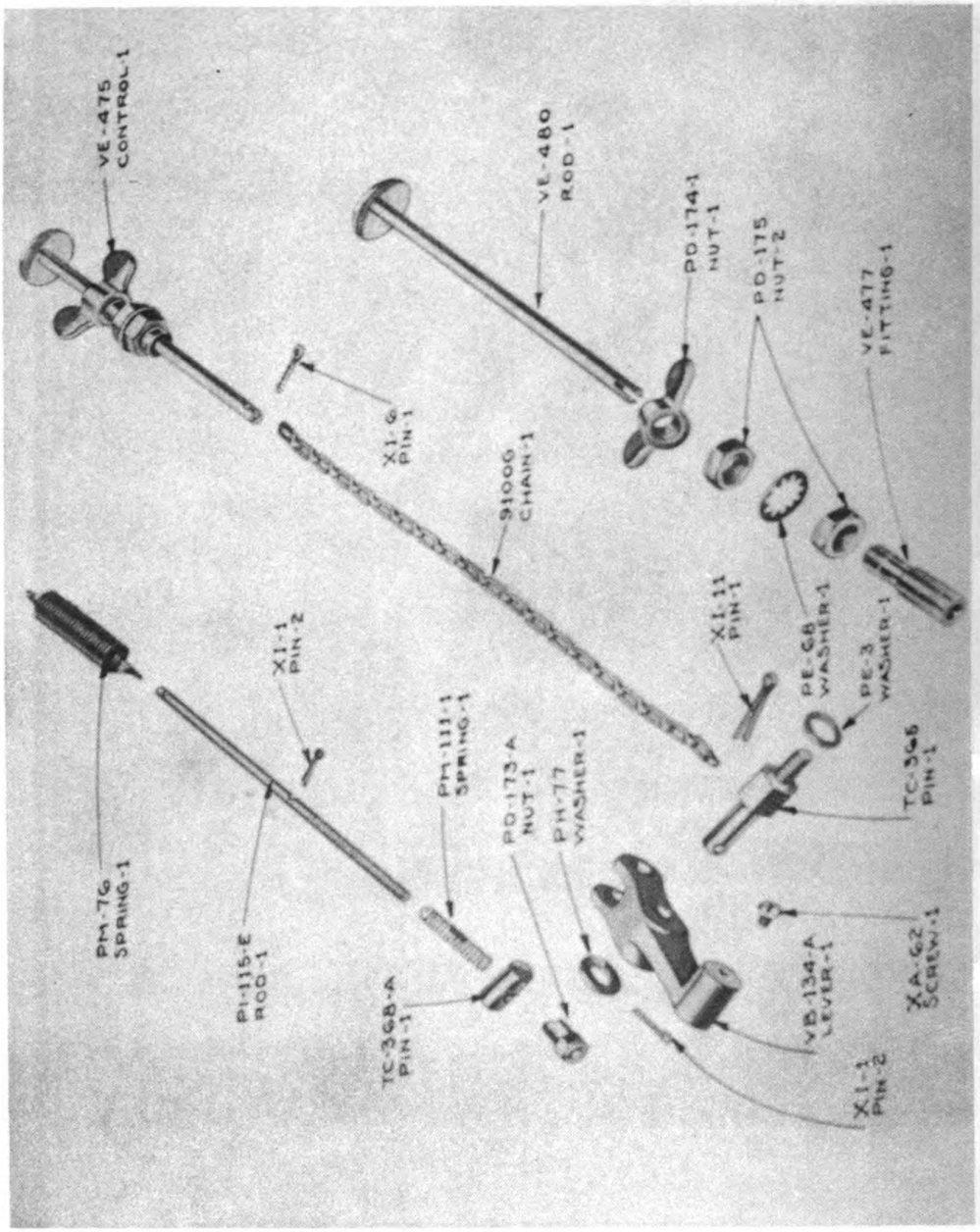




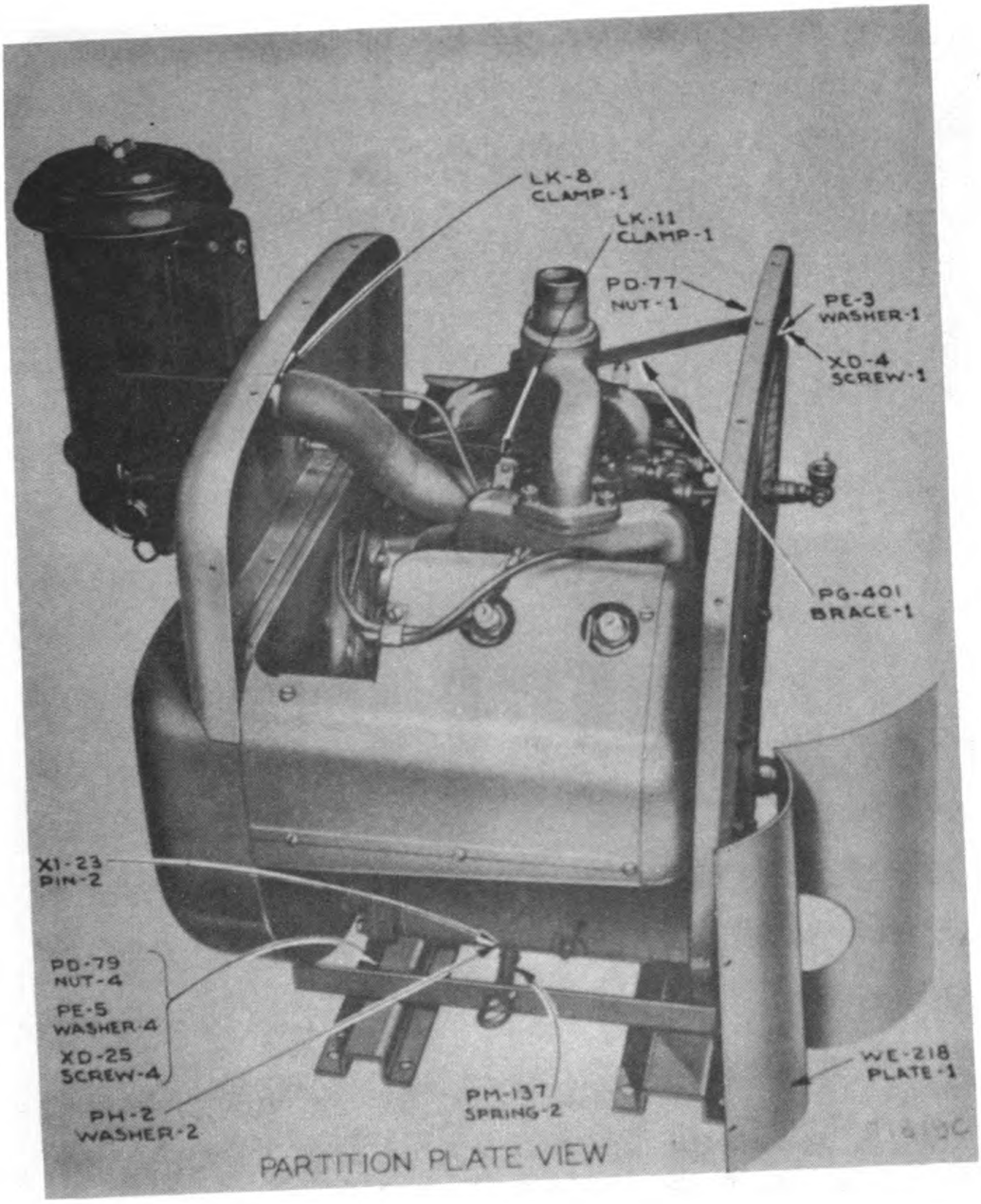


A.C. Nº 1537421
WIS MOTOR-LP-38

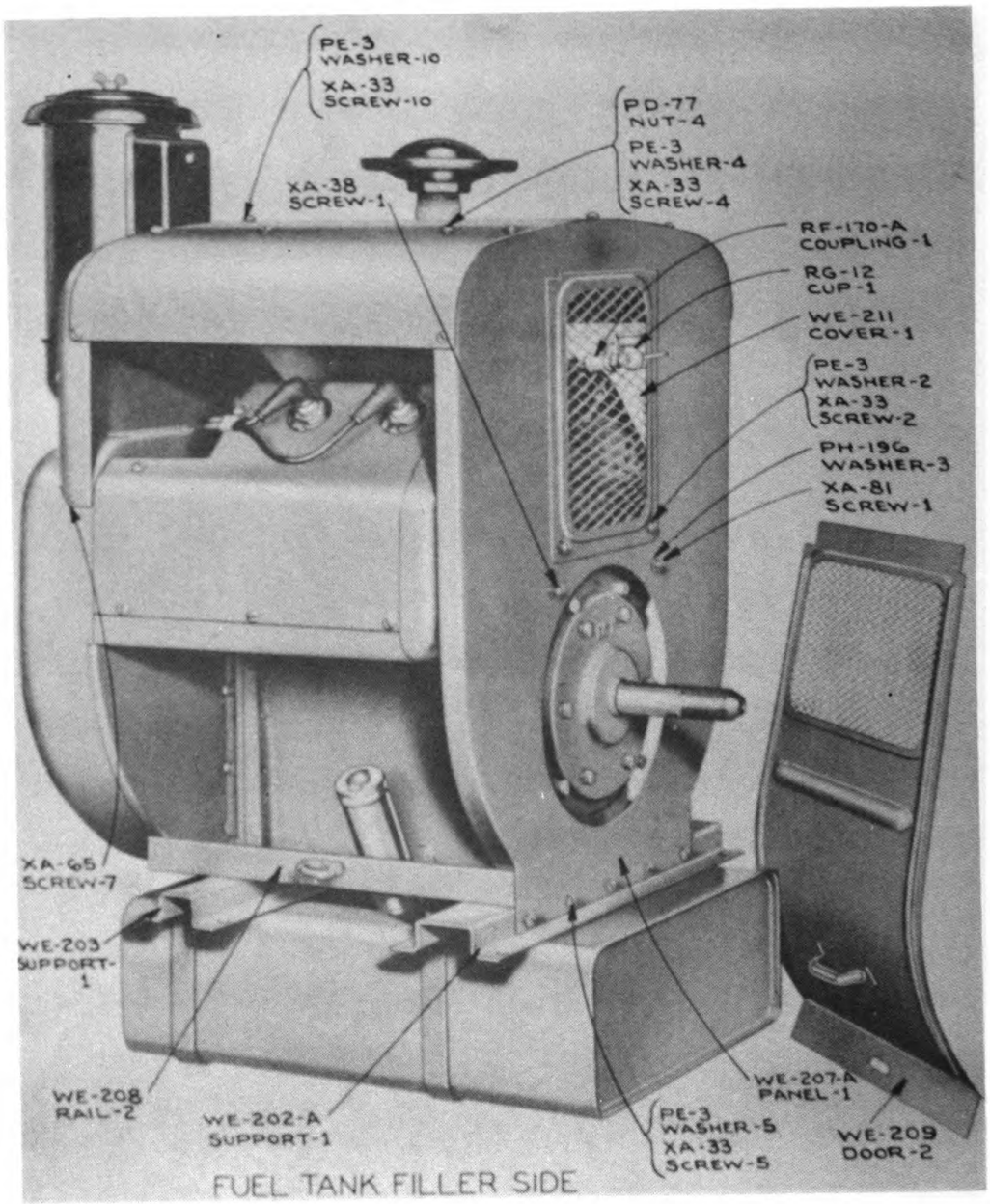


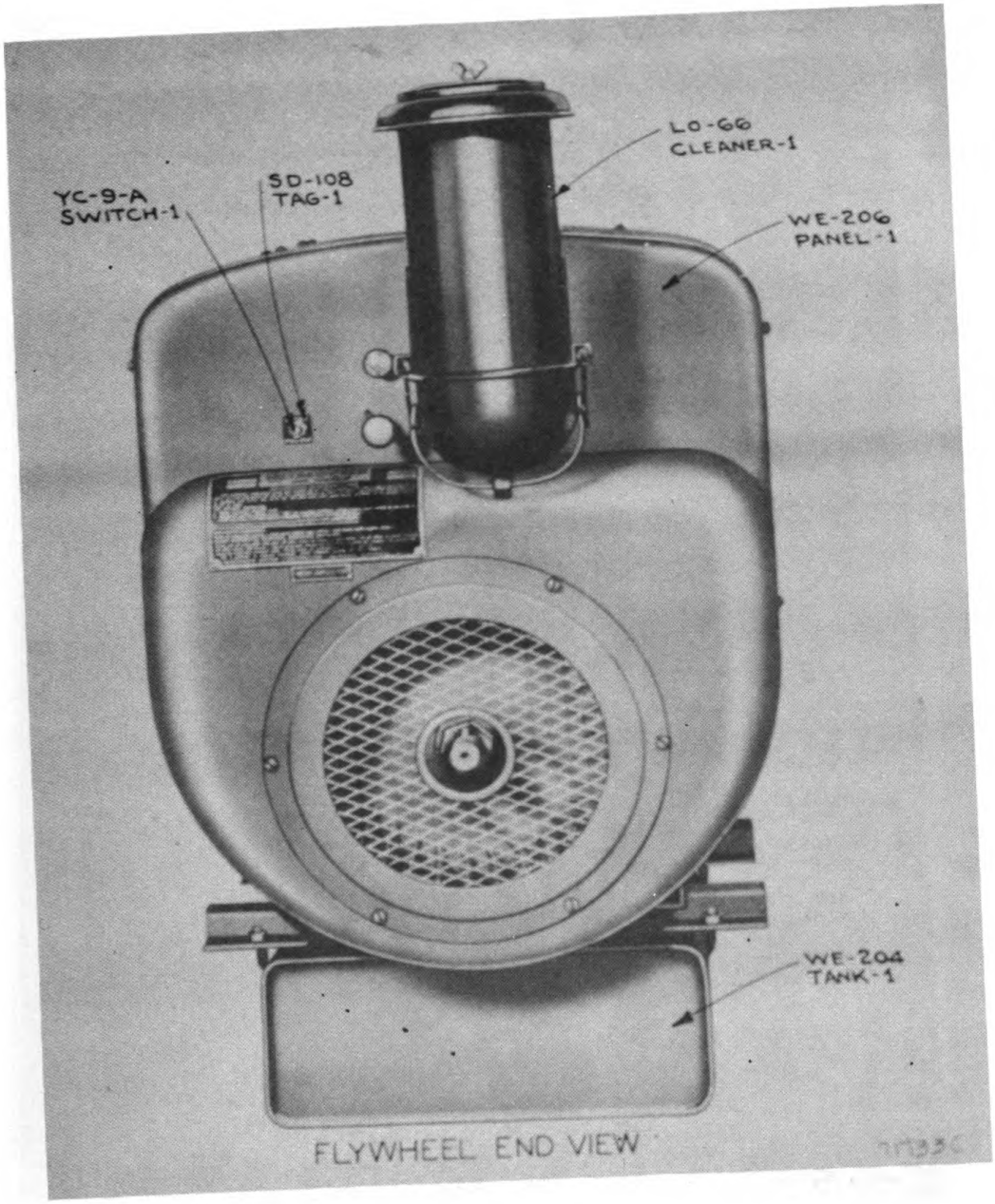


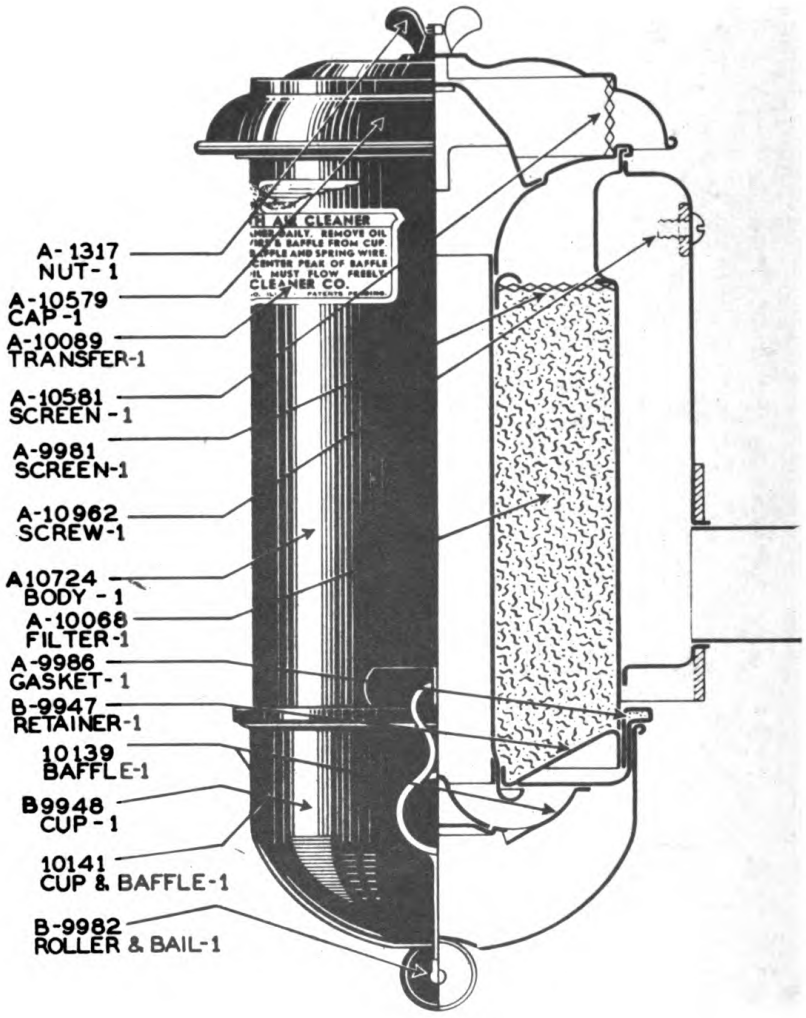
SPEED CONTROL ASSEMBLY TT-45-L-1



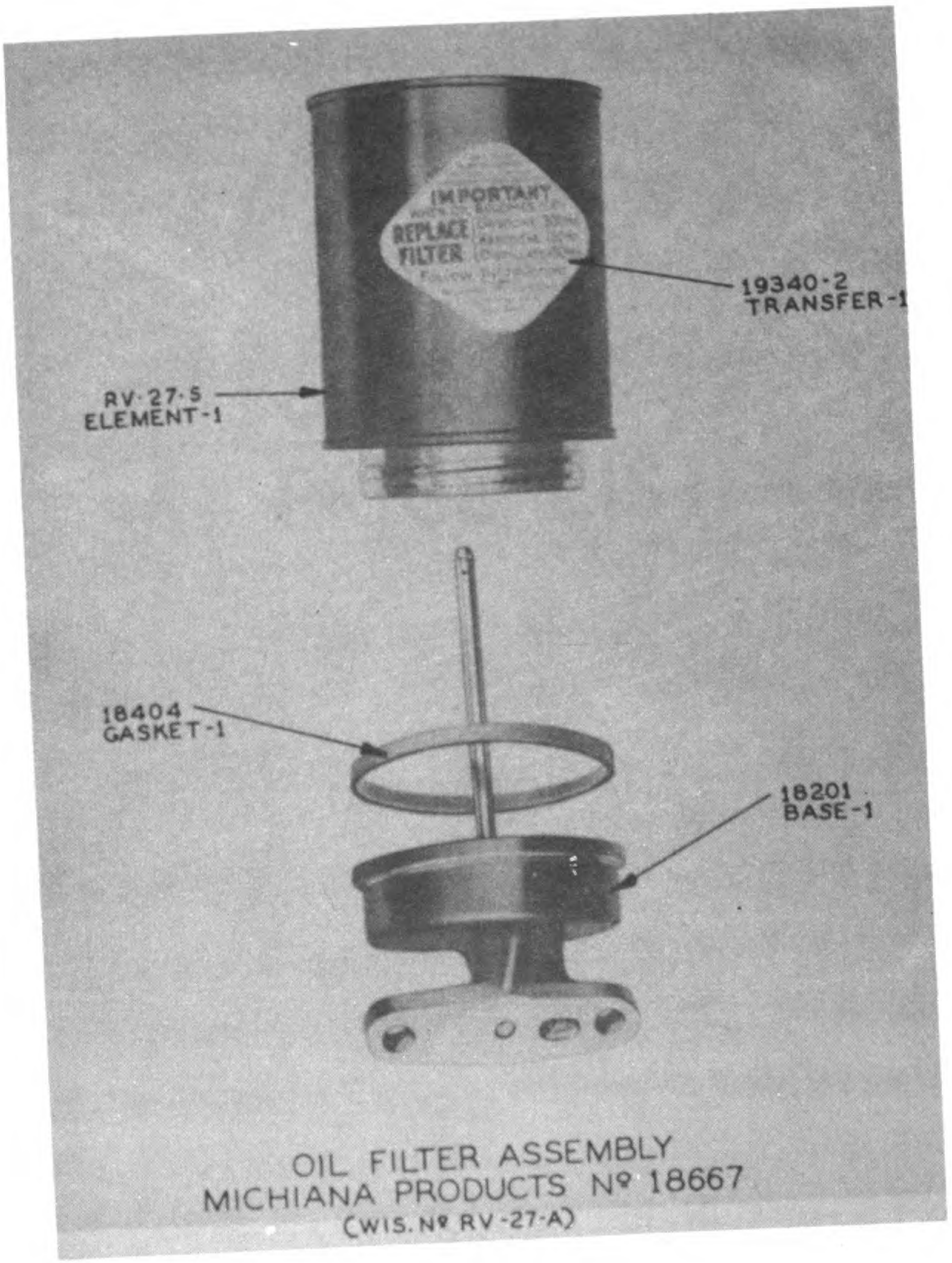
PARTITION PLATE VIEW







LO-66
AIR FILTER ASSEMBLY



OIL FILTER ASSEMBLY
MICHIANA PRODUCTS Nº 18667
(WIS. Nº RV-27-A)

PARTS PRICE LIST

DISTRIBUTOR AND PUMP

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
16-G	Gasket, Volute Set	215	1		2	$ .90
16-Z	Volute, including Bolts	216	1	139		62.00
18	Weight, Small Valve	215	1		6	.30
20	Weight, Large Valve	216	1	1		.60
31	Intermediate	215	1	34		18.00
37	Bushing, Seal	216	1	2		3.60
37-A**	Ring, Seal	215	2		2	1.30
37-B**	Cone, Seal	215	2		2	1.80
37-C**	Spacer Sleeve	215	1		6	.60
37-E**	Spring, Compression	215	1		2	.50
37-F**	Ring, Neoprene Packing	215	2		1	.30
37-G**	Washer, Flat	215	2		1	.10
37-J	Washer, Impeller Adjusting Sets	215	1		1	.25
40	Clamp	215	1	3		1.50
50	Cover	215	1	2	8	1.00
50-G	Gasket, Cover	215	1		1	.20
95	Impeller	216	1	12		12.00
131-C	Check Valve and Gasket	215	1		4	1.80
136	Screw, Clamp Bar, 5/8"	215	1		12	.60
215-1	Cup Grease, Special	215	1		8	2.00
267	Plate, Wear	215	1	8	4	4.00
1617	Base	216	1	30		25.00
1617-A	Bail, Lifting	216	1	14		2.50
A223	End, Faucet	212	***		6	.90
A224	Cap, Dust	212	***		8	1.50
A225	Coupling, Hose	212	***	3	4	3.40
A226	Connector, Hose	212	***		8	1.60
C-062	Stud, 3/8"x1 1/2"	215	8		2	.05
C-088	Stud, 1/2"x2"	215	6		3	.08
C-109	Stud, 5/8"x2 1/4"	215	4		3	.10
D443	End, Faucet, 3"	213	***	2		2.40
D444	Cap, Dust, 3"	213	***	2	8	1.90
D444G	Gasket, Dust Cap, 3"	213	***		2	.60
D445	Coupling, Hose, 3"	213	***	10	4	9.90
D446	Connector, Double, 3"	213	***	2	6	4.40
GS-1250	Seal, Grease, Complete	215	1		14	8.10
M36	*Nipple, Flange, 4" (at Pump Inlet)	201	1	8	8	8.00
M37	Screen (Suction Screen Inside)	201	1	12		2.90
M38	*Nipple, Flange, 4" (at Pump Outlet)	201	1	9		6.20
M39	*Nipple, Flange, Discharge	202	1	29		8.40
M40	*Pipe, Vertical Sprayline, 3", 45 1/2" TBE	202	1	29		8.40
M41	Header, Spraybar (Tee and 2 Pipes)	204	1	30		14.00
M43	Sleeve, w/Ell & Support Plate, R	204	1	12		9.60
M44	Sleeve, w/Ell & Support Plate, L	204	1	14		10.00
M45	Gland, Adjustor Sleeve	204	2	2	8	3.60
M46	Sleeve, Outer w/Vertical Pivot Pipe	204	2	12		10.00
M47	Skirting, Wheel Front, L	207	1	32		10.40

*Specify Overall Length—varies slightly with each mounting
