

TM 9-1727K

**RESTRICTED**

**WAR DEPARTMENT**

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**TECHNICAL MANUAL**



**ORDNANCE MAINTENANCE**  
**HYDRAULIC TRAVERSING**  
**MECHANISM FOR**  
**LIGHT TANK M5 (OILGEAR)**

**APRIL 30, 1943**



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**ORDNANCE MAIN ENANCE**  
**HYDRAULIC TRAVERSING MECHANISM FOR**  
**LIGHT TANK M5 (OILGEAR)**

Prepared under the direction of the  
 Chief of Ordnance

(with the cooperation of the Oilgear Company)

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**ORDNANCE MAINTENANCE—HYDRAULIC TRAVERSING MECHANISM  
FOR LIGHT TANK M5 (OILGEAR)****Section I****INTRODUCTION**

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Scope .....	1
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**1. SCOPE.**

a. This manual is published for the information and guidance of ordnance maintenance personnel. It contains detailed instructions for inspection, disassembly, assembly, maintenance and repair of the hydraulic turret traversing mechanism on the Light Tank M5, supplementary to those in the Field and Technical Manuals prepared for the using arm. Additional descriptive matter and illustrations are included to aid in providing a complete working knowledge of the materiel.

**2. ARRANGEMENT OF MANUAL.**

a. Section II gives a general description of the operation of the system as a whole and Section III covers the trouble shooting of the components in the tank. Sections IV through X are devoted to the overhaul of the components. The references are listed in the last section of the manual.

**3. NATURE OF MATERIEL.**

a. The information for the operation of the turret traversing mechanism and the using arm maintenance is covered in the Operator's Manual TM 9-732, Light Tank M5. This equipment is used to traverse the turret by hydraulic means. The control handle has two switches for firing the guns in the combination gun mount.

**Section II****GENERAL DESCRIPTION**

	Paragraph
Description .....	4
Description of components.....	5
Operation of turret.....	6
Reference to operator's manual.....	7

**4. DESCRIPTION (figs. 1 and 2).**

a. The hydraulic traversing mechanism enables the operator to turn the turret quickly and accurately with a minimum of effort. Characteristics inherent in the hydraulic mechanism are: Variable speed control in either direction; rapid acceleration or deceleration in either direction; hydrodynamic braking; automatic protection against overloading the drive mechanism; pressure and flood lubrication of all working parts in the hydraulic pump and in the hydraulic motor with oil in the system.

b. The principal parts of the system are: Variable displacement traverse pump; constant displacement traverse motor; gear box; control; and the oil pot. The variable displacement traverse pump is driven counterclockwise by an electric motor which also drives the stabilizer oil pump. The electric motor, pump and oil reservoir are mounted to the under side of the turret basket. The control and firing mechanism is mounted on the turret wall to the left of the gun mount. The constant displacement traverse motor is bolted to the gear box. The turret drive pinion on the gear box shaft engages the rack gear around the circumference of the turret. Oil delivered by the traverse pump is variable from zero to maximum in either direction and flows direct to and from the traverse motor. The constant displacement traverse motor drives the gear train in the gear box which, in turn, turns the turret.

c. In case of power failure, the operator can, through a gear shift lever on gear box, disengage the power drive and engage a hand crank drive for manual operation of the turret. Rotating the hand crank clockwise traverses the turret clockwise. Rotating the hand crank counterclockwise traverses the turret counterclockwise. Releasing the hand lever locks the hand crank drive and turret in a fixed position. Two firing switches and a safety trigger integral with the control handle enable the guns in the combination gun mount to be fired.

