

DEPARTMENT OF THE ARMY

***OPERATORS'S
MANUAL FOR***

T-62



PRODUCED BY 203d MILITARY INTELLIGENCE BATTALION

CHAPTER I

INTRODUCTION

Section I. GENERAL

1-1 SCOPE

a. This manual is intended only to provide clarification on the most commonly used and encountered systems of the Soviet Medium Tank T-62. Questions concerning malfunctions and deviations from normal operations that occur in systems not explicitly explained in this manual will be directed to the address listed below:

COMMANDER

203~~B~~ MI BN

ATTN: IAM-T-0

Aberdeen Proving Ground, MD 21005-5301

AUTOVON 298-2712/2833

Telephone inquiries can be made to AUTOVON 283-3969/5482. Queries should include the system affected, the nature of the malfunction and/or the symptoms. Photographs of the system and the in-operative area should also be included.

b. This manual contains operator instructions and limited organizational maintenance responsibilities for the Soviet Medium Tank T-62, i.e., lubrication, preventive maintenance checks, and services required.

1-2 FORMS AND RECORDS

a. DA Forms and records used for equipment maintenance will be those prescribed in TM 38-750 for its closest US counterpart (M-60 A1).

b. Records of errors, omissions and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted to the address listed in paragraph 1-1 above.

Section II. DESCRIPTION AND DATA

1-3 DESCRIPTION

a. General. The T-62 series Soviet Medium Tank is a full tracked armored fighting vehicle (Illustrated in figures 1-1 to 1-6). It is a heavily armed combat vehicle designed to currently meet the bulk of Soviet armored forces needs.

This section provides a brief description of and tabulated data for the T-62 and T-62A tanks. The information contained in this section is arranged to cover descriptions of hull and turret components, and tabulated data beneficial to the crew. The tank crew consists of a commander, gunner, loader, and driver.

The primary differences between the T-62 and T-62A tanks are the contour and size of the turret, the removal of the fixed loader's hatch from the T-62 with the addition of a machine gun mount on a

rotating cupola in the loader's hatch of the T-62A, and the thickness of the armor on the top of the turret and engine deck lid.

b. Definition and Locational Terms. The terms "right", "left", "front", and "rear" designate the general areas or sides of the tank as viewed when facing the tank at the engine end.

c. Hull. The hull of the tank is divided into four sections (from front to rear): Driver's compartment, turret compartment, engine compartment and power train compartment. The upper part of the hull has openings for the driver's hatch, and the turret, engine and power train deck lids. An escape hatch is located in the hull floor behind the driver's seat.

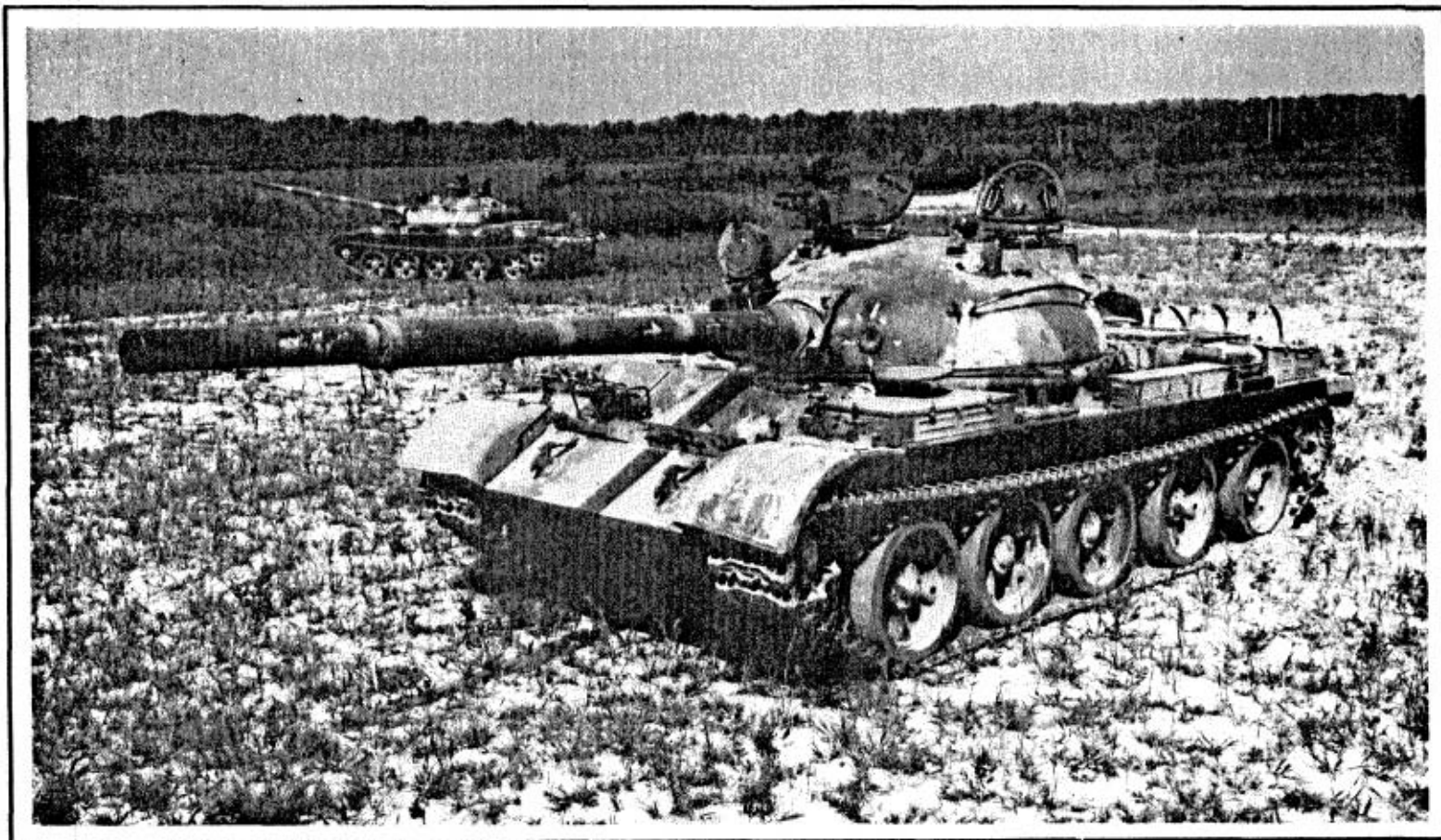


FIG. 1-1 THE T-62A SOVIET MEDIUM TANK

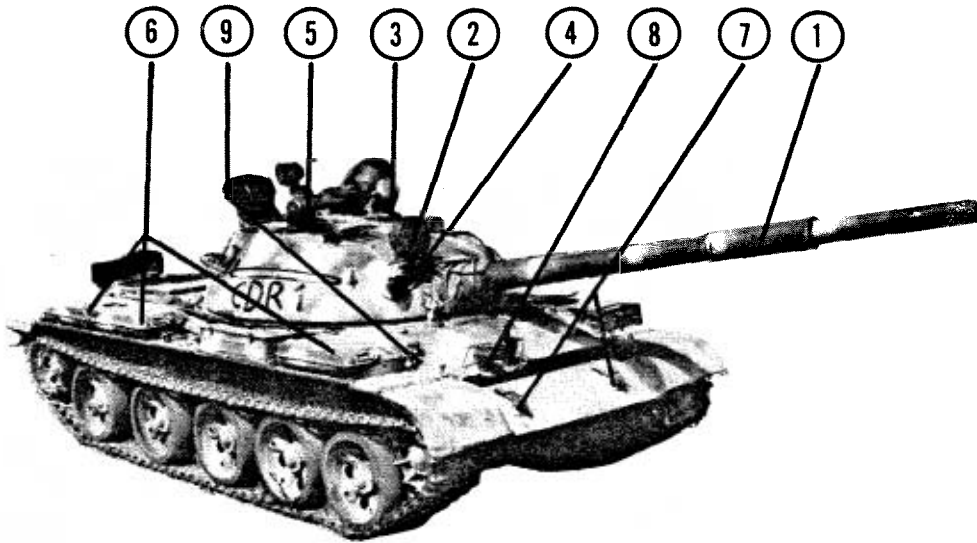


FIG. 1-2. T-62A: RIGHT FRONT VIEW

- 1 BORE EVACUATOR**
- 2 L-2G MAIN SEARCHLIGHT**
- 3 OU-3GK TC SEARCHLIGHT**
- 4 AUXILIARY I.R. DRIVING LIGHT**
- 5 LOADER'S 12.7mm MACHINEGUN MOUNT**
- 6 EXTERNAL FUEL CELLS (3)**
- 7 TOWING HOOKS**
- 8 HEADLIGHT AND I.R. DRIVING LIGHT**
- 9 MARKER LIGHTS**

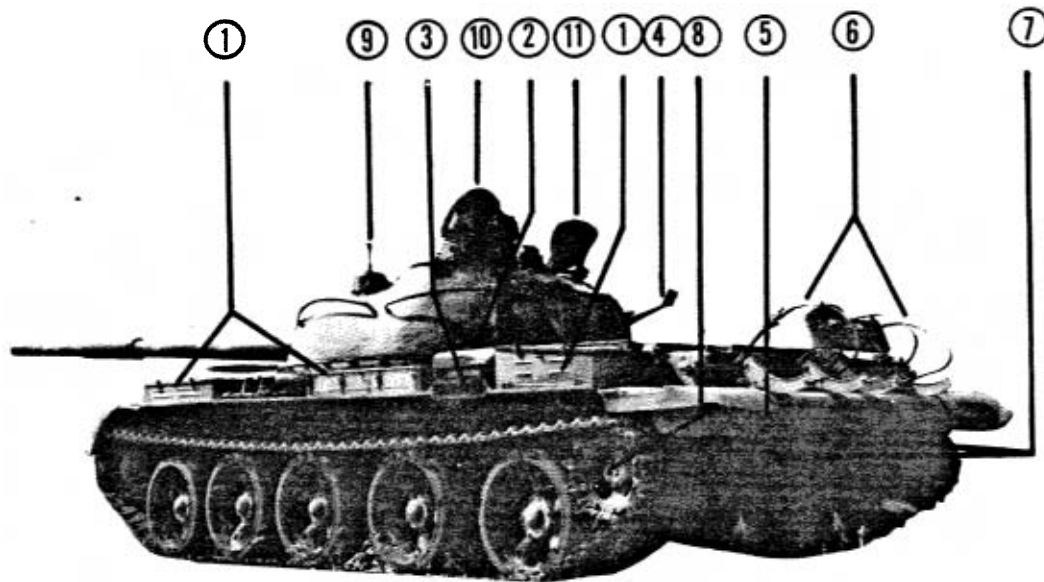


FIG. 1-3. T-62A: LEFT REAR VIEW

- 1 SPONSON BOXES
- 2 SPARE OIL TANK
- 3 EXHAUST PORT
- 4 MACHINEGUN DISMOUNTED STOWAGE MOUNT
- 5 SELF-RETRIEVAL LOG
- 6 SPARE FUEL BARREL STRAPS
- 7 TOWING HOOKS
- 8 DRIVE SPROCKET
- 9 ANTENNA MOUNT
- 10 TC CUPOLA
- 11 LOADERS CUPOLA

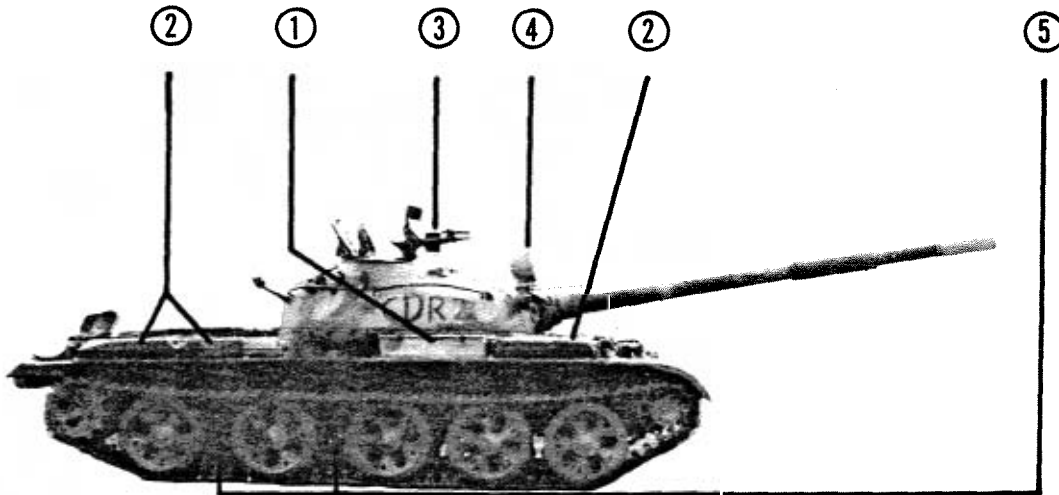


FIG. 1-4. T-62A: **RIGHT FLANK VIEW**

- 1 SPONSON BOX
- 2 EXTERNAL FUEL TANKS
- 3 MACHINEGUN MOUNT
- 4 L-2G SEARCHLIGHT
- 5 ROAD WHEEL SPACING

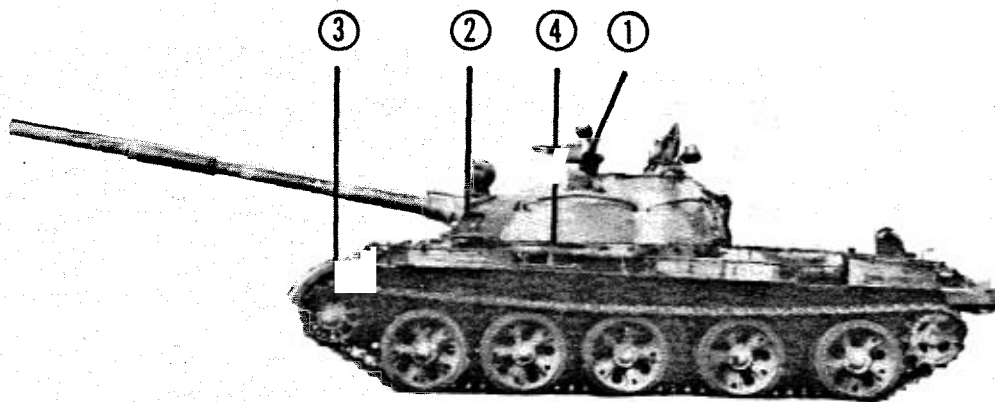


FIG. 1-5. T-62A: **LEFT FLANK VIEW**

- 1 GUNNER'S PERISCOPE HOUSING
- 2 GUNNER'S TELESCOPE PORT
- 3 IDLER WHEEL
- 4 SPARE TRACK BLOCKS

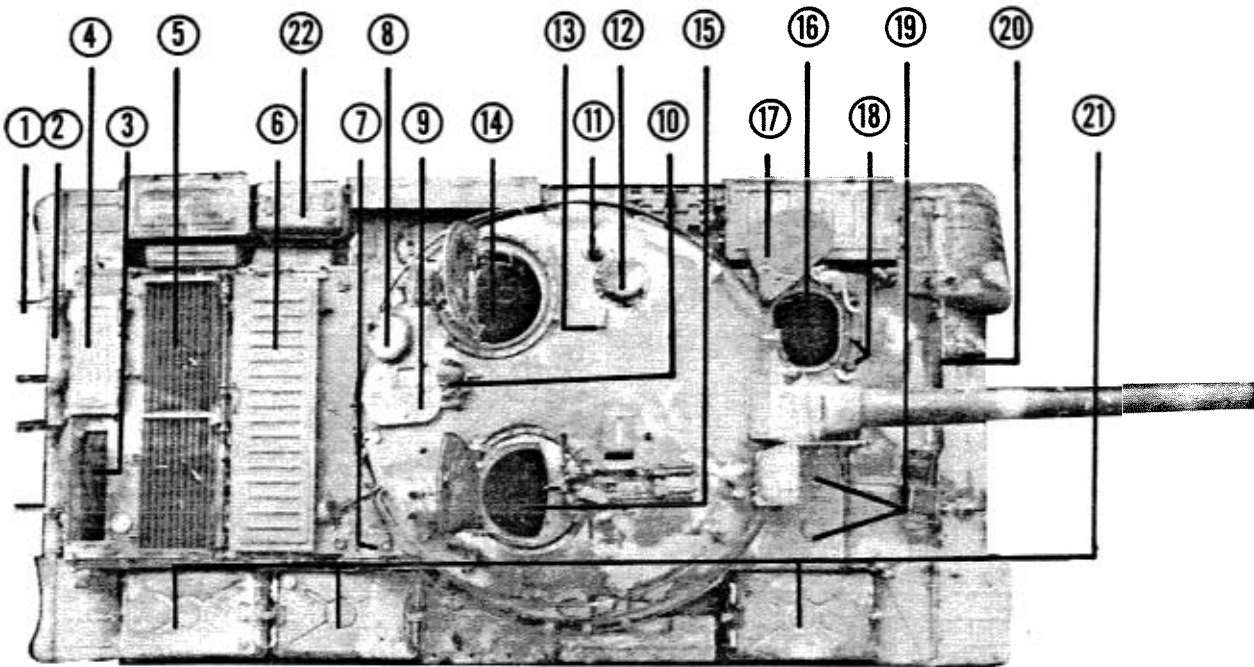


FIG. 1-6. T-62A: **AERIAL VIEW**

- | | |
|---|-------------------------------|
| 1 SPARE FUEL DRUM BANDS | 15 LOADER'S CUPOLA |
| 2 LOG | 16 DRIVER'S COMPARTMENT |
| 3 ENGINE PORT | 17 DRIVER'S HATCH |
| 4 COOLING PORT | 18 DRIVER'S VISION BLOCKS (2) |
| 5 ENGINE LOUVERS | 19 FRONT INTERNAL FUEL CELLS |
| 6 ENGINE LOUVERS COVER FOR SNORKELING | 20 WAVE DEFLECTOR |
| 7 REAR FUEL INTAKE PORT | 21 AUXILIARY FUEL TANKS |
| 8 TURRET VENTILATOR | 22 AUXILIARY OIL TANK |
| 9 SPENT SHELL EJECTION PORT | |
| 10 TURRET IDENTIFICATION LIGHT | |
| 11 ANTENNA MOUNT | |
| 12 ARMORED HOUSING FOR GUNNER'S PERISCOPE | |
| 13 GUNNER'S VISION BLOCK | |
| 14 TANK COMMANDER'S CUPOLA | |

Section II. DESCRIPTION AND DATA

1-3 DESCRIPTION (CONT.)

Four drain valves are located in the hull bottom; one to drain the driver's compartment, one to drain the engine compartment, one to drain the power train compartment, and one to drain the turret compartment. An armored deck lid and a hinged radiator provide access to the top of the power train compartment. Two towing hooks at the rear of the hull as well as two hooks at the front are provided for towing. Storage boxes are provided along both sides of the vehicle for accessories. One headlight is mounted on the front of hull.

(1) Driver's Compartment.

The driver's compartment, situated in the left front of the tank, contains all controls and instruments necessary to operate the tank. These controls and instruments include: steering laterals, a clutch pedal with an air assist lever, a brake, an accelerator, a manual throttle handle, a fuel tank selector valve with hand primer pump, master switch, as well as gauges and other engine, transmission, and turret warning indicators.

A centralized ethylene bromide (DANGER: POISONOUS!) fire extinguisher system utilizing three cylinders located in the engine compartment and power train compartment provides protection against electrical, fuel or oil fires in the engine, power train, or crew compartment. The cylinders are joined by connecting red lines. The system in the engine compartment can be activated automatically by the thermocouple heat sensors in the engine and power train compartment or by the manual control box mounted to the right of the driver's right vision block.

The fighting compartment system can also be activated automatically by sensors or manually by the control box mounted below the vehicle commander's seat near the engine preheater controls.

(2) Turret Compartment.

The turret, which fits into the hull opening, is a one-piece cast homogenous armor steel unit. Openings in the turret accommodate the mounting of the 115mm main gun, the gunner's telescope, the gunner's and loader's periscopes, the 7.62mm coaxial machine gun, the vehicle commander's cupola, the loader's hatch (cupola in T-62A), and the spent shell ejection port. Externally, the turret has a rail welded to it, to which can be attached crew equipment. Internally, the turret has many racks for storage of items like small arms, ammunition, binoculars, spare optical components, rations and canteens.

(a) Armament Components.

The armament components include a 115 mm main gun U5-TS (2A20), a coaxially-mounted 7.62 mm machine gun PKT, and in the case of the T-62A, an externally mounted 12.7 mm anti-aircraft machine gun DShK.

The 115 mm main gun is a hypervelocity smooth-bore weapon that currently fires the fastest HVAPFSDS round in the world at a very flat trajectory. The major components of the gun are the bore evacuator, the gun tube and the breech mechanism. The bore evacuator aids in removing propellant gases from the gun tube out the muzzle end of the gun, thereby reducing the amount of gases in the crew compartment. The tank is ventilated by an electrically-operated ventilator that draws outside air into the turret.

Section II. DESCRIPTION AND DATA

(b) Commander's Cupola.

The commander's cupola is a self-contained unit mounted and secured in the top of the turret. The cupola contains the commander's periscope, TKN-3, and searchlight, OU-3Gk, and the necessary controls to lay the main gun in azimuth (deflection). The cupola has four vision blocks to provide the tank commander with external vision. The loader in the T-62A also has a rotating cupola to which is attached a mount for a 12.7 mm DShK anti-aircraft machine gun. This machine gun can only be fired from outside the tank.

(c) Gun Elevating and Turret Traversing System. The gun elevating and turret traversing system consists of mechanical, electrical and hydraulic components arranged so that only the gunner can elevate or depress (electric/hydraulic) the gun but either the gunner or tank commander can traverse (all electric) the turret 360 degrees in either direction.

The power elevation mode is fully stabilized, but either stabilized or unstabilized power traverse can be used. In case of power failure, the turret can be traversed and the gun elevated manually, but only by the gunner.

(d) Sighting and Fire Control Components. Two types of sighting and fire control components are available for the T-62 or T-62A tank. These types are conventional (daylight) and IR (infrared). The gunner's primary sight is the TSh2B-41u telescope. The telescope features a rotating reticle for the super-elevation required of the different types of ammunition. It has dual magnification and a filter capability as well as an integral lens wiper. It also has a stadiametric range finder.

The gunner's IR sight is the TPN1-41-11 periscope. It is used in conjunction with the main searchlight, L-2G.

The tank commander's sight is the TKN-3. This binocular day/night sight features a stadiametric range finder (day use only) and is coaxially mounted with the tank commander's searchlight, OU-3GK.

The auxiliary sighting and fire control system includes the azimuth indicator and the gunner's quadrant. The azimuth indicator is based on 6000 mils in 360° and has fine and gross needles. The gross adjustment indicator is shaped like the gun in the turret and tells the gunner the precise location of the turret with respect to the hull. The gunner's quadrant is graduated from 2700 to 3800 mils and has a fine adjustment screw for 0-100 mil settings.

(3) Engine Compartment.

Power is supplied by a V-12 (580 HP) water-cooled diesel engine with an injection pump type fuel system. The engine is pressure lubricated. The air cleaner is a three stage canister type that can only be fitted in one sequence.

(4) Power Train Compartment.

(a) Master Clutch.

The master clutch consists of ten driving, nine driven steel discs and a release mechanism.

(b) Transmission.

The transmission is a five speed manual type with five forward gears and one reverse gear. Upshifting and downshifting is accomplished by using the double-clutch procedure.

(c) Steering Clutch.

The steering clutch is a two stage planetary type. The steering clutch transmits torque to the final drives of the vehicles. The steering clutches also serve as brakes for the vehicle.



FIG. 1-7. ENGINE AND POWER TRAIN DECK LIDS

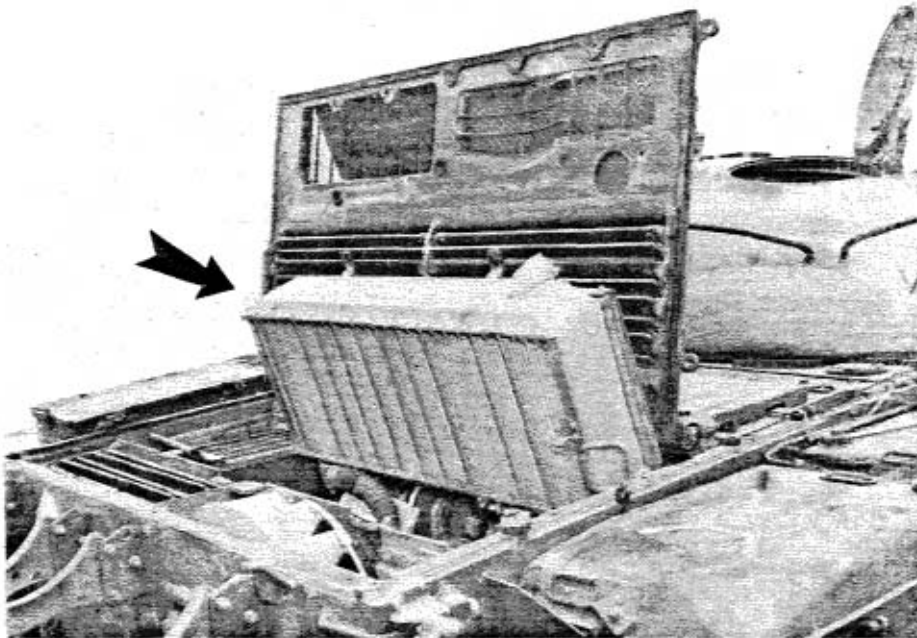


FIG. 1-8. ENGINE RADIATOR

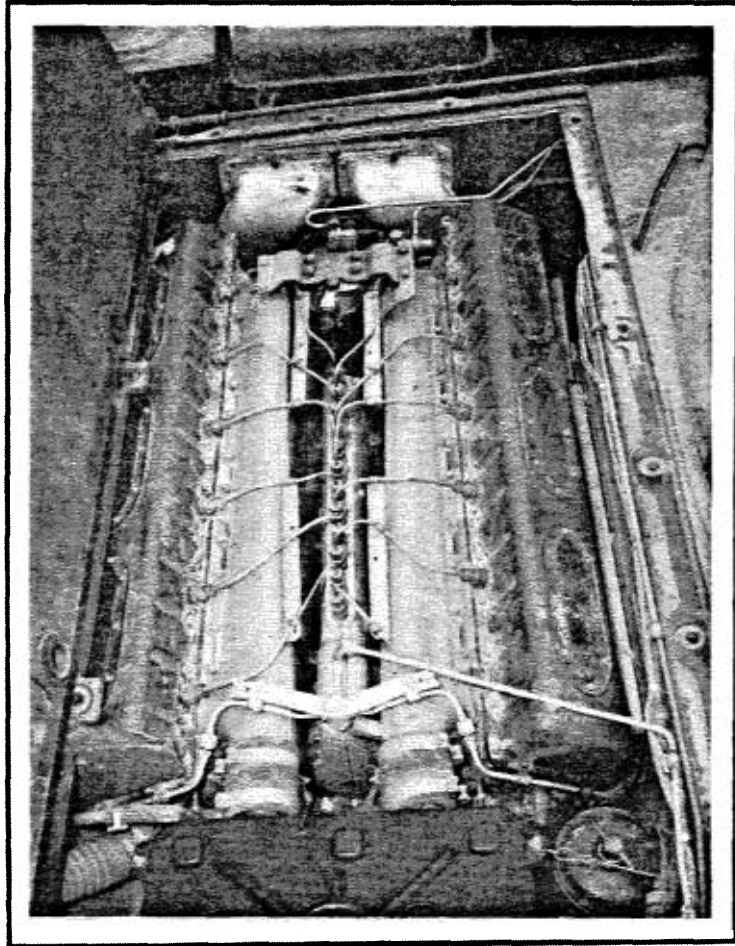


FIG. 1-9. ENGINE, V-12 DIESEL

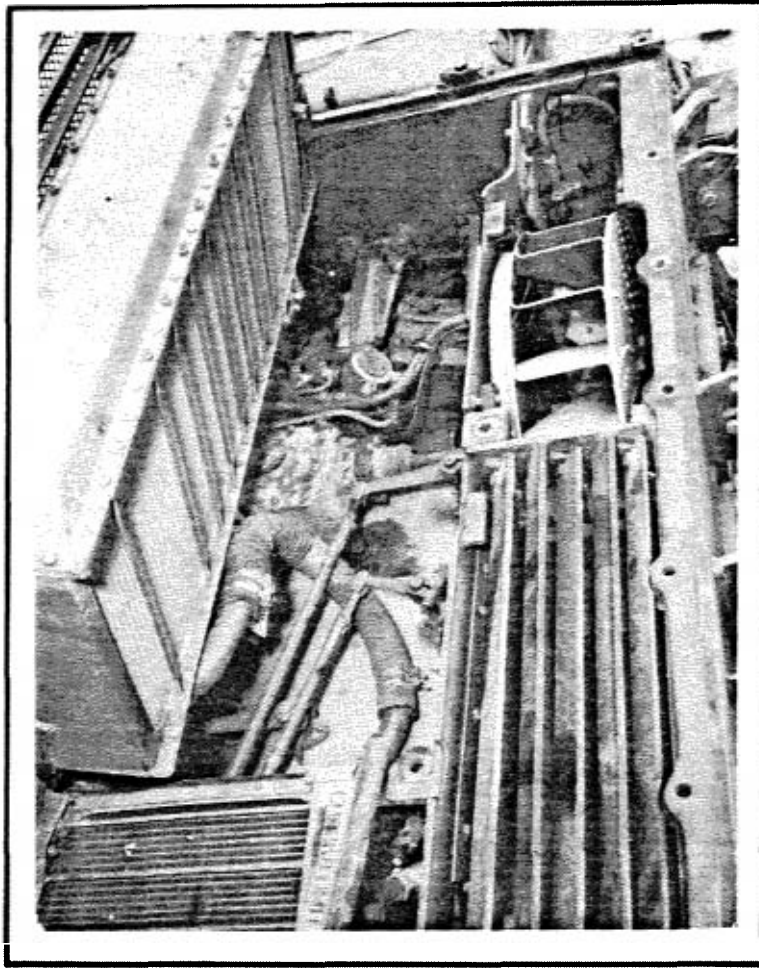


FIG. 1-10. TRANSMISSION AND FAN

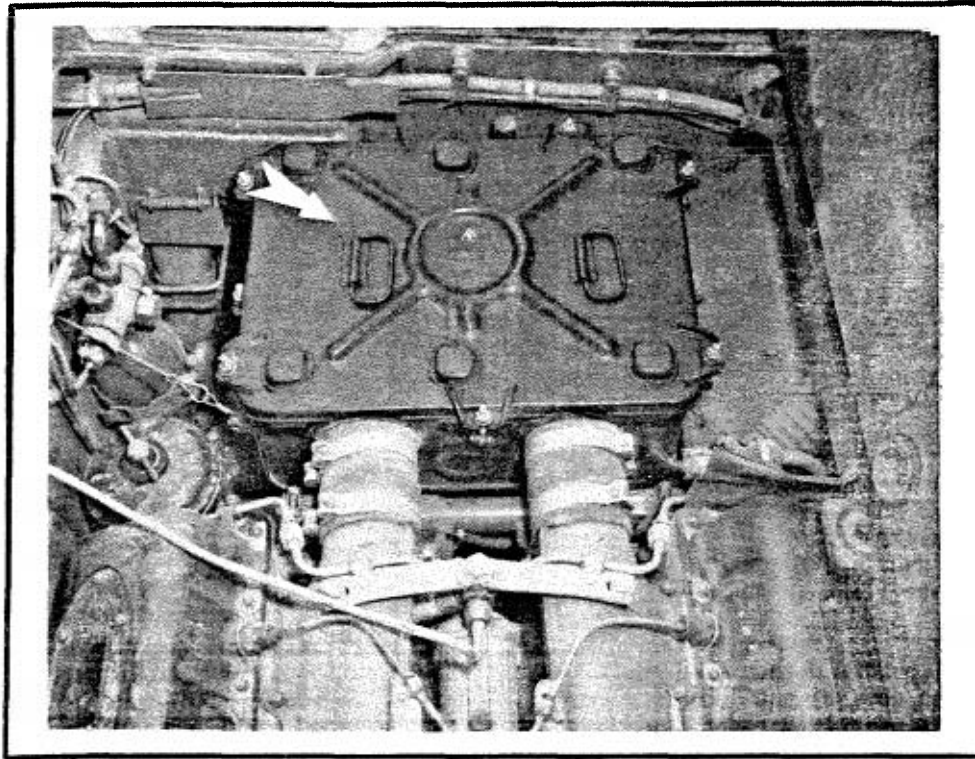


FIG. 1-11. AIR FILTER COMPARTMENT

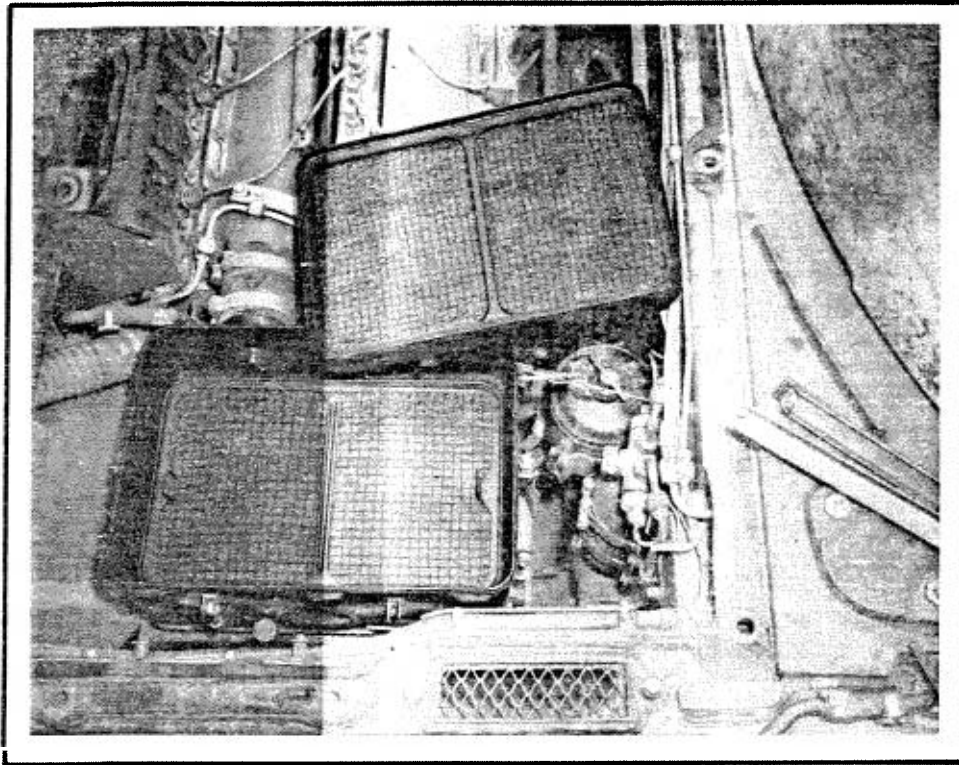


FIG. 1-12. AIR FILTER ELEMENTS

Section II. DESCRIPTION AND DATA

(d) Final Drive.