**Part of Grease Seal GS-1250
***As ordered on individual contracts

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Oz.	Price Each
M48	Skirting, Wheel, Front, R	207	1	32		$10.40
M49	Skirting, Wheel, Rear, L	207	1	40		14.00
M50	Skirting, Wheel, Rear, R	207	1	40		14.00
M51	Rack, Spare Tire	207	2	70		12.00
M52	Bar, Lock	207	2	5	1	1.50
M53	Box, Tool	207	2	69		18.00
M54	Rail, Rear Platform, L	207	1	20		6.40
M55	Rail, Rear Platform, R	207	1	14		5.80
M57	Rail, Side Platform	207	2	14		2.00
M58	Rack, Hose, Rear (for 1½" Hose)	208	1	14		1.20
M59	Clamp, Hose—Front	208	2	1		1.40
M60	Pin, Hose Clamp	208	2		8	.40
M61	Hanger, Spraybar Support	208	2	4		1.60
M62	Stick, Calibrated Measuring	208	1	3		5.00
M63	Guide, Shift Lever	214	1	2		.60
M64	Arm, Shift Lever	214	1	3		.30
M65	Lever, R, Spraybar Valve Control	214	1	8		1.80
M66	Lever, L, Spraybar Valve Control	214	1	9		2.20
M67	Arm, R, Spraybar Valve Control	214	1	4	8	2.00
M68	Arm, L, Spraybar Valve Control	214	1	1		1.80
M98	Plug, Screen Cleanout	201	1	3	8	2.00
M145	Rod, Drain Valve Connecting	200	1	1	8	1.00
M147	Plate, Valve, 4", Suction	208	1	1	8	2.50
M148	Plate, Valve, 3", Discharge	208	1	1	8	2.50
M153	Sleeve, Spraybar Pin, ½x8⅝ Pipe	208	2		12	.40
M154	Bar, Header Guide	214	1	2	8	.20
M155	Bracket, Header Guide Bar	214	1	10		1.80
M156	Support, U Bolt Bracket, ⅜"	214	1		8	.50
M157	Cable and Deadeye Assembly	211	1	34		52.00
M158	Plate, Rub, R	211	1	18		7.20
M159	Plate, Rub, L	211	1	18		7.20
M160	Leg, Vertical, R	211	1	46		22.00
M161	Leg, Vertical, L	211	1	46		22.00
M165	Rod, Tie	211	2	13	8	8.20
M166	Bushing, Tie Rod Eye	211	2		8	.40
M167	Bracket, Tie Rod, R	211	1	9	4	9.20
M168	Bracket, Tie Rod, L	211	1	9	4	9.20
M172	Eye, Front Bumper	211	2	2		1.40
M173	Support, Eye	211	2	8	8	3.00
M174	Angle, Bumper Brace	211	2	3	8	.40
M177	Bracket, Frame Support	206	2	1		.60
M178	Saddle, Cable, L	211	1	12		9.60
M179	Saddle, Cable, R	211	1	12		9.60
M181	Clip, Cable Saddle	211	2		4	.30
M183	Angle, Cable Support	211	1	6	12	.60
M194	Clamp, Angle Companion (Upper)	211	2		4	.25
M195	Clamp, Angle Companion (Lower)	211	2		4	.20
M196	Shim, Eye Support	211	2	1	8	.20
M198	Wrench, Drain Valve	200	1	5	12	1.80
M199	Bolt, 'U' Drain Pipe	200	1	3		1.25
M200	Bolt, 'U' Discharge Pipe	202	1		8	.80
M201	Bracket, Transfer Pipe	202	1	1		.90
P4	Valve, Transfer 1½" ACF D125	202	1	8		7.80
P6	Valve, Header 2½" ACF D125	204	2	18		11.50
P7	Valve, Drain 3" ACF D125	200	1	33		15.25
P17	Valve, Discharge 3" 3-Way ACF D953	202	1	58		54.00