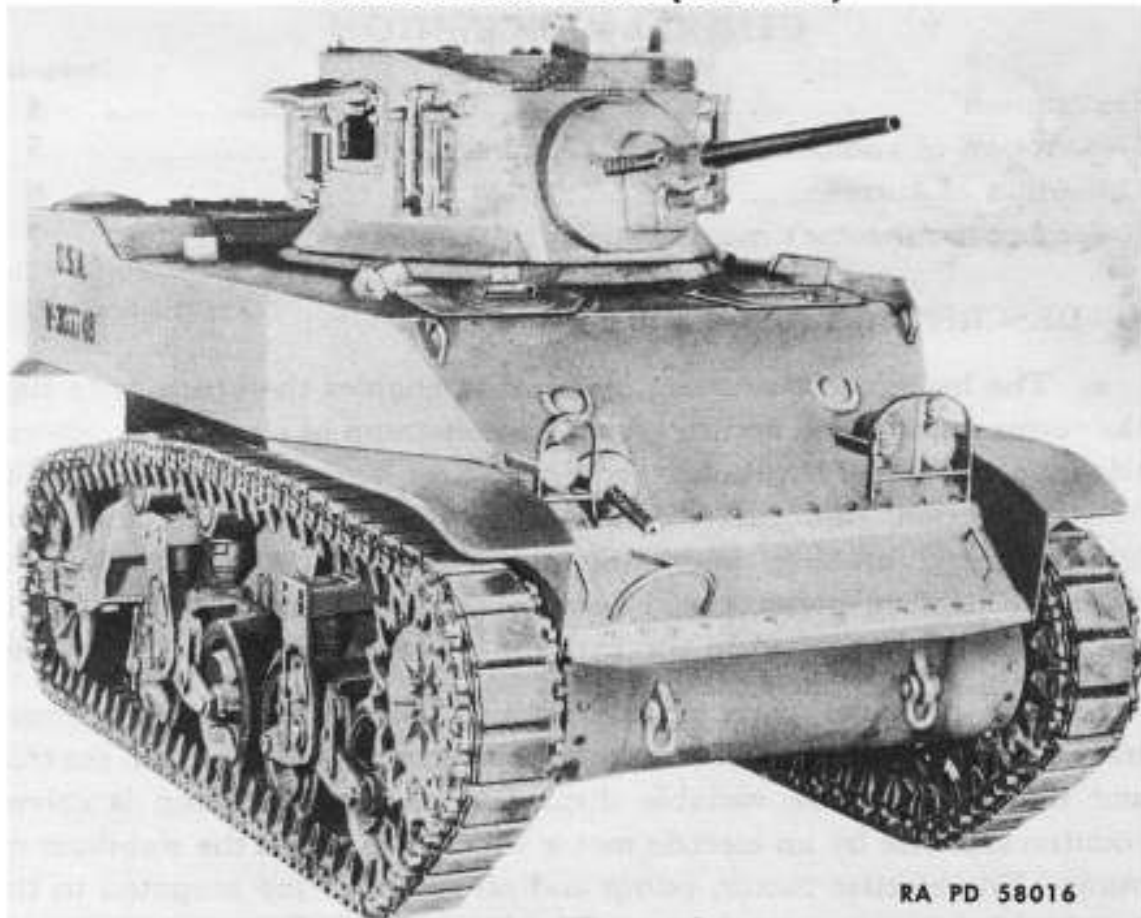
**5. DESCRIPTION OF COMPONENTS.**

a. **Variable Displacement Traverse Pumps (figs. 3 and 73).** Two styles of two-way variable displacement traverse pump are covered in this manual. The type TH-211 (Model 1) traverse pumps D-59737 are

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**Figure 1 — Right Front View Of Vehicle**

covered by Oilgear serial numbers X-40545 to X-45999 (section IV). The improved type TH-211 (Model 2) pumps D-59967 are covered by Oilgear serial numbers X-46000 and up (section X). Each pump is directly connected to an electric motor and supplies controlled fluid power for the turret drive.