The final drives are intended for increasing the torque on the drive sprockets. Each final drive is a two-step, step-down reduction gear.

1st gear	14.5 Km/h
2d gear	20 Km/h
3d gear	29 Km/h
4th gear	45.5 Km/h
5th gear	7 Km/h
Reverse	
Maximum on paved road	50 Km/h

d. Track and Suspension.

The tank is equipped with a torsion bar Christie suspension with shock absorbers on the first and last road wheels on each side. The track is an all steel, dead-type that is very strong and wear-resistant. Each side of the suspension system is comprised of 5 road wheels, a compensating idler, and a drive sprocket. The track pins are not secured at their outer end and are free to travel towards the hull. The pin hammer, a raised portion of metal welded to the hull just forward of the sprocket, drives the track pins back into position each time they pass over the sprocket. The center guides of the track ride between the road wheels both above and below. This characteristic makes the track very hard to throw.

c. Operational Data.

(1) Fuel consumption per 100 km travel;

on dirt roads	300-330 l.
on paved roads	190-210 l.

(2) Oil consumption per engine hour
1.5-3.0 l.

(3) Travel distance per tank of fuel;

on paved roads	up to 450 Km
on dirt roads	up to 320 Km

(4) Travel distance with two extra barrels of fuel;

on paved roads	up to 650 Km
on dirt roads	up to 450 Km

1-4 TABULATED DATA

a. General Vehicle.

Combat weight	40 tons
Crew	4
Basic dimensions	
length with gun forward	9335 mm
length with gun rearward	9068 mm
hull length	6630 mm
width	3300 mm
height	2395 mm
clearance	430 mm

b. Travel Speeds (rated at 1800 engine RPM):

d. Surmountable Obstacles.

Maximum grade angle	30°
Maximum lateral bank angle	30°
Ditch width	2.85 m
Wall height	0.8 m
Ford depth	1.4 m
Water obstacle (using snorkel)	
river depth	5.5 m
river width	1000 m

e. Armament

(1) Main Gun

Type	U5-TS (2A20) Smooth bore
Caliber	115 mm

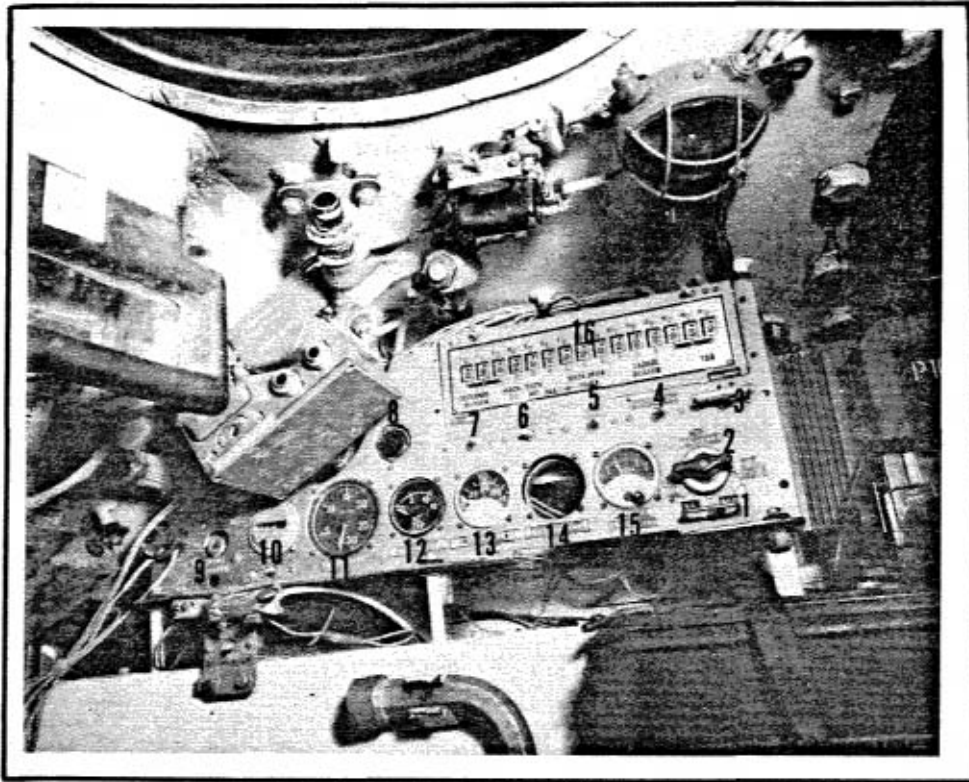


FIG. 2-3. INSTRUMENT PANEL

- 1 BILGE PUMP TOGGLE
- 2 OIL PUMP-AIR START SWITCH
- 3 SMOKE SCREEN SWITCH
- 4 REAR MARKER SWITCH
- 5 I.R. HEADLIGHT SWITCH
- 6 SERVICE DRIVE LIGHT SWITCH
- 7 FRONT MARKER LIGHT SWITCH
- 8 HORN
- 9 ELECTRIC STARTER
- 10 ENGINE HOUR GAUGE
- 11 TACHOMETER
- 12 OIL PRESSURE GAUGE
- 13 OIL TEMPERATURE GAUGE
- 14 WATER TEMPERATURE GAUGE
- 15 VOLTMETER-AMMETER
- 16 FUSE BOX

Section II. DESCRIPTION AND DATA

e. Armament (Cont.).

(a) Maximum sighting range using TSh2B-41U gunner's telescope:

APDS	4000 m
HEAT	3700 m
HE 18	4800 m
HE 11	3600 m

(b) Using TPN-1-41-11 gunner's IR periscope: Sighting range is up to 800 m.

(c) Maximum rate of fire aiming from a standstill is four rounds per minute.

(d) Recoil
 Normal recoil 350-415 mm
 Counterrecoil hydraulic fluid capacity 4.25-4.45 l.
 Recoil limit 430 mm
 Counterrecoil brake fluid capacity (approx) 7 l.

(2) Machine Gun

Type	PKT
Caliber	7.62 mm
Max. effective range using TSh2B-41U sight	2000 m
Max. rate of fire (effective, rds/min)	200-250 rds
No. of rds per belt	250 rds

(3) Ammunition Complement

U5-TS Main Gun	40 rds
PKT (SGMT) machine gun	2500 rds
Fixed-round weight	
APDS	22.5 kg
HEAT	26.2 kg
HE	28.1 kg

f. Aiming and Viewing Instrument.

(a) TKN-3	Day	Night
Power	5X	4.2X
Field of view	10°	8°
Range of view	--	400 m

(b) TSh2B-41U

Power	3.5x and 7x
Field of view	18° and 9°

(c) TPN-1-41-11

Power	5.5
Field of view	6°
Range	800 m with L-2G main searchlight.

g. Driver's Viewing Instrument.

Night Viewing	TVN-2
Power	1x
Field of view	30°
Range of view	60 m

h. Loader's Viewing Instrument.

Day viewing	MK-4 or MK-4S
Field of view, forward	25°
Field of view, rearward	16°

i. Engine.

Engine Model	V-55
Cylinders	V-12
Max. HP at 2000 RPM	580 HP
Max. torque @ RPM (Kgm)	1200-1250 240 Kgm
Cooling	Water
Fuel	Diesel

j. Fuel Supply System.

Fuel used (US)	Diesel #2
Fuel tank capacities	
interior	675 l.
exterior	285 l.
Fuel filter	Coarse and fine

k. Lubrication System.

Oil used (US)	OE-50
System capacity	77 l.
oil tank capacity	55 l.
exterior oil tank capacity	35 l.

l. Cooling & Preheating System.

Coolant capacity	77 l.
Preheater type	injection with electric (primary) and manual (emergency) activation

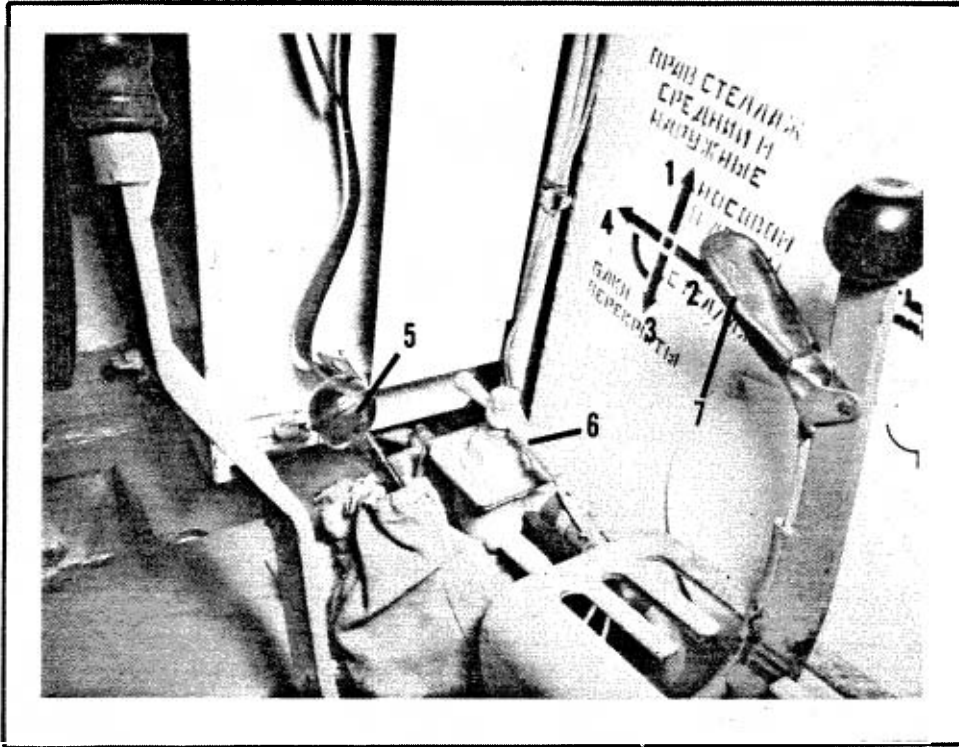


FIG 2-4 FUEL TANK SELECTION LEVER

- 1 EXTERNAL AND REAR CELL**
- 2 FRONT FUEL CELLS**
- 3 ALL CELLS**
- 4 OFF**
- 5 PURGE PUMP AIR BLEEDER HANDLE**
- 6 LEVER ARROW**
- 7 GEAR SHIFT GATE RELEASE**

Section II. DRIVER'S CONTROLS AND INSTRUMENTS

2-8 PURGE PUMP (Fig. 2-4)

The purge pump is used in conjunction with the air bleeder button to purge air from the fuel lines before starting the vehicle. By pumping the purge pump and depressing the air bleeder button, air is removed from the fuel line. This is done ordinarily when the tank has not been operated for several weeks.

2-9 GYRO COMPASS (Fig. 2-5)

This tank has an organic land navigation system of which the gyro compass is a component. It is used for azimuth direction and enables the driver to follow an assigned direction by observing the gyro compass.

2-10 FUSE BOX (Fig. 2-3)

The fuse box is located on the instrument panel above the toggle switches.

2-11 SLAVE RECEPTACLE (Fig. 2-2)

This is used to provide external current to start the tank when the batteries are discharged or the air pressure in the compressed air bottles is too low to start the vehicle.

2-12 BATTERIES (Fig. 2-2)

There are 4 lead-acid batteries connected in series in the storage chamber beneath the instrument panel. They provide a 24 volt circuit when the engine is off, and 26.5-28.5 volts when the engine is running.

2-13 SPEEDOMETER (Fig. 2-5)

The speedometer is a mechanical gauge that indicates vehicle speed in kilometers per hour. An odometer in the dial's lower center indicates the aggregate kilometers travelled.

2-14 HAND THROTTLE (Fig. 2-13)

The hand throttle located on the left hull wall is used to set the engine idling speed. By pushing in on the block knob, the lever can be moved up and down. Moving the lever all the way up shuts down the engine--moving it down, sets the engine idle progressively higher. This handle is used to set the idle to the recommended rpm after starting the vehicle.

2-15 STEERING LATERALS (Fig. 2-5)

The steering laterals are a two-stage planetary type with interlocking clutches. These laterals are used to turn, slow or stop the tank when it is moving on land. These laterals have three positions: The "0" position when the laterals are fully forward, the "1" position when the laterals are nearly vertical and the "2" position when the laterals have been pulled as far to the rear as they will go. The "0" position is used when the vehicle is operating normally and moving in a straight line. The "1" position is a gear reduction that applies maximum power to the tracks but slows the tank's overall speed. The "2" position is an additional means of braking the vehicle.

2-16 ACCELERATOR PEDAL (Fig. 2-5)

The accelerator pedal provides fuel to the engine during vehicle operation. Depressing the accelerator provides maximum fuel to the engine. By releasing the accelerator pedal and moving the hand throttle up all the way, the tank is shut down.

2-17 BRAKE PEDAL (Fig. 2-5)

The brake pedal is the primary means available to the driver for slowing or stopping the tank. Use of the brake pedal is preferred for braking the tank rather than the steering laterals' "2" position. Never depress the brake pedal for sustained periods of time.

Section II. DRIVER'S CONTROLS AND INSTRUMENTS

2-18 PARKING BRAKES (Fig. 2-5)

The parking brake rod is located between the brake and clutch pedals. By depressing the brake pedal and pulling back on the parking brake rod until it engages the brake pedal, the tank can be braked for parking. Push down on the brake pedal to release the park brake rod.

2-19 CLUTCH PEDAL (Fig 2-5)

The clutch is a multiple-disc dry-friction, steel-on-steel type and is one of the most vulnerable parts of the T-62/T-62A. The air-assist lever is on the mid-left arm of the clutch pedal (Figs. 2-6/2-7). This lever is used to provide compressed air-assisted clutch operations when shifting to reduce clutch wear. The air-assist can be engaged by pushing the lever to the left. This clutch pedal engages and disengages the master clutch when released and depressed.

NOTE: NEVER START THE VEHICLE WITH THE AIR-ASSIST LEVER TO THE LEFT. SEE PARAGRAPH 2-24 FOR USE OF THE AIR-ASSIST LEVER WHEN SHIFTING.

2-20 GEAR SHIFT LEVER (Fig. 2-5)

The gear shift lever, located to the driver's right side, can engage five-forward speeds and one reverse speed. The gear selection lever has a gate release which permits engagement of 2d, 3d, 4th and 5th gears. The gate release is not applied when engaging 1st or reverse gear (Fig. 2-4).

2-21 DRIVER'S AUXILIARY EQUIPMENT

a. Communications (Fig. 2-2) A US intercom junction box has been provided for crew communication when operating the tank.

b. Compressed Air Bottles (Fig. 2-8)

Two 5-liter compressed air bottles are mounted on brackets on the left hull wall behind the driver. They each have a handle valve. Rotate the valve clockwise to close the system and counter-clockwise to open the system. The valves are always left closed until preparing to start the tank. The compressed air gauge (Fig 2-8) displays the pressure in kg/cm² (atmospheres) that the system contains. A minimum of 50 atmospheres is required to start the vehicle with compressed air. The maximum permissible bottle capacity is 150 atmospheres.

c. Driver's Hatch (Fig. 2-9) The driver's hatch has three possible positions: Closed, open-and-up and open-and-down. To lock the driver's hatch in the closed position, pull out on the hatch lever and rotate it to the right. Place the lever in a perpendicular position to the driver's hatch shaft and rotate the lever and hatch back towards the compressed air bottles. Push the handle down and towards the hull wall until it locks (Fig. 2-12). This closed position is used whenever the turret is placed in power operation. The hatch has a microswitch that will not complete the electric circuit of the turret unless the hatch is closed (see paragraph 3-11). To put the hatch in the open-and-up position, pull out and rotate the hatch handle, moving it on a horizontal axis towards the front of the tank until the pin catches in the hole (Fig. 2-11). To put the hatch in the open-and-down position, proceed as for the open-and-up position. Upon reaching the position where the pin would engage the hole, rotate the handle along the left hull from the front of the tank to the rear until it engages as it did for the closed position (Fig. 2-10). This position is recommended for maximum safety whenever the tank is driven with the hatch open.

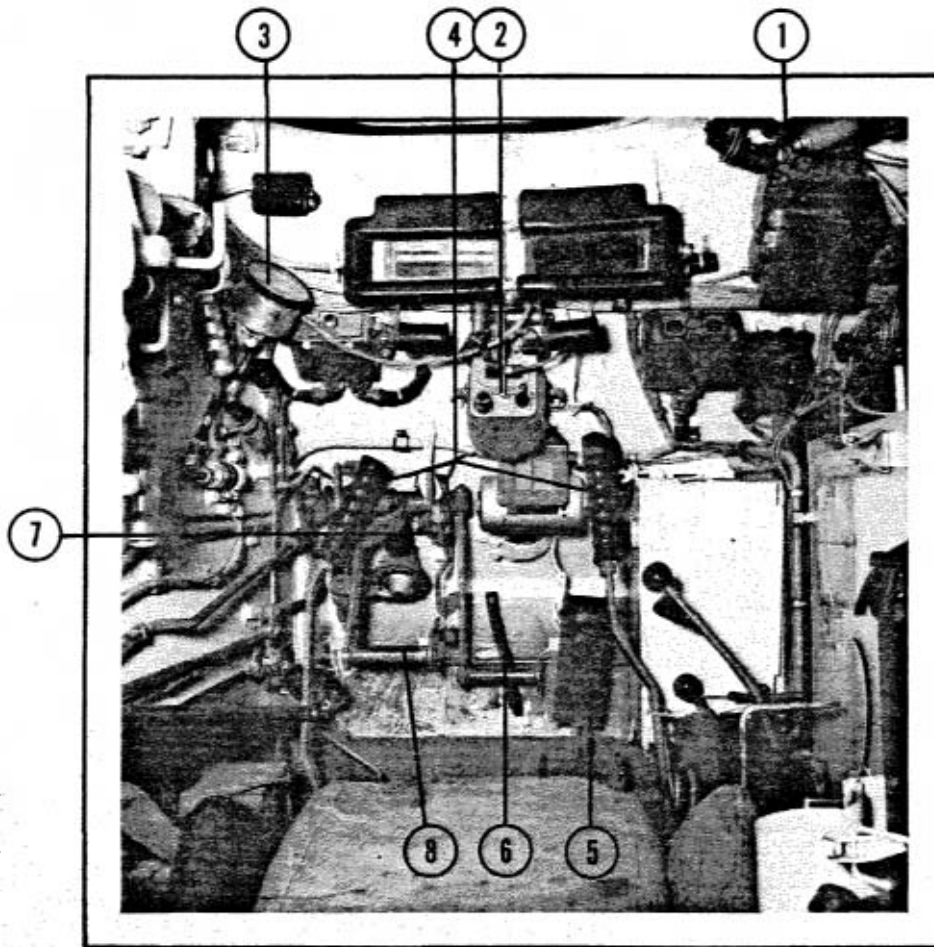


FIG. 2-5. DRIVER'S COMPARTMENT

- 1 PURGE PUMP AIR BLEEDER BUTTON**
- 2 GYRO COMPASS**
- 3 SPEEDOMETER**
- 4 STEERING LATERALS**
- 5 ACCELERATOR PEDAL**
- 6 BRAKE PEDAL**
- 7 PARK BRAKE**
- 8 CLUTCH PEDAL**
- 9 GEAR SHIFT LEVER**

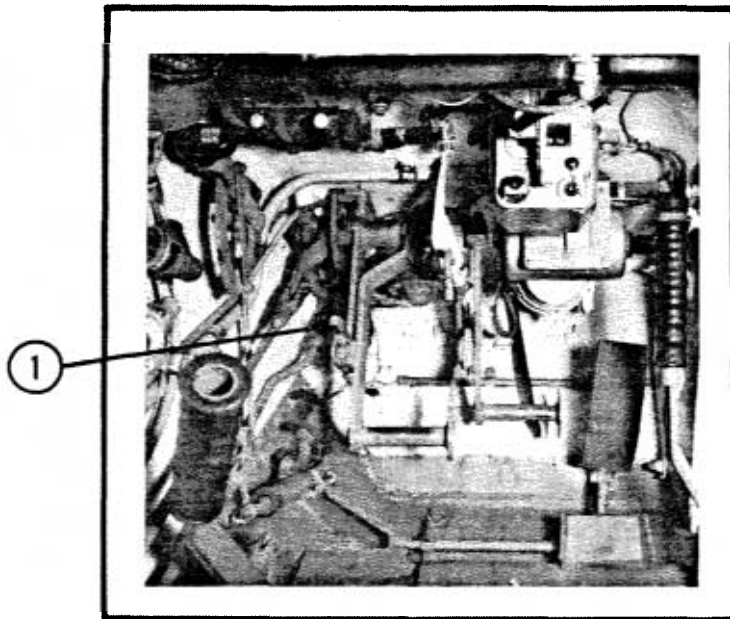


FIG. 2-6. MECHANICAL CLUTCH

- 1. AIR CLUTCH ENGAGEMENT LEVER
- 2. HAND THROTTLE

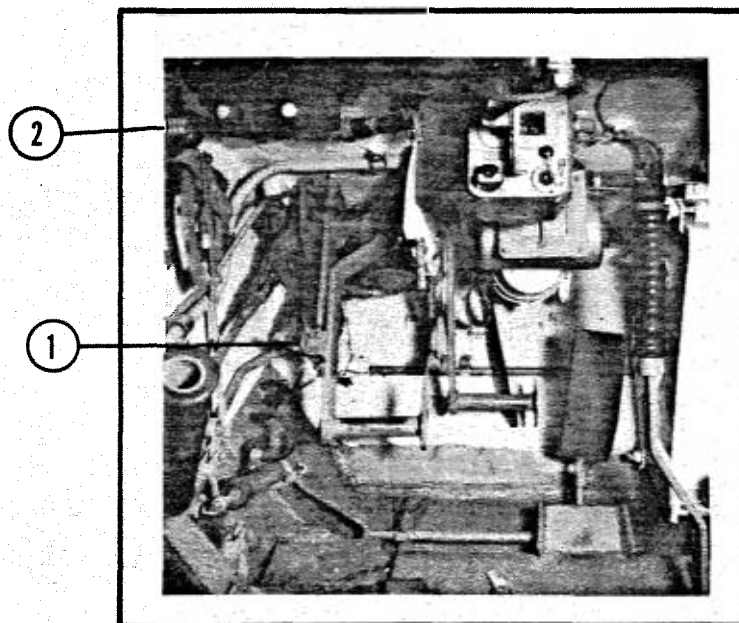


FIG. 2-7. AIR CLUTCH

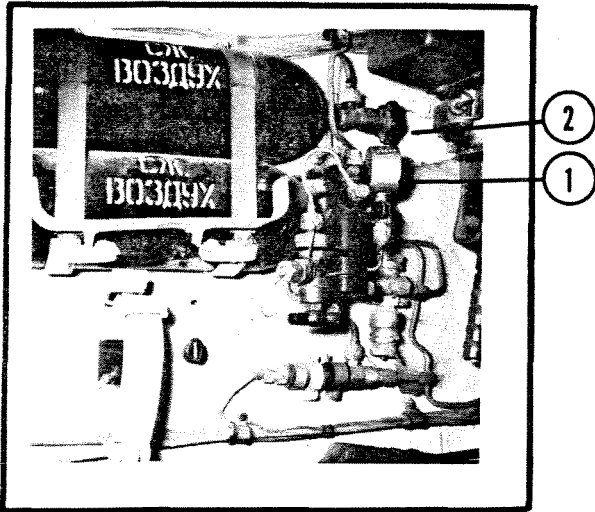


FIG. 2-8. AIR BOTTLES

- 1. GAUGE
- 2. VALVES

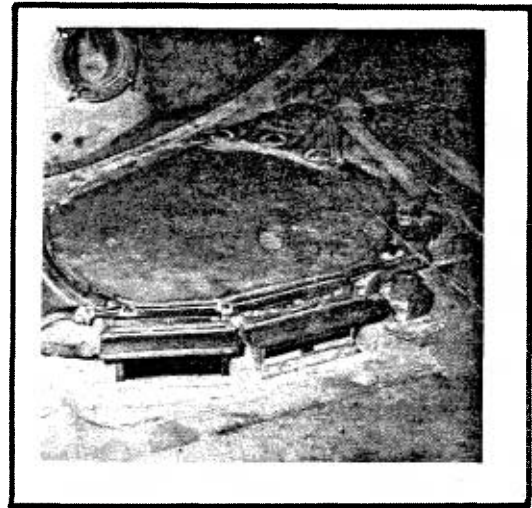


FIG. 2-9. DRIVER'S HATCH

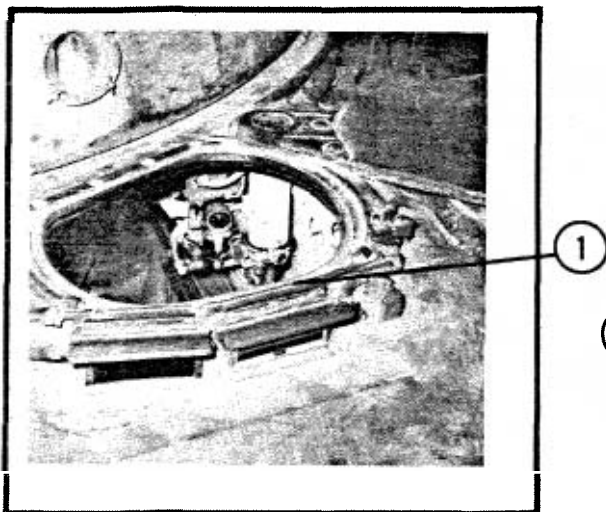


FIG. 2-10. OPEN-AND-DOWN

- 1. HANDLE

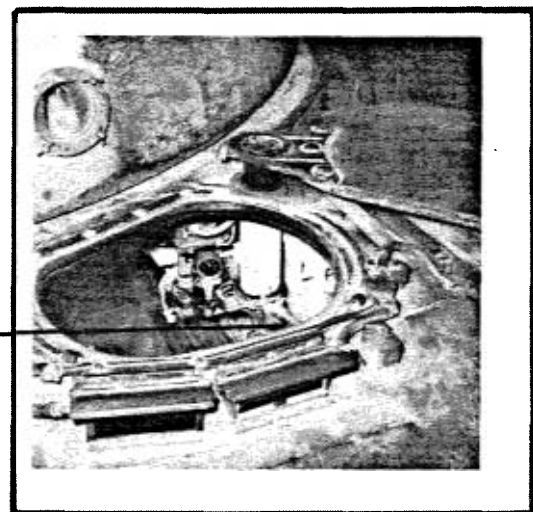


FIG. 2-11. OPEN-AND-UP

- 1. HANDLE

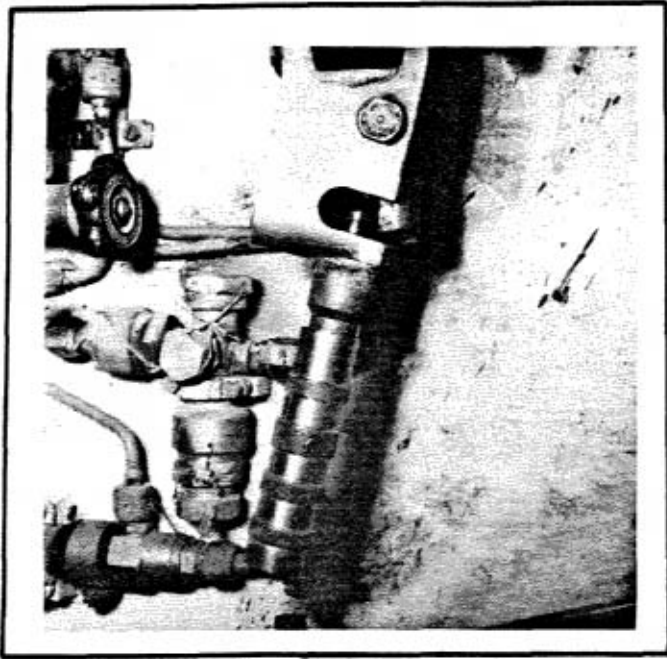


FIG. 2-12. HATCH HANDLE

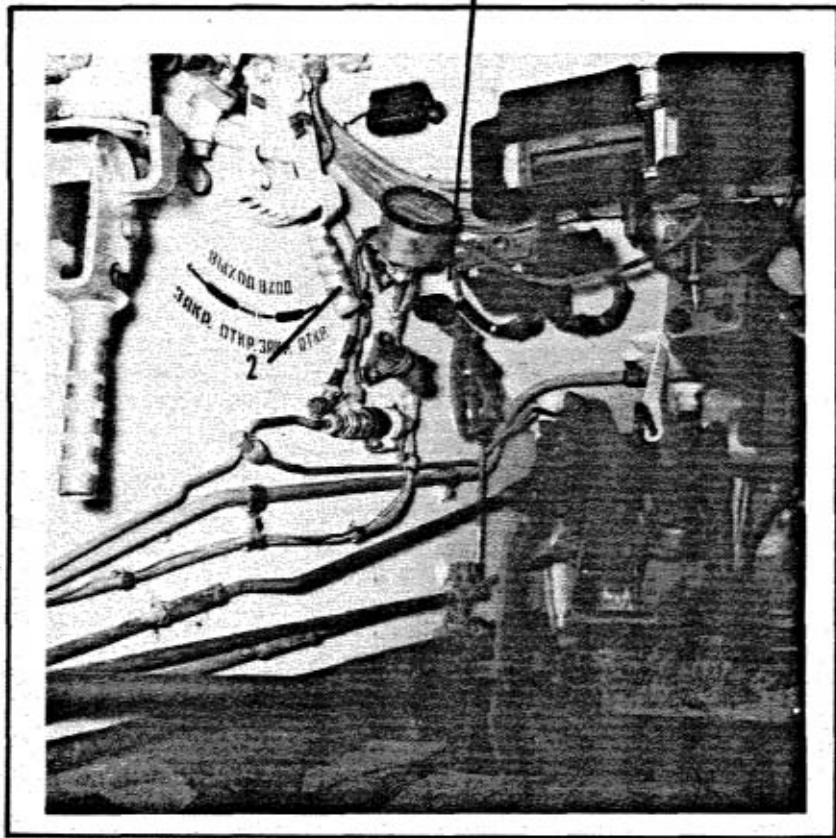


FIG. 2-13 DRIVER'S COMPARTMENT

- 1 HAND THROTTLE
- 2 ENGINE COVER HANDLE

Section II. DRIVER'S CONTROLS AND INSTRUMENTS

d. Engine Cover Handle (Fig. 2-13) The engine cover handle, located to the driver's left on the hull wall, is used to close the engine covers when the tank is snorkeling. These covers prevent water from seeping into the engine compartment. There are two positions; open, when the handle is toward the tank bow; and closed, when the handle is towards the tank rear. The tank should always be operated with the engine covers open.