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Oz.	Price Each
P18	Valve,Suction 4"3-WayACF D953	201	1	128		$80.00
P22	Wrench, Transfer Valve ACF Type A	202	1		8	.35
P23	Lubricant, 3/8"—1½" ACF Valve	—	—	—	—	.65
P24	Lubricant, ½"—2½" ACF Valve	—	—	—	—	.85
P26	Lubricant, 5/8"—3 & 4 ACF Valve	—	—	—	—	1.15
P27	Wrench, Discharge Valve ACF Type F	202	1	3	8	1.60
P28	Wrench, Suction Valve ACF— Type H	201	1	4		1.20
P31	Spring, 7/16 ID x 5"	208	2		1	.20
P36	Reflector OD Red KD-333-OD	209	4		5	.90
P37	Reflector OD Amber KD-333-OD	209	4		5	.90
P38	Pin and Chain, Clamp	207	2		8	.40
P40	Fitting, Grease No. 5010, ¼" SAE	203	7	—	—	.07
P49	Wheel, Disc, D290Y25AC Geneva	206	1	7		5.00
P50	Bearing, Ball, GS1690 Schatz	206	2		6	2.50
P51	Joint, Drive, No. 660A	206	1	1	8	11.20
P57	Strainer, Hose, Basket Type, 3"	214	1	10		4.00
P58	Gage, Sprayline–Diaphragm Type	202	1	3		5.50
P59	Packing, ⅛", Valve Stem, 4'	204	2		2	.20
P60	Rod, Threaded- ½"x12" USS	204	4	1		.24
P61	Hose, Suction, 3", 15', Rubber	209	2	40		40.00
P62	Hose, Discharge, 1½", 25', CJ	209	1	15		24.00
P63	Nozzle, 1½"x10"	209	1	2		1.60
P64	Shaft, Flex. Drive, No. 95000, 156"	206	1	1	8	9.15
P65	Head, Tachometer, No. 557GZ	206	1	1	12	19.00
P66	Cable, Lifting, ⅛", 150"	206	1		8	1.50
P67	Cap, Stuffing Box	210	2	—	—	.30
P68	Rack w/Shaft	210	1	—	—	2.00
P69	Pin, Rack Guide	210	1	—	—	.16
P70	Roller, Guide Pin	210	1	—	—	.30
P71	Gear, Pointer	210	1	—	—	2.20
P72	Box, Gear	210	1	—	—	8.00
P73	Shaft, Pointer	210	1	—	—	.70
P74	Pointer	210	1	—	—	1.20
P75	Dial w/Frame	210	1	—	—	6.00
P76	Pin, Linkage	210	3	—	—	.16
P77	Connector, Push Rod	210	1	—	—	2.20
P80	Arm, Float	210	1	—	—	1.80
P90	Chain, Support, 3/16"x45"	204	2	2		.80
P96	Light Clearance OD Red KD-541-OD-6	209	2		14	1.10
P97	Light Clearance OD Amber KD-541-OD-6	209	2		14	1.10
P98	Light, Blackout Clearance OD Red KD-541-BO-6	209	2		14	1.80
P99	Light, Blackout Clearance OD Blue KD-541-BO-6	209	2		14	1.80
P102	Gong, Mechanical, 6" Dia	209	1	2	8	4.00
P103	Cable, Gong to Cab–⅛", 72" long	209	1		4	.80
P104	Clevis and Pin	206	3		2	1.60
P105	Pulley, Awning, 1½"	206	3		4	.25
P106	Pulley, Hot House, Upper, 1¾"	206	1		8	1.50
P109	Link, Split Chain, 3/16"	204	6	—	—	.06
P110	Wrench, Handle–¾"x15" Pipe TOE	201	1	1	8	.30

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
P143	Tire, Tachometer 4.00x8, 2 Ply, and Tube	206	1	5		$6.40
P214	Cable, Clearance Light	209	1	4		9.50
R809	Collar, Extension, Folding	205	2	4		6.00
R810	Pin, Break (Cast Iron)	205	1	1		.25
R851	Gasket (3 1/8"x2 5/8"x 3/16")	205	4	—	—	.15
R852	Gasket (3 1/2"x2 7/8"x 3/16")	204	4	—	—	.15
R853	Gasket (3 15/32"x3 31/32"x 3/16")	203	4		1	.20
R855	Cap, 2" Hex	205	2	1		1.20
R856	Cap, Drain, 2 1/2" (Vert. Pivot Pipe)	204	2	3		1.60
R857	Cap, Spindle Drain, 3"	203	2	4		2.80
R911	Gasket (7 1/2"x3 1/8"x 1/32")	202	1		1	.35
R926	Nozzle, Rosco Plain Type, No. 6	205	36		2	.50
R970	Tee, Shift, 3"	203	2	10		5.60
R1127	Cover, Manhole	208	1	13		3.00
R1128	Lever	208	1	10		3.20
R1130	Clamp, Lock Bar	208	1		8	1.00
R1132	Cover, Manhole, Complete	208	1	25		7.20
R1200	Float	210	1	—	—	3.80
R1225	Spindle, Shift, 3"	203	2	5		6.00
R1267	Sump, Spraybar, R (threaded)	205	1	11		9.50
R1268	Sump, Spraybar, L (threaded)	205	1	11		9.50
R1306	Lever, Spraybar, Shift	214	1	16		1.40
R1481	Support, Bearing Lift	206	1	1	8	2.20
R1486	Support, Drive Joint Bearing	206	1	1	8	2.00
R1488	Gasket (9"x4 1/8"x 1/32")	201	1		2	.40
R1490	Tachometer, Wheel Type	206	1	50		70.00
R1491	Bar, Pivot, 3/4"x10 1/2"	206	1	1	8	.30
R1492	Fork, Wheel	206	1	6		1.80
R1493	Shaft, Axle Drive	206	1		8	1.80
R1494	Yoke, Wheel Fork Lifting	206	1	1		1.40
R1495	Handle, Cable Tee	206	1		8	.50
R1496	Clamp, Lifting Cable Hook	206	1	1		1.60
R1497	Clamp, Lifting Cable Companion	206	2		8	.60
R1498	Clamp, Lifting Cable Guide	206	1		12	1.20
R1501	Spraybar, Center Section	205	2	12		8.50
R1503	Extension, Spraybar 1', No Nozzles	205	—	3		2.50
R1504	Extension, Spraybar 2', No Nozzles	205	—	8		5.00
R1515	Handle, Header Valve	214	2	2		.80
R1520	Extension, Spraybar, 3' Folding	205	2	12		9.80
R1521	Packing, Manhole 5' Flax 5/8" Sq.	208	1	1		1.50
W9	Capscrew, 1/4"x1/2" N.C	—	4	—	—	.03
W11	Capscrew, 1/4"x1" USS	—	1	—	—	.03
W23	Capscrew, 3/8"x2" USS	—	1	—	—	.04
W25	Capscrew, 3/8"x1" USS	—	4	—	—	.04
W27	Capscrew, 3/8"x1 1/2" USS	—	7	—	—	.05
W37	Capscrew, 1/2"x3" USS	—	1	—	—	.09
W43	Capscrew, 5/8"x1 1/2" USS	—	4	—	—	.12
W82	Pin, Spraybar Support, 1/2"x10"	—	2		12	.12
W85	Bolt, Machine, 5/8"x1 3/4" USS	—	8	—	—	.06
W89	Nut, Hex, 1/4" N.C	—	4	—	—	.03
W91	Nut, Hex USS, 3/8"	—	13	—	—	.04
W92	Nuts, Hex, 1/2" USS	—	17	—	—	.05
W93	Nut, Hex USS, 5/8"	—	8	—	—	.06
W106	Nut, Hex, 1" N.F	—	4		1	.12
W121	Setscrew—5/16"x1" Cone Point	—	6	—	—	.05

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
W122	Setscrew, Pointer, 1/4"x1" Sq. Hd.	—	1	—	—	$.05
W127	Setscrew, Allan, 1/4"x1/4"	—	4	—	—	.05
W129	Setscrew, Allan, 5/16"x1/2" long	—	2	—	—	.08
W131	Lockwasher, 3/16"	—	64	—	—	.03
W132	Lockwasher, 1/4"	—	4	—	—	.03
W133	Lockwasher, 5/16"	—	8	—	—	.03
W136	Lockwasher, 5/8"	—	32	—	—	.05
W138	Lockwasher, 7/8"	—	4	—	—	.06
W142	Flatwasher, 3/8"	—	3	—	—	.03
W150	Pin, Cotter, 1/8"x1"	—	2	—	—	.03
W151	Pin, Cotter, 1/8"x1 1/2"	—	1	—	—	.03
W174	Plug, Pipe, 1/2"	—	4		2	.05
W190	Ell, Street, 1 1/2" (Transfer Line)	—	1	1		.35
W196	Ell, 3"	—	1	5	8	1.20
W197	Ell, 3/4"	—	1		8	.15
W198	Ell, Street, 3"	—	1	5	12	1.40
W199	Ell, 3", 45°	—	3	4	8	1.40
W205	Tee, 4" (Suction Screen Inside)	—	1	12		1.20
W229	Nipple, Close, 3"	—	2	1	8	.40
W230	Nipple, Close, 4"	—	1	2		.60
W233	Nipple, 1 1/2" Short	—	1		8	.12
W247	Nipple, 3/4"x4" (to Gauge)	—	1		8	.10
W248	Nipple, 3/4"x6"	—	1		8	.12
W259	Nipple, 1 1/2"x15"	—	1	4		.55
W273	Nipple, 3"x4"	—	2	2		.50
W276	Nipple, 3"x7 1/2"	—	2	4		.90
W282	*Pipe, Horizontal Swing, 3"x13" TBE	—	1	7		1.60
W286	Nipple, 4"x4"	—	1	3		.80
W300	Flange, Companion, 3" (at pump outlet)	—	1	7	8	1.25
W318	Ell, Reducing, 4"x3"	—	1	8		2.20
W338	Union, 1 1/2", 150 lb. (at transfer outlet)	—	1	1		1.10
W340	Union, 3", 150 lb.	—	1	4		3.40
W378	Bolts, Stove, 3/16"x3/4"	—	16	—	—	.03
W379	Bolts, Stove, 3/16"x1/2"	—	32	—	—	.03
W380	Bolts, Dial Support, 1/4"x1/2" RH Stove	—	22	—	—	.03
W381	Screws, Flat Head Machine, 1/4"x3/4"	—	4	—	—	.03
W382	Bolt, Stove, Rd. Hd., 5/16"x1/2"	—	4	—	—	.03
W383	Bolt, Stove, Rd. Hd., 5/16"x3/4"	—	4	—	—	.03
W500	Capscrew, 5/8"x1 1/2" N.F.	—	16		2	.10
W501	Capscrew, 5/8"x2" N.F.	—	12		2	.11
W503	Capscrew, 7/8"x3 1/2" N.F.	—	4		10	.33
W506	Nut, Hex, 5/8" N.F.	—	28		1	.06
W508	Nut, Hex, 7/8" N.F.	—	4		1	.14
W512	Capscrew, Flat Head, 5/8"x2" N.C	—	4		2	.20
W1001	Wrench, Pipe, 36"	—	1	17		14.00
W1002	Wrench, Pipe, 24"	—	1	9		6.65
W1003	Wrench, Pipe Trimo, 18"	—	1	5		3.85
W1008	Wrench, Crescent, 15"	—	1	4		2.65
W1009	Wrench, Crescent, 10"	—	1	1	4	1.20
W1010	Wrench, Crescent, 8"	—	1	1		.95
W1014	Wrench, Setscrew, 1/4" Allan	—	1		1	.03
W1015	Wrench, Setscrew, 5/16" Allan	—	1		1.	.03
W1020	Wrench, Universal Hose Spanner	—	2	1		.90
W1024	Wrench, Nozzle, 1 1/16" Open End	—	1	1	4	1.10
W1036	Pliers, 6" Combination	—	1		8	.50
W1038	Hammer, Ball Peen	—	1	1		1.25
W1040	Padlock with Keys, H-700	—	2	—	—	1.60

PARTS PRICE LIST ENGINE

MAGNETOS AND CARBURETORS GROUPED SEPARATELY -- CHECK SERIAL NO. OF MACHINE TO DETERMINE WHICH COMPONENT WAS USED.

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
9100G	Chain, Throttle	228	1		3	$ .20
10128	Retainer Spider	232	1		3	.25
10139	Baffle Assembly	232	1		4	.35
10141	Cup and Baffle, Oil	232	1	1	4	.85
18201	Base, Casting	233	1	1		1.50
18404	Gasket	233	1		2	.16
19340-2	Transfer	233	1		1/8	.08
851297	Gasket, Drain Screw	226	1		1	.01
855064	Lockwasher, Cover Screw	226	6		1	.01
855279	Valve	226	2		1	.01
855493	Screw, Cover	226	6		1	.01
856270	Spring, Valve	226	2		1	.01
856374	Screw, Valve Retainer	226	3		1	.01
1521471	Plate, Valve (outlet)	226	1		1	.15
1521472	Gasket, Valve Plate	226	1		1	.02
1521473	Retainer, Outlet Valve Spring	226	1		1	.02
1521475	Plate, Cover	226	1		2	.10
1521476	Gasket, Cover Plate Capscrew	226	1		1	.01
1521479	Screen	226	1		1	.10
1521480	Gasket, Cover Plate	226	1		1	.02
1521612	Screw, Drain	226	1		1	.01
1521640	Pin, Rocker Arm	226	1		1	.10
1521641	Cover and Valve Seat Assembly	226	1	1		1.15
1521862	Arm, Rocker	226	1		2	.50
1521863	Link	226	1		1	.25
1521864	Bushing, Rocker Arm Pin	226	1		1	.15
1522091	Spring, Rocker Arm	226	1		2	.05
1523258	Body	226	1	1		.75
1523301	Diaphragm Assembly	226	1		3	.50
1523714	Spring, Diaphragm	226	1		1	.05
1537148	Capscrew, Cover Plate	226	1		1	.02
A-1317	Nut, Wing	232	1		1/2	.05
A-9981	Screen, Filter	232	1		3	.10
A-9986	Gasket, Oil Cup	232	1		1	.05
A-10068	Filter Unit (4 balls)	232	1		5	1.45
A-10089	Decalcomania	232	1		1/8	.05
A-10579	Cap, Top	232	1		6	.60
A-10581	Screen, Intake	232	1		3	.15
A-10724	Body Assembly with Filter	232	1		14	5.00
A-10962	Screw	232	1		1/8	.05
AA-85	Block, Cylinder with 4 HG-201 inserts	220	2	37	8	22.00
AA-85	Block, Cylinder with studs, inserts, valves, springs, seats and inspection covers	220	2	37	8	29.50
AB-80-G	Head, Cylinder	220	2	10	9	4.20
AE-75-B	Valve, Exhaust and Inlet	223	8		3	1.21
AF-46	Spring, Valve, Inlet	223	4		1 1/4	.20
AF-49-A	Spring, Valve, Exhaust	223	4		1 1/4	.20
AG-26	Spring, Valve Seat	223	8		3/8	.15
AH-9	Locks, Valve Spring Retainer	223	8 pr.		1/8	.04