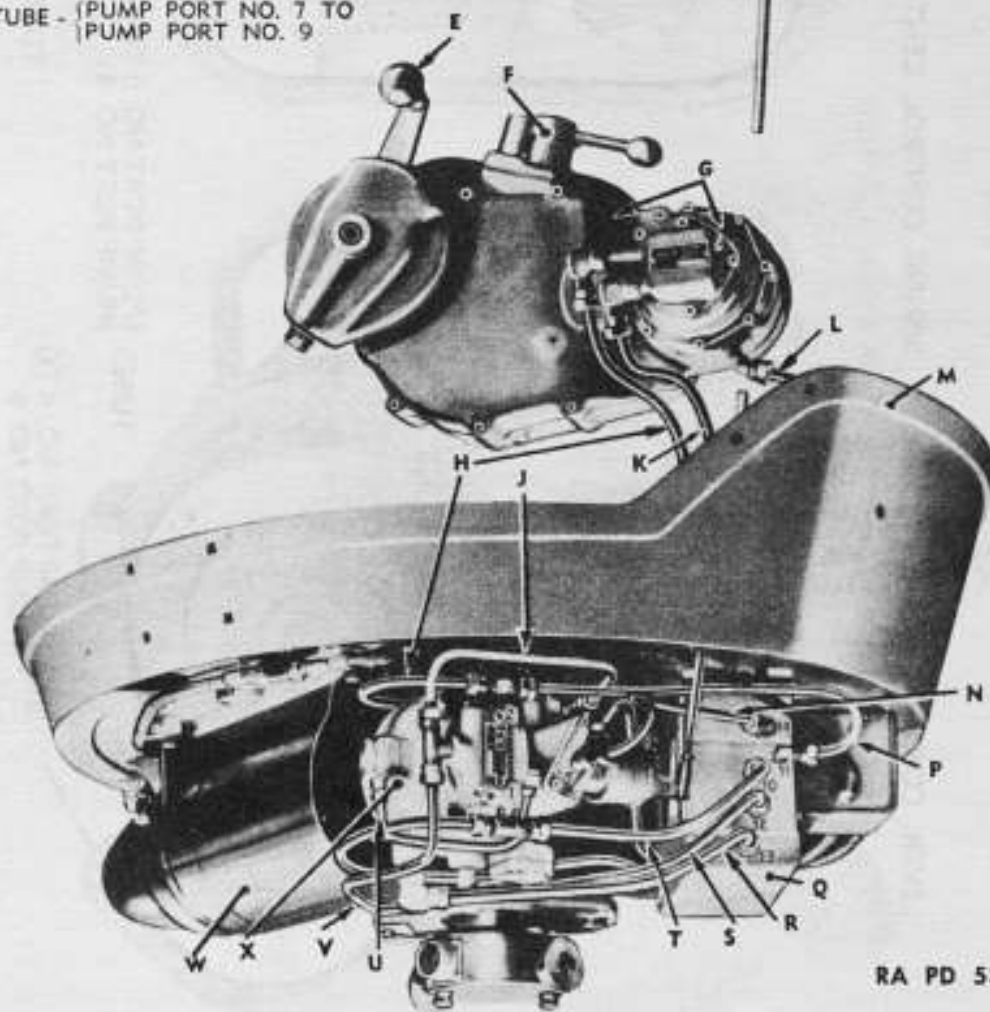
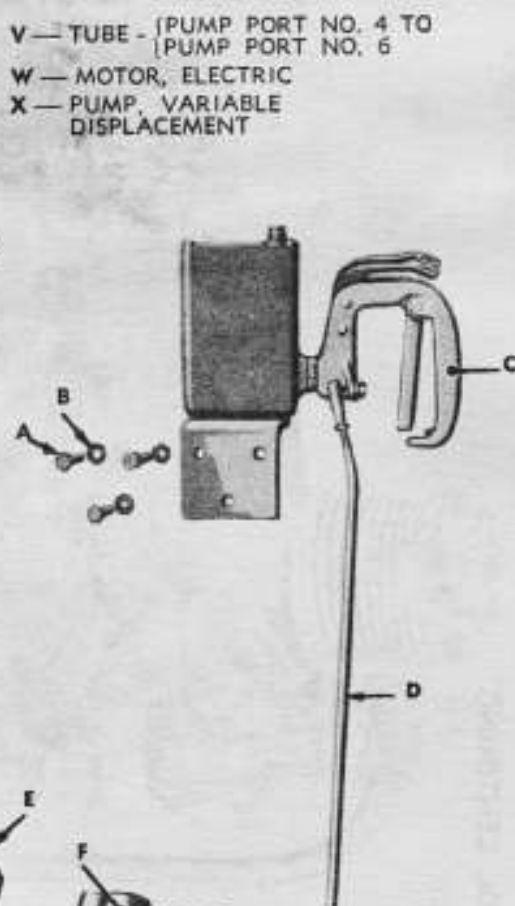
**b. Constant Displacement Traverse Motor (fig. 4).** A type S-211 constant displacement traverse motor D-60068, flanged integral with the gear box and piped to the variable displacement traverse pump, transmits controlled fluid power into a rotary drive for traversing the turret in either direction.