e. Vision Blocks (Fig. 2-14) The driver has 2 vision blocks to aid him when driving with his hatch closed. There are two defroster cables connected to the vision blocks (Fig. 2-15) that can defrost the blocks when turned on (Fig. 2-21). To remove the blocks, rotate the white mounting rod (Fig. 2-14) and pull down on the vision block handle. The vision blocks can be cleaned with compressed air and cleaning fluid from a reservoir (Fig. 2-16) by depressing the push button on the right lateral hand grip (Fig. 2-14).

f. TVN-2 Infrared Periscope (Fig. 2-17) The driver has the TVN-2 IR periscope for night driving. The left vision block is removed and the TVN-2 mounted in its place. The IR power cable from the BT-6-26 power supply is connected to the TVN-2 and when the switch on the BT-6-26 is placed in the "ON" position, the TVN-2 will illuminate. This periscope has an unaided range of 60 meters.

g. Dome Lights (Figs. 2-18/2-19) There are several dome lights available to the driver to illuminate his compartment. The main dome light near the instrument panel will generally illuminate the driver's compartment even if the master is off. There are two lights that illuminate the driver's instrument panel and speedometer. They work with a 3-position toggle switch with the center position for all lights off, right position for dim, and left position for bright.

h. Fire Extinguisher Control Box (Fig. 2-20) The fire extinguisher control box on the hull ceiling near the instrument panel operates the organic T-62 fire extinguisher system. It has two red check

lamps that will glow to indicate an operational system when the master switch is on. There is a small check window on the left panel front that reveals the number of fire extinguisher bottles still full. It should read "3". There are two metal covers on the panel front. The left cover conceals the resetting mechanism for the number of extinguisher bottles. The right cover (Fig. 2-20) conceals two push buttons and a toggle switch. The toggle switch selects either automatic or manual operation of the system. The push buttons activate fire extinguisher bottles for the turret or the engine compartment. NOTE: The mixture used in the fire extinguisher bottles is extremely toxic. All crew members must exit the tank when this system is used.

i. Escape Hatch The escape hatch is behind the driver and below the gunner's feet. The hatch is lifted up and into the tank rather than dropped from the tank.

j. Turret Warning Lights (Figs. 2-18/2-19) There are two warning lights in the driver's compartment that illuminate to warn the driver when the gun tube is over or beyond either fender. The right warning light illuminates when the gun tube extends beyond the right fender; the left warning light illuminates when the gun tube is beyond the left fender.

k. KUV-3 Ventilator Control Box (Fig. 2-21) The KUV-3 ventilator control box under the driver's right vision block has 2 push buttons that turn the turret ventilator on or off. The button on the left starts the ventilator and the right button turns it off.

l. KRP-1 CBR Relay Box (Fig. 2-22) The KRP-1 CBR relay box under the driver's left vision block performs a variety of functions related to the PAZ CBR system on the T-62. Since the PAZ system is not present on the T-62 tanks available for training, it is strongly recommended that this relay box be disregarded. Otherwise, activation of the system will automatically seal certain parts of the tank.

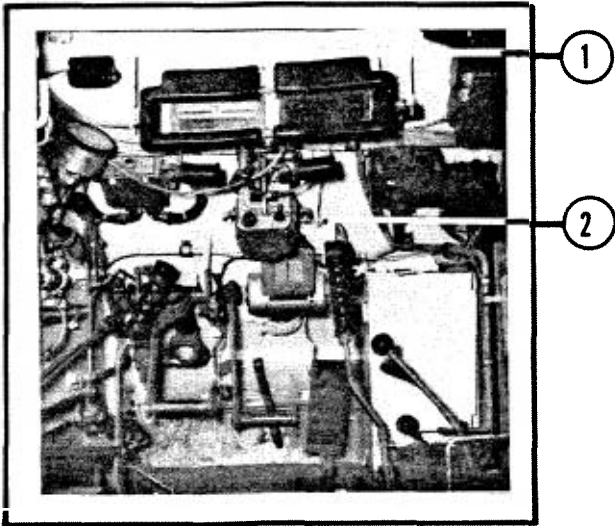


FIG. 2-14. DRIVER'S AREA

- 1 PERISCOPE MOUNTING RODS
- 2 PERISCOPE AIR-WATER CLEANER BUTTON

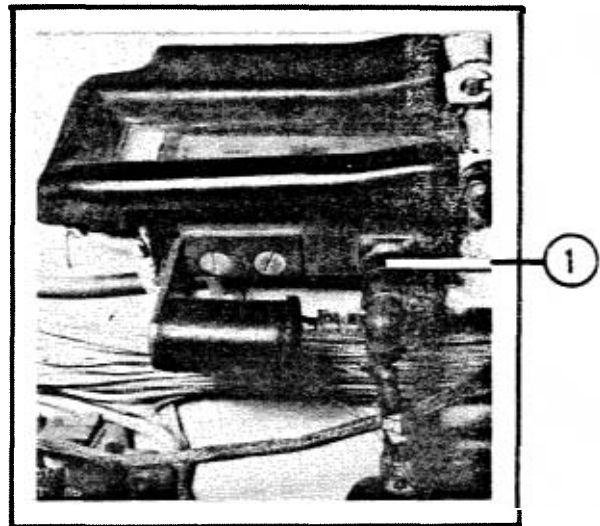


FIG. 2-15. VISION BLOCK
DEFROSTER CABLE

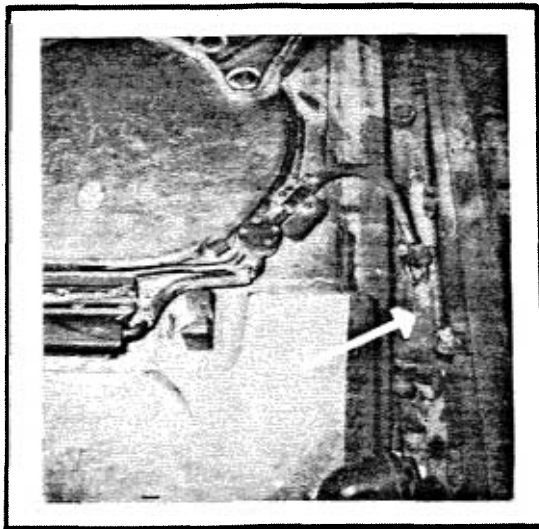


FIG. 2-16. VISION BLOCK
WASHER RESERVOIR

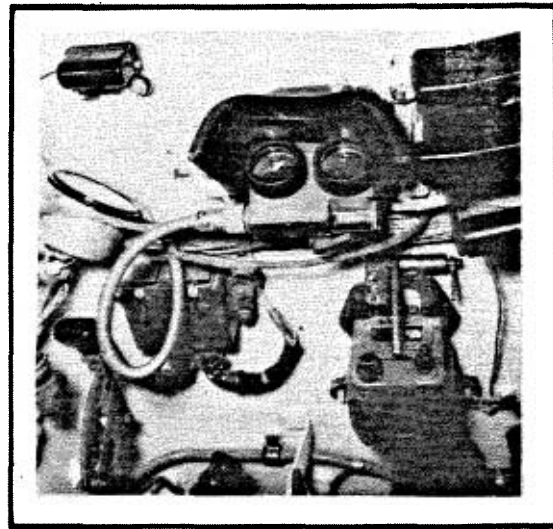


FIG. 2-17. TVN-2 I.R. PERISCOPE

- 1 INSTRUMENT LIGHTS
- 2 DOME LIGHT
- 3 TURRET WARNING LIGHT
- 4 PURGE PUMP
AIR BLEEDER BUTTON

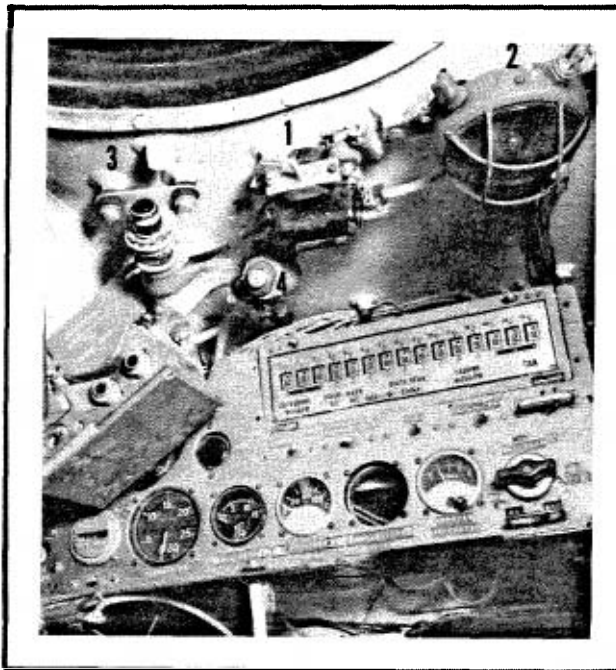


FIG. 2-18. COMPARTMENT LIGHTS

- 1 INSTRUMENT LIGHT
- 2 WARNING LIGHT

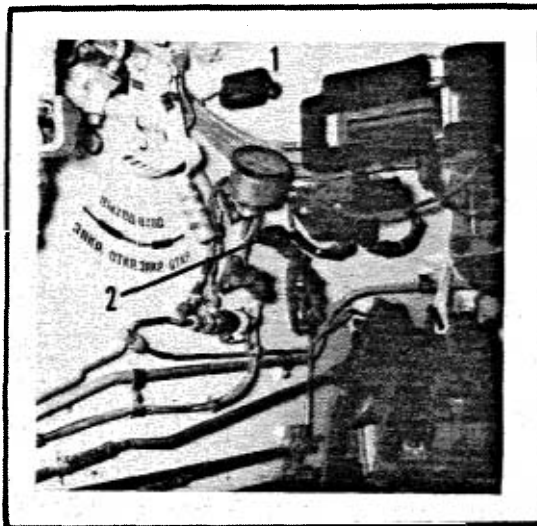


FIG. 2-19. SPEEDOMETER LIGHT

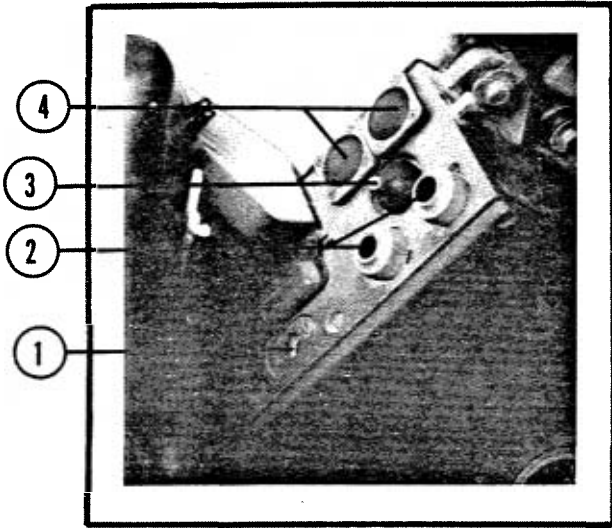


FIG. 2-20. FIRE EXTINGUISHER
CONTROL BOX

- | | |
|--------------|----------------------|
| 1 WINDOW | 3 AUTO-MANUAL TOGGLE |
| 2 RED LIGHTS | 4 PUSH BUTTONS |

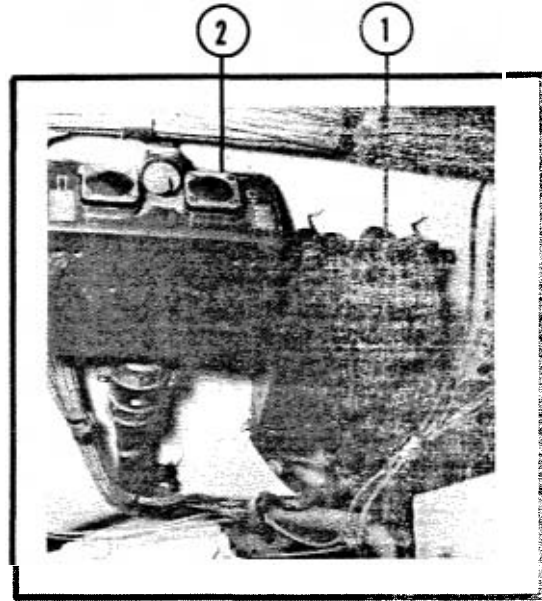


FIG. 2-21. HULL VENTILATOR
CONTROL BOX

- | |
|-----------------------|
| 1 PERISCOPE DEFROSTER |
| 2 VENTILATOR BOX |

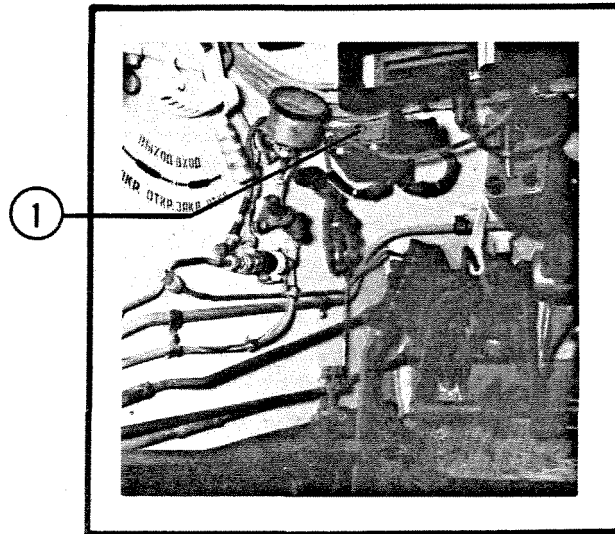


FIG. 2-22. DRIVER COMPARTMENT

- | |
|-----------------------|
| 1 KRP-1 CBR RELAY BOX |
|-----------------------|

Section III. OPERATION OF VEHICLE (AUTOMOTIVE)

2-22 GENERAL

This section contains the procedures for operating the tank under normal and unusual conditions. Read Section II, Driver's Controls/Instrument, of this chapter to become familiar with the location and operation of driver's controls and instruments before attempting to implement the procedures outlined in this section.

NOTE: The T-62 Medium Tank possesses substantially different operating procedures than those normally encountered on US equipment. For this reason, it is imperative that personnel become intimately familiar with the contents of this chapter before attempting vehicle operation.

2-23 PRE, DURING, POST OPERATION SERVICES

Prior to starting the engine a pre-operational check must be made (Table 2-1). The operator/crew will log all discrepancies and/or malfunctions noted during the pre-operational check on a DA Form 2404. Malfunctions and discrepancies whose correction is beyond the user unit's responsibility will be reported to the installation maintenance facility.

2-24 STARTING THE ENGINE

a. Check the driver's hatch to insure it is locked.

b. Open the air bottles by rotating the valve handles counter-clockwise (Fig. 2-8). Minimum air pressure to start is 50 kg/cm².

c. Adjust the driver's seat for a comfortable leg position.

d. Insure that the parking brake is engaged (Fig. 2-5).

e. Insure that the gear shift lever is in neutral.

f. Insure that the air assist lever is in the 12 o'clock position; thus, the air clutch is not engaged (Fig. 2-6).

NOTE: Never start the tank if the air assist lever on the clutch pedal is to the left. This means the air clutch is engaged and the tank will partially elevate when the clutch is released upon beginning movement.

g. Place the steering laterals in the far forward "0" position.

h. Insure that engine cover handle is in the "OPEN" position.

i. Turn master switch on (Fig. 2-2).

j. Depress the voltmeter check button; the voltage reading should be between 22-26 volts (Fig. 2-3).

NOTE: Do not use the electric starter to start the engine if the voltage is below 22.

k. Check the fire extinguisher system control box (Fig. 2-20) to see that the lights are illuminated and that the number "3" appears in the check window.

l. Place the fuel distribution lever in a position that will select fuel from the fuel cells (See para 2-6).

m. If the tank has not been started for several weeks, depress the air bleeder button and pump the purge pump several times until fuel can be heard moving through the lines (Figs. 2-3/2-4).

n. Alert the crew that the engine is about to be started.

o. Move and hold the air start-oil pump switch at the 12 o'clock position to activate the oil pump and watch the oil pressure gauge until the oil pressure is between 6-7 kg/cm².

CAUTION: Do not activate the oil pump for periods longer than 5 seconds. If the engine oil pressure fails to reach the desired level, release the switch, wait 30 seconds and try again.

Section III. OPERATION OF VEHICLE (AUTOMOTIVE)

Minimum oil pressure to start is 2 kg/cm².

p. Without releasing the oil pump - air start switch, depress the accelerator pedal and move the air start-oil pump switch to the air start position (3 o'clock).

CAUTION: Do not hold the air start switch in the "start" position for periods longer than 5 seconds. If engine fails to start, wait 15 seconds and repeat steps 2-24o and 2-24p.

g. When the engine starts, release the oil pump-air start switch and, while depressing the accelerator, move the hand throttle down (Fig. 2-13) until the engine rpms are 700-800 on the tachometer. Check the gauges on the instrument panel. If the engine oil pressure is less than 2 kg/cm², stop the engine (see para 2-28) and determine cause. If all gauges are operating, increase engine rpms to 1300-1600 to warm-up the engine. The engine is considered warmed-up when the oil and water temperature are 50°C and the engine oil pressure is between 6-9 kg/cm².

r. If the engine fails to start using the air start system, move the oil pump-air start switch to the oil pump position, depress accelerator and press the electric starter button (Fig. 2-3). After engine starts, follow the same procedure outlined in para 2-24q.

NOTE: Never depress electric starter button for periods exceeding 5 seconds. If engine fails to start within 5 seconds, release the starter button, wait 15 seconds and try again.

2-25 PUTTING THE TANK IN MOTION

a. Ensure area around the tank is clear and that personnel and equipment are not in the vehicle travel path.

b. Use front and rear ground guides when moving the tank around the motor park or in congested area.

c. The vehicle should be placed in motion using second gear under normal driving conditions. When driving conditions are poor, or when moving the vehicle around the motor park, use first gear.

d. To move the tank, proceed as follows:

(1) After the engine has sufficiently warmed up, set the engine rpms to 550-600 with the hand throttle.

(2) Place the steering laterals in the middle "1" position.

(3) Release the park brake.

(4) Insure that the air clutch engagement lever is not engaged, depress the clutch pedal and hold it down for 2-3 secs. Move the gear shift lever into second gear, exerting rearward pressure until it engages. Do not be alarmed if it takes an inordinate amount of force to engage second gear. If you fail to engage second gear, place the gear shift lever in neutral, release the clutch pedal, depress the clutch pedal and attempt to engage second gear again.

NOTE: A unique feature of the T-62 is the master clutch system. This system can be operated either mechanically or hydro-pneumatically, employing the compressed air system. The mechanical clutch is used whenever the tank is in first or reverse gears and when the tank is being placed in motion (second gear). The hydro-pneumatic clutch is engaged after the tank has begun movement in second gear by moving the air clutch engagement lever on the clutch pedal to the left. The hydro-pneumatic operation of the clutch reduces clutch wear and lengthens clutch life. Thus, the tank is always driven with the hydro-pneumatic clutch after it moves initially.

Remember: Never attempt to move the tank with the air clutch engagement lever to the left (Fig. 2-6). Always move the air clutch engagement lever to the 9 o'clock position (Fig. 2-7) after the tank has started to move forward.

Section III. OPERATION OF VEHICLE (AUTOMOTIVE)

(5) Tell the TC you are ready to move the tank.

(6) When the TC reports all clear, release the clutch pedal quickly and smoothly, simultaneously increasing the engine fuel supply by depressing the accelerator pedal gradually.

(7) As the tank begins to roll forward, smoothly move the steering laterals to the "0" position. This will increase tank speed.

(8) After the vehicle has moved forward 20-30 yards, move the air assist lever to the left.

2-26 SHIFTING GEARS

a. Up Shifting. To shift to a higher gear (e.g. second to third gear) wait until the engine speed is 1600-1900 rpms. Let up on the accelerator pedal and depress the clutch pedal. Move the gear shift lever to neutral, release the clutch pedal, depress the clutch pedal, move the gear shift lever to third gear, release the clutch pedal quickly while simultaneously accelerating. This shifting procedure is often referred to as "double-clutching" and is a requisite procedure for T-62 drivers to lengthen clutch life.

b. Down Shifting. To shift to a lower gear from a higher one, let up on the accelerator pedal and depress the clutch pedal. Move the gear shift lever to neutral, release the clutch pedal, depress clutch pedal and simultaneously increase engine speed by depressing the accelerator, move gear shift lever to lower gear, release the clutch and accelerate slowly. The engine acceleration during shifting is necessary to make the engine rpm the same as that of the transmission.

2-27 STEERING THE TANK

a. To maneuver the vehicle while in motion, forward or rearward, it is necessary to pull the corresponding lateral to the "1" position. For example, to turn to the right,

pull the right lateral to the "1" position and keep the left lateral in the "0" position. The reverse is applicable when steering to the left.

b. The tank can also be turned when both laterals are in the "1" position (gear reduction). Simply pull the right/left lateral back to the "2" position to turn right/left. The "2" position brakes the respective tracks and is used for shorter radius turns in conjunction with the "1" position.

c. Never place one of the laterals in the "2" position when the tank is in 4th or 5th gear. It is recommended to use the laterals sparingly for turning, i.e. minimize the number of small steering corrections.

d. When making a turn, increase engine speed as the turn is made to prevent engine stalling. When making a larger radius turn, "pump" the respective lateral by alternately moving it back and forth from the "0" to the "1" position.

e. Avoid turns on steep uphill or downhill slopes.

2-28 STOPPING THE TANK

a. To stop the tank gradually, let up on the accelerator, depress the clutch pedal, shift to neutral, release the clutch pedal and pump the brake pedal until the tank comes to a halt.

b. To stop the tank in emergencies, depress the brake pedal quickly (or pull both laterals to the "2" position), depress the clutch pedal and release the accelerator. Place the gear shift lever in neutral and release the clutch.

c. To slow the vehicle when driving, pull the laterals to the "1" position. When ready to resume speed, return the laterals to the "0" position.

Section III. OPERATION OF VEHICLE (AUTOMOTIVE)

2-29 SHUTTING DOWN THE ENGINE

a. Turning off the engine after sustained operation can cause the engine coolant as well as the engine to overheat. Thus, after braking the vehicle to stop and engaging the park brake, idle the engine at 1500-1600 rpms until the water temperature is 70°C or less.

b. Move air assist lever to upright (12 o'clock) position.

c. Reduce engine speed to 700-800 rpms and idle for 2 more minutes.

d. Move hand throttle all the way up to shut down the engine (Fig. 2-13).

e. Turn off master switch (Fig. 2-2).

f. Close air bottles by rotating hand valve clockwise.

2-30 SMOKE GENERATING SYSTEM

a. The T-62 tank has its own smoke generating capability. This system can produce a dense, white smoke screen that will persist for 2-4 minutes. The system basically consists of spraying diesel fuel into the exhaust manifold when the manifold is sufficiently hot enough for fuel combustion. This partial combustion creates the thick white smoke that exits from the tank's exhaust port.

b. To operate the system:

(1) The engine must be running and warmed-up. The engine coolant temperature should be at least 60°C.

(2) The tank should be moving in 2d or 3d gear.

(3) The driver turns on the smoke screen switch on his instrument panel (Fig. 2-3). After a 3-5 second delay, the smoke cloud will appear from the exhaust port.

(4) The driver must depress the accelerator fully to prevent engine fuel starvation. Minimum engine rpm is 1600. Never attempt to use the smoke system in a gear higher than third.

(5) To turn off the smoke screen, turn off the smoke screen switch. Smoke will continue for a 5-15 second period until all the fuel is expelled from the exhaust manifold.