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Oz.	Price Each
B9948	Cup, Oil	232	1		8	$ .35
B9982	Roller and Bail Assembly	232	1		4	.60
BA-48-A-1	Crankcase with studs	220	1	67		31.00
BD-100-C-2	Gear Cover	225	1	15		7.30
BG-209	Plate, Bearing Retainer	222	1		8¼	.66
BG-210	Plate, Main Bearing	221	1	7		2.90
BH-141	Plate, Crankcase bottom cover	220	1	1	3	.28
CA-55-4	Crankshaft	221	1	37		38.00
DA-51-A	Rod, Connecting, Complete	221	4	1	8	7.99
DB-199	Piston—standard	221	4	1	1	5.20
DB-199	Piston—semi-finished	221	4	1	1	4.60
DC-163	Ring, Piston—compression	221	8		½	.26
DC-163-1	Ring, Piston—scraper	221	4		5	.32
DC-109	Ring, Piston—oil regulator	221	4		¾	.32
DE-65	Pin, Piston	221	4		2¾	.61
EA-102	Camshaft	222	1	4		8.20
FA-40-B	Tapper, Valve	223	8		4	.73
GA-36-A	Gear, Crankshaft	221	1		13	2.20
GB-45-A	Gear, Camshaft	222	1	2	3	3.50
GC-27-B-1	Gear, Idler	222	1	2	5	2.90
GD-93-C	Gear, Magneto	225	1	1	4	2.14
GD-94-A	Gear, Oil Pump	224	1	1	10	2.20
GD-100-A	Gear, Governor	225	1	1		2.00
HF-261	Seal, Oil	221	1		¼	.06
HF-380	Spacer	227	1		⅛	.16
HF-381	Spacer	225	1		⅛	.10
HG-157-A-S	Bushing, Piston Pin	221	4		1	.34
HG-201	Inserts, Valve Seat	223	8		½	.34
K-95-A	Pump, Oil	222	1	4		11.80
KA-61-A	Body, Oil Pump	222	1	2	8	4.50
KB-39	Cover, Oil Pump	222	1		8	.60
KC-54-1	Gear, Oil Pump—driver	222	1		4	.80
KC-55-1	Gear, Oil Pump—driven	222	1		1	.80
KD-121	Shaft, Oil Pump Drive	222	1		4	.56
KD-122	Shaft, Oil Pump Stub	222	1		2	.14

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
L-45-11	Carburetor, Stromberg UC7/8 (used on machines 41 to 229)	251	1	5	2	$16.50
L-48	Carburetor (Zenith No. 161-7 used on machines having serial numbers 480 up)	255	1	5	2	16.50
LD-227	Manifold—upper branch	220	1	6	8	4.00
LD-228	Manifold—lower branch	220	2	4	1/8	3.00
LJ-280	Nipple, Pipe	220	1		6	.18
LJ-300-A	Tube, Oil Filler	221	1		6	.18
LK-8	Clamp, Hose	229	1		1/4	.10
LK-11	Clamp, Hose, 1 7/8"	229	1		1	.09
LL-64	Hose, air cleaner to carburetor	227	1		9	.82
LO-60	Cap, Oil Filler and Breather	221	1		6	.40
LO-66	Cleaner, Air	232	1	5	4	11.50
LP-38	Pump, Fuel AC No. 1537421	222	1	3		9.00
ME-60	Ball, Steel, for oil pump valve	224	1		1/8	.03
ME-69-1	Cup, main bearing fan end	224	1		6	2.10
ME-71	Main Bearing, Complete (fan end)	221	1	1		5.93
ME-71-1	Cone—Timken No. 420	221	1		10	3.83
ME-114	Bearing, Main, Complete	221	1	1	4	5.30
ME-114-1	Cone—Timken No. 3382	221	1		14	3.40
ME-114-2	Cup—Timken No. 3328	221	1		6	1.90
NC-140	Flywheel	219	1	8	4	7.00
PA-64	Pin, for oil pump gear—driven	224	1		1/8	.03
PA-239	Pin, starting crank	221	1		1/4	.03
PA-265	Pin, Governor weight fulcrum	225	2		1/2	.29
PA-291	Pin, Dowel, for gear cover to case	225	2		1/4	.03
PB-147	Screw, Valve tapper adjusting	223	8		3/4	.12
PB-148	Bolt, connecting rod	221	8		3/4	.12
PC-110	Magneto, Stud, upper mtg. hole	225	1		1 1/8	.14
PC-112	Stud, mtg. oil filter	221	2		1	.10
PC-171	Stud, mtg. lower to upper manifold	220	8		1/2	.10
PC-337	Stud, mtg. block to crankcase	220	12		1 1/2	.18
PC-369	Stud, mtg. manifold to cylinder	220	4		1	.14
PD-10	Nut, Hex, 5/16-24	—	6		1/8	.03
PD-10-A	Nut, Hex, 5/16-24 brass	220	4		1/8	.06
PD-11	Nut, Hex, 3/8-24	—	1		1/8	.03
PD-12	Nut, Hex, 7/16-20	—	12		1/8	.04
PD-76	Nut, Hex, 3/8-16	—	1		1/8	.09
PD-77	Nut, Hex, 1/4-20	—	9		1/8	.03
PD-78	Nut, Hex, 5/16-18	—	4		1/8	.03
PD-79	Nut, Hex, 3/8-16	—	4		1/8	.04
PD-100-1	Nut, Special, mtg. oil pump gear	224	1		1	.10
PD-109	Nut, Hex, 3/8-24 brass	220	4		1/4	.06
PD-123	Nut, Special, Crankshaft	221	1		1/2	.38
PD-141	Nut, Hex, 5/16-24	—	8		1/8	.03
PD-148	Nut, Slotted, 5/16-24	221	8		1/8	.03
PD-155	Nut, Hex, No. 5-20	—	1		1/8	.03

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
PD-173-A	Nut, Special, for gov. adj. screw	228	1		1/4	$ .52
PD-174-1	Nut, Wing, for gov. control	226	1		3/4	.04
PD-175	Nut, 7/16-20 Hex for gov. control	226	2		1	.06
PE-3	Lockwasher 1/4"	—	72		1/8	.03
PE-4	Lockwasher 5/16"	—	58		1/8	.03
PE-5	Lockwasher 3/8"	—	16		1/8	.03
PE-6	Lockwasher 7/16"	—	12		1/8	.04
PE-7	Lockwasher 1/2"	—	4		1/8	.03
PE-14	Lockwasher No. 10	—	6		1/8	.03
PE-44	Lockwasher No. 10, Everlock	—	1		1/8	.03
PE-46	Lockwasher 5/16"	—	3		1/8	.03
PE-49	Lockwasher 5/16", Everlock	—	4		1/8	.03
PE-66	Lockwasher, Special for flywheel	221	1		1/8	.04
PE-68	Lockwasher 7/16"	—	1		1/8	.03
PE-72	Lockwasher, Special ign. switch wire	231	1		1/8	.13
PF-18	Plug, Pipe 1/8" slotted	221	7		1/2	.06
PF-25	Plug, Pipe 3/8" slotted	225	1		1	.14
PF-52	Button, Camshaft, thrust plunger	225	1		1/2	.04
PF-101	Plunger, thrust for camshaft	221	1		9	.80
PF-118	Cup, governor cross shaft seal	225	1		1	.03
PG-314	Clip, Spark Plug Wire	219	2		1/4	.08
PG-323	Clip, Doors	218	2		3	.30
PG-329-A	Straps, Fuel Tank	218	2	2		.96
PG-401	Brace, House—T.O. end	229	1		5 3/8	.36
PG-402	Brace, House—Flywheel end	227	1		5 7/8	.30
PH-2	Washer, Plain 29/64 O.D. x 3/16 I.D.	—	2		1/8	.03
PH-14	Washer, Copper	223	4		1	.06
PH-22-A	Washer, Plain 3/8 Std.	—	1		1/8	.03
PH-77	Washer, Gov. control	228	1		2	.03
PH-77-A	Washer, Plain 5/16 Std.	—	34		1/8	.03
PH-196	Washer, Special Flat	230	3		1/8	.04
PH-245	Washer, Cork, oil level gauge	221	1		1/8	.08
PH-267-1	Washer, Felt	—	1		1/8	.03
PH-299	Seal, Oil	225	1		1	.80
PH-313-A	Washer, gov. drive gear bushing	225	1		1/8	.04
PH-318-A	Seal, Oil, gov. cross shaft	225	1		1	.04
PI-115-E	Screw, Adj. governor	228	1		3/4	.54
PI-143-A	Lockscrew, Oil Pump	224	1		1/2	.28
PJ-105	Stud, Idler Gear	222	1		10	1.80
PK-52	Ring, Retaining, piston pin	221	8		1	.10
PL-53	Key, Woodruff, No. 8	221	1		1/4	.03
PL-83	Key, Woodruff, No. 23	221	1		3/4	.12
PL-137	Key, Woodruff, No. 1	224	1		1/2	.03
PM-76	Spring, Governor	228	1		3/4	.39
PM-108	Spring, camshaft thrust plunger	222	1		1/4	.46
PM-111	Spring, oil pump relief valve	224	1		1/8	.03
PM-111-1	Spring, Control Rod	228	1		1/8	.03

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
PM-137	Spring, Door Clip	229	2		½	$ .07
Q-10	Gasket Set, Complete Engine	—	1		½	2.38
QA-108-A	Shims, Connecting Rod	221	8		⅛	.12
QB-75	Gasket, inlet and exh. manifold part	220	6		⅛	.12
QB-78	Gasket, exhaust manifold	220	2		¼	.03
QB-79	Gasket, inlet manifold	220	2		¼	.03
QC-58	Gasket, mtg. carburetor	220	1		½	.03
QD-67	Gasket, fuel pump adaptor	222	1		1	.03
QD-527-A	Gasket, main brg. plate	221	2		⅛	.06
QD-535	Gasket, oil pump cover	224	1		⅛	.03
QD-538-A	Gasket, mtg. fuel pump	222	1		⅛	.10
QD-595-A	Gasket, oil filter	221	1		½	.03
QD-610-A	Gasket, crankcase bottom cover plate	220	1		½	.12
QD-611	Gasket, gear cover	225	1		⅝	.16
QD-612-A	Gasket, valve insp. cover	223	4		⅛	.03
QD-613	Gasket, cylinder head	220	2		2	.24
QD-614	Gasket, gear cover spacer	225	1		⅛	.10
QD-615-A	Gasket, governor housing	225	1		⅛	.03
QD-616	Gasket, magneto	225	1		⅛	.04
QD-617	Gasket, cylinder base	220	2		4	.06
QF-33	Shim, main brg. plate—.006" thick	221	2		⅝	.32
QF-33-A	Shim, main brg. plate—.003" thick	221	2		1¼	.32
RC-91	Screen, oil filler	221	1		¼	.22
RD-119	Screen, oil pump	224	1		¼	.16
RF-170-A	Coupling, ⅛"	230	1		½	.20
RF-269-2	Fitting, Straight	225	1		½	.12
RF-270	Elbow	218	4		2	.30
RF-320-3	Elbow, fuel pump inlet	227	1		2	.39
RF-794	Nipple, ⅛"x¾" long	227	1		2	.10
RF-937	Coupling, ⅜"	218	1		¾	.15
RF-1139	Nipple, ⅜"x4" long	227	1		4	.18
RF-1121	Nozzle, oil spray, long	224	2		¼	.40
RF-1128	Pipe, Stand, oil filter drain hole	224	1		4	.20
RF-1143	Nozzle, Oil spray, short	224	2		⅛	.16
RF-1162	Nipple, ⅛"x2¾" long	227	1		2	.12
RG-12	Cup, Priming	230	1		2	.67
RJ-143	Gauge, oil level	221	1		¼	.48
RK-167	Plate, splash, crankcase	222	2		2⅜	.08
RK-170	Sling, oil, crankshaft	221	1		4	.06
RM-850	Line, fuel, pump to carburetor	222	1		3	.50
RM-900	Line, fuel, tank to pump	218	1		3	.82
RM-980	Tubing, copper	221	1		8	.60

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
RV-27-A	Filter, Oil—Michiana No. 18667	221	1	1	4	$ 3.80
RV-27-S	Element, Oil Filter	233	1		8	1.00
SA-26	Plug, Welch, 5/8"	220	2		2	.04
SA-52	Plug, Welch, 1/2"	225	1		1/2	.06
SA-58	Plug, Welch, 13/8"	220	1		4	.04
SA-68	Plate, Valve inspection cover	223	4		6 1/2	.08
SD-43	Retainer, cork seal on take off end	221	1		1/2	.08
SD-108	Tag, ignition switch	231	1		1/8	.06
SD-115-A	Plate, name and instruction	219	1		1 3/4	.26
SE-20-B-3	Screen, Flywheel	219	1	1	4	1.82
SE-74	Shroud, Flywheel	219	1	12		7.00
SE-75-B	Shroud, Lower cyl. R. H	219	1	1		1.16
SE-76-B	Shroud, Lower cyl. L. H	219	1		12	1.10
SE-77-A	Deflector, cylinder heat, L. H	219	1		8	.90
SE-77-B	Deflector, cylinder heat, R. H	219	1		12	90
SE-78-A	Shroud, cylinder head, R. H	219	1		12	.70
SE-79-A	Shroud, cylinder head, L. H	219	1	1		.68
SE-80	Cover, side, air shroud	219	1		4	.18
SE-82-B	Cover, rear shroud, L. H	219	1	1		1.26
SE-83-B	Cover, rear shroud, R. H	219	1	1		1.26
T-89-2	Governor, Complete	—	1	10		14.00
TA-111	Plunger, fuel pump	222	1		3	.22
TB-105-A	Adaptor, fuel pump	222	1	1	8	1.30
TC-322-A	Flyweight, governor	225	2		2 1/4	.22
TC-328	Pin, Thrust, Governor Flyweight	225	2		13 1/4	.22
TC-365	Pin, Fulcrum, Governor Lever	227	1		1	.50
TC-368-A	Pin, gov. adj. screw	228	1		1/4	.20
TC-388-1	Shaft, Drive, Governor	225	1		3	.36
TC-389-1	Bushing, Governor Drive Gear	225	1		6	.52
TC-391	Sleeve and Bearing, Gov. Thrust	225	1		10	1.60
TC-395	Housing, Governor	225	1	2	4	2.20
TC-398	Lever and Cross Shaft, Governor	225	1		4	.26
TT-45-L-1	Speed Control Assembly	228	1		14	2.07
U-212	Crank, Starting	219	1	1	2	1.70
VB-134-A	Lever, Governor Control	228	1		3 1/4	.44
VB-151	Yoke, Governor	225	1		2	.44
VE-435	Control, Carburetor Choke	219	1		8	.40
VE-464	Rod, Governor Control	225	1		1/2	.30
VE-475	Governor, Control Assembly	228	1		10	1.50
VE-477	Fitting, Governor Control	228	1		1/2	.50
VE-480	Rod, Governor Control	228	1		4	.46
WD-26-A	Muffler	220	1	1	2	1.70
WE-182-A	Spacer, crankcase and gear cover	225	1	2	2	1.50
WE-198-A-1	Canopy, House	218	1	4	12	4.20
WE-202-A	Support, Engine—T. O. end	230	1	3		1.34