**c. Gear Box (fig. 5).** Interposed between the turret ring gear and hydraulic traverse motor is a gear reducer unit D-59769. Integral with the gear box is a gear shift lever for selecting either the power or hand drive to the turret and a self-locking lever for hand operation of the turret drive.

**d. Control C-105859 (fig. 6).** Both the speed and direction of turret rotation are selected through a control handle connected by a rod to the variable displacement traverse pump. The control handle is spring cen-

## GENERAL DESCRIPTION

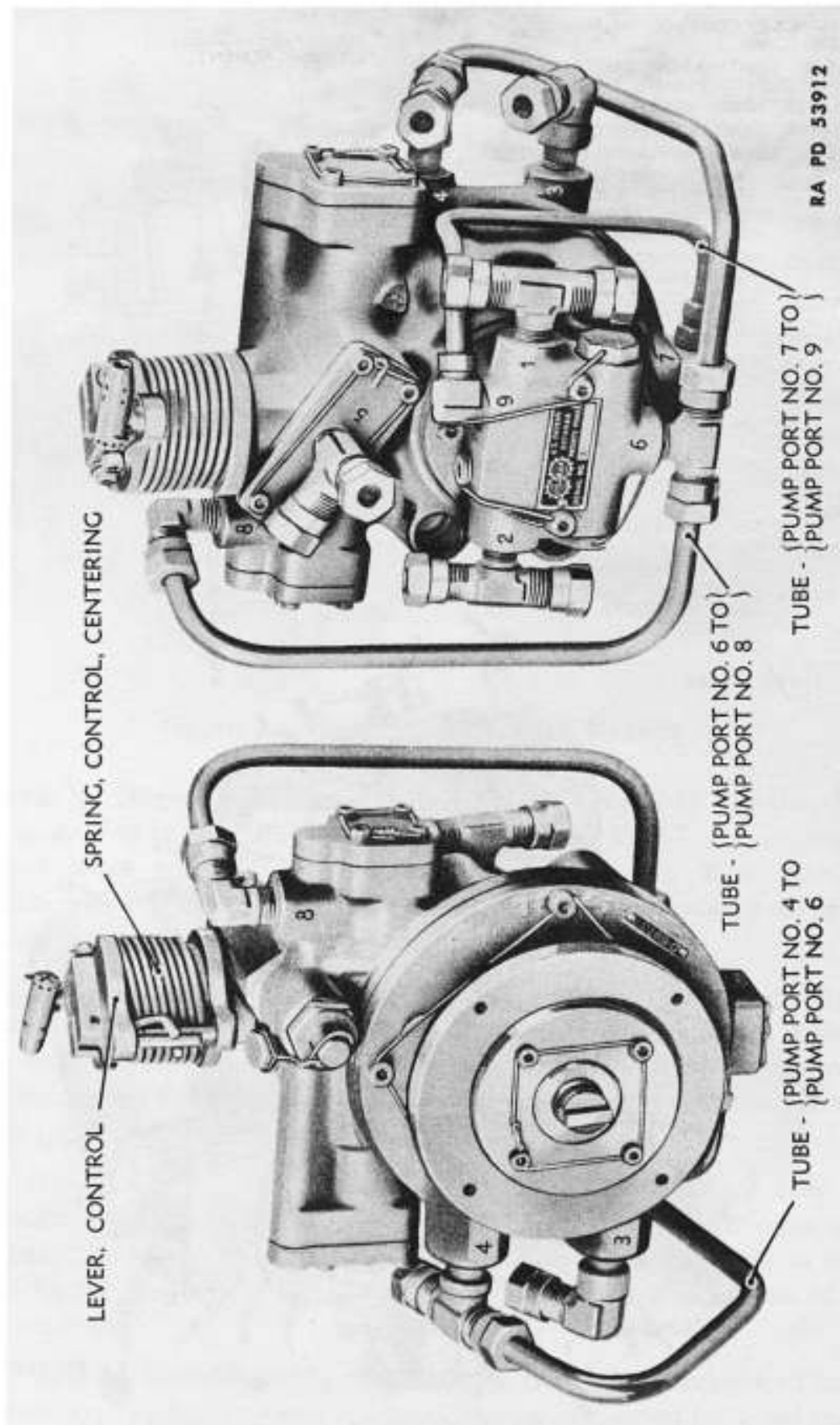
- A — SCREW, CAP  
 B — WASHER, LOCK  
 C — HANDLE, CONTROL, W/FIRING SWITCHES  
 D — ROD, CONTROL CONNECTING HANDLE TO PUMP  
 E — LEVER, HAND OPERATED  
 F — LEVER, GEAR BOX SHIFTER  