SECTION III

OPERATION OF VEHICLE (AUTOMOTIVE)

Table 2-1 Pre, During and Post Operation Checks

<u>PRE</u>	<u>DURING</u>	<u>POST</u>	<u>ITEM TO BE CHECKED</u>	<u>PROCEDURE</u>
				Visually inspect for evidence of lubricant and fuel leaks concurrently with the daily checks and services.
1			Fire Extinguishing System (Fig. 2-20)	Check the fire extinguisher control box for broken seals, that there is a "3" in the check window and that the check lights are illuminated.
2		25	Fluid Levels	<p>Before starting engine, check that the engine, transmission, transfer case, final drives and the radiator have sufficient fluid for operation. Check for evidence of fuel, lubricant and coolant leaks in power plant and power train compartment. Check oil levels as follows:</p> <p>ENGINE OIL (Fig. 2-23)</p> <p>Raise power train armor deck lid. Raise the radiator and lock in place. Remove oil filler plug with wrench.</p>

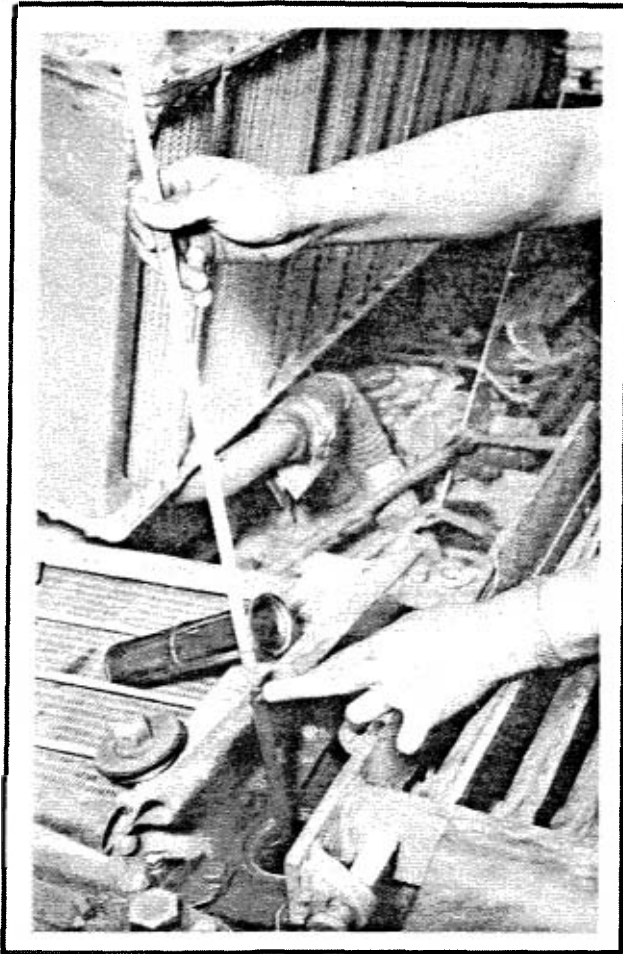


FIG. 2-23. ENGINE OIL

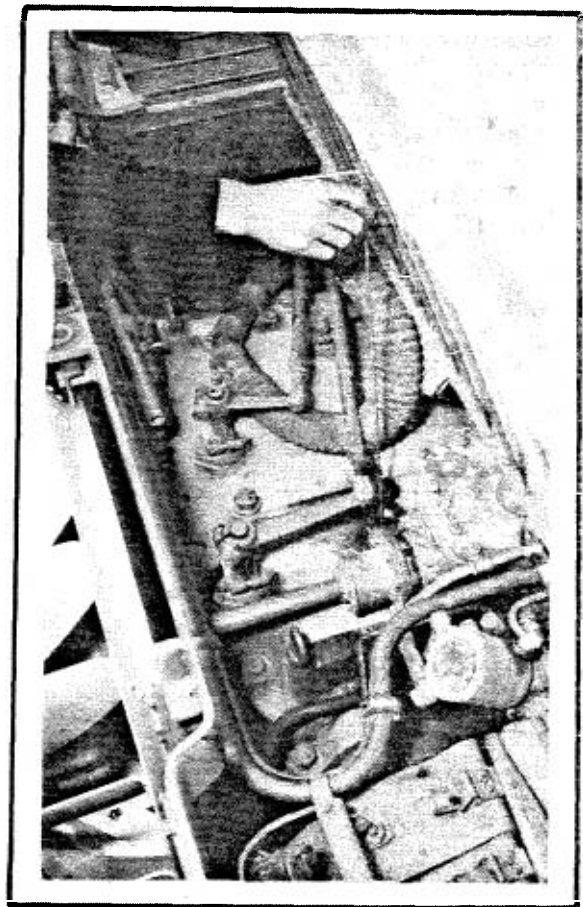


FIG. 2-24. TRANSMISSION OIL

Table 2-1 Pre, During and Post Operation Checks

<u>PRE</u>	<u>DURING</u>	<u>POST</u>	<u>ITEM TO BE CHECKED</u>	<u>PROCEDURE</u>
				Remove oil screen from filler opening. Use dipstick and measure the oil level. The oil level should not be above the top mark or more than an inch below the mark. Add OE 50 oil if needed.
				TRANSMISSION (Fig. 2-24) Remove red bolt (Filler bolt) and check oil level with lower dipstick mark. Add OE 50 oil if needed.
				ENGINE COOLANT (Fig. 2-25) Lower the radiator (horizontal position) and remove filler cap with special tool, insuring that pressure release detent has been replaced. Check coolant level - coolant level should be 30-40 mm below the filler neck.
				TRANSFER CASE (Fig. 2-26) <u>Weekly</u> , remove red bolt and check oil level with middle dipstick mark. Add OE 50 oil if needed.
				FINAL DRIVE (Fig. 2-27) <u>Weekly</u> , remove the final drive fill plug. Use special dipstick to check level. Add GO 90, if needed, to

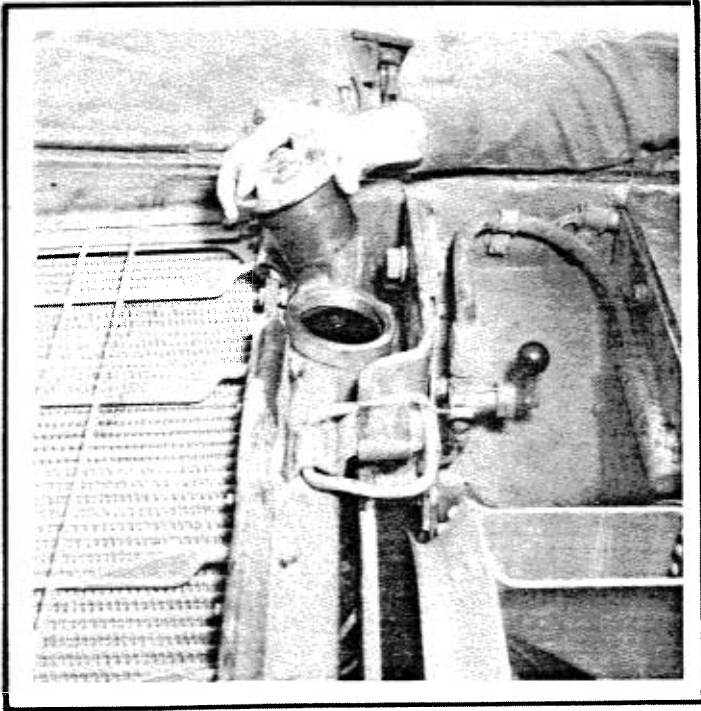


FIG. 2-25. ENGINE COOLANT

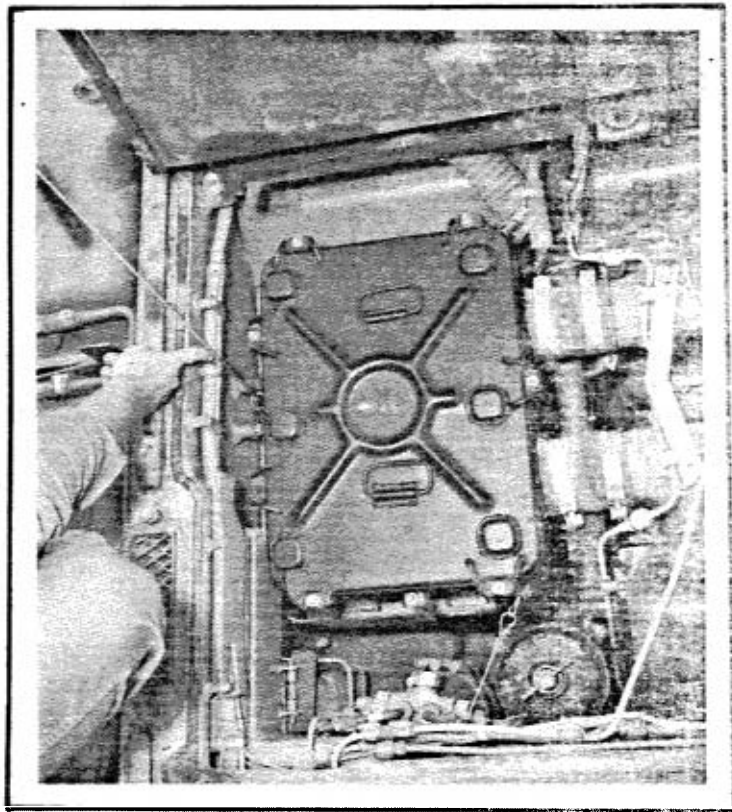


FIG. 2-26 TRANSFER CASE

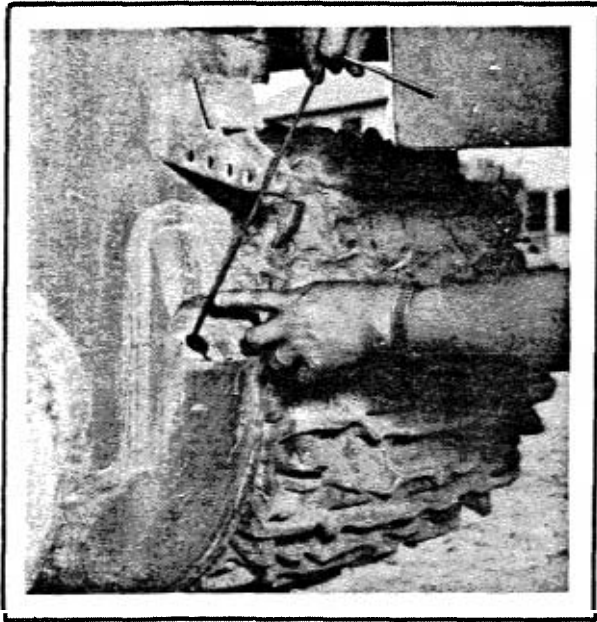


FIG. 2-27. FINAL DRIVE

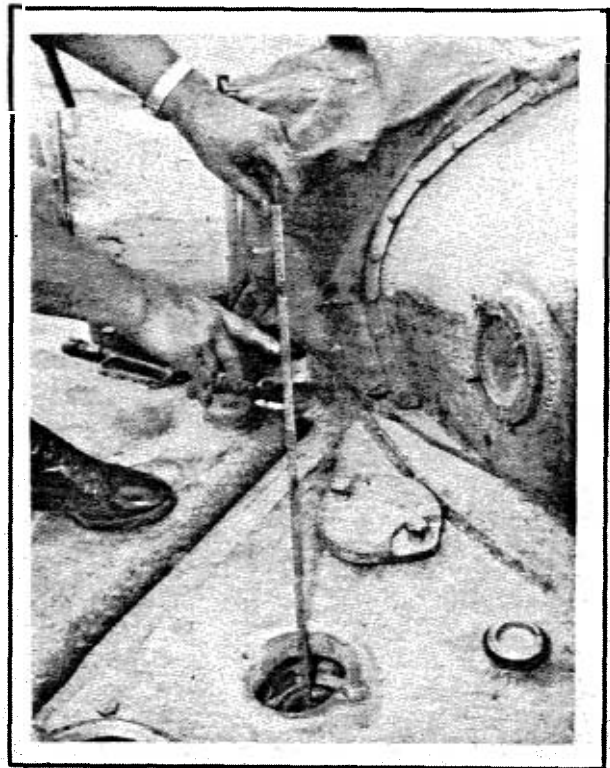


FIG. 2-28. NOSE INTERNAL FUEL CELLS

Table 2-1 Pre, During and Post Operation Checks

<u>PRE</u>	<u>DURING</u>	<u>POST</u>	<u>ITEM TO BE CHECKED</u>	<u>PROCEDURE</u>
				bring level up to mark on dipstick. <u>Do not</u> over fill.
3		26	Fuel System (Figs. 2-28 - 2-31)	Check fuel lines (yellow) for leaks. Fill nose, external and rear tanks leaving 4-6 in. below top of filler neck for expansion.
4		27	Suspension System (Figs. 2-32 - 2-34)	Inspect tracks, road wheels, idler wheels, drive sprockets and shock absorbers for excessive wear or damage. Check shock absorbers for fluid leakage indicating damaged seals. Check torsion bars by lifting road wheel. The road wheel will lift easily if torsion bar is broken. Check track tension. Tension is considered normal when the track is 60-80 mm above the 1st road wheel.
5	17	28	Air Start Switch (Fig. 2-3)	Ensure air start switch is in the off position (arrow to the left).
6		29	Master Switch (Fig. 2-2)	Push in master switch rod to engage electric power. Check voltmeter to ensure storage batteries have between 22-26 volts. To turn off, push the catch release and the master switch rod will return to the upper position.

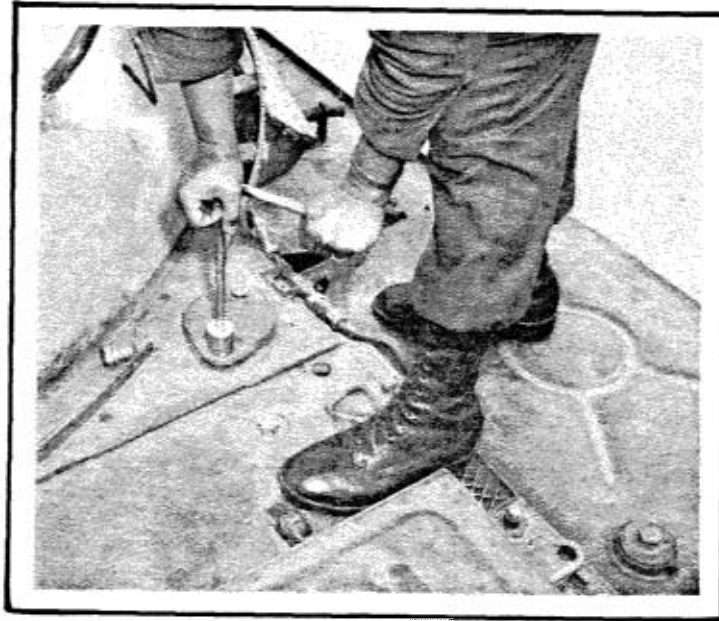


FIG. 2-29. REAR INTERNAL FUEL CELL

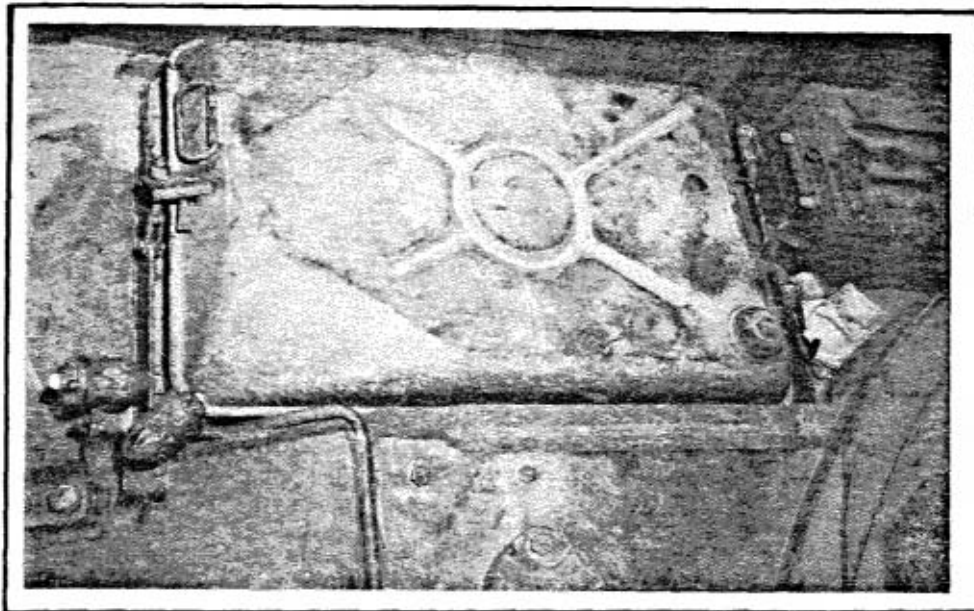


FIG. 2-30. FRONT EXTERNAL FUEL CELL

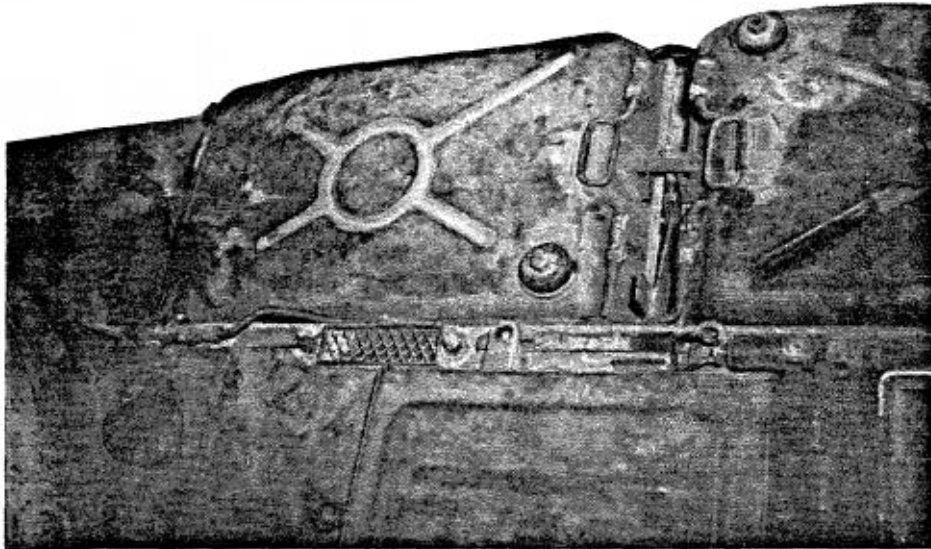


FIG. 2-31. REAR EXTERNAL FUEL TANKS

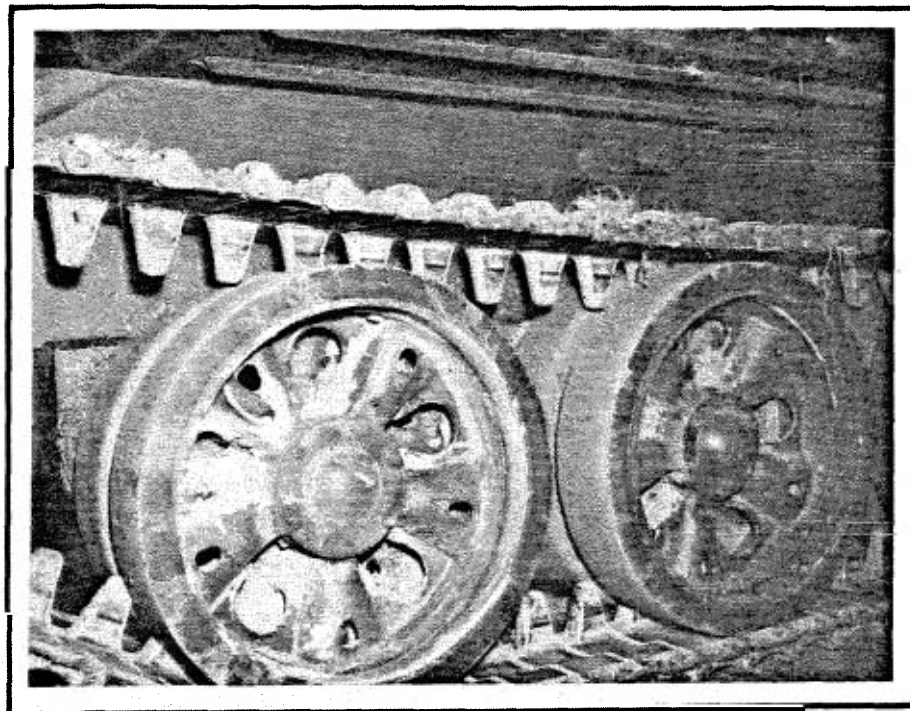


FIG. 2-32. ROAD WHEELS

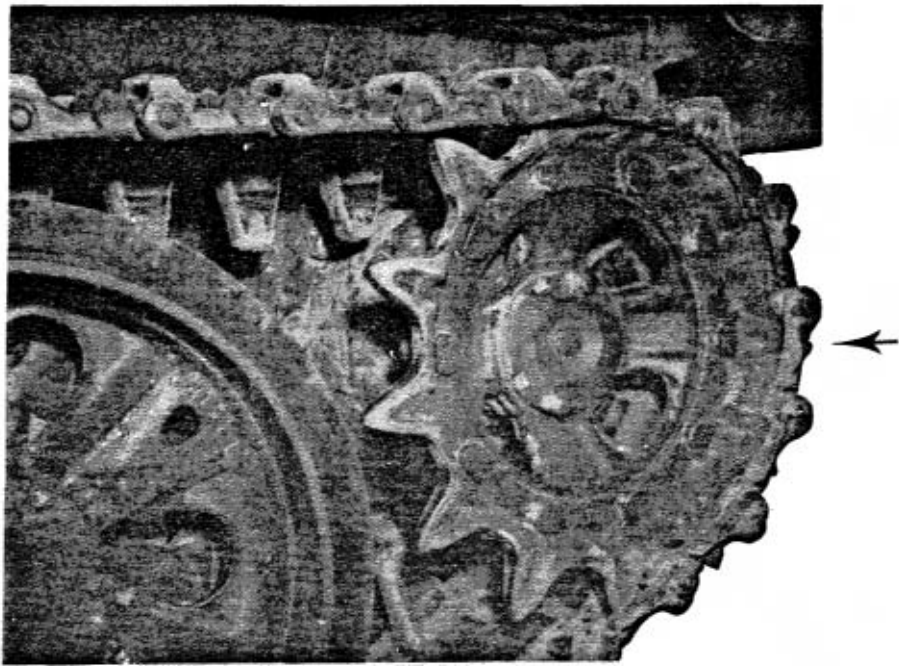


FIG. 2-33. DRIVE SPROCKET

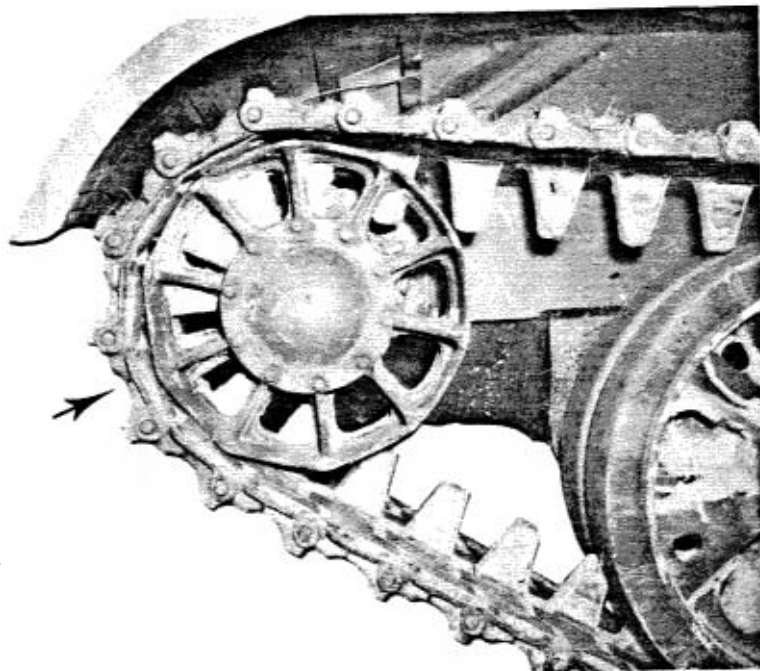


FIG. 2-34. IDLER WHEEL

Table 2-1 Pre, During and Post Operation Checks

<u>PRE</u>	<u>DURING</u>	<u>POST</u>	<u>ITEM TO BE CHECKED</u>	<u>PROCEDURE</u>
7		30	Compressed Air Bottles (Fig. 2-8)	Open air bottle valves and check air pressure. A minimum of 50 kg/cm ² is required to start the engine with the air starter. The maximum air pressure is 150 kg/cm ² with engine running. After operation, close the air bottle valves. Insure a minimum of 50 kg/cm ² is reading on the gauge.
8	18	31	Instrument Panel (Fig. 2-3)	Observe gauges for normal readings. Ensure all instruments are operational. <u>Engine coolant</u> temperature range is 70° - 90°C. <u>Engine oil</u> temperature range is 70° - 90°C. <u>Engine oil pressure</u> range is between 6-9 kg/cm ² . <u>Voltmeter</u> --the charging rate should not fall below 5A and not exceed 35A. If the charge rate exceeds 35A, recharge the storage batteries.
9	19	32	Intercom System	Perform communication checks with all crew stations.
10		33	Lights and Markers	Check the operation of driving and marker lights. Check IR headlamp by placing hand over lens. Heat can be felt if the light is operating.

Table 2-1 Pre, During and Post Operation Checks

<u>PRE</u>	<u>DURING</u>	<u>POST</u>	<u>ITEM TO BE CHECKED</u>	<u>PROCEDURE</u>
11	20		Throttle/accelerator (Fig. 2-7)	Check hand throttle and accelerator controls for binding, grabbing or excessive linkage play.
12	21		Steering and Braking Controls (Fig. 2-5)	Check steering laterals for braking actions, binding, grabbing or "spongy" feel. Check brake pedal for excessive play or binding.
	22	34	Road Wheel, Idler Wheel, Final Drive and Shock Absorbers (Figs. 2-32, 2-34, 2-27)	During halts and after vehicle operation, feel these components cautiously for noticeable variation in temperatures between like components. An overheated hub indicates a maladjusted, inadequately lubricated or damaged bearing. Shock absorbers should feel warmer than hull.
	23		Unusual Noises or Odors	Be alert for unusual noises, odors, or visual indications of malfunction of power plant, power train or suspension components.
		35	Bilge Pumps	Check operation of bilge pumps. Air should be felt at outlets.
13		36	Storage Batteries	Check electrolyte level, inspect terminals and cables for corrosion. Coat with thin film of grease.
		37	Air Breather (Fig. 2-35)	Clean air breather weekly or more often when operating in dusty/sandy areas.

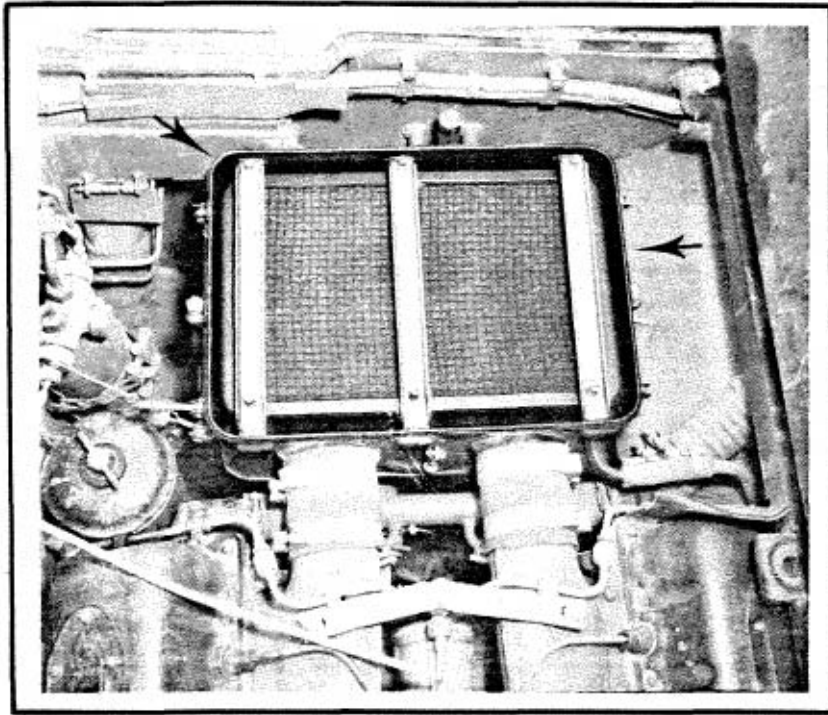


FIG. 2-35. AIR BREATHER

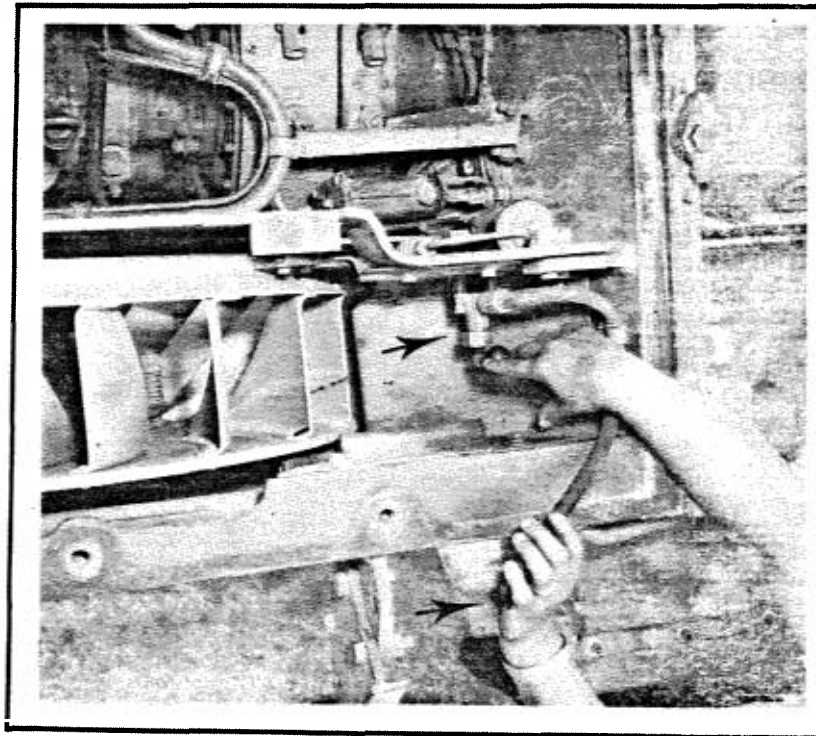


FIG. 2-36. AIR SYSTEM SEDIMENT DRAIN

Table 2-1 Pre, During and Post Operation Checks

<u>PRE</u>	<u>DURING</u>	<u>POST</u>	<u>ITEM TO BE CHECKED</u>	<u>PROCEDURE</u>
				<ul style="list-style-type: none"> a. Wash in solvent. b. Blow inside and outside dry with compressed air.
14			Engine Covers	Open and close engine covers to ensure their satisfactory operation.
15		38	Hatch Covers	Operate driver's hatch to ensure it operates freely.
16		39	Hull	Check under hull for evidence of fuel or oil leaks. Ensure that access plates are secure.
	24		Hull Blower	With engine running, turn on hull blower with KUV-3 control box in the driver's compartment.
		40	Compressed Air System Sediment Drain (Fig. 2-36)	Take the hose and lay it over the rear hull and rotate valve counter-clockwise to drain water and sediment from the system.

CHAPTER III

TURRET OPERATING INSTRUCTIONS

Section I. TURRET CONTROLS AND EQUIPMENT

3-1 GENERAL

This section contains information covering location and operation of the armament, conventional and infrared sighting and fire control equipment and auxiliary equipment in the turret. The information in this chapter is arranged to cover the commander's, gunner's, and loader's equipment, location and operation, and auxiliary turret controls and equipment.

3-2 LOCATION AND OPERATION OF COMMANDER'S CONTROLS AND EQUIPMENT

a. Tank Commander's Hatch (Figs. 3-1, 3-4). The tank commander's hatch opens to the vertical position and can be locked in either the opened or closed position. Locking the hatch from the outside requires the use of a special hatch key. (Fig. 3-2) Locking the hatch from the inside (combat lock) is accomplished by rotating the locking pin after the hatch is secured by the locking handle (Fig. 3-3).

When the hatch is locked open, pulling up on the hatch release handle permits lowering of the hatch.

The small round hatch in the Tank Commander's hatch permits the vehicle commander to fire his flare gun with a closed hatch.

b. Vision Blocks. The Tank Commander has four (4) one-power vision blocks. Two are mounted in the cupola and two are mounted in the Tank Commander's hatch. These blocks, in addition to the sight, give the Tank Commander a greater than 180° field of view at any one time.

c. Tank Commander's Periscope, TKN-3 (Figs. 3-3, 3-5). The Tank Commander's periscope sight is the TKN-3.

It is a day/night binocular vision device which employs an integral infrared capability for night observation. It is mounted in the Tank Commander's hatch by one quick-release turn-screw and can be rotated along its mounted axis to view above or below the horizontal.

TKN-3

	<u>DAY</u>	<u>NIGHT</u>
Magnification	5x	4.2 x
Field of View	10°	8°
Range	--	400m (with OU-3GKSLT)
Reticle	yes	no

The screen and diaphragm switches are used only in the night mode to reduce the glare of the IR on the target. During day operation, they must be left in the closed (3AKP) position.

The day-night mode selection switch is located on the right side of the periscope. "A" is day and "H" is night.

Beneath the left side of the sight is the infrared power source which, when turned on after the sight is in the night mode ("H"), makes a ticking sound (Fig. 3-5).

The handles of the TKN-3 serve a multitude of purposes. First, they are held to protect the Tank Commander from the recoil of the tank during service firing. Second, they are used to rotate the Tank Commander's cupola left or right. Third, on the end of the right handle is a spring-loaded push button that turns on the Tank Commander's searchlight for brief periods of time. (NOTE: Tank Commander's cupola electrical power switch must be turned on first). Fourth, the spring-loaded button on the left handle provides the target designation capability that the Tank Commander has. This allows him to override the gunner's controls in the horizontal mode (azimuth) only.