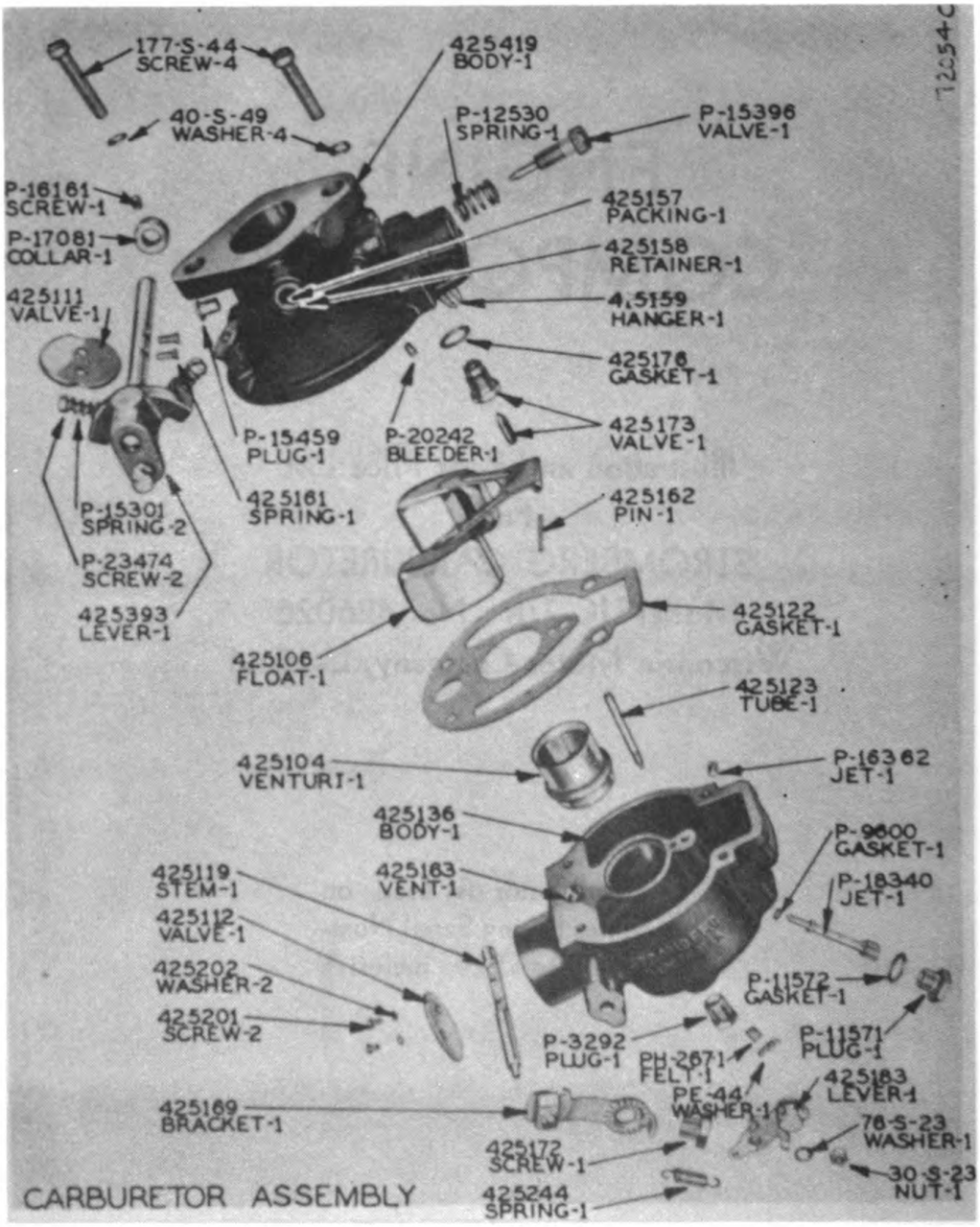
Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
WE-203	Support, Engine—Flywheel End	230	1	3		$ 1.14
WE-204	Tank, Fuel	231	1	14		9.50
WE-206	Panel, Front, House	231	1	8		5.20
WE-207-A	Panel, Rear, House	230	1	8		7.50
WE-208	Rails, Side	230	2	2		.54
WE-209	Doors, House	230	2	4		2.60
WE-211	Cover, Opening in rear house panel	230	1		12	2.20
WE-218	Plate, Heat Deflector & Partition	229	1	1	4	1.60
XA-8	Screws No. 10-32x1/2" Rd. Hd	—	6		1/8	.03
XA-33	Screws 1/4-20x3/8" Rd. Hd	—	48		1/8	.03
XA-35	Screws 1/4-20x3/4" Rd. Hd	—	2		1/8	.03
XA-38	Screw 1/4-20x1" Rd. Hd	—	1		1/8	.08
XA-62	Screw No. 8-32x1/4"	—	1		1/8	.03
XA-65	Screw TYPE "A" No. 8x1/2"	230	7		1/8	.03
XA-67	Screw TYPE "A" No. 4x1/4"	219	4		1/8	.03
XA-81	Screw 1/4-20x3 1/4" Rd. Hd	—	1		1/8	.08
XB-75	Screw 1/4-20x3/4" Socket Hd	222	2		1/8	.10
XC-17	Screw 5/16-18x3/4" Flat Hd	222	4		1/8	.10
XD-3	Screw 1/4-20x3/8" Hex. Hd	—	4		1/8	.03
XD-4	Screw 1/4-20x1/2" Hex Hd	—	12		1/8	.03
XD-6	Screw 1/4-20x3/4" Hex Hd	—	6		1/8	.04
XD-13	Screw 5/16-18x1/2" Hex Hd	—	6		1/8	.06
XD-14	Screw 5/16-18x5/8" Hex Hd	—	16		1/8	.06
XD-15	Screw 5/16-18x3/4" Hex. Hd	—	7		1/8	.06
XD-16	Screw 5/16-18x7/8" Hex. Hd	—	6		1/8	.06
XD-17	Screw 5/16-18x1" Hex Hd	—	3		1/8	.06
XD-19	Screw 5/16-18x1 1/4" Hex Hd	—	40		1/8	.06
XD-21	Screw 5/16-18x1 1/2" Hex Hd	—	4		1/8	.07
XD-22	Screw 5/16-18x1 3/4" Hex Hd	—	4		1/8	.12
XD-25	Screw 3/8-16x3/4" Hex Hd	—	4		1/8	.06
XD-29	Screw 3/8-16x1 3/4" Hex Hd	—	6		1/8	.06
XD-33	Screw 3/8-16x2 1/4" Hex Hd	—	1		1/8	.08
XD-41	Screw 1/2-13x1" Hex Hd	—	4		1/8	.08
XE-17	Screw 1/4-20x3/8"	—	1		1/8	.06
XE-55	Screw 5/16-18x3/8" Allen set	222	1		1/8	.10
XH-1	Pin, Taper No. 0x3/4"	225	1		1/8	.03
XI-1	Pin, Cotter, 1/16x1/2"	—	11		1/8	.03
XI-6	Pin, Cotter, 3/32x1/2"	—	1		1/8	.03
XI-9	Pin, Cotter, 3/32x1"	—	1		1/8	.03
XI-11	Pin, Cotter, 3/32x1 1/4"	—	1		1/8	.03
XI-16	Pin, Cotter, 1/8x1"	—	1		1/8	.03
XI-23	Pin, Cotter, 1/8x3/4"	—	1		1/8	.03
XI-32	Pin, Cotter, 3/64x3/8"	—	2		1/8	.03
XI-33	Pin, Special Cotter, Governor Flyweight	225	4		1/8	.03
XK-1	Plug, Pipe, 1/8" Sq. Hd	—	1		1/4	.08
XK-2	Plug, Pipe, 1/4"	220	2		1/2	.10
XK-3-10	Plug, Special	220	1		1/4	.40
XK-38	Ell, Street, 1/8"	227	1		1/2	.20
XK-63	Tee, 1/8x1/8x1/8"	227	1		1/2	.22

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Oz.	Price Each
Y-37-C	Magneto, J-4 Wico (used on machines having serial numbers 41 to 299 inclusive)	259	1	7		$32.50
Y-41	Magneto, Fairbanks-Morse Type FM-JV4B7 (used on machines having serial Nos. 480 up)	267	1	7		28.00
YC-9A	Switch, Ignition	231	1		2	.44
YD-12	Nipple, Spark Plug	220	4		1/4	.20
YD-47	Plug, Spark—Champion No. 7—18 mm	220	4		6	.40
YD-15	Terminals, ignition switch	227	2		1	.04
YD-27	Insulators, ignition switch	227	2		1/4	.03
YL-63	Pc. No. 71 armored cable 18" long	227	1		3	.52
YL-79	Cable, Ignition, No. 1 Cylinder	225	1		6	.64
YL-80	Cable, Ignition, No. 2 Cylinder	225	1		6	.72
YL-81	Cable, Ignition, No. 3 Cylinder	225	1		6	.76
YL-82	Cable, Ignition, No. 4 Cylinder	225	1		6	.86

ENGINE COMPONENT

Illustration and Parts Price List
For
STROMBERG CARBURETOR
Model UC-7/8 No. 426026
Wisconsin Motor Company, L-45-11

This carburetor is used on machines having Serial Numbers 41 to 229 inclusive



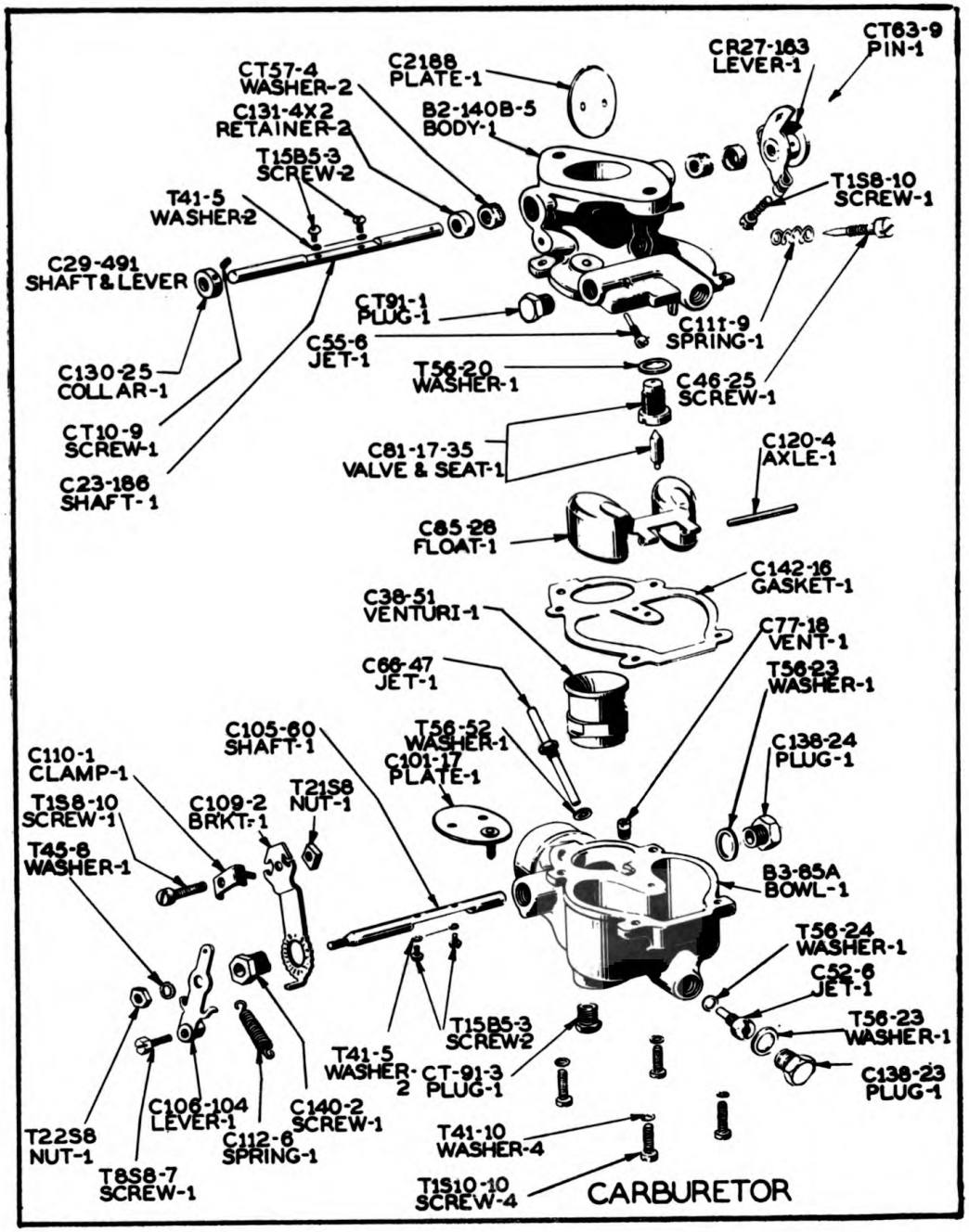
PARTS PRICE LIST FOR STROMBERG CARBURETOR
MODEL UC-7/8, No. 426026 (Wisconsin L-45-11)
This carburetor is used on machines having Serial No. 41 to 229 incl.