 G — BOX, GEAR, W/HYDRAULIC MOTOR  
 H — TUBE - { MOTOR PORT NO. 1 TO  
 PUMP PORT NO. 2  
 J — TUBE - { PUMP PORT NO. 6 TO  
 PUMP PORT NO. 8  
 K — TUBE - { MOTOR PORT NO. 2 TO  
 PUMP PORT NO. 1  
 L — TUBE - { MOTOR PORT NO. 3 TO  
 PUMP PORT NO. 5  
 M — BASKET, TURRET  
 N — TUBE - { PUMP PORT NO. 5 TO  
 OIL POT PORT NO. 14  
 P — TUBE - { PUMP PORT NO. 2 TO  
 OIL POT PORT NO. 11  
 Q — POT, OIL  
 R — TUBE - { PUMP PORT NO. 3 TO  
 OIL POT PORT NO. 13  
 S — TUBE - { PUMP PORT NO. 4 TO  
 OIL POT PORT NO. 12  
 T — TUBE - { PUMP PORT NO. 1 TO  
 OIL POT PORT NO. 10  
 U — TUBE - { PUMP PORT NO. 7 TO  
 PUMP PORT NO. 9



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**Figure 2 — Installation Of Hydraulic Traversing Mechanism —  
 Model 1 Pump**