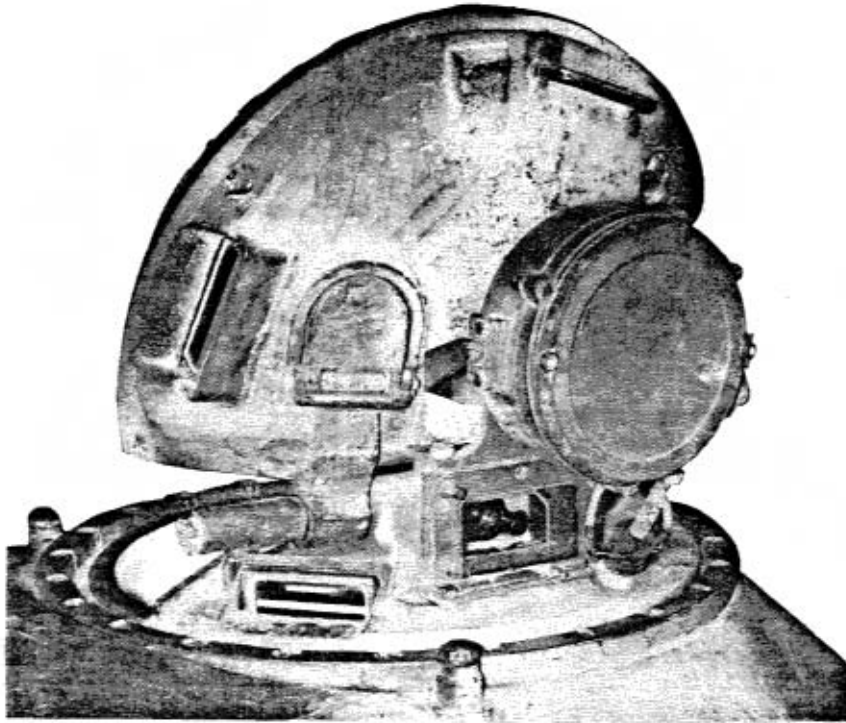
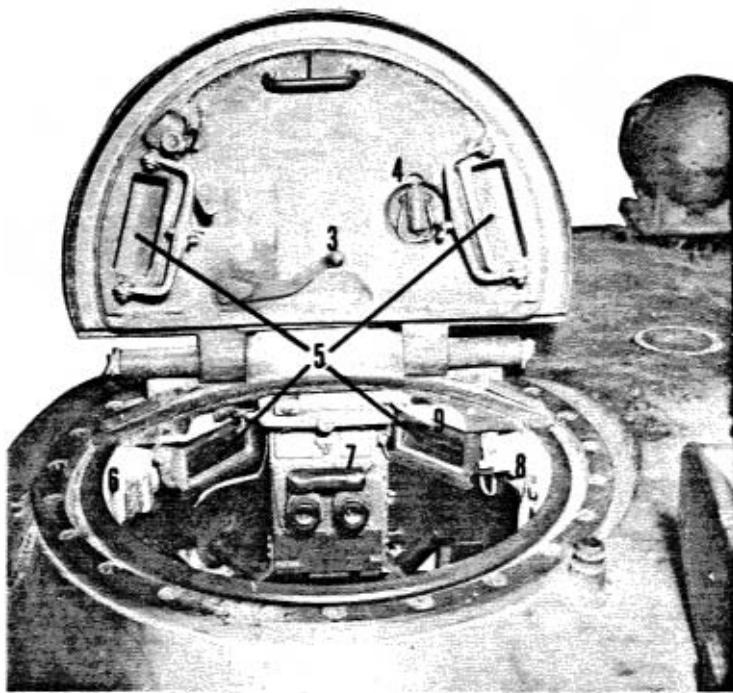


FIG. 3-1. TANK COMMANDER'S HATCH



FIG. 3-2. HATCH KEY



- 1 HATCH HANDLE
- 2 COMBAT LOCK
- 3 HATCH RELEASE HANDLE
- 4 FLARE HATCH
- 5 VISION BLOCKS (4)
- 6 TC SEARCHLIGHT SWITCH
- 7 TC PERISCOPE, TKN-3
- 8 TC CUPOLA RING LOCK
- 9 WIPER HANDLE

FIG. 3-3. OPEN HATCH: REAR VIEW

- 1 LIGHT OU-3GK WITH COVER
- 2 WIPER
- 3 GUNNER'S VISION BLOCK
- 4 GUNNER'S PERISCOPE TPN 1-41-11

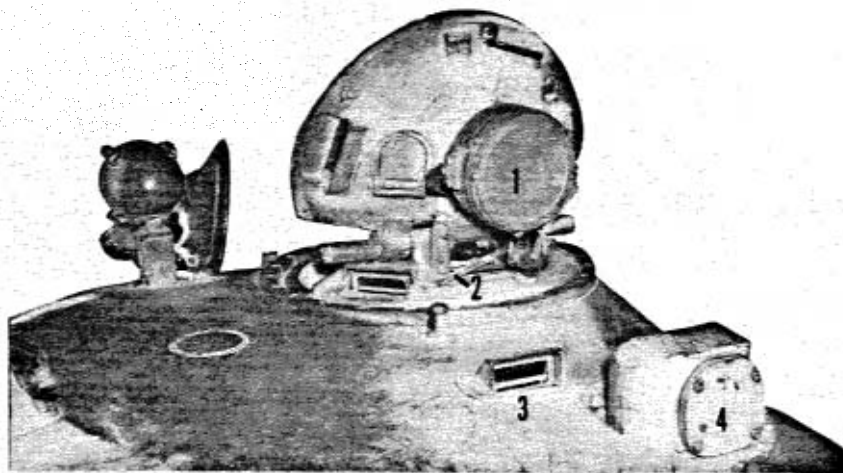


FIG. 3-4. OPEN HATCH: FRONT VIEW

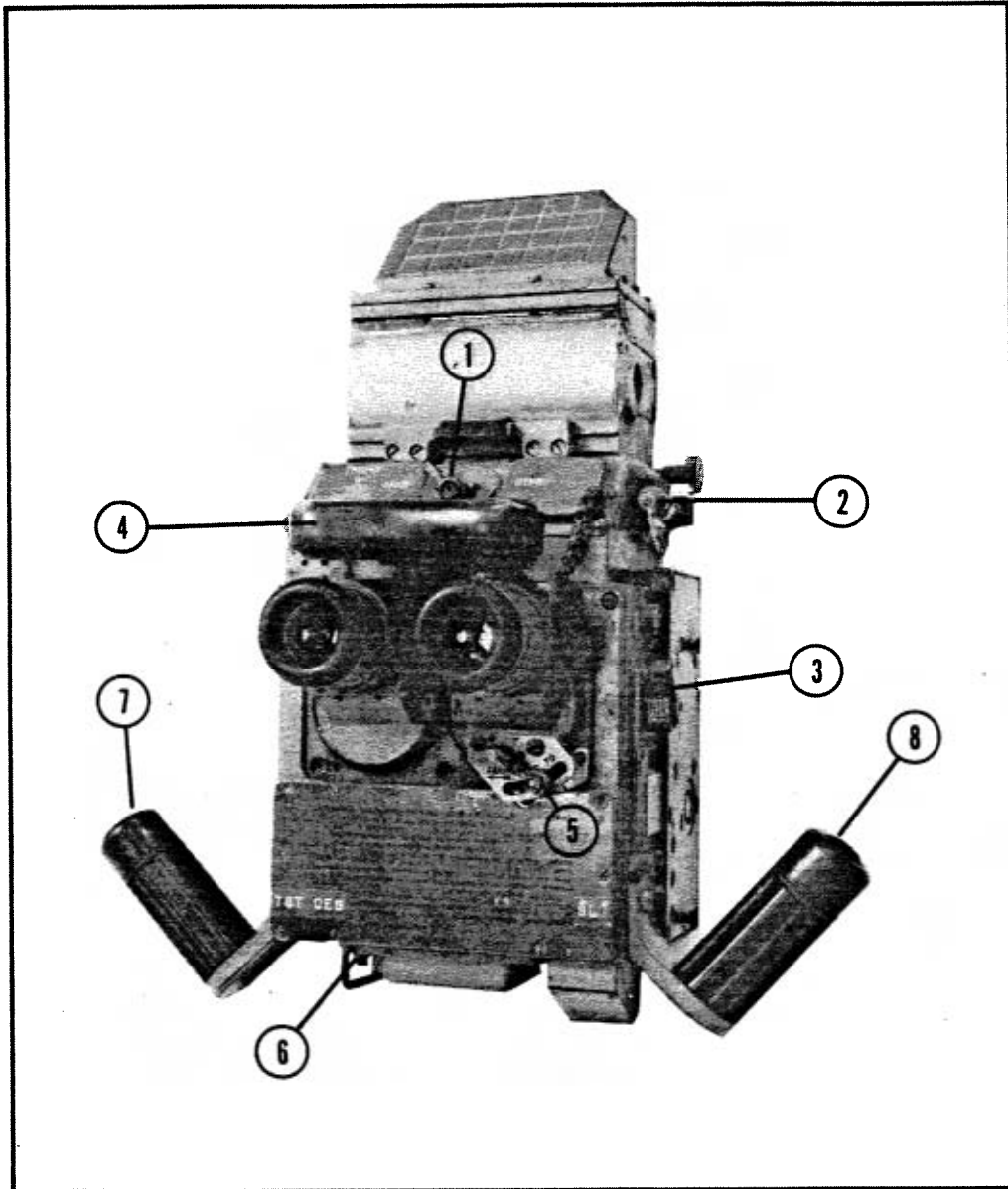


FIG 3-5. TKN-3 PERISCOPE

- | | |
|--------------------------------|----------------------------------|
| 1 SCREEN LEVER | 5 EYE DISTANCE ADJUSTMENT |
| 2 DIAPHRAGM LEVER | 6 IR POWER SUPPLY SWITCH |
| 3 DAY/NIGHT MODE SWITCH | 7 TARGET DESIGNATE BUTTON |
| 4 HEADREST | 8 IR ON-OFF PUSH BUTTON |

Section I. TURRET CONTROLS AND EQUIPMENT

The eyepieces can be adjusted for separation and can be focused + four (4) diopters (Fig. 3-5). The protective covering (Fig. 3-4) over the external lens of the sight is kept dust-and-dirt-free by moving the white handle above the TKN-3 sight. This activates a rubber wiper that moves across the lens cover.

d. Tank Commander's Searchlight, OU-3GK (Figs. 3-6, 3-7). Mounted coaxially with the Tank Commander's sight, TKN-3, is a searchlight, OU-3GK. This light has visible and infrared capabilities by changing filters. The filter of the searchlight is protected by a metal cover whenever the searchlight is not being used.

The searchlight is activated by one of two means. After the cupola electrical switch is on (see para e) (Figs. 3-9, 3-3), either the button on the right handle of the TKN-3 is pushed or a toggle switch on the cupola ring is turned on. The toggle would be used for prolonged illumination; the push-button for intermittent illumination.

The searchlight can be bore-sighted to the TKN-3 Tank Commander's periscope by adjusting its connecting linkage (Fig. 3-8).

e. Tank Commander's Cupola Electrical Power Switch (Fig. 3-9). Before the Tank Commander can activate his searchlight or target designator, he must first turn on the cupola electrical power switch that is mounted beneath the cupola ring to the Tank Commander's right side.

f. Cupola Ring Lock (Fig. 3-3). The Tank Commander's cupola can be locked either to the front or the rear. The cupola ring lock is located on the right side of the cupola ring to the rear of the right vision block.

To unlock the cupola, permitting free manual movement of the cupola, the lock ring is pulled out and rotated 90° (one quarter turn). This step must be done before attempting to perform the target designator function.

g. Rear Lights and Switch (Fig. 3-10) There are ~~two lights mounted~~ between the Tank Commander's hatch and loader's hatch outside the turret. The large light is an identification light for night movements and the light below it is a rear marker light which is turned on when in a static night defensive mode or in convoy under blackout/IR conditions. With it on, an approaching soldier will know the orientation of the main gun over the hull of the vehicle which also has marker lights. In the case of a night convoy, drivers will be able to follow vehicles to their front by observing the bright spots in their TVN-2 driver IR device.

The toggle switch for these lights is located inside the turret on the rear wall (Fig. 3-11). When facing the switch, move the toggle to the right to turn on the rear identification light, and to the left to turn on the rear marker light. The center position is "OFF".

h. Turret Ring Lock (Fig. 3-12). The Tank Commander also has responsibility for the turret ring lock located to his left on the turret ring. The lock is operated by extending the handle, rotating the white lever (which unlocks the bolt), raising or lowering the bolt into the receptacle on the hull, locking it in place by rotating the white locking lever, and moving the handle out of the way. When unlocked, the bolt must be secured in the up position (by rotating the white lever) to preclude damage to it as the turret rotates.

There are receptacles for the turret ring lock bolt on both sides of the hull (Figs. 3-12, 3-13) permitting locked turret operation with the main gun pointing over the front slopes or the rear deck.

i. Gun Shield (Fig. 3-14). For the protection of the Tank Commander from the recoil of the main gun and the operation of the spent-shell ejection mechanism, there is a shield that is mounted on his seat along his right side. THIS SHIELD SHOULD ALWAYS BE MOUNTED WHEN THE VEHICLE IS MOVING.

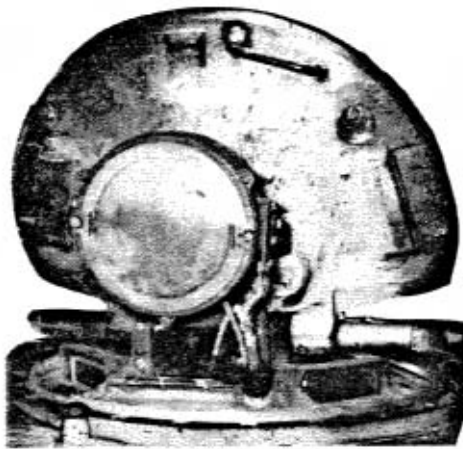


FIG. 3-6. LIGHT WITH COVER

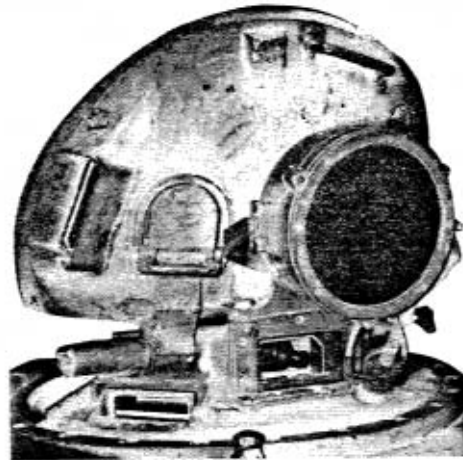


FIG. 3-7. LIGHT WITH IR FILTER

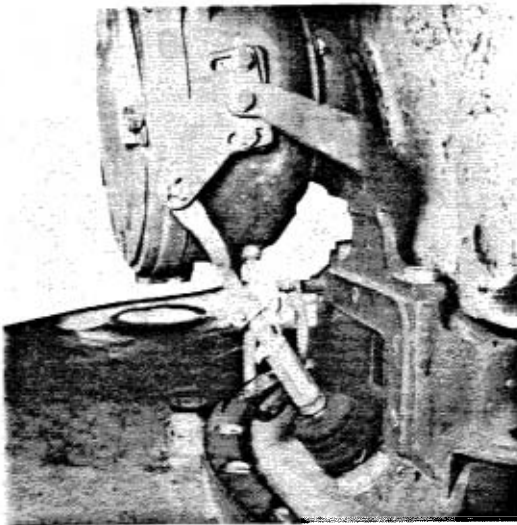


FIG. 3-8. SIGHT LINKAGE

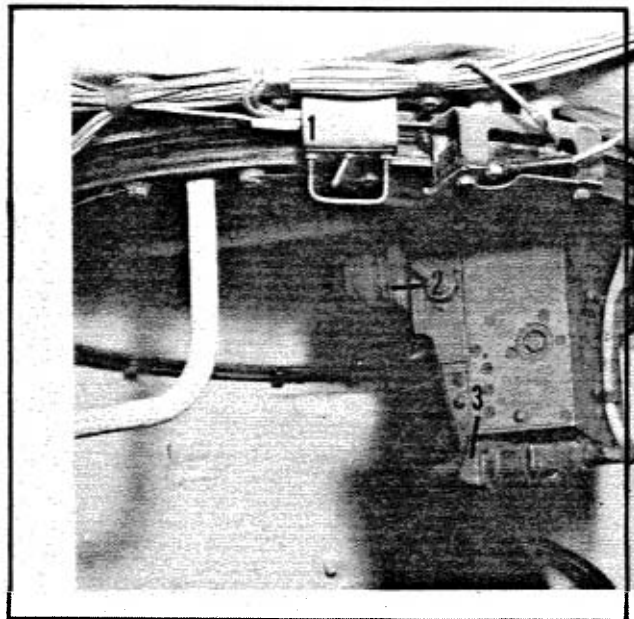
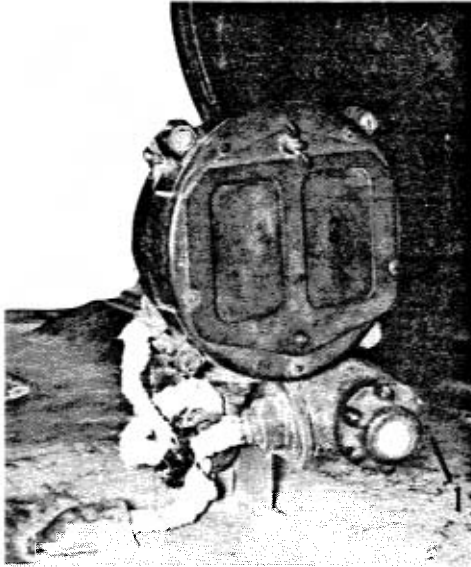


FIG. 3-9. TC CUPOLA ELECTRICAL SWITCH

- 1 ELECTRIC POWER SWITCH
- 2 DAY/ NIGHT MODE SWITCH
- 3 POWER CABLE CONNECTION
- 4 SEARCHLIGHT PUSH BUTTON SWITCH



- 1 MARKER LIGHT
- 2 IDENTIFICATION LIGHT

FIG. 3-10. REAR TURRET LIGHTS

- 1 LIGHT SWITCH
- 2 TC SEAT BACKREST
- 3 CUPOLA HANDGRIP

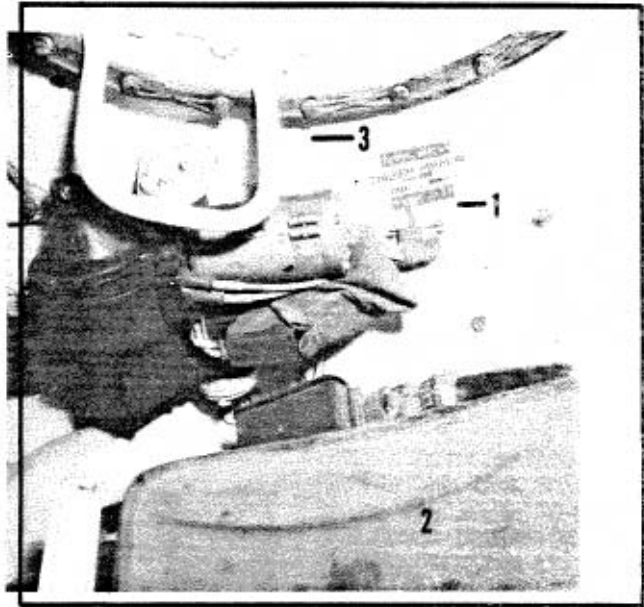


FIG. 3-11. TURRET LIGHTS SWITCH

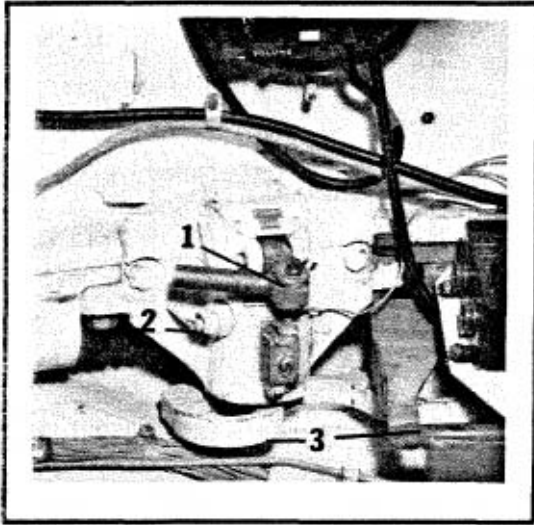
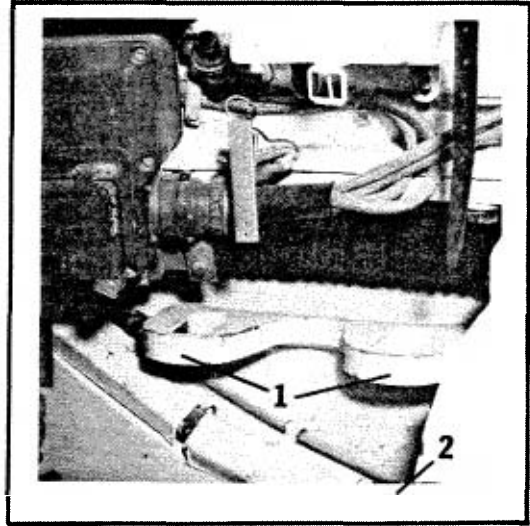


FIG. 3-12. TURRET RING LOCK

- 1 HANDLE**
- 2 LOCKING HANDLE**
- 3 RECEPTICLE**



**FIG. 3-13. TURRET LOCK
RECEPTICLES ON LOADER'S SIDE**

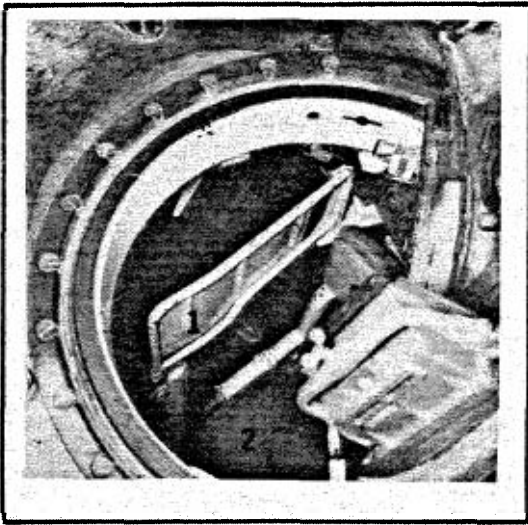


FIG. 3-14. TC BALLISTIC SHIELD

- 1 SHIELD**
- 2 TC SHEET**

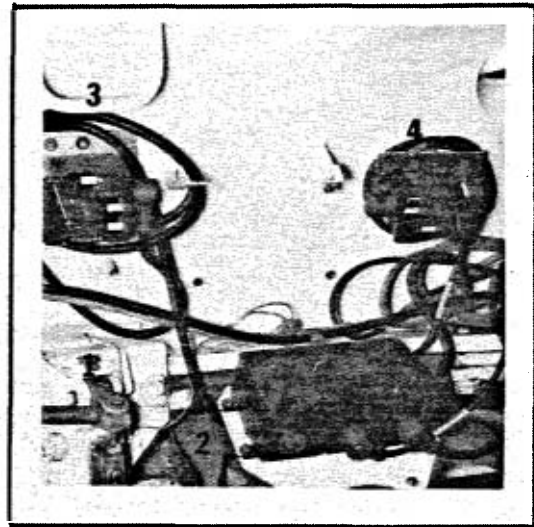


FIG. 3-15. INTERCOM

- 1 TURRET RING LOCK**
- 2 SOVIET RADIO MOUNT**
- 3 TC INTERCOM BOX**
- 4 GUNNER INTERCOM BOX**

Section I. TURRET CONTROLS AND EQUIPMENT

j. Radio (Fig. 3-15). For the safety of the tank crew, a US intercom system has been mounted throughout the tank. The AM 1780/VRC is located between the Tank Commander and gunner, with intercom junction boxes for all crewmen. NEVER OPERATE THE VEHICLE WITHOUT CLEAR INTERCOM COMMUNICATIONS.

3-3 GUNNER'S CONTROLS AND EQUIPMENT

The following paragraphs cover location of the gunner's controls and equipment in a T-62 or T-62A tank equipped with conventional sighting and fire control components. For discussion purposes, the gunner's controls and equipment have been divided into three areas: Sighting and fire control, gun elevating and turret traversing, and miscellaneous equipment.

a. Sighting and Fire Control Equipment (Figs. 3-16, 3-17).

(1) Gunner's Telescope, TSh2B-41U is the gunner's primary means of target engagement and the sole means for daylight use. It is an excellent optical device that incorporates a rotating reticle to compensate for superelevation, a selection of filters, a choice of magnifications, and an adjustable headrest for right or left eye use.

TSh2B-41U

	<u>DAY</u>	<u>NIGHT</u>
Magnification	7x	3.5 x
Field of View	9°	18°

The front of the telescope is mounted on a bracket that is bolted to the gun frame. (Fig. 3-19) The rear of the sight is suspended from the turret roof by a bracket. The headrest can be positioned to accommodate either right eye or left eye use (Figs. 3-20, 3-21).

A filter switch is positioned on the left side of sight just forward of the rear mounting bracket (Fig. 3-16). The filter is used to reduce glare in the field of view.

Forward of the filter switch is the magnification lever that is used to select between the 3.5 and 7 power operation.

On the right side of the scope is the wiper lever that cleans dust from the front lens of the telescope (Fig. 3-17).

Located on top of the telescope is a wrench that is used to tighten the scope to its front mount and to adjust the boresight azimuth and elevation knobs (Fig. 3-17).

On the underside of the telescope is the range knob which rotates the 5 reticles over a fixed black line (Fig. 3-17). This knob is rotated to index the range commanded by the Tank Commander according to the ammunition he selected for target engagement. This compensates for the superelevation required for the ammunition specified.

The reticles from left to right are (Fig. 3-18):

HVAPDSFS - HEAT - HE 18 - HE 11 - COAX

At the bottom of the reticle is the stadimetric range finder based on a vehicle height of 2.7 meters.

(2) For night target engagement, the gunner uses the TPNI-41-11 infrared monocular periscope that is mounted to the left of the telescope (Fig. 3-20). The sight is fixed in position but a linkage connects it to the main gun carriage.

CHARACTERISTICS

Magnification	5.5 x
Field of View	6°
Range	800 m (with use of main searchlight)

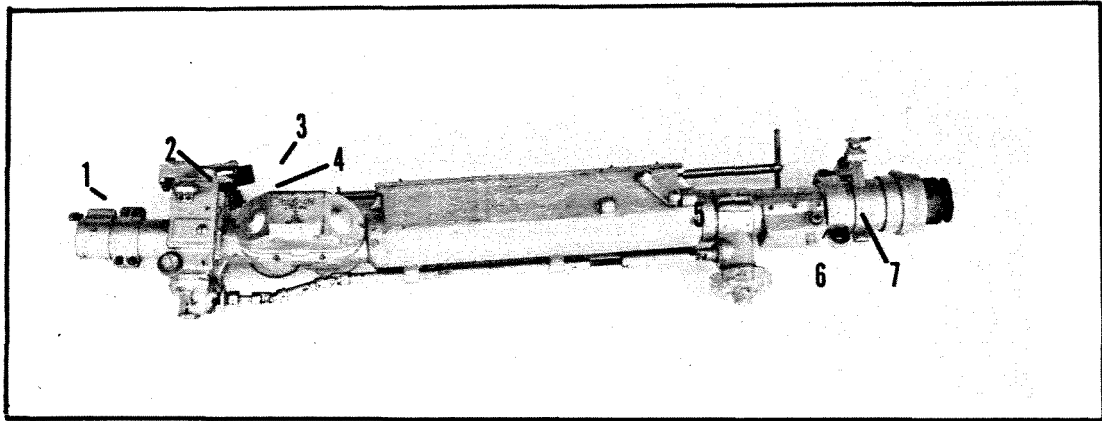


FIG. 3-16. TSh2B-41u GUNNER'S TELESCOPE, LEFT SIDE

- 1 WIPER
 - 2 DEFROSTER CABLE CONNECTOR
 - 3 ATTACHMENT SCREW
 - 4 BORESIGHT KNOBS
 - 5 MAGNIFICATION LEVER
 - 6 RANGE KNOB
 - 7 FILTER LEVER
- EYEPIECE

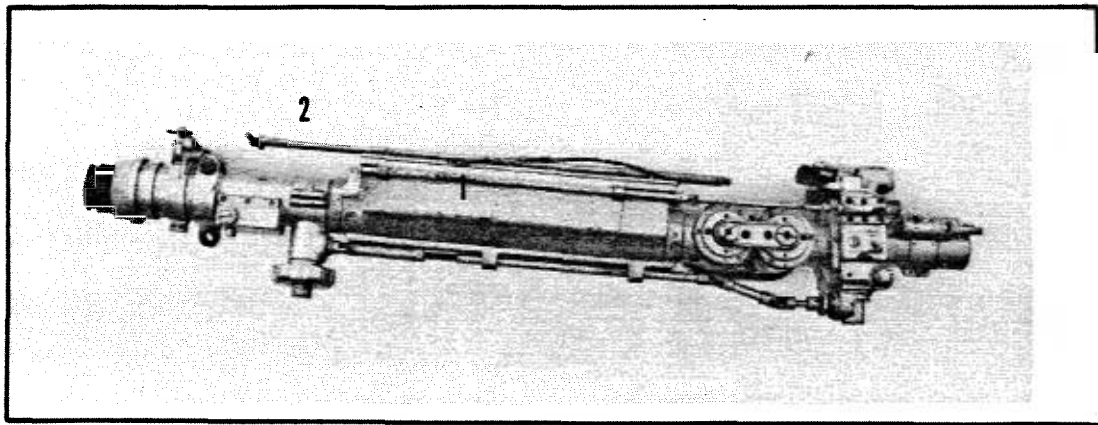
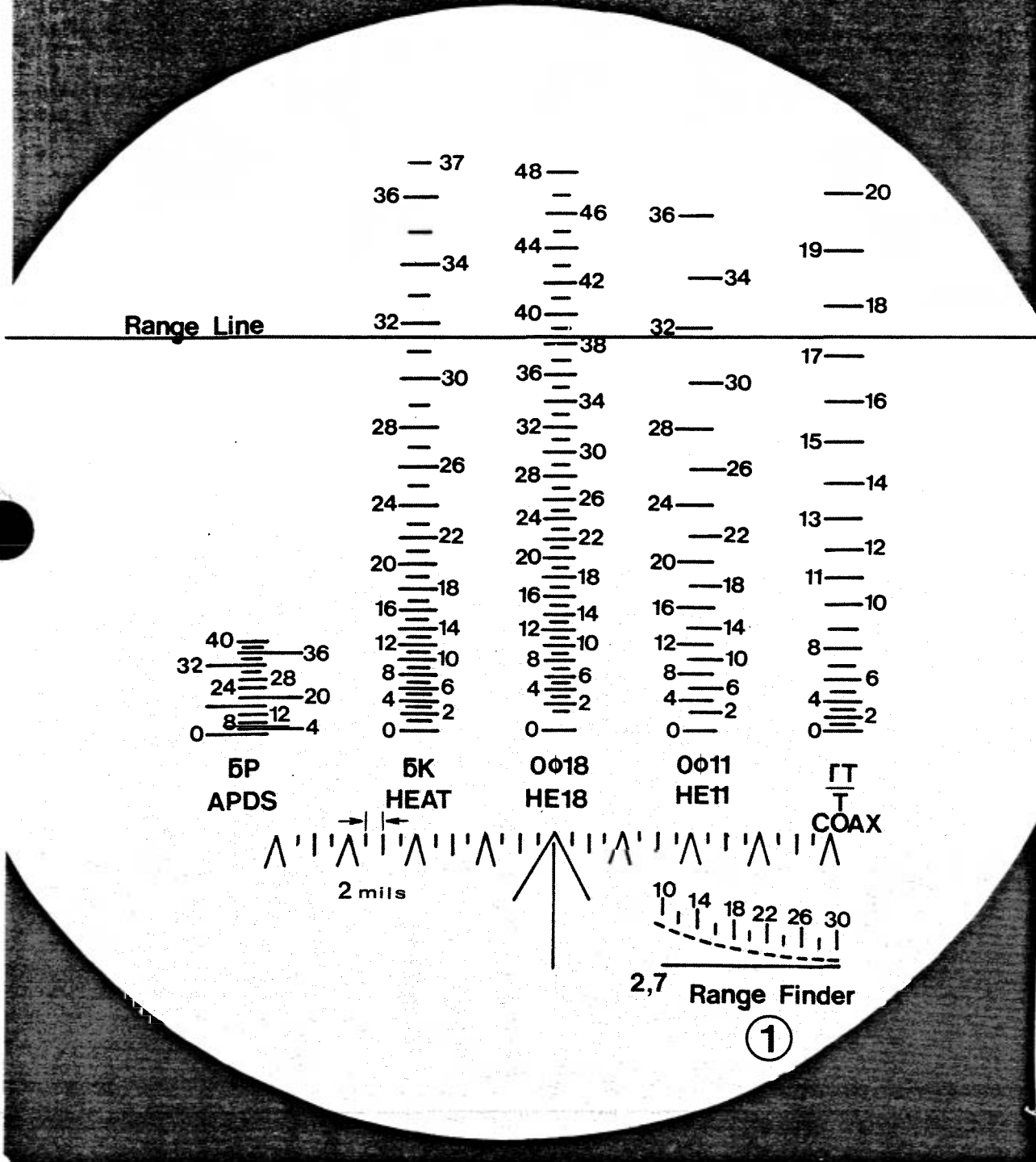


FIG. 3-17. TSh2B-41u GUNNER'S TELESCOPE, RIGHT SIDE

- 1 WIPER ARM
- 2 ADJUSTMENT WRENCH

FIG. 3-18 TSh2B-41u Telescope Reticle

1. Stadiometric Range Finder



Section I. TURRET CONTROLS AND EQUIPMENT

The headrest can be positioned for left eye or right eye use. The eyepiece is adjustable for ± 4 diopters (Figs. 3-20, 3-21).