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
30-S-23	Nut, Choke Lever Mounting	252	1		1/8	$ .01
40-S-49	Washer	252	4		1/8	.03
76-S-23	Lockwasher, Choke Lever Nut	252	1		1/8	.01
177-S-44	Screw, Main Body Mounting	252	4		1/8	.02
382391	Gaskets, Carburetor, Complete Set (not illustrated)	252	1		1	.40
425104	Venturi, 3/4"	252	1		1	.50
425106	Float Assembly	252	1		1	1.10
425111	Valve, Throttle	252	1		1/8	.30
425112	Valve, Carburetor Choke	252	1		1/8	.20
425119	Stem and Lever, Carburetor Choke	252	1		2	.65
425122	Gasket, Main Body	252	1		5	.10
425123	Idle Tube No. 74	252	1		1/8	.40
425136	Main Body, Carburetor	252	1	1	10	4.00
425157	Packing, Felt	252	1		1/8	.10
425158	Retainer, Felt Packing	252	1		1/8	.05
425159	Hanger, Carburetor Float	252	1		1/8	.15
425161	Screw, Throttle Valve Mounting	252	2		1/8	.01
425162	Pin, Float Fulcrum	252	1		1/8	.10
425163	Vent, Carburetor	252	1		1/8	.20
425169	Holder, Choke Tube	252	1		1/2	.56
425172	Screw, Choke Bracket Mounting	252	1		1	.05
425173	Valve and Seat	252	1		1/8	.65
425176	Gasket, Float Needle Valve	252	1		1/8	.03
425183	Lever, Choke	252	1		1/2	.30
425201	Screw, Choke Valve Mounting	252	2		1/8	.01
425202	Lockwasher, Choke Valve Mounting	252	2		1/8	.01
425244	Spring, Choke Valve Return	252	1		1/8	.05
425393	Lever and Shaft, Throttle	252	1		2	1.45
425419	Throttle Body, Complete with Idle Holes, Throttle Stem, Lever and Valve	252	1	1	8	7.50
P-3292	Plug, Pipe	252	1		1/8	.10
P-9600	Gasket, Main Discharge	252	1		1/8	.02
P-11571	Plug, Main Discharge Jet	252	1		1/8	.25
P-11572	Gasket, Main Discharge Plug	252	1		1/8	.01
P-12530	Spring, Idle Needle Valve	252	1		1/8	.10
P-15301	Spring, Throttle Stop Screw	252	2		1/8	.05
P-15396	Valve, Idle Needle	252	1		1/8	.40
P-15459	Plug, Channel	252	1		1/8	.05
P-16161	Setscrew, Throttle Stem Collar	252	1		1/8	.05
P-16362	Jet, Metering, .053"	252	1		1/8	.35
P-17081	Collar, Throttle Stem	252	1		1/8	.05
P-18340	Jet, Main Discharge No. 52	252	1		1/8	.85
P-20242	Bleeder, High Speed No. 70	252	1		1/8	.25
P-23474	Screw, Throttle Stop	252	2		1/8	.01

ENGINE COMPONENT

Illustration and Parts Price List
For
ZENITH CARBURETOR
Model 161-7, No. 0-10034
Wisconsin Motor Company, No. L-48

This carburetor is used on machines having Serial Numbers 480 and up



PARTS PRICE LIST FOR ZENITH CARBURETOR
MODEL 161-7, No. 0-10034 (Wisconsin No. L-48)

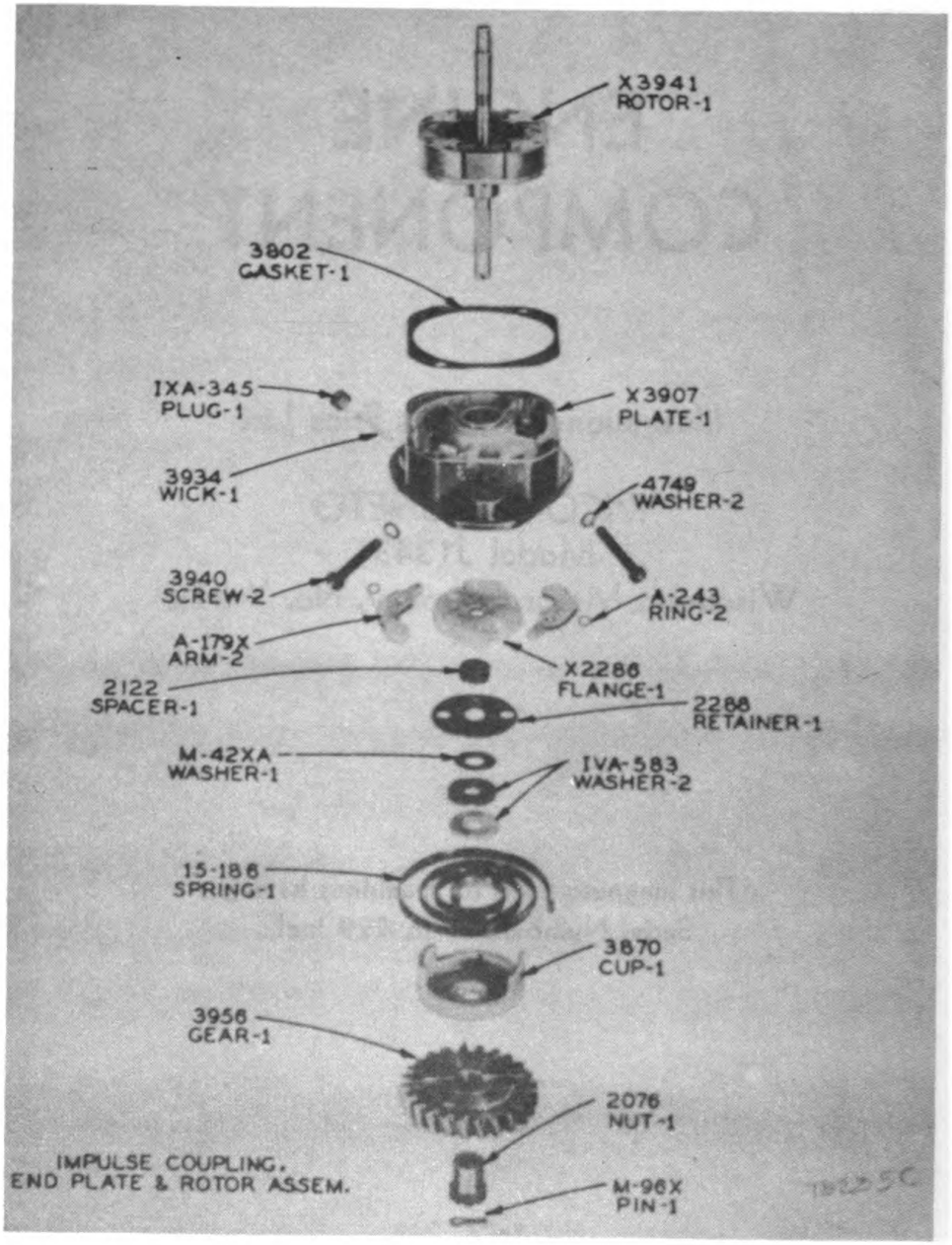
This carburetor is used on machines having serial numbers 480 and up.

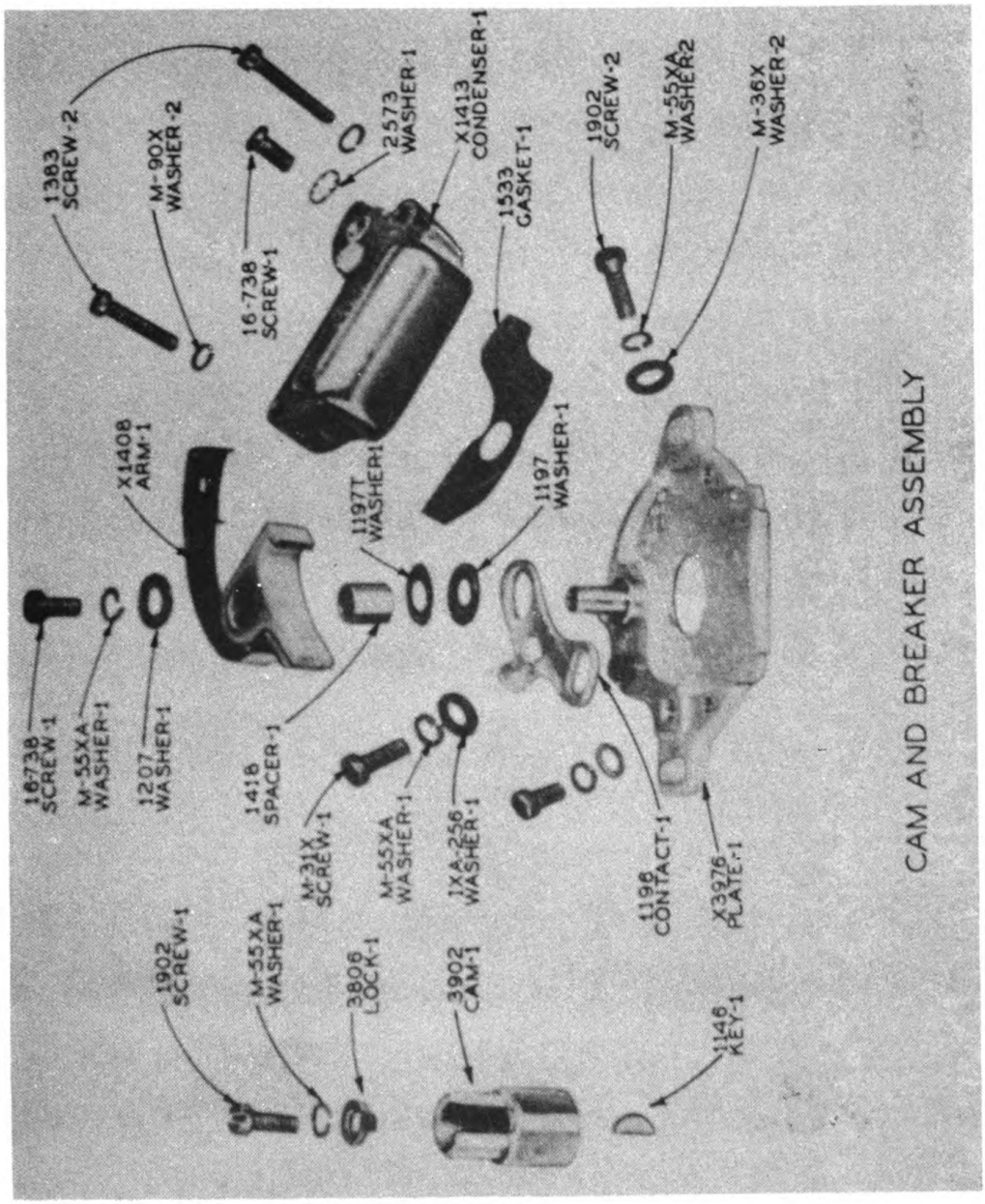
Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
B2-140B-5	Body, Throttle	256	1	2		$ 4.00
B3-85A	Bowl, Fuel	256	1	3		5.00
C2188	Plate, Throttle	256	1		2	.70
C23-186	Shaft, Throttle	256	1		2	.50
C29-491	Shaft and Lever, Throttle	256	1		2	1.30
C46-25	Screw, Idle Adjusting	256	1		1	.30
C55-6	Jet, Idling No. 12	256	1		1	.50
C81-17-35	Valve and Seat, Fuel	256	1		1	.75
C85-28	Float	256	1		1	1.00
C52-6	Jet, Main (No. 22)	256	1		1	.75
C38-51	Venturi (No. 19)	256	1		1	1.00
C66-47	Jet, Discharge (No. 60)	256	1		1	.60
C77-18	Vent, Well (No. 16)	256	1		1	.25
C101-17	Plate, Air Shutter	256	1		1	.50
C105-60	Shaft, Air Shutter	256	1		2	.85
C106-104	Lever, Air Shutter	256	1		1	.35
C109-2	Bracket, Air Shutter	256	1		1	.35
C110-1	Clamp, Bracket Tube	256	1		1	.05
C111-9	Spring, Idle Adjusting Screw	256	1		1	.10
C112-6	Spring, Air Shutter Return	256	1		1	.10
C120-4	Axle, Float	256	1		1	.10
C130-25	Collar, Throttle Shaft Thrust	256	1		1	.15
C131-4x2	Retainer, Packing	256	2		1	.05
C138-23	Plug, Main Jet Passage	256	1		1	.35
C138-24	Plug, Air Shutter Shaft Hole	256	1		1	.35
C140-2	Screw, Bracket Assembly	256	1		1	.05
C142-16	Gasket, Bowl to Body	256	1		1	.10
C181-129	Kit, Gasket (NOT ILLUSTRATED)	256	—		1	.45
C182-197	Kit, (NOT ILLUSTRATED)	256	—		1	2.20
CR27-163	Lever, Swivel, Throttle Stop	256	1		1	.75
CT10-9	Screw, Thrust Collar Set	256	1		1	.05
CT57-4	Washer, Packing	256	2		1	.05
CT63-9	Pin, Stop Lever Taper	256	1		1	.05
CT91-1	Plug, Fuel Inlet	256	1		1	.10
CT91-3	Plug, Bowl Drain	256	1		1	.10
T1S8-10	Screw, Throttle Stop	256	1		1	.05
T1S8-10	Screw, Bracket Clamp	256	1		1	.05
T1S10-10	Screw, Bowl to Body Mounting	256	4		1	.05
T8S8-7	Screw, Swivel	256	1		1	.05
T21S8	Nut, Clamp Screw	256	1		1	.05
T22S8	Nut, Shaft	256	1		1	.05
T15B5-3	Screw, Air Shutter Retainer	256	2		1	.05
T15B5-3	Screw, Throttle Plate	256	2		1	.05
T41-5	Lockwasher	256	4		1	.05
T41-10	Lockwasher	256	4		1	.05
T45-8	Lockwasher	256	1		1	.05
T56-20	Washer	256	1		1	.05
T56-23	Washer	256	1		1	.05
T56-23	Washer	256	1		1	.05
T56-24	Washer	256	1		1	.05
T56-52	Washer	256	1		1	.05

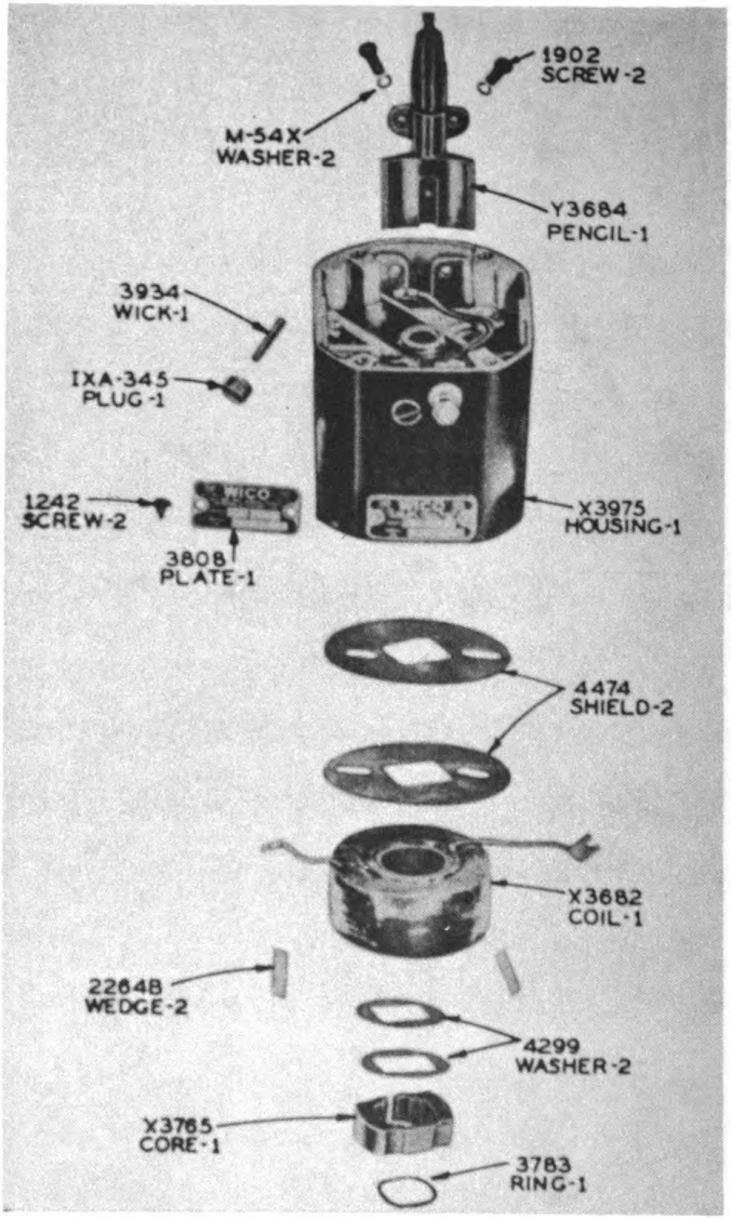
ENGINE COMPONENT

Illustrations and Parts Price List
For
WICO MAGNETO
Model J1343
Wisconsin Motor Company, No. Y-37C