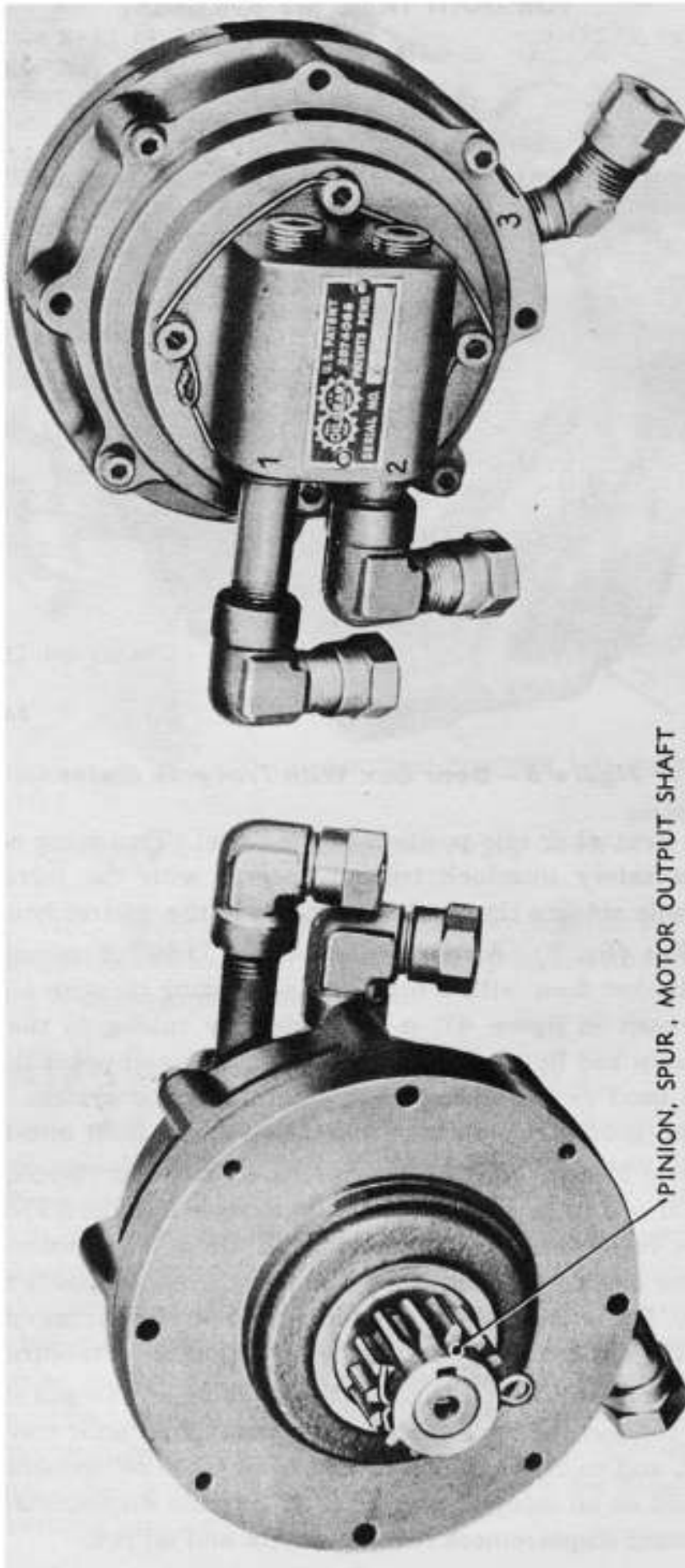
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**Figure 3 — Front And Rear View Of Variable Displacement Traverse Pump — Model 1**