Above and to the right of the eyepiece is an adjustment wrench to adjust the boresight knobs which are located at the bottom of the scope (Fig. 3-21). The knob on the left adjusts azimuth while the right one changes elevation.

To the left of the eyepiece is the power connection for the infrared power supply, model BT-6-26 and the intensity adjustment knob (Fig. 3-21). The power supply has one two-position "ON-OFF" toggle switch that should be left "OFF" at all times when the periscope is not in use. (Up is on; down is off).

Above the headpiece is a chart that shows the ranges for various types of ammunition at specific points on the reticle (Fig. 3-20, 3-21).

CHART FROM TPN1-41-11 PERISCOPE

APDS	HEAT HE 11	HE 18	COAX
8	1	1	1
14	3	2	2
19	5	4	3.5
30	9	7	6

In daytime, do not turn on without the diaphragm being on. In bright light, do not operate.

During the day, the gunner's periscope is protected by an armored shield that bolts to the front of the protective housing (Figs. 3-22, 3-23). This shield and the mounting bolts should be carefully stored after removal.

(3) Searchlight, Model L-2G (Fig. 3-24). The main searchlight of the T-62 tank is the L-2G searchlight. It is mounted to the right of the main gun on a platform that is linked to the main gun housing.

It has both visible and infrared modes which are available by changing filters. In the infrared mode, the searchlight gives the gunner an 800 meter range at which he can successfully engage targets.

The searchlight is protected by a metal cover that should be kept in place at all times when the searchlight is not in use (Figs. 3-24, 3-25).

The searchlight power switch is located in the gunner's compartment above the telescope bracket (Fig. 3-26). When it is turned on (MASTER must be on), a dim red light illuminates in the combat compartment near the searchlight switch.

(4) Vision Block, Type TNP-165 (Figs. 3-22, 3-26). Above the gunner's telescope, suspended from the turret ceiling, is a 1 x power vision block that can be used for general sight, main gun orientation before acquiring a target in the relatively narrow field of vision of the telescope.

(5) Main Gun/Coax Switches (Fig. 3-26). To the right of the telescope is located the fuse box for the armament system and a bank of toggle switches.

In the T-62A tank, there are only two toggle switches. The right toggle is the main gun switch; the left is the coax switch. In the T-62 tank, there are four toggle switches. The bottom two are the same as in the T-62A; right is main gun, left is coax. The two switches above are from left to right: sight reticle illumination and sight defogger/defroster.

(6) Azimuth Indicator (Fig. 3-27). The T-62 is equipped with an azimuth indicator that is located to the left of the gunner. The azimuth indicator shows the gunner the orientation of the turret and, more specifically, the gun tube over the hull of the vehicle. It is also used for range card target engagement.

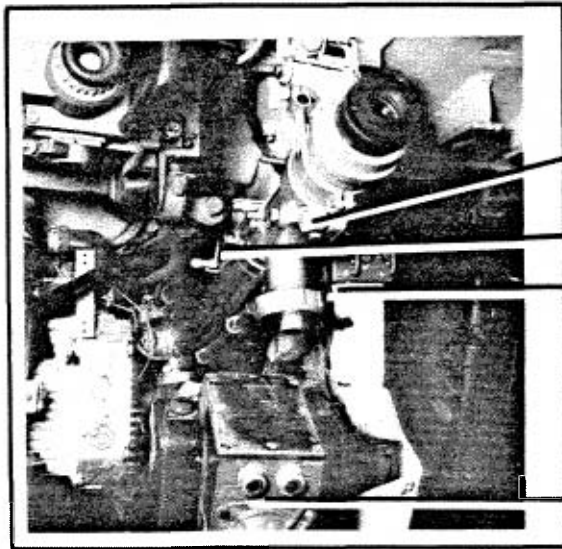


FIG. 3-19. TELESCOPE IN TANK

- 1 RANGE KNOB
- 2 MAGNIFICATION LEVER
- 3 FILTER LEVER
- 4 GUNNER'S CONTROLS

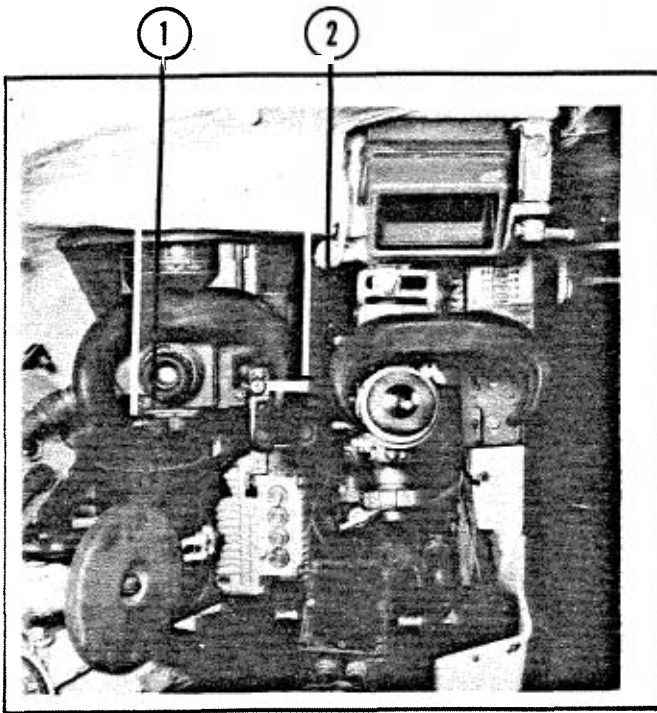


FIG. 3-21. TELESCOPE AND PERISCOPE
PREPARED FOR RIGHT EYE USE

- 1 GUNNER'S VISION BLOCK
- 2 IR POWER SUPPLY
- 3 MANUAL TRAVERSE HANDLE
- 4 GUNNER'S CONTROLS
- 5 TPN BORESIGHT WRENCH

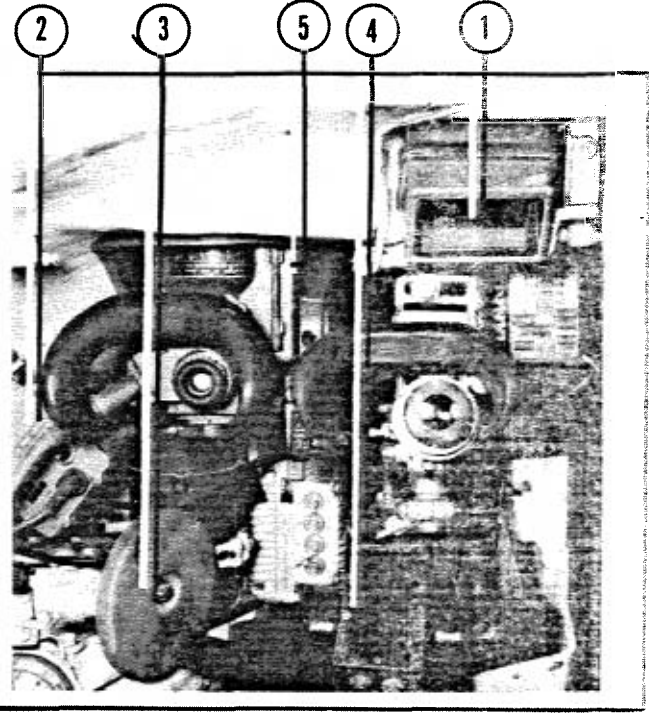


FIG. 3-20. TELESCOPE AND PERISCOPE
PREPARED FOR LEFT EYE USE

- 1 AZIMUTH ADJUSTMENT
- 2 ELEVATION ADJUSTMENT

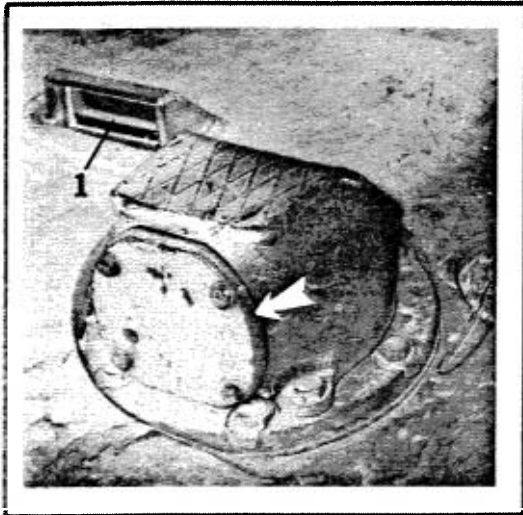


FIG. 3-22. PERISCOPE WITH PROTECTIVE COVER

1 GUNNER'S VISION BLOCK



FIG. 3-23. PERISCOPE READY FOR NIGHT USE

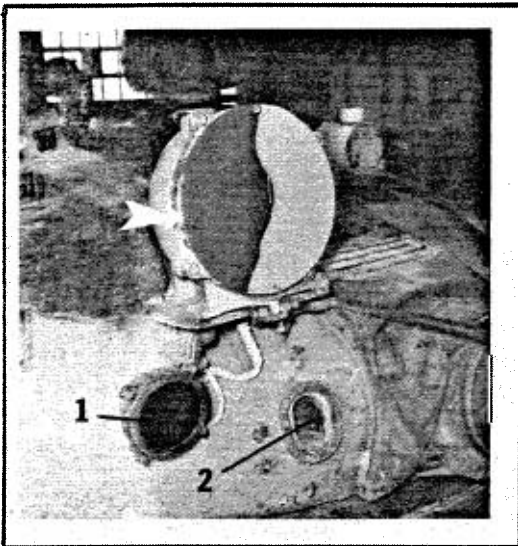


FIG. 3-24. SEARCHLIGHT, L-2G, WITH COVER

1 AUXILIARY IR DRIVING LIGHT
2 COAX FIRING PORT

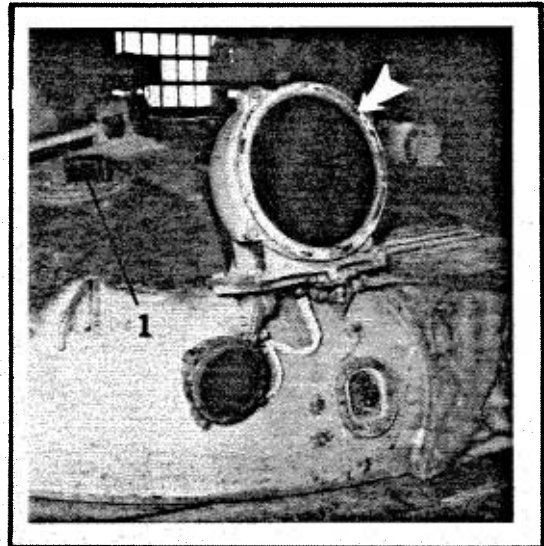


FIG. 3-25. SEARCHLIGHT, L-2G, READY FOR NIGHT USE

1 LOADER'S PERISCOPE

Section I. TURRET CONTROLS AND EQUIPMENT

The azimuth indicator is based on 6000 mils in 360° and has two hands; a 100 mil minute-hand and the 6000 mil "hour-hand" that show the orientation of the gun tube over the hull.

Below the azimuth indicator is a toggle switch which provides illumination for night reading of the dial.

(7) Gunner's Quadrant (Fig. 3-28). The gunner's quadrant is located to the right of the gunner on the gun frame. It is used to lay the gun in elevation on pre-planned targets with the use of a range card.

Just forward of the gunner's quadrant, is a toggle switch for night illumination of the gun frame.

The gunner's quadrant is graduated from 2700-3200 mils and has a micrometer adjustment knob graduated from 0-100 mils.

(8) Manual Cocking Handle (Fig. 3-29) Along the top edge of the gun carriage to the right of the gunner is the manual cocking handle.

The gun is recocked (as in the case of a misfire) by pulling the cocking handle to the rear. When the gun is cocked, there is an audible click.

Forward of the cocking handle is the manual breech closing handle (Fig. 3-29). This handle is pulled out from the gun carriage and pushed toward the front turret wall. After the breech closes, the handle is released.

(9) Mechanical Trigger (Fig. 3-30). Set into the gun carriage to the right of the gunner, below the cocking handle, is the mechanical trigger. If the electric system fails, the mechanical trigger can be depressed to fire the main gun.

b. Gunner's Elevation and Traverse Controls.

(1) Manual Traverse Handcrank (Fig. 3-31). To the left of the gunner is the manual traverse handcrank. By rotating it, the turret moves left or right. On the end of the traverse handle is an auxiliary electrical trigger for the coaxial machine gun.

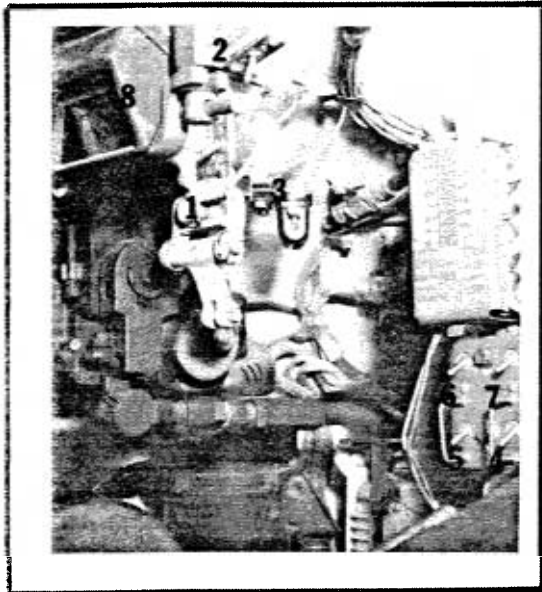
(2) Manual Elevation Handcrank (Fig. 3-32). The manual elevation handcrank is located below the gunner's electrical controls. By rotating it, the main gun elevates or depresses. At the base of the handle is located an auxiliary electrical trigger for the main gun.

(3) Manual Traverse Disengagement Lever (Fig. 3-33). To the left of the manual traverse handle is the manual disengagement lever. When the turret is placed in power operation, this handle must be rotated toward the gunner to disengage the manual traverse handcrank (Fig. 3-34). If the sleeve does not immediately fall into its disengaged position, make minor movements of the traverse handle until it does.

(4) Manual Elevation Disengagement Lever (Figs. 3-35, 3-36). The manual elevation handcrank must be disengaged to permit power elevation of the main gun.

Behind the gunner's controls is located a round handle that must be pulled up and rotated to the right till it locks in place. If any difficulty is experienced, push down on the assist handle located below and to the left of the gunner's controls (Fig. 3-35)

WARNING! NEVER DISENGAGE MANUAL ELEVATION HANDLE WITHOUT HAVING STARTED THE TANK ENGINE AND HAVING FOLLOWED THE PROCEDURE TO SAFELY PUT THE TURRET INTO POWER OPERATION. GUN TUBE WILL GO TO MAXIMUM DEPRESSION IF DISENGAGEMENT LEVER IS MOVED TO THE RIGHT WHILE TANK ENGINE IS OFF.



- 1 MAIN SEARCHLIGHT SWITCH
- 2 GUNNER'S DOME LIGHT SWITCH
- 3 GUNNER'S DOME LIGHT
- 4 MAIN GUN SWITCH
- 5 COAX SWITCH
- 6 TELESCOPE RETICLE ILLUMINATION SWITCH
- 7 TELESCOPE DEFROSTER
- 8 GUNNER'S VISION BLOCK

FIG. 3-26. SWITCHES

- 1 IR POWER SOURCE BT-6-26 FOR TPN 2-41-11
- 2 FINE NEEDLE INDICATOR
- 3 GROSS NEEDLE INDICATOR
- 4 MANUAL TRAVERSE CRANK
- 5 AZIMUTH INDICATOR ILLUMINATION SWITCH

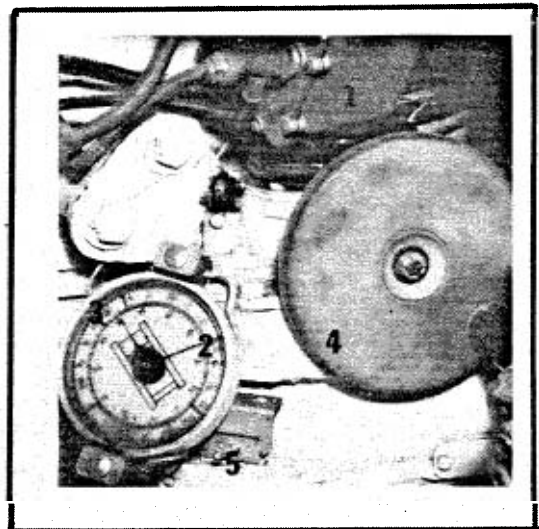
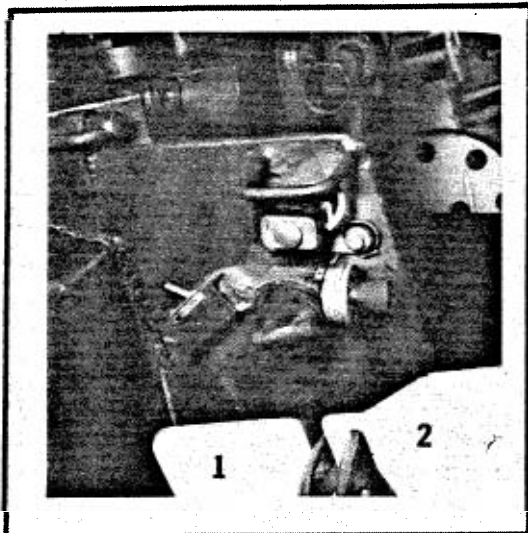
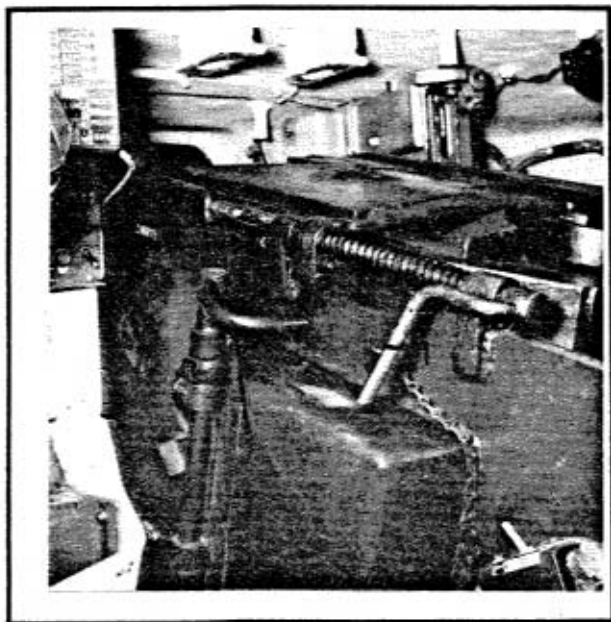


FIG. 3-27. AZIMUTH INDICATOR



- 1 ILLUMINATION SWITCH
- 2 MICROMETER ADJUSTMENT

FIG. 3-28. GUNNER'S QUADRANT



- 1 COCKING LEVER
- 2 BREECH CLOSING HANDLE

FIG. 3-29. COCKING AND BREECH CLOSING HANDLE

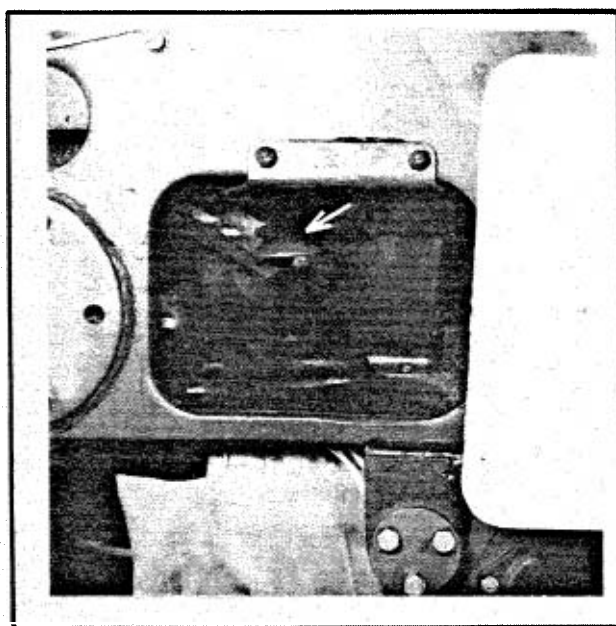
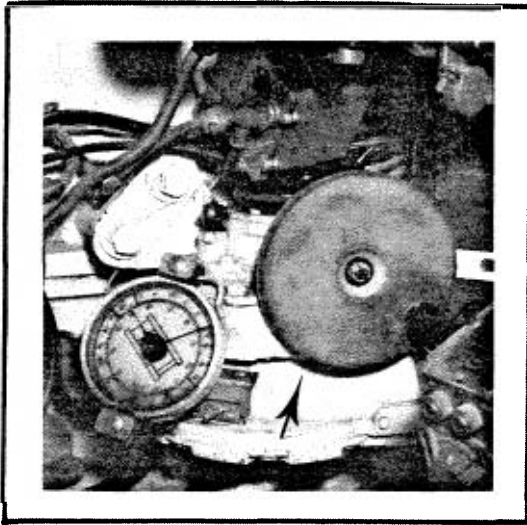


FIG. 3-30. MANUAL TRIGGER



**FIG. 3-31. MANUAL TRAVERSE
HANDCRANK**

- 1 TRAVERSE HANDCRANK**
- 2 GUNNER'S PANIC GRIP**
- 3 AUXILIARY COAX TRIGGER**
- 4 ELEVATION HANDCRANK**
- 5 AUXILIARY MAIN GUN TRIGGER**

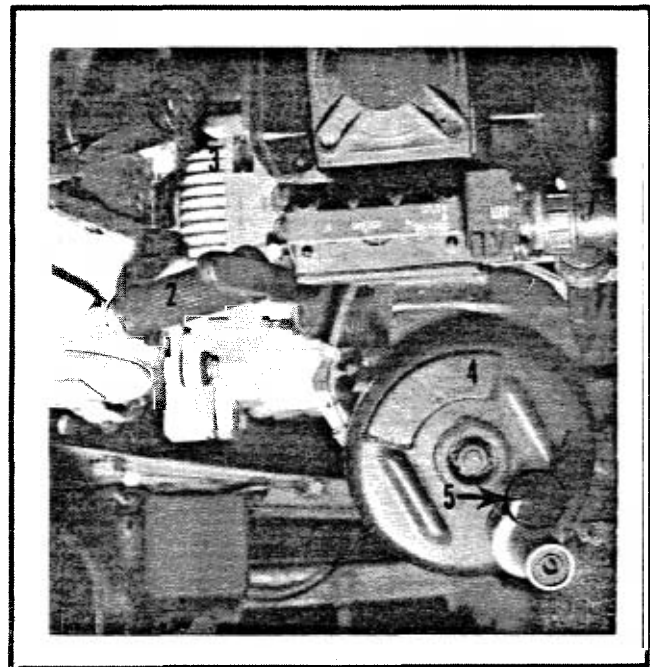


FIG. 3-32. MANUAL ELEVATION HANDCRANK

Section I. TURRET CONTROLS AND EQUIPMENT

To reengage the mechanical elevation handcrank, pull up the elevation disengagement lever, and move it to the left. If any difficulty is experienced in locking it to the left, wiggle the manual elevation handcrank till gear teeth mesh.

(5) Gunner's Controls (Fig. 3-37). Directly in front of the gunner's seat are the gunner's controls. With these controls he can electrically traverse, elevate and fire the main gun and coax machine gun. In addition, there are three toggle switches across the bottom of the control gauge that turn on (from left to right) unstabilized traverse (UNSTAB TRAV), stabilized elevation (STAB ELEV) and stabilized traverse (STAB TRAV).

There are two lights above the toggle switches. The red one on the right illuminates when the center toggle (STAB ELEV) is turned on. The left one is green and illuminates when the far left toggle (UNSTAB TRAV) is turned on.

The handgrips on the gunner's control box are used to elevate the main gun and traverse the turret. The grips are twisted up and down or right and left to cause turret and main gun movement.

At the top of each handgrip is a black push-button. These buttons are the main electrical triggers. The right handgrip button is the coax trigger. NOTE: On some models of the T-62 tank, another push-button is found by the right fore-finger on the right handgrip. This button has no function.

c. Miscellaneous.

(1) Gunner's Seat and Footrest (Figs. 3-38, 3-39). The gunner's seat can be lowered or raised by squeezing together the grips along the top of the seat mount. The lowering of the seat facilitates access to the escape hatch and to electrical components and gyros beneath the main gun.

The gunner's footrest likewise can be lowered for operation to keep the gunner's feet off the turret floor or can be raised to provide better access to areas beneath the gunner's controls and the main gun (Figs. 3-38, 3-39).

(2) Gunner's Backrest (Fig. 3-40). The gunner has no rigid backrest as do the other crewmen. Instead, there is a strap that is fixed to the main gun carriage. The free end of the strap is connected to one of the holes in the radio mount.

(3) Gunner's Grip Handle (Panic Grip) (Fig. 3-32, 3-37). When firing the main gun or protecting himself from jolts when the vehicle moves cross-country, the gunner can hold a fixed handle mounted below the manual traverse handle to the left of the gunner's control gauge.

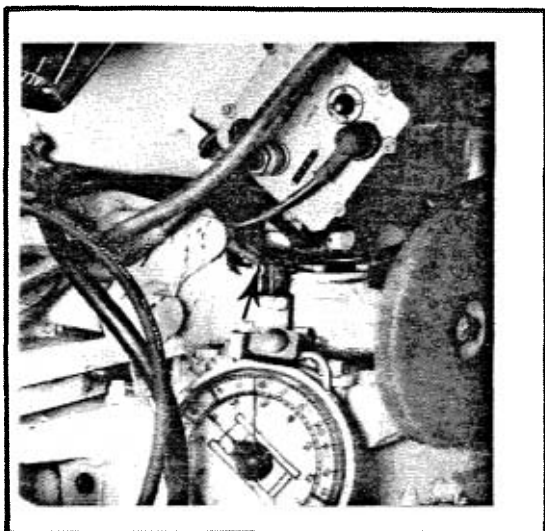
(4) Gunner's Dome Light (Fig. 3-26). The gunner has a dome light located behind the 1 x-power vision block above the main infrared searchlight switch.

(5) Intercom. The gunner's seat is next to the AM T780/VRC fitted to the Soviet radio mount. The gunner has been provided with his own junction box, mounted by his left side.

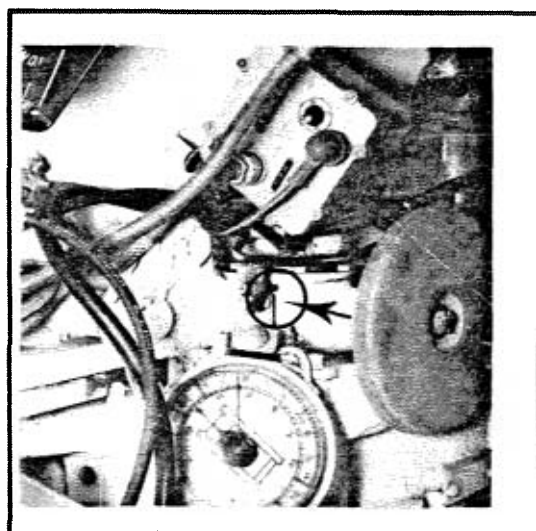
3-4 LOADER'S CONTROLS AND EQUIPMENT

a. General. This section contains information on the loader's controls and equipment of the T-62 and T-62A equipped with conventional armament and fire control systems.

b. Loader's Hatch (Figs. 3-41, 3-42, 3-43). The loader in a T-62 has a fixed hatch that can be secured in either the locked open or locked closed positions. In a T-62A, the loader's hatch is mounted on a cupola to which is also attached a machine gun mount for a 12.7 mm DShK anti-aircraft machine gun. This cupola can be rotated 360°. The loader's hatch can be locked in either the open or closed position and has a combat lock identical to the type found on the Tank Commander's hatch.