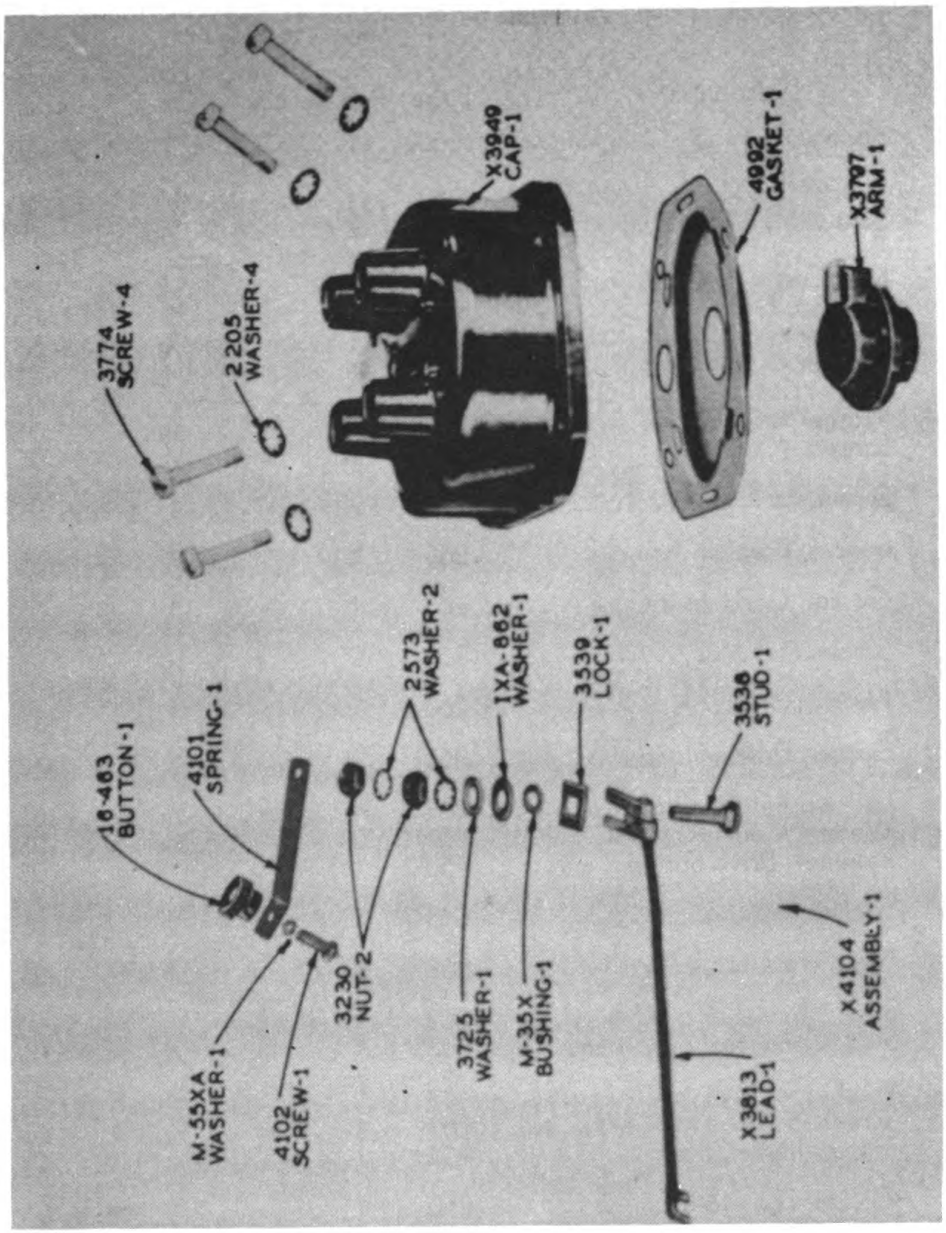
This magneto used on machines having
Serial Numbers 41 to 229 incl.







MAIN HOUSING ASSEMBLY



STOP SWITCH,
GROUND LEAD & CAP ASSEM.

PARTS PRICE LIST FOR WICO J1343 MAGNETO WISCONSIN NO. Y-37-C

This magneto used on machines having serial numbers 41 to 229 inclusive.

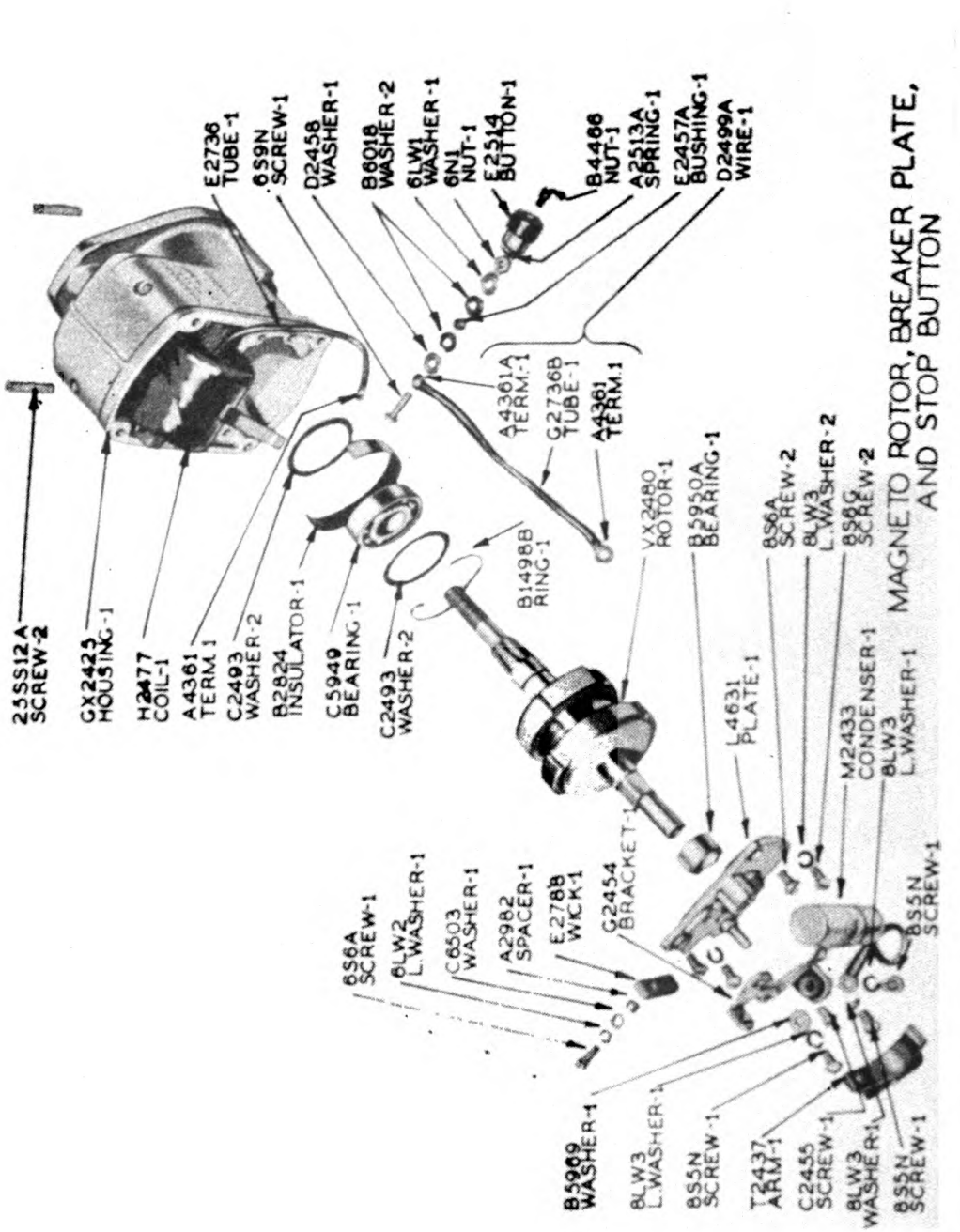
Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
15-186	Spring, Drive	260	1		1	$ .60
16-463	Button	263	1		½	.10
16-738	Screw	261	2		½	.05
1146	Key, Cam	261	1		⅛	.05
1196	Contact, Fixed	261	1		2	.05
1197	Washer	261	1		⅛	.05
1197T	Washer	261	1		⅛	.05
1207	Washer	261	1		⅛	.05
1242	Screw	262	2		⅛	.05
1383	Screw	261	2		1	.05
1418	Spacer, Breaker Arm	261	1		½	.05
1533	Gasket, Condenser Case	261	1		1	.05
1902	Screw	261	5		½	.05
2076	Nut	260	1		1	.40
2122	Spacer, Driven Flange	260	1		1	.10
2205	Lockwasher (Special)	263	4		⅛	.05
2264B	Wedge, Coil	262	2		⅛	.05
2288	Retainer, Drive Spring	260	1			.05
2573	Lockwasher	263	3		⅛	.05
3230	Nut	263	2		⅛	.05
3538	Stud, Connector or Ground,	263	1		½	.10
3539	Stud, Connector or Ground	263	1		½	.05
3725	Washer	263	1		⅛	.05
3774	Screw	263	4		⅛	.05
3783	Spring, Inner Core	262	1		⅛	.05
3802	Gasket, End Plate	260	1		½	.05
3806	Plate, Cam Screw Lock	261	1		½	.05
3808	Plate, Name	262	1		1	.20
3870	Cup, Drive	260	1		3	2.20
3902	Cam	261	1		2	1.10
3934	Wick, Oil	260	2		⅛	.05
3940	Screw	260	2		1	.05

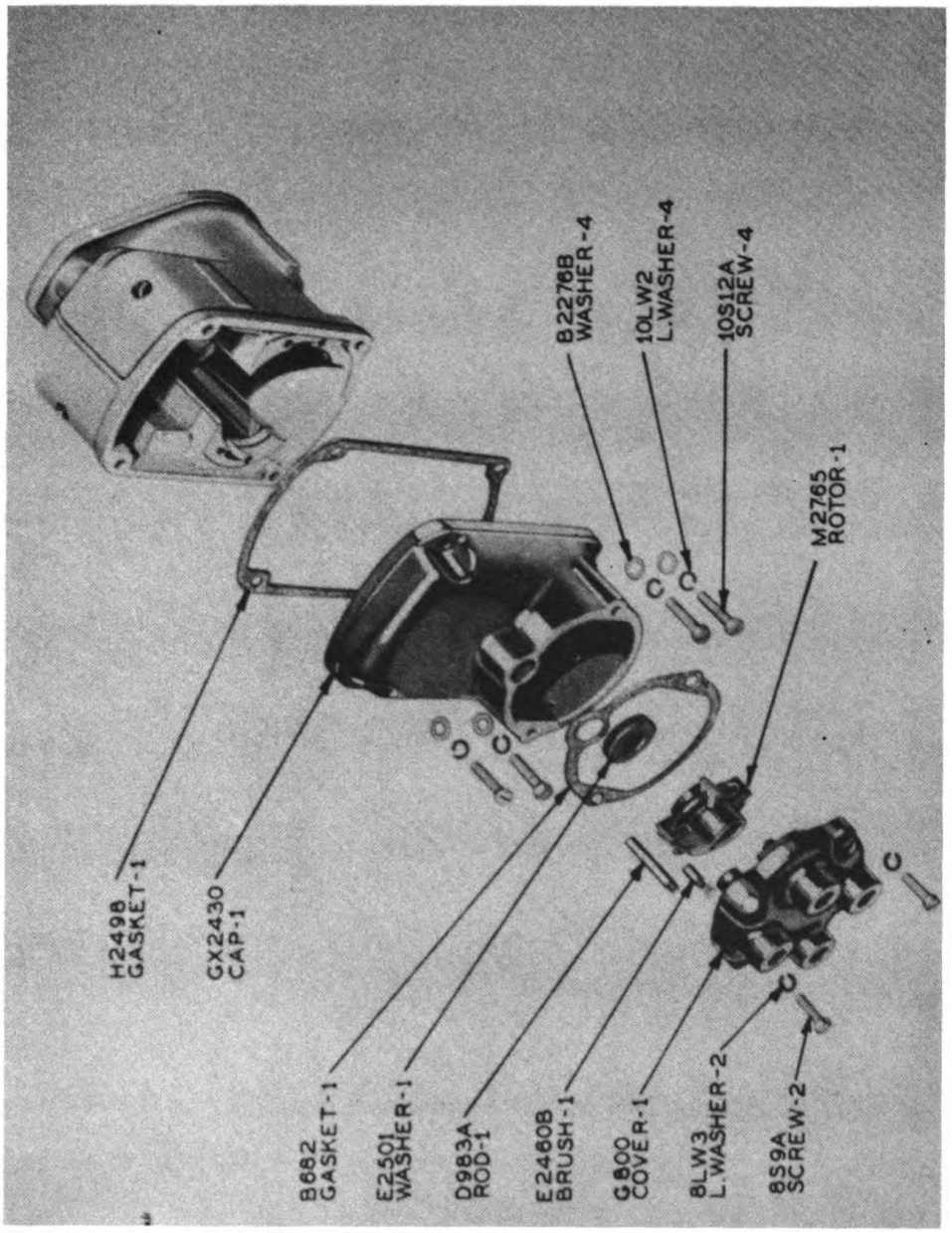
Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
3956	Gear, Drive	260	1		4	$ 1.65
4101	Spring, Stop Switch	263	1		1/8	.20
4102	Screw, Stop Switch	263	1		1/8	.05
4299	Washer	262	2		1/8	.05
4474	Shield, Coil	262	2		1/8	.10
4749	Washer	260	2		1	.05
4992	Gasket, Distributor Cap (3634)	263	1		1	.10
A-179X	Arm, Trip	260	2		2	.30
A-243	Ring, Snap	260	2		1	.20
IVA-583	Washer	260	2		1	.10
IXA-256	Washer	261	1		1/8	.05
IXA-345	Plug, Oil	260	2		1	.05
IXA-862	Washer, Insulating	263	1		1/8	.05
M-31X	Screw	261	1		1/8	.05
M-35X	Washer	263	1		1/8	.05
M-36X	Washer	261	2		1/8	.05
M-42XA	Washer	260	1		1/8	.05
M-54X	Lockwasher	262	2		1/8	.05
M-55XA	Lockwasher	261	6		1	.05
M-90X	Lockwasher	261	2		1/8	.05
M-96X	Cotterpin	260	1		1/8	.05
X1408	Arm, Breaker, Group (X3343)	261	1		3	1.35
X1413	Condenser Group	261	1		2	1.30
X2286	Flange, Driven, Group	260	1		3	.55
X3682	Coil, Group	261	1		8	3.30
X3765	Core, Inner, Group	261	1		2	.55
X3797	Arm, Distributor, Group	263	1		1	.50
X3813	Lead, Ground Stud, Group	263	1		1/2	.10
X3907	Plate, End, Group	260	1		3	3.30
X3939	Coupling, Impulse, Unit	—	1		4	3.85
X3941	Rotor Assembly	260	1		4	7.40
X3949	Cap, Distributor Unit	263	1		5	2.50
X3975	Housing, Main, Assembly	262	1		8	7.40
X3976	Plate, Breaker, Assembly	261	1		3	1.10
X4104	Switch, Stop, Group	263	1		3	.30
Y3684	Pencil, Secondary	262	1		2	.55