**GENERAL DESCRIPTION**



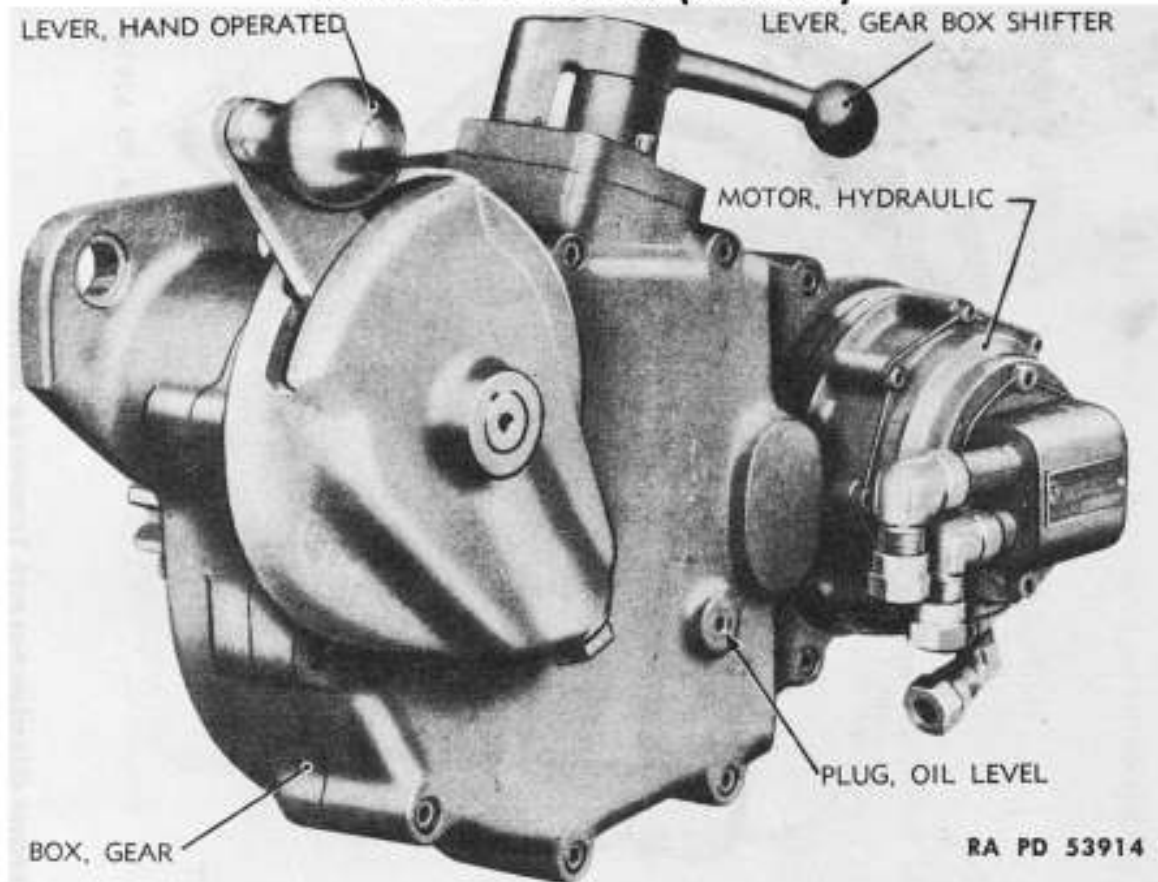
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**Figure 4 — Front And Rear View Of Constant Displacement Traverse Motor**

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**Figure 5 – Gear Box With Traverse Motor**

tered for a neutral or idle position of the turret. Two firing control triggers and a safety interlock trigger integral with the turret traverse control handle actuate three micro switches in the control housing.

**e. Oil Pot (fig. 7).** A rectangular oil pot D-59738, mounted underneath the basket floor with a filler cap protruding through a hole in the floor, as shown in figure 47, is connected by tubing to the hydraulic traverse pump and hydraulic traverse motor. The oil pot is the reservoir for the oil used as the fluid power medium in the system. Both high pressure and gear pump pressure relief valves are built into the oil pot.

**f. Electric Motor.** A Westinghouse direct current, 12-volt, 1.4 horsepower, 1,800 revolutions per minute motor, style number 957817, is used to drive the variable displacement traverse pump. This motor also drives the stabilizer oil pump which is mounted on the end opposite to the traverse pump. For complete maintenance of the electric motor, refer to section XIII, TM 9-1798A, Ordnance Maintenance, Stabilizers.

**g. Tubing And Fittings (fig. 8).** Steel tubing and forged steel fittings are used to connect the hydraulic traverse pump, hydraulic traverse motor and oil pot, and to carry the oil to and from these components. Fittings are furnished as an integral part of each variable displacement traverse pump, constant displacement traverse motor and oil pot.