**FIG. 3-33. MANUAL TRAVERSE ENGAGED
HANDLE ROTATED TOWARD TURRET
WALL**



**FIG. 3-34. MANUAL TRAVERSE DISENGAGED
HANDLE ROTATED TOWARD GUNNER
SLEEVE IS DOWN**



**FIG. 3-35. MANUAL ELEVATION ENGAGED
1 DISENGAGEMENT ASSIST HANDLE
2 DISENGAGEMENT KNOB**

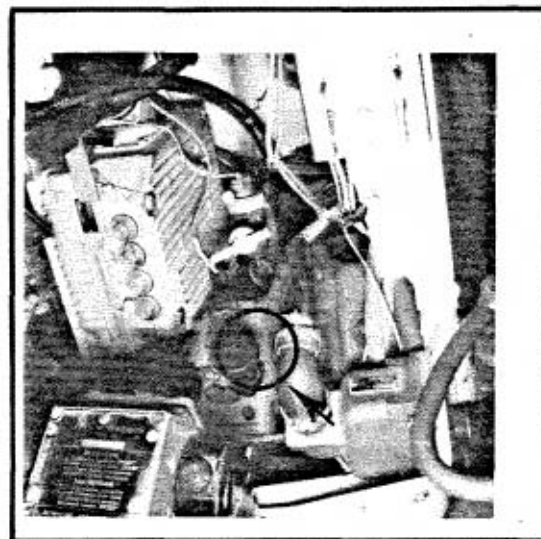


FIG. 3-36. MANUAL ELEVATION DISENGAGED

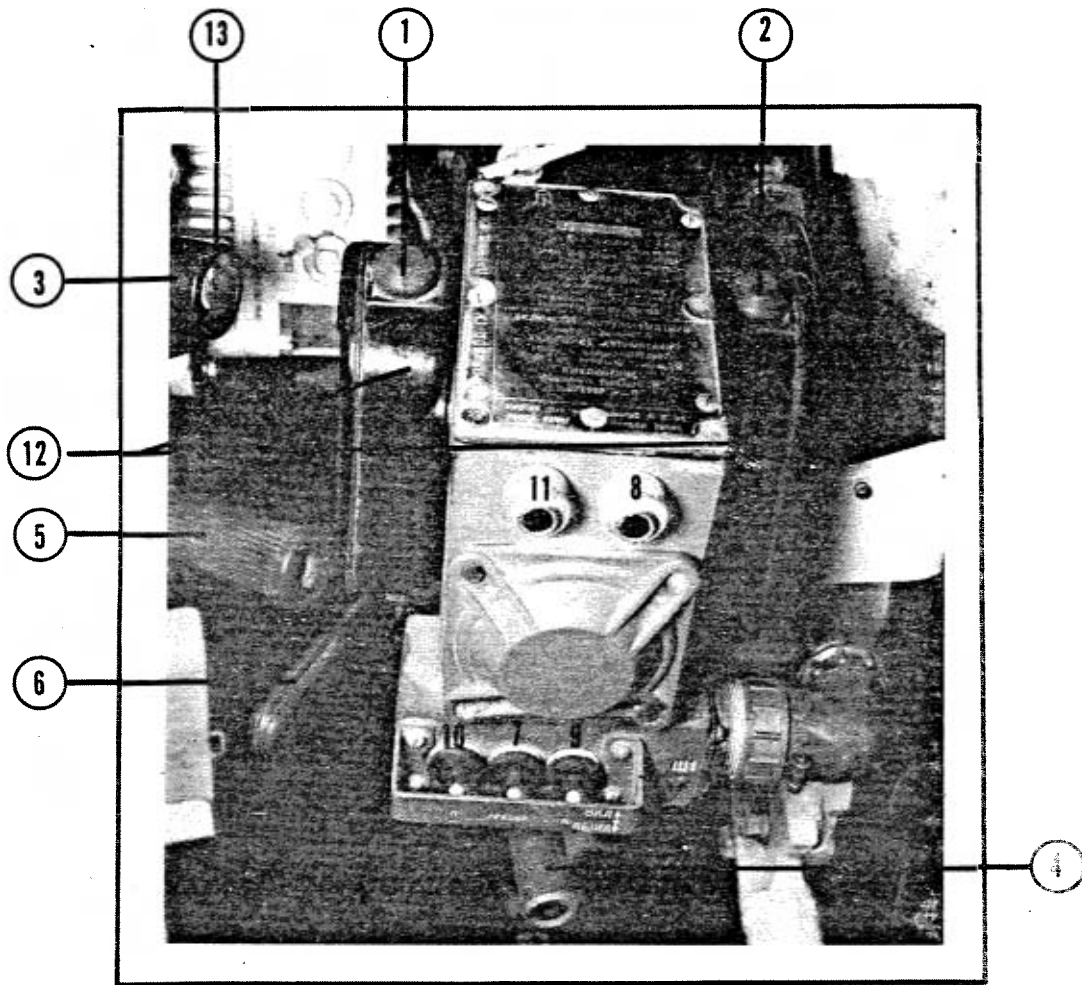


FIG. 3-37. GUNNER'S CONTROLS

- 1 COAX TRIGGER**
- 2 MAIN GUN TRIGGER**
- 3 TRAVERSE HANDCRANK**
- 4 ELEVATION HANDCRANK**
- 5 PANIC GRIP**
- 6 MANUAL ELEVATION DISENGAGEMENT ASSIST LEVER**
- 7 STABILIZED ELEVATION SWITCH**
- 8 RED LIGHT**
- 9 STABILIZED TRAVERSE SWITCH**
- 10 UNSTABILIZED TRAVERSE SWITCH**
- 11 GREEN LIGHT**
- 12 POWER ELEVATION-TRAVERSE HANDGRIPS**
- 13 AUXILIARY COAX TRIGGER**



FIG. 3-38. GUNNER'S SEAT AND FOOTREST STOWED

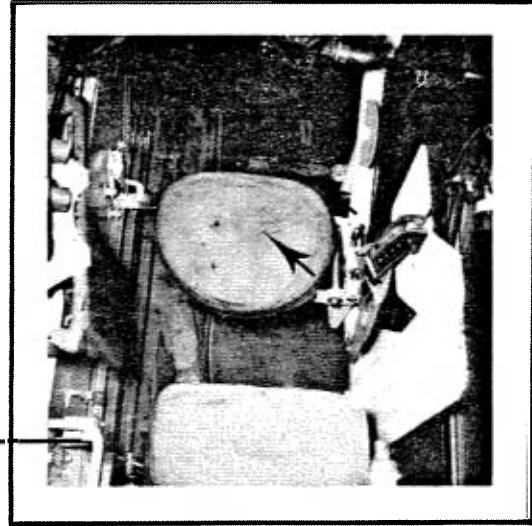


FIG. 3-39. GUNNER'S SEAT AND FOOTREST IN POSITION
1. HEAT SENSOR BUTTON



FIG. 3-40. GUNNER'S BACK REST
1 BACK REST
2 SOVIET TANK CREWMAN HELMET

Section I. TURRET CONTROLS AND EQUIPMENT

c. Loader's Seat (Fig. 3-44). The loader's seat is springloaded in both the T-62 and T-62A. In the T-62, there are two mounts for the seat along the turret wall of the loader's compartment. In the T-62, the loader has only one mount for his seat.

d. Loader's Safety (Fig. 3-45). The loader's safety is located on the right side of the gun carriage. This safety is a two-position device. When the lever is pushed in, the safety is in the "FIRE" position. When the black button on the side of the safety is pushed in, the lever springs to the extended position and the safety is in the "SAFE" position (Fig. 3-46).

The loader's safety is an absolute safety. When the safety is in the "SAFE" position, no trigger will fire, to include the main gun mechanical trigger. In addition, a "SAFE" safety will render the turret powerless. The gunner will have no electrical traverse or elevation control. The safety is returned to the "SAFE" position each time the main gun fires.

e. Loader's Periscope, MK-4S (Figs. 3-47, 3-48). The loader has a periscope mounted in the turret ceiling that gives him vision to the front and side of the vehicle. The periscope swivels in its mount and can be rotated about its horizontal mounting axis.

The sight has a dual periscope vision capability to the front and to the rear. The sight is normally mounted to allow the loader to look to his front. In this mode the loader has a 25° field of vision. By pulling down on the headrest, the loader can configure the periscope to look to his rear. In this mode, the loader has a 16° field of view.

f. Loader's Handgrip (Panic Grip) (Fig. 3-47). The loader has a handle to the right of his periscope that is to be used during firing of the main gun or during vehicular movement across rough terrain.

g. Coax Mount (Fig. 3-49). The loader is responsible for loading and servicing the 7.62 mm PKT coax machine gun. The mount for the coax is located to the right of the main gun on the gun frame. Beneath the mount hangs a cloth bag that catches the shell casings.

h. Travel Lock (Fig. 3-50). The main gun travel lock in the T-62 series tank is located inside the turret. A bar is hung from the turret roof and fixed by a pin at the top of the breech. There are three positions in which the T-62 main gun can be locked.

When the gun is not in travel lock, the bar is removed from the turret roof and stowed in a special mount behind the two round ready rack along the right rear of the turret wall (Fig. 3-51).

i. Automatic Ejection System. The T-62 series tank has an integral spent shell ejection mechanism which is activated by the recoil of the main gun and ejects shell casings from the turret. The ejector mechanism consists of three main elements; the tray, the ejector port (Figs. 3-53, 3-54, 3-55, 3-56), and the electrical control box (Fig. 3-57).

(1) The Ejector Tray (Fig. 3-52). The frame of the ejector tray is bolted to the gun carriage. Normally, the ejection mechanism is functioned by the recoil of the gun, but the mechanism can be tested electrically.

WARNING! WHEN TESTING THE ELECTRICAL OPERATION OF THE EJECTION MECHANISM, KEEP WELL CLEAR OF THE EJECTOR TRAY.

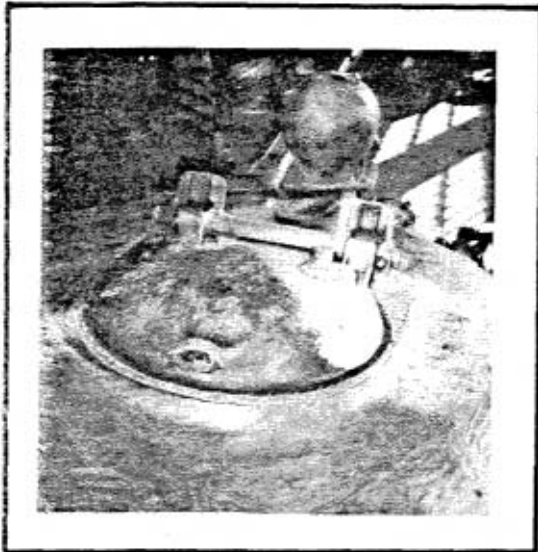


FIG. 3-41. LOADER'S HATCH T-62

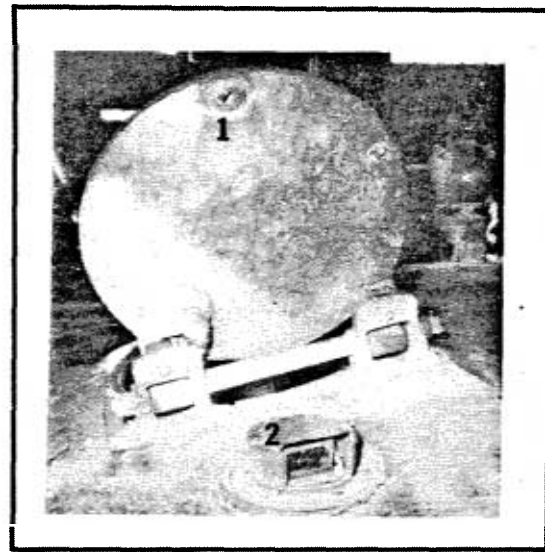


FIG. 3-42. LOADER'S HATCH, FRONT VIEW

- 1 HATCH LOCK
- 2 LOADER'S PERISCOPE, MK-4

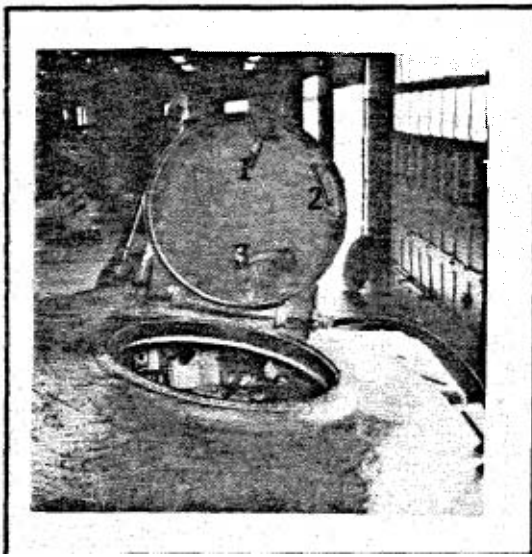


FIG. 3-43. LOADER'S HATCH, REAR VIEW

- 1 COMBAT LOCK
- 2 HANDLE
- 3 HANDLE RELEASE HANDLE



FIG. 3-44. LOADER'S SEAT



FIG 3-45 LOADER'S SAFETY - "FIRE"

- 1 SAFETY SELECTOR
- 2 SAFETY RELEASE BUTTON

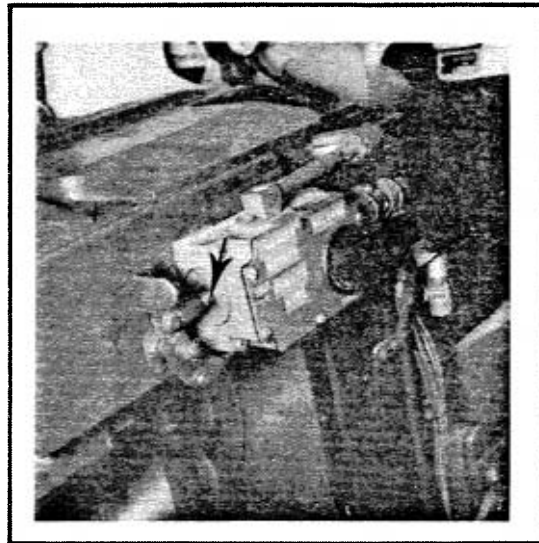


FIG 3-46 LOADER'S SAFETY - "SAFE"

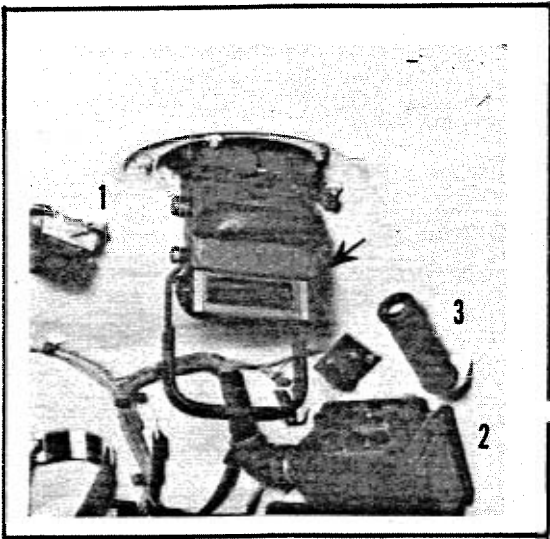


FIG 3-47 LOADER'S PERISCOPE MK-4,
FOR VIEWING TO THE FRONT

- 1 LOADER'S DOME LIGHT
- 2 EJECTOR CONTROL BOX
- 3 LOADER'S HANDGRIP

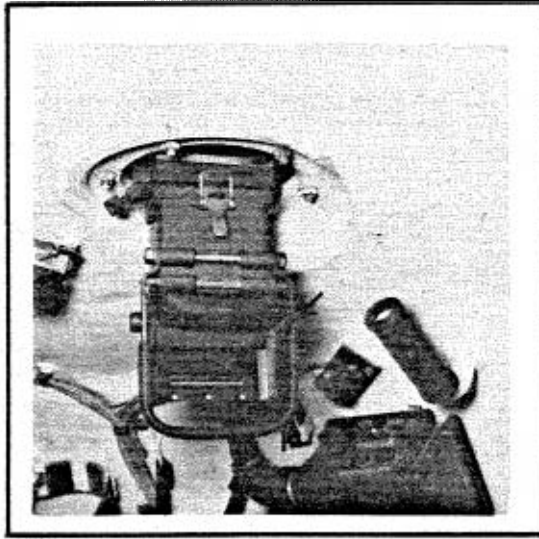


FIG 3-48 LOADER'S PERISCOPE
FOR VIEWING TO THE REAR

- 1 AUXILIARY IR DRIVING LIGHT
- 2 PERISCOPE IN EXTENDED
POSITION AND ROTATED 180°
- 3 LOADER'S HANDGRIP

Section I. TURRET CONTROLS AND EQUIPMENT

When activated (by either recoil or electrical means), the tray assembly separates from the framework and rises to the ejection port.

(2) The Ejector Port (Figs. 3-53, 3-54). There is an ejector port on the rear side of the turret. It is through this port that spent shells are ejected. The port is opened and closed by a servomotor mounted to its side. The door opens automatically when the ejection system functions and can also be opened electrically without the entire system functioning (Figs. 3-55, 3-56). The port can be opened manually (with difficulty) by disengaging and pushing up the servomotor which is joined to the port.

The door has a handle on it so it can be locked shut. This handle must always be in the open position before attempting to function the door separately or the ejection system tray either electrically or by recoil.

(3) The Ejection System Control Box (Fig. 3-57). Immediately below the loader's panic grip on the turret wall is mounted the electrical control box for the ejection system. This box has one toggle switch and two push buttons.

The toggle switch is used to select two different electrical modes of opening the ejector port. With the switch in the AUTO position (toward the front turret wall), the ejector mechanism (tray and door) can be functioned by the recoil of the gun or by tripping the micro switch at the rear of the shell tray.

When the toggle is in the MAN position (toward rear of turret), the loader can push the "OPEN" button to function only the door. Pushing the "CLOSE" button shuts the port.

j. Breech Opening Handle (Fig. 3-58). The breech opening handle is located on the top edge of the gun. The springloaded handle (Fig. 3-59) must be raised to clear its detent from the locked travel position. The

handle is then swung towards the gunner's seat (Fig. 3-60). This movement takes a minimum of effort since the gear does not engage until it's fully open. An audible click signals that the handle is engaged (Fig. 3-60).

The loader then pulls the handle back towards his position until the extractors in the breech-block audibly click into the locked open position (Fig. 3-61). At this point, the handle is still not locked in its travel position. On top of the handle near its shaft is the handle disengagement lever that is spring-loaded (Figs. 3-62). By squeezing the lever, tension is released on the handle and it can be secured in its travel position (Fig. 3-63).

k. Turret Ventilator (Fig. 3-56). The turret ventilator is located in the Tank Commander's area, but the "ON-OFF" control box is located near the ejector port, within reach of the loader. It should be turned on to remove gases and smoke from the turret compartment.

l. Dome Light (Fig. 3-64). The loader has an adjustable screen dome light with which he can illuminate his working area. The switch for the light is located on the turret ceiling just left and forward of the loader's periscope.

m. Driver's Auxiliary IR Light (Fig. 3-24). The switch for the driver's auxiliary infrared light is mounted in the loader's area just above the power connection for the loader's electrical control box (Fig. 3-57). The infrared light itself is located on the fixed platform of the main/searchlight mount.

Even though the loader has no infrared viewing capability, the height of this auxiliary light is of great assistance to the driver during IR conditions.

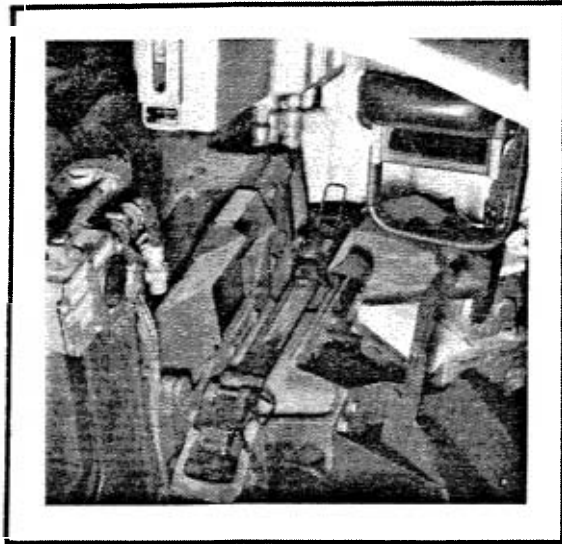


FIG. 3-49. COAX MOUNT

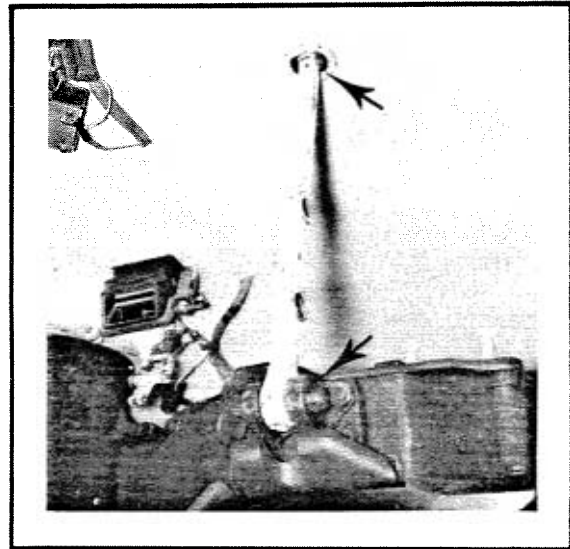


FIG. 3-50. TRAVEL LOCK MOUNTED

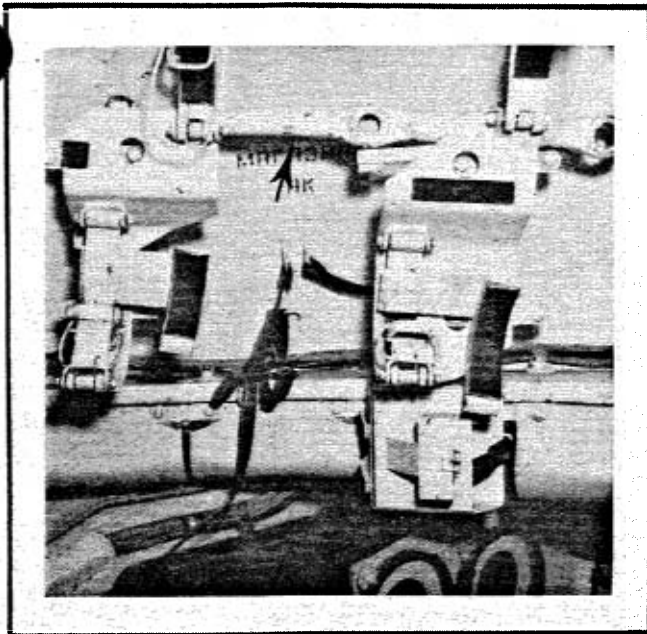


FIG. 3-51. TRAVEL LOCK BAR STOWED

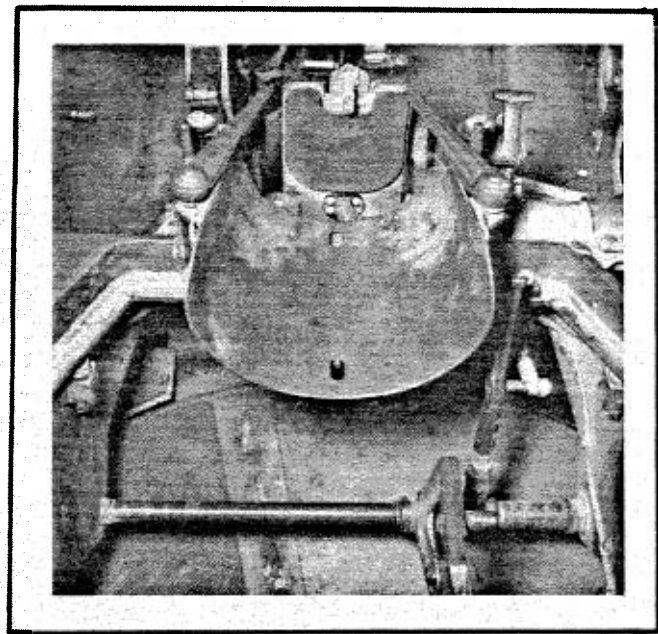


FIG. 3-52. EJECTOR TRAY

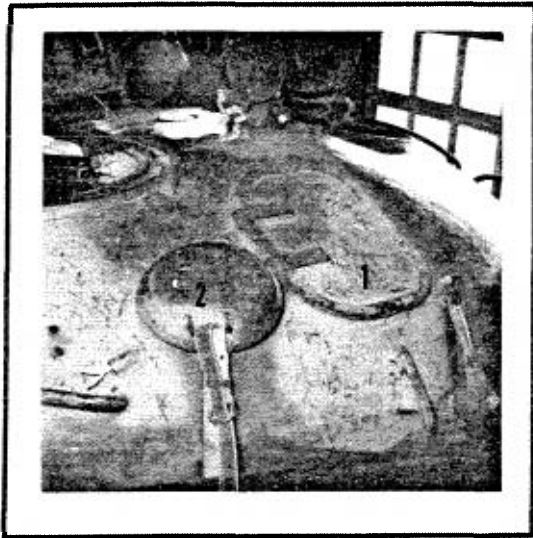


FIG. 3-53. EJECTION PORT
 1 EJECTION PORT
 2 TURRET VENTILATOR



FIG. 3-54. EJECTION PORT AND SERVOMOTOR
 1 SERVOMOTOR DISENGAGEMENT HANDLE

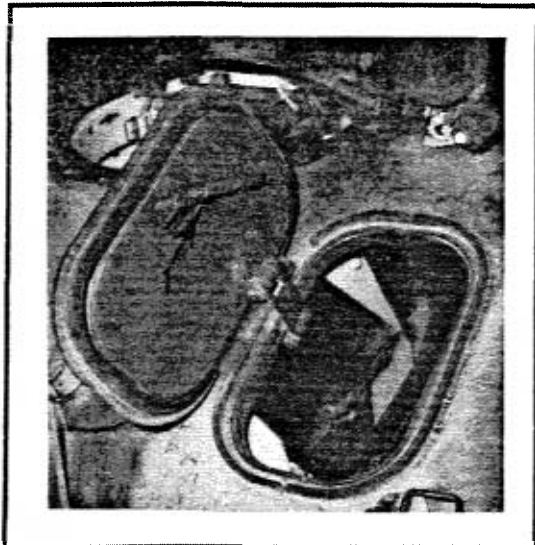


FIG. 3-55. EJECTION PORT OPEN
 1 EJECTION PORT LOCKING HANDLE

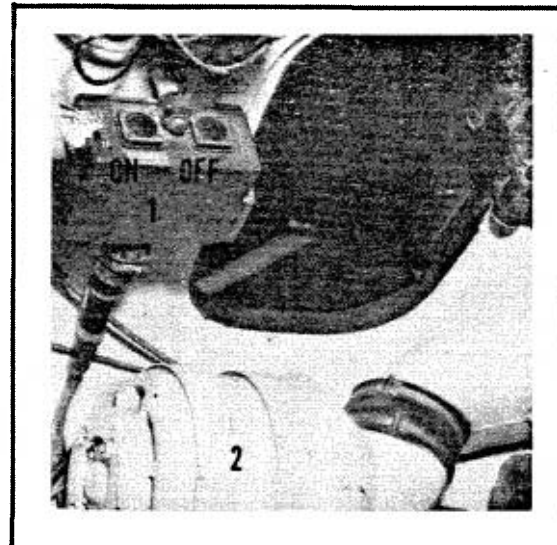


FIG. 3-56. EJECTION PORT OPEN
 FROM TURRET
 1 VENTILATOR CONTROL BOX-
 ON-OFF
 2 VENTILATOR

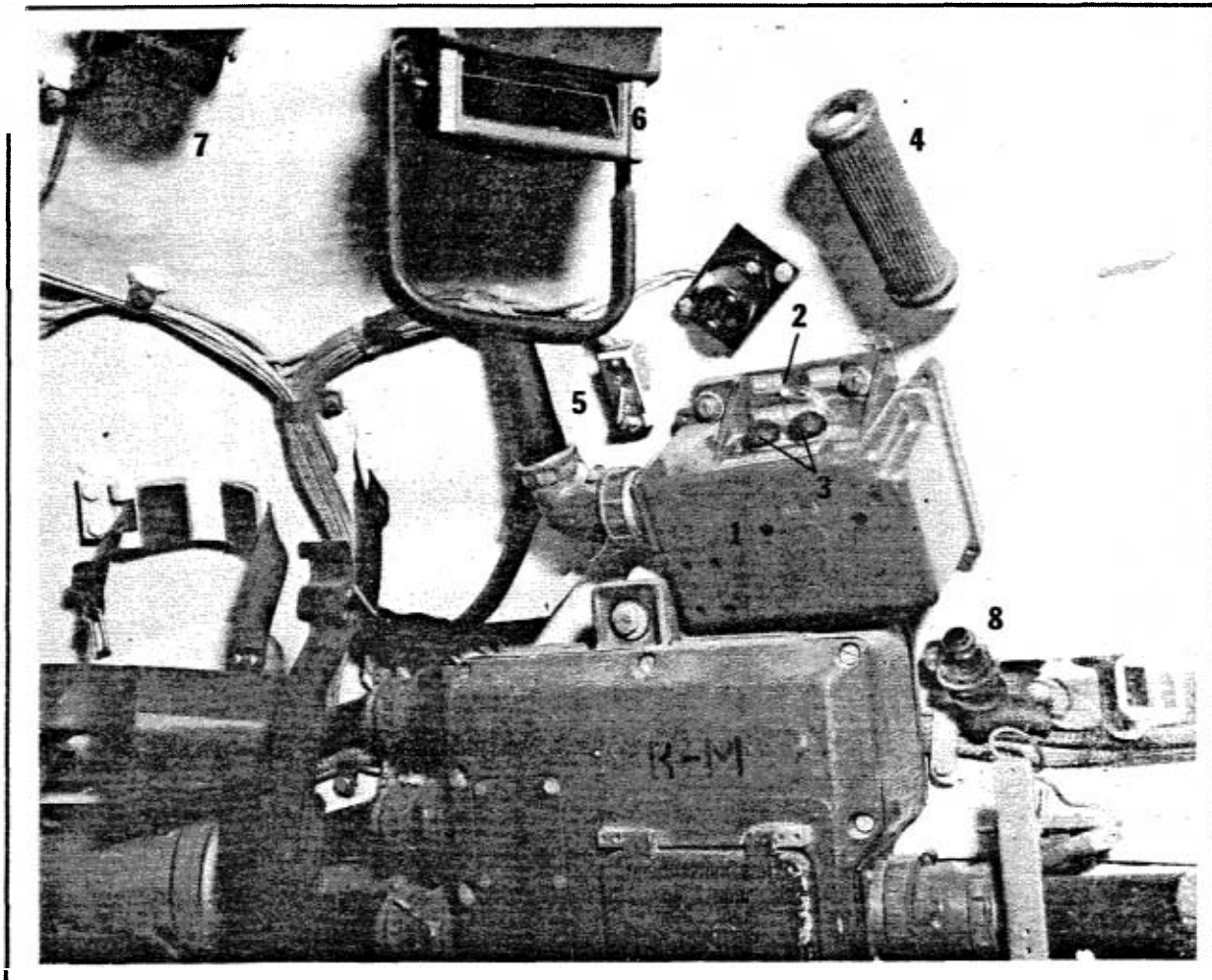


FIG. 3-57. EJECTOR CONTROL BOX

- 1 CONTROL BOX**
- 2 AUTO-MAN TOGGLE SWITCH**
- 3 OPEN-CLOSE PUSH BUTTON**
- 4 LOADER'S PANIC GRIP**
- 5 DRIVER'S AUXILIARY IR LIGHT SWITCH**
- 6 LOADER'S PERISCOPE**
- 7 DOME LIGHT**
- 8 MAIN GUN "ON" WARNING LIGHT**

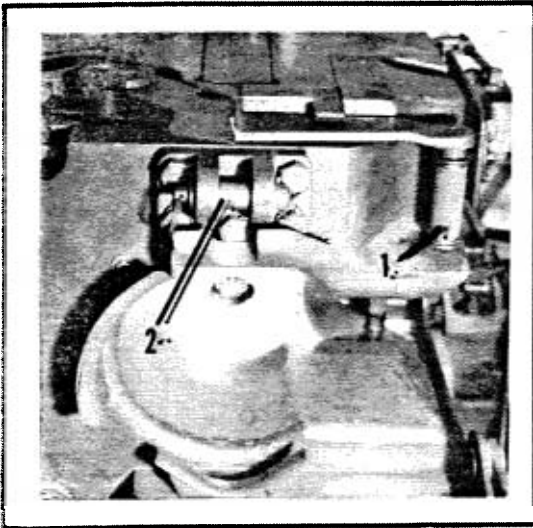


FIG. 3-58. BREECH HANDLE STOWED

- 1 HANDLE
- 2 TRAVEL LOCK PIN

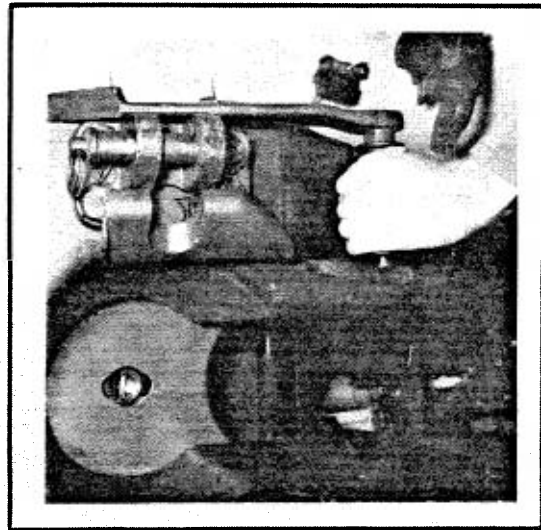


FIG. 3-59. HANDLE OUT OF DETENT



FIG. 3-60. HANDLE ENGAGED

Section I. TURRET CONTROLS AND EQUIPMENT

n. Replenisher (Fig. 3-64). The loader has prime responsibility for monitoring the level of hydraulic fluid in the gun recoil system. He checks to confirm the presence of hydraulic fluid in the window. This window is located to the right side of the main gun above the coax mount.

o. Communications (Fig. 3-65). The loader has access to his own intercommunication junction box (US) that is located to his rear on a protective plate that covers the turret ring.