ENGINE COMPONENT

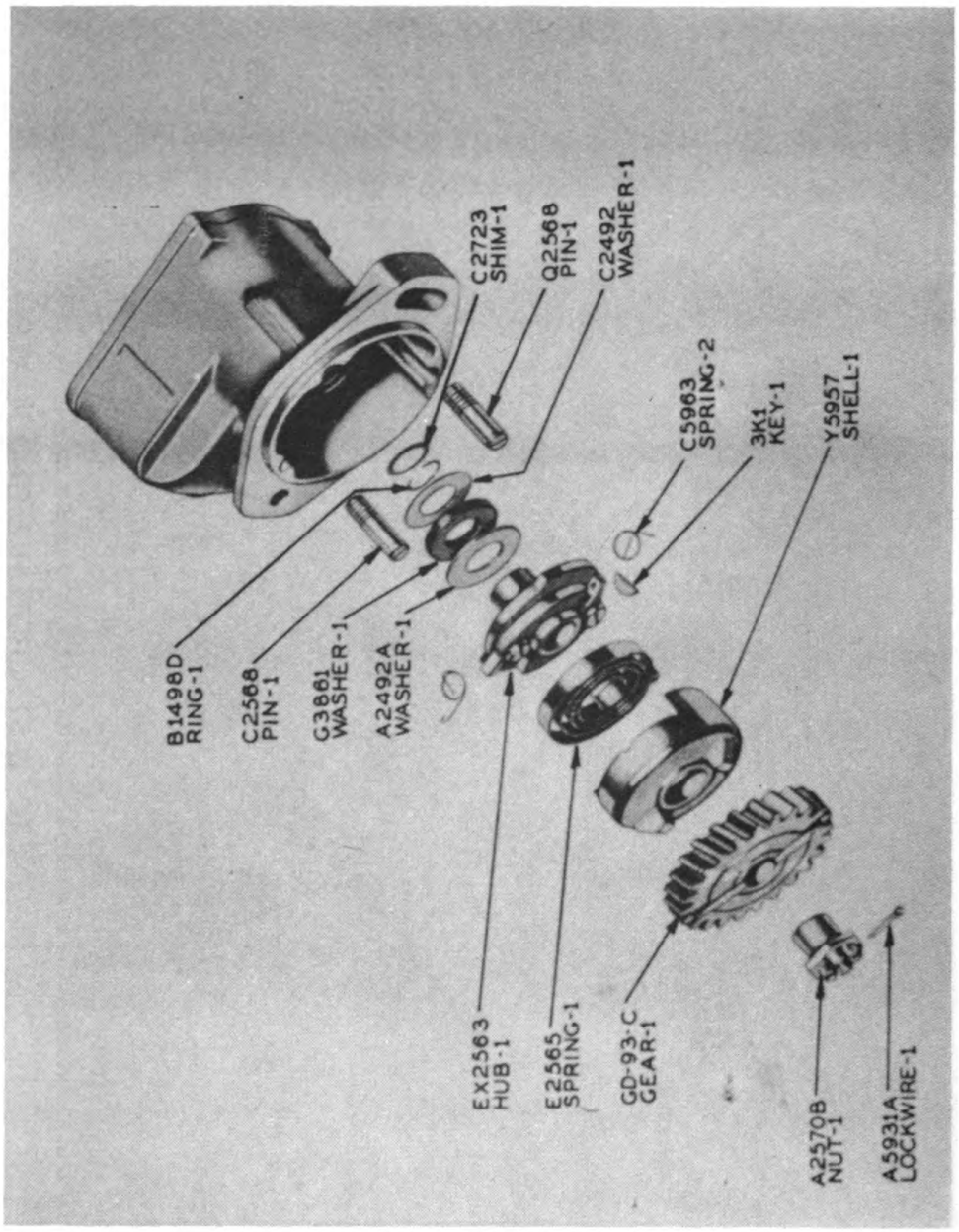
Illustrations and Parts Price List
For
FAIRBANKS-MORSE MAGNETO
Model FM-JV4B7
WISCONSIN No. Y-41

This magneto is used on machines having Serial Numbers from 480 and up





MAGNETO DISTR.,ROTOR & END PLATE



MAGNETO IMPULSE COUPLING

PARTS PRICE LIST
FOR FAIRBANKS-MORSE TYPE FM-JV4B7 MAGNETO
WISCONSIN MOTOR CORPORATION NO. Y-41

This magneto is used on machines having serial numbers from 480 and up.

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
3K1	Key, Woodruff No. 3 coupling hub	266	1		1	$ .01
6LW1	Lockwasher	268	1		1	.01
6LW2	Lockwasher	268	1		1	.01
6N1	Nut	268	1		1	.01
6S6A	Screw	268	1		1	.01
6S9N	Screw	268	1		1	.01
8LW3	Lockwasher	268	7		1	.01
8S5N	Screw	268	3		1	.01
8S6A	Screw, Plate	268	2		1	.01
8S6G	Screw	268	2		1	.01
8S9A	Screw	269	2		1	.01
10LW2	Lockwasher	269	4		1	.01
10S12A	Screw	269	4		1	.01
25SS12A	Screw	268	2		1	.03
A-2492A	Washer	270	1		1	.05
A2513A	Spring	268	1		1	.05
A2570B	Nut	270	1		2	.75
A2982	Spacer, Cam Felt Wick	268	1		1	.05
A4361	Terminal, Primary Lead Wire	268	1		1	.03
A4361	Terminal, Coil Lead Wire	268	1		1	.03
A4361A	Terminal, Primary Lead Wire	268	1		1	.03
A5931A	Lockwire, Impulse Coupling Nut	269	1		1	.02
B682	Gasket, Distributor Cover	269	1		1	.05
B1498B	Ring, Rotor Bearing Snap	268	1		1	.05
B1498D	Ring, Rotor Shaft Snap	270	1		1	.05
B2276B	Washer, End Cap	269	4		1	.02
B2824	Insulator, Rotor Bearing	268	1		1	.01
B4466	Nut, Ground Screw	268	1		1	.13
B5950A	Bearing, Rotor Sleeve	268	1		1	.25
B5969	Washer	268	1		1	.01
B6018	Washer	268	2		1	.01

Part No.	Description	Page	No. Req'd	Weight Ea. Lbs.	Weight Ea. Oz.	Price Each
C2455	Screw	268	1		1	$ .02
C2492	Washer	270	1		1	.02
C2493	Washer	268	2		1	.02
C2568	Pin, Impulse Coupling Pawl Stop	270	1		3	.15
C2723	Shim, Thrust Bearing	270	1		1	.02
C5949	Bearing, Rotor	268	1		6	1.15
C5963	Spring, Impulse Coupling Pawl	270	2		1	.05
C6503	Washer	268	1		1	.02
D983A	Rod, Distributor High Tension Lead	269	1		1	.10
D2458	Washer	268	1		1	.01
D2499A	Wire, Primary, Complete	268	1		2	.15
E2457A	Bushing, Insulating	268	1		1	.02
E2460B	Brush, Coil Lead with Spring	269	1		1	.11
E2501	Washer	269	1		1	.05
E2514	Button, Ground Screw Push	268	1		1	.20
E2565	Spring, Impulse Coupling Drive	270	1		2	.25
E2736	Tube, Primary Lead Wire	268	1		1	.09
E2788	Wick, Cam Felt	268	1		1	.05
EX2563	Hub, Impulse Coupling	270	1		8	3.45
G800	Cover, Distributor	269	1		5	1.40
G2454	Bracket, Stationary Support	268	1		2	.50
G2736B	Tube, Primary Terminal	268	1		1	.08
G3861	Washer	270	1		1	.12
GD-93-C	Gear, Magneto	270	1		4	2.14
GX2425	Housing	268	1		8	5.20
GX2430	Cap, Distributor End	269	1		10	1.50
H2477	Coil	268	1		13	5.25
H2498	Gasket, End Cap	269	1		1	.05
L4631	Plate, Bearing & Breaker Support	268	1		14	1.40
M2433	Condenser	268	1		2	.90
M2765	Rotor, Distributor	269	2		2	.50
Q2568	Pin, Impulse Coupling Pawl Stop	270	1		2	.20
T2437	Arm, Breaker, Complete	268	1		2	1.50
VX2480	Rotor, Complete	268	1		4	8.50
Y5957	Snell, Impulse Coupling	270	1		12	1.85
GK-17	Kit, Complete Gasket	—	1		6	.26

ACCESSORY LIST

Rosco Part No.	Description	Manufacturer	Mfg. Address	Mfg. Part or Model No.
None	Engine, Air Cooled	Wisconsin Motor Co.	Milwaukee, Wis.	VE-4I
None	Sparkplug 18 MM	Champion Mfg. Co.	Toledo, Ohio	No. 7
None	Pump, Centrifugal	Gorman-Rupp Company	Mansfield, Ohio	30M
D443	End, Faucet, 3″	Morrison Brothers Co.	Dubuque, Iowa	D443
D444	Cap, Dust, 3″	Morrison Brothers Co.	Dubuque, Iowa	D444
D444G	Gasket, Dust Cap, 3″	Morrison Brothers Co.	Dubuque, Iowa	D444G
D445	Coupling, Hose, 3″	Morrison Brothers Co.	Dubuque, Iowa	D445
D446	Connector, Double, 3″	Morrison Brothers Co.	Dubuque, Iowa	D446
L-41-11	Carburetor, Stromberg (used on machines having serial numbers 41 to 229)	Bendix Aviation Corp.	Detroit, Michigan	426026
L-48	Carburetor, Zenith (used on machines having serial numbers 480 and up)	Bendix Aviation Corp.	Detroit, Michigan	0-10034
LO-66	Filter, Air	United Specialties Co.	Chicago, Illinois	None
P4	Valve, Transfer, 1½″	American Car & Foundry Co.	Detroit, Mich.	1½″ D125 ACF
P6	Valve, Header, 2½″	American Car & Foundry Co.	Detroit, Mich.	2½″ D125 ACF
P7	Valve, Drain, 3″	American Car & Foundry Co.	Detroit, Mich.	3″ D125 ACF
P17	Valve, Discharge, 3″, 3-Way	American Car & Foundry Co.	Detroit, Mich.	3″ D953 ACF
P18	Valve, Suction, 4″, 3-Way	American Car & Foundry Co.	Detroit, Mich.	4″ D953 ACF
P22	Wrench, Transfer Valve	American Car & Foundry Co.	Detroit, Mich.	ACF Type A
P23	Lubricant, ⅜″	American Car & Foundry Co.	Detroit, Mich.	——
P24	Lubricant, ½″	American Car & Foundry Co.	Detroit, Mich.	——
P25	Wrench, Valve	American Car & Foundry Co.	Detroit, Mich.	No. 802 Type C ACF
P26	Lubricant, ⅝″			——
P27	Wrench, Discharge Valve	American Car & Foundry Co.	Detroit, Mich.	ACF Type F
P28	Wrench, Suction Valve	American Car & Foundry Co.	Detroit, Mich.	ACF Type H
P36	Reflector, Rear, Red	K-D Lamp Company	Cincinnati, Ohio	KD-333-R-OD
P37	Reflector, Front, Amber	K-D Lamp Company	Cincinnati, Ohio	KD-333-A-OD
P42	Joint, Suction Swing, 3″	Chiksan Tool Company	Brea, California	3″ Style 50
P49	Wheel, Disc	Geneva Metal Wheel Co.	Geneva, Ohio	D290Y.25AC
P50	Bearing, Ball	Schatz Mfg. Co.	Poughkeepsie, N. Y.	CS1690
P51	Drive, Angle Shaft	Stewart-Warner Corp.	Chicago, Illinois	660A

ACCESSORY LIST

Rosco Part No.	Description	Manufacturer	Mfg. Address	Mfg. Part or Model No.
P52	Shaft, Flexible Drive	Stewart-Warner Corp.	Chicago, Illinois	95000—100″
P57	Strainer, Suction Hose	Gorman-Rupp Company	Mansfield, Ohio	3″
P58	Gauge, Pressure, 4½″	United States Gauge Co.	New York, N. Y.	60 lb., 4½″ Dial
P65	Head, Tachometer	Stewart-Warner Corp.	Chicago, Ill.	557GZ
P81	Wheel, 2-Piece Disc	Kelsey-Hayes Wheel Co.	Detroit, Mich.	25692
P82	Nut, Wheel Attaching	Kelsey-Hayes Wheel Co.	Detroit, Michigan	24575
P83	Hub, with Bolts—no Cups	Kelsey-Hayes Wheel Co.	Detroit, Mich.	25968 less Cups
P84	Bearing, Inner Wheel w/cup	Timken Roller Bearing Co.	Canton, Ohio	15118 Cone 15250 Cup
P85	Bearing, Outer Wheel w/cup	Timken Roller Bearing Co.	Canton, Ohio	09074 Cone 09196 Cup
P86	Seal, Inner Grease	National Motor Bearing Co.	Chicago, Illinois	5796
P87	Cap, Outer Grease	Kelsey-Hayes Wheel Co.	Detroit, Mich.	68-1139
P88	Lock, Ring	Kelsey-Hayes Wheel Co.	Detroit, Mich.	25930
P96	Light, Clearance—Red	K-D Lamp Company	Cincinnati, Ohio	KD-541-OD-6
P97	Light, Clearance—Amber	K-D Lamp Company	Cincinnati, Ohio	KD-541-OD-6
P98	Light, Clearance, Blackout—Red	K-D Lamp Company	Cincinnati, Ohio	RED KD-541-BO-6
P99	Light, Clearance, Blackout—Amber	K-D Lamp Company	Cincinnati, Ohio	BLUE KD-541-BO-6
P137	Joint, Swing	Chiksan Tool Co.	Brea, California	M303
P138	Coupling, Swing	Chiksan Tool Co.	Brea, California	M301
P139	Ell, Swing	Chiksan Tool Company	Brea, California	M305
P140	Packing, Swing (Set)	Chiksan Tool Company	Brea, California	L331
P141	Ball, Set (65 Balls)	Chiksan Tool Company	Brea, California	L332
P142	Plug, Swing Joint	Chiksan Tool Company	Brea, California	L334
RV-27-A	Filter, Oil	Michiana Products Co.	Michigan City, Ind.	18667
Y-37-C	Magneto, Wico (used on machines having serial numbers 41-229)	Wico Electric Co.	Springfield, Mass.	J1343
Y-41	Magneto, Fairbanks-Morse (used on machines having Serial Nos. 480 and up)	Fairbanks-Morse & Co.	Beloit, Wisconsin	FMJV4B7

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