3-5 AUXILIARY CONTROLS AND EQUIPMENT

a. General. This section contains operation information for auxiliary controls and equipment in the turret. The information in this section covers the hull blower, engine-preheater, fire detector and ammunition racks.

b. Hull Ventilator (Fig. 3-67). The hull ventilator is located below and to the rear of the Tank Commander's seat. It pulls air from the turret area into the engine compartment. This ventilator must be used to supply air to the engine when the tank snorkels.

The control box for this ventilator is located in the driver's compartment (see Driver Controls and Equipment).

c. Pre-Heater(Figs. 3-66, 3-67). The engine pre-heater apparatus is located beneath the Tank Commander's seat. The control panel for the pre-heater is located immediately to the left and below the Tank Commander's seat.

The pre-heater is used in winter operations to warm the engine coolant.

d. Ammunition Racks. There are five separate ammunition racks in the T-62; a two round turret ready rack (Fig. 3-70), a 16 round front hull rack (Fig. 3-72), and two one-round racks (Figs. 3-73, 3-74), along the floor beneath the gunner's footrest. Total basic load is 40 rounds.

The rear hull 20-round rack is color coded to facilitate its construction as ammunition is placed into it.

e. Heat Sensor. By the base of the front 16 round ammo rack (Fig. 3-68), and by the fuel cell near the rear 20-round rack (Fig. 3-69), are heat sensors that will activate the fire extinguisher system automatically. If the system does not activate automatically, the vehicle commander can activate the system by pushing a button located below and to the left of the TC's seat (Fig. 3-39).

WARNING! IF FIRE EXTINGUISHER EVER GOES OFF, IMMEDIATELY VACATE THE VEHICLE. SOVIET FIRE EXTINGUISHER GAS IS HIGHLY POISONOUS.



FIG. 3-61. BREECH FULLY OPENED

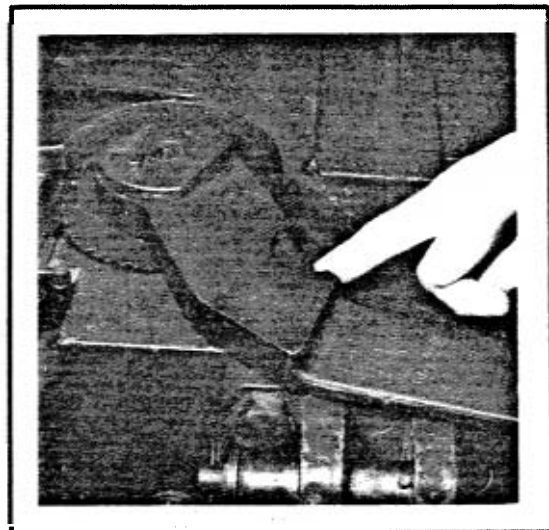
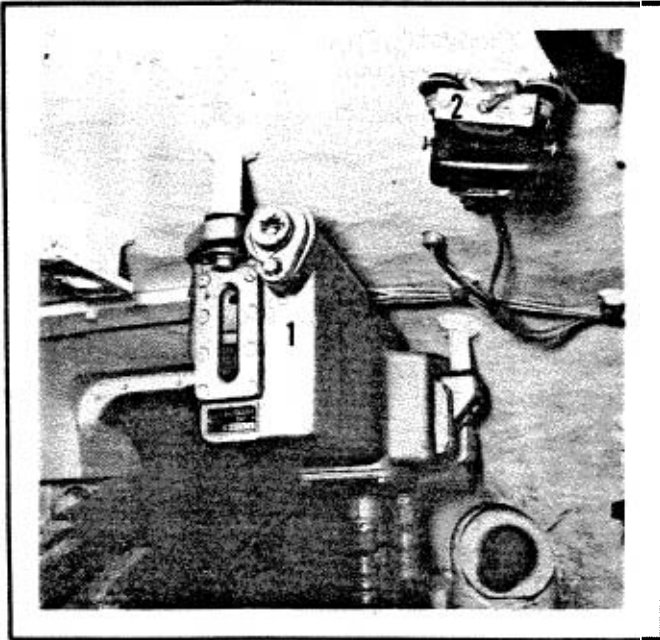


FIG. 3-62. HANDLE DISENGAGEMENT LEVER



FIG. 3-63. DETENT RAISED TO STOW



- 1 REPLENISHER
- 2 LOADER'S DOME LIGHT

FIG. 3-64. REPLENISHER

- 1 TURRET VENTILATOR
- 2 TURRET RING

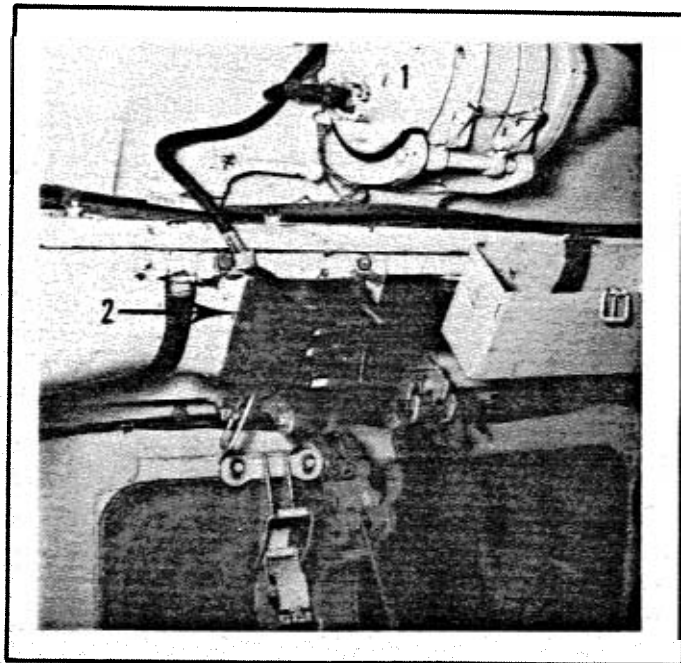


FIG. 3-65. LOADER'S INTERCOM BOX

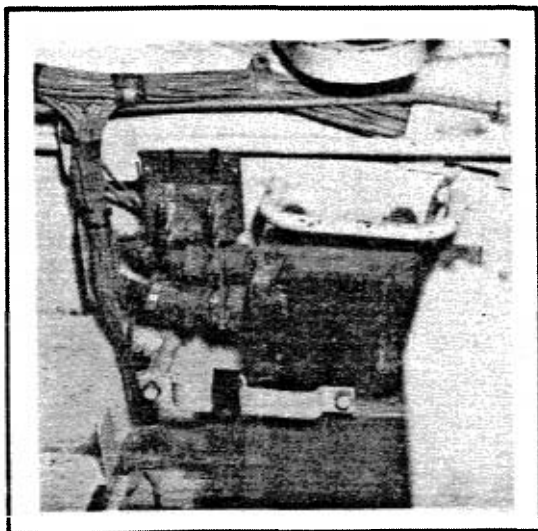


FIG. 3-66. PREHEATER CONTROLS

- 1 GLOW PLUG SWITCH
- 2 MOTOR SWITCH

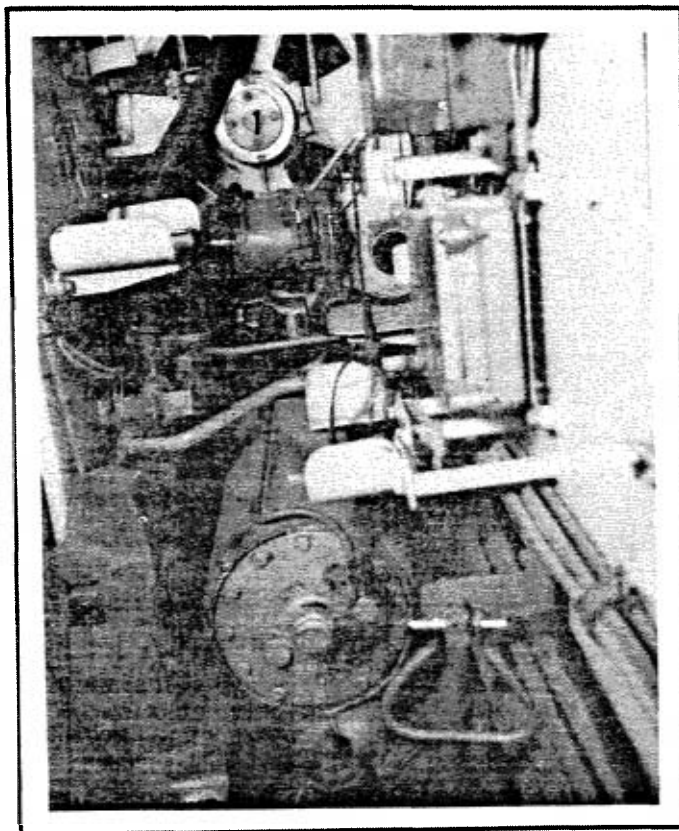


FIG. 3-67. PREHEATER

- 1 HULL VENTILATOR

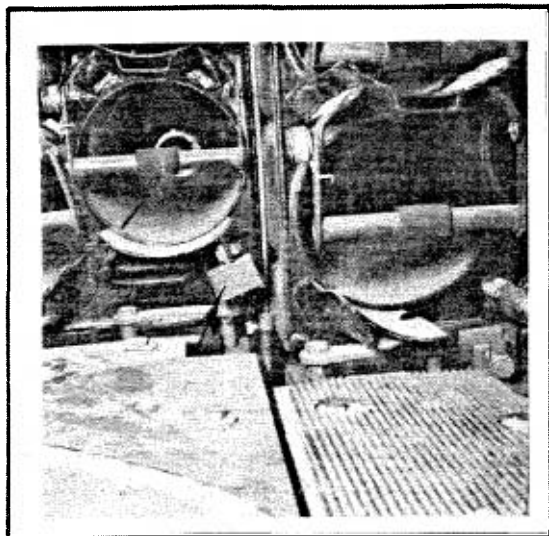


FIG. 3-68. HEAT SENSOR BY FORWARD HULL AMMO RACK

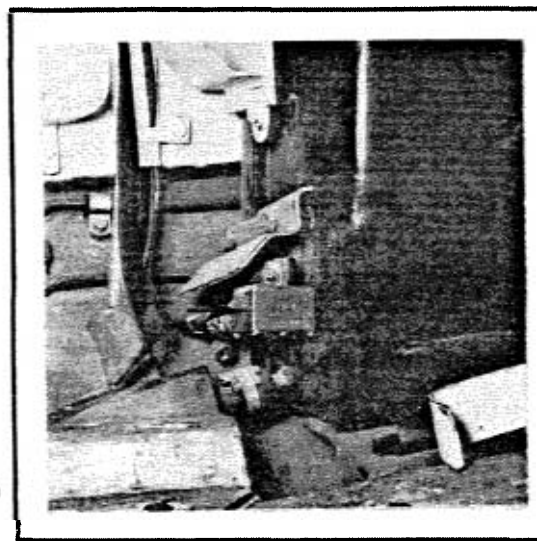


FIG. 3-69. HEAT SENSOR BY FUEL CELL

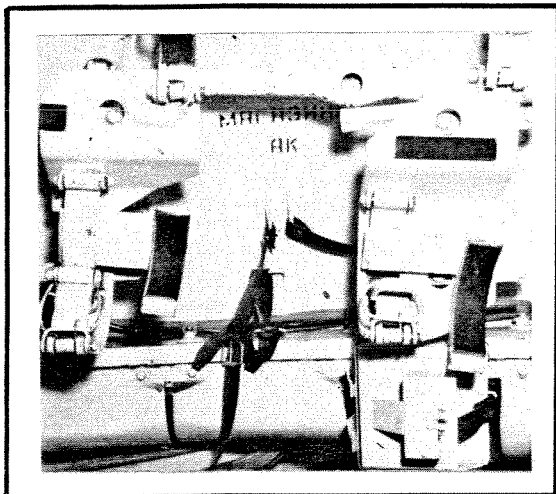


FIG. 3-70. TWO-ROUND READY RACK

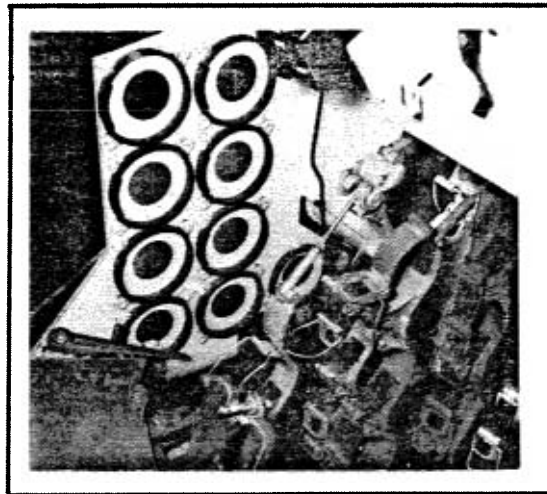


FIG. 3-71. 20-ROUND HULL RACK

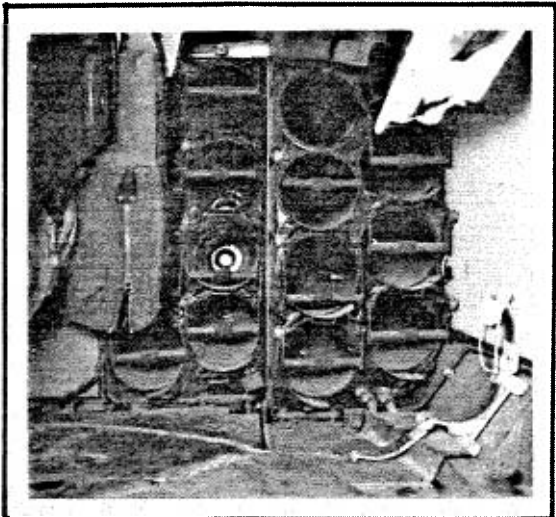


FIG. 3-72. 16-ROUND HULL RACK

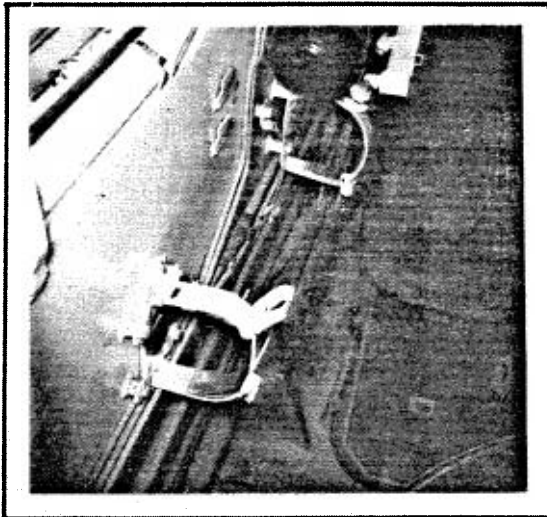


FIG. 3-73. 1-ROUND RACK BY GUNNER'S FEET

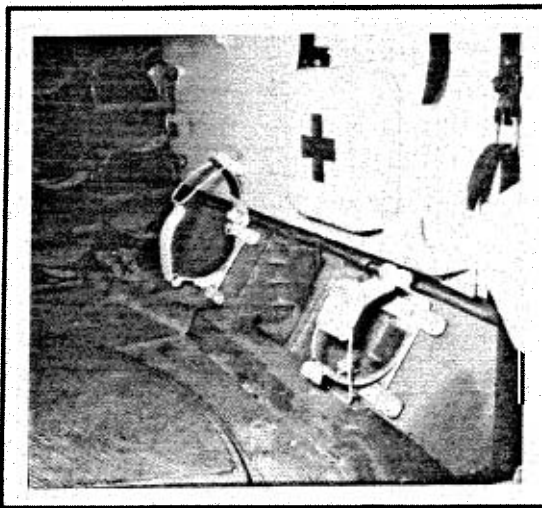


FIG. 3-74. 1-ROUND RACK BY LOADER'S FEET

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

3-6 GENERAL

This section contains the procedures for the operation and employment of the turret armament and associated fire control and sighting equipment in the T-62A Soviet Medium tank.

3-7 AMMUNITION TYPES AND STORAGE

a. Types of T-62 Ammunition. The T-62 has three types of ammunition for the 115 mm U5-TS main gun. These are a hypervelocity, armor piercing, finstabilized, discarding sabot (HVAPFSDS) round, two types of high-explosive fragmentation (HE-FRAG) round, charges 11 and 18, and a high explosive anti-tank (HEAT) round. These rounds are issued in ammunition boxes. When these rounds are loaded on the tank, grease or dirt should be removed from the ammunition. Ensure that the fuses have caps and that the V-429V fuse for the HE-FRAG round is set at "0". Do not use any rounds that have cracks at the base or casing flange or have noticeable dents. Remember the rounds are electrically fired. Use the same precautions you would use when handling US tank ammunition.

b. Ammunition Storage. The T-62 has a basic load of 40 rounds unless it is a command tank. In that case, it stows 37 rounds. The storage configuration is shown in section 3-5d.

The basic load for the PKT machine gun is 2500 rounds in 10 250 round replenishable belts. There are 120 rounds for the AK-rifle, 10 hand grenades and 12 flare pistol cartridges.

3-8 PREPARING AND INSPECTING ARMAMENT FOR FIRING

a. 115 mm Main Gun. The following will be accomplished before firing the main gun:

(1) Boresight the TSh2B-41 telescope, TPN 1-41-11 infrared periscope and the TKN 3 Tank Commander's periscope (See section 3-12).

(2) Clean the gun tube and breech. Examine the barrel for cracks or bulges.

(3) Remove and clean the breech-block. Disassemble firing pin mechanism and remove all dust, dirt or grease. Measure the firing pin head length. It must be between 2 and 2.42mm long.

NOTE: Breech removal, disassembly and assembly will be addressed in a change to this manual should ammunition become available for service firing.

(4) Cock the firing pin with the cocking handle, turn on the main gun switch and depress the main gun trigger to check operation of the firing pin. (NOTE: Do not leave firing pin cocked. This will weaken the spring).

(5) Rotate the manual elevation handcrank. If it binds unnecessarily, clean dirt from spur gear.

(6) Rotate manual traverse handcrank.

b. Automatic Ejection System. The following checks will be made before firing the main gun:

(1) Check for completeness of ejection assembly.

(2) Function the automatic ejection system. To do this:

(a) Start the tank.

(b) Unlock the ejector port. Levers should be in positions shown (Fig. 3-75).

(c) Disengage ejection framework from travel lock and secure the travel lock in "open" position (Figs. 3-76, 3-77).

(d) Turn on main gun switch. A green warning light should illuminate next to the ejection system control box (Fig. 3-78).

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

(e) Move mode selector switch on ejection system control box to "automatic" (Fig. 3-78).

(f) Take a 3-foot board and from the loader's position push the circuit activating pin (Fig. 3-79).

(g) The tray will elevate in line with the ejector port which will open. The shell will be ejected, the framework will return to its original position and the hatch will close. Personnel should stand clear of the framework and ejector port when it is in operation.

c. Stabilizer System. The following checks will be made before firing the main gun or using the turret in the stabilized mode:

(1) Check replenisher fluid level in the check window. (Fig. 3-80). It should be visible in the window.

(2) Check horizontal and vertical performance of stabilizer system (See Section 3-11 for instructions on placing the stabilizer system in operation).

(3) Check operation of TC's TKN-3 override in both stabilized and unstabilized modes (See Section 3-11 for instructions on operation of TC's override) (Fig. 3-81).

(4) Check operation of main gun hydraulic braking. This is done by placing gun in power elevation. When the manual elevation controls are disengaged the gun should remain in place. If there is a system malfunction, the gun will depress rapidly (See Section 3-11 for instructions on placing elevation system in power operation).

d. 7.62 mm PKT Coaxial MG.

(1) Preparation of the Machine Gun for Firing. These items and procedures should be checked and followed before firing the weapon.

(a) Ammo. Examine the ammo belts to be sure all the rounds are firmly seated in their belts. Loose cartridges will fall out if the belt is shaken.

(b) Spare Parts and Accessories. Spare parts, accessories, ammo box, shell and belt bag, and MG mounting should all be in good condition.

(c) Pre-Firing Weapon Check.
1. Remove cover from weapon and the weapon from the mounting (See Annex A).

2. Break the weapon down, clean and check the parts, with careful cleaning of gun bore.

3. Apply light oil to all movable parts.

4. Reassemble weapon and check the gas chamber indicator, usually set at slot 2 (Fig. 3-82).

5. Check the assembled weapon and attach it to the mounting (Fig. 3-82).

6. Attach PKT solenoid cable to electrical socket located forward of the loader's safety (Fig. 3-83).

7. Pull the trigger and check the gun action.

(d) Sighting Weapon. Bore-sight the PKT as outlined in para 3-12b.

(2) Stages and Steps in Firing the Machinegun. There are four basic stages in operating this weapon; loading, sighting, firing and unloading. The steps for each stage follow:

(a) Loading.

1. Open receiver and place belt into feed chamber, with first round in the extractor catches. Pull belt backwards until it stops (Figs. 3-84, 3-85).

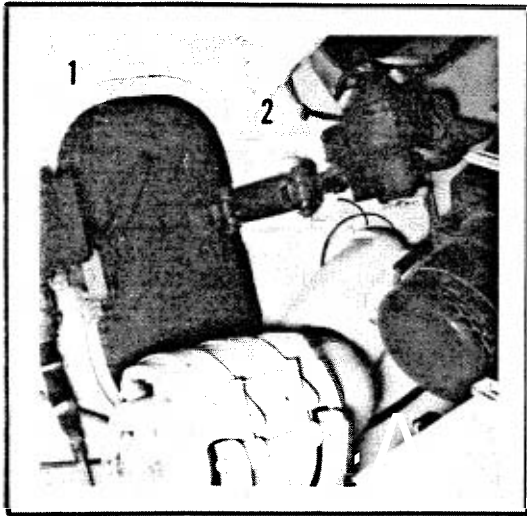


FIG. 3-75. EJECTION PORT
1 DOOR LOCKING HANDLE
2 SERVOMOTOR ENGAGEMENT ARM

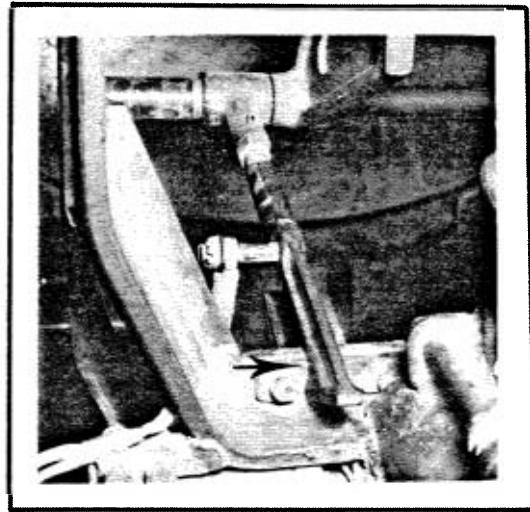


FIG. 3-76. EJECTOR TRAY LOCKED

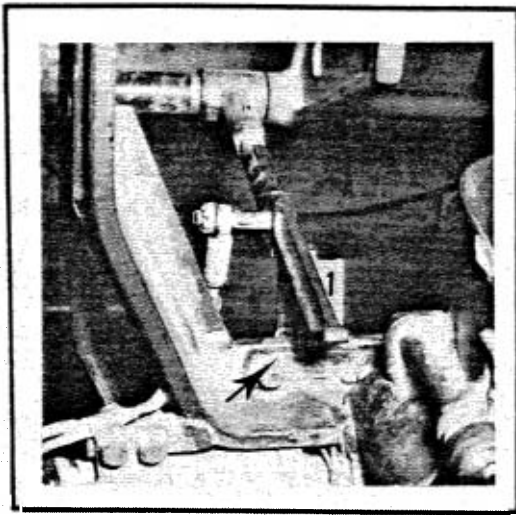


FIG. 3-77. EJECTOR TRAY UNLOCKED
1 METAL LATCH

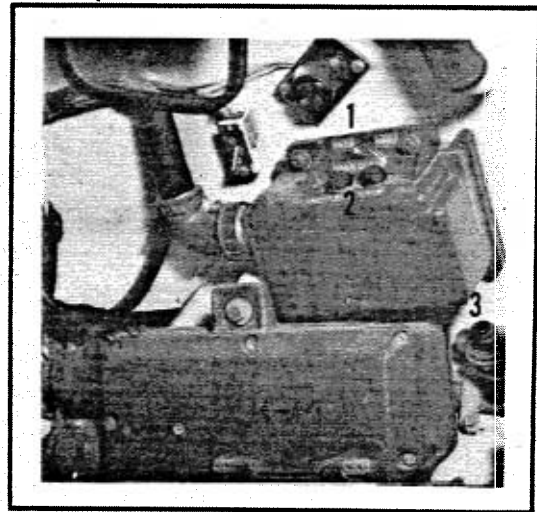


FIG. 3-78. EJECTOR CONTROL BOX
1 AUTO-MANUAL SWITCH
2 OPEN-CLOSE PUSH BUTTONS
3 WARNING LIGHT

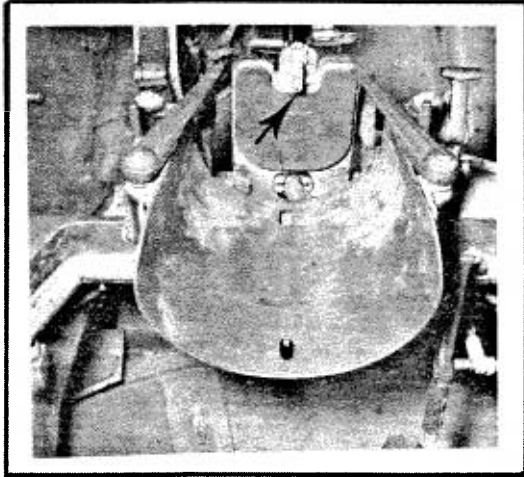


FIG. 3-79. ACTIVATING PIN

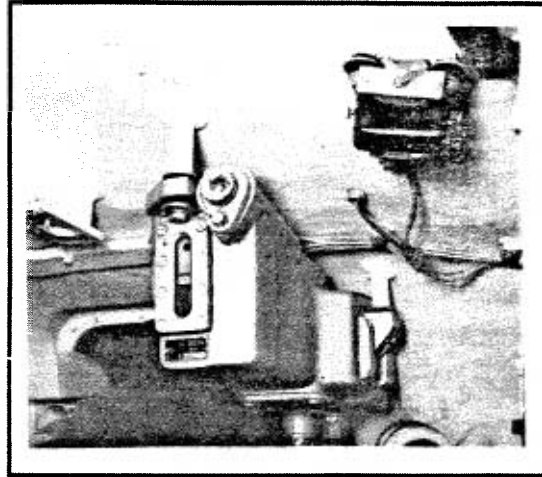


FIG. 3-80. REPLENISHER

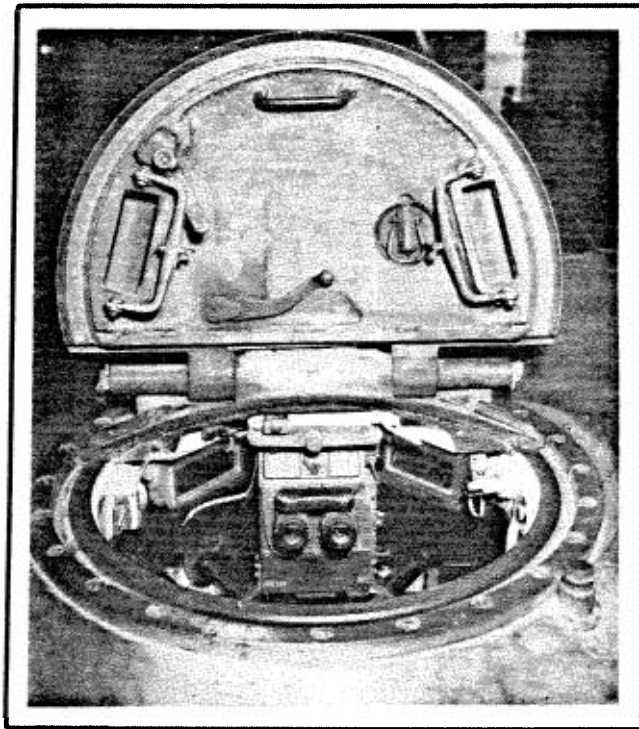


FIG. 3-81. TKN-3 PERISCOPE IN CUPOLA

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

2. Close receiver and pull charging handle backwards, then push forward. (Fig. 3-85).

(b) Sighting and Aiming.

1. Use the TSh2B-41U telescope. Rotate range knob until the horizontal line corresponds to the range for the PKT.

2. Then place the main aiming point on the target by traversing the turret and/or elevating/depressing the main gun.

(c) Weapon Firing.

1. Weapon fires light-weight steel rounds, tracer or armor-piercing. The rate and intensity of fire are determined by the kind of target and nature of combat.

2. The electric trigger is operated by a push button on the left hand-grip of the gunner's controls. Cease fire by releasing the button (See Fig. 3-37).

3. Firing of the weapon is automatic while the button is depressed until, of course, all the rounds are expended. Firing is usually in bursts of 2 to 4 rounds at targets up to 600 meters, while tank is moving. Targets at longer ranges, 600-1,000 meters are usually large targets such as truck columns or infantry groups. Firing in bursts over 10 rounds is effective in unusual circumstances only.

(d) Unloading Weapon.

1. Open receiver cover and feed tray; remove cartridge from feedlock opening.

2. Remove ammo belt and close receiver.

3. Do not cock weapon. Close receiver cover.

4. Open shell and belt bag and pour expended rounds into bucket.

(3) Immediate Action.

(a) If a stoppage occurs, wait five seconds. (The bolt must remain forward for the first five seconds due to the possibility of a hangfire).

(b) After the five second delay, raise the cover and remove the ammunition belt and links from the feed tray.

(c) Pull the charging handle to the rear, making sure that the sear engages the sear notch in the operating rod; close the cover immediately, then return the cocking handle to its forward position.

(d) During the retraction of the bolt, observe if the round is extracted and ejected.

1. If the round is NOT extracted, pull the trigger, attempting to fire the round. If the round does not fire and the barrel is hot, wait at least five minutes with the bolt in the forward position to preclude damage or injury in the event of a cook off. After the five minute wait, remove the round by using a cleaning rod inserted from the muzzle of the weapon.

2. If a round is extracted, or when a round is removed from the chamber, inspect the weapon and the ammunition to determine the cause of the stoppage.

(e) After clearing the weapon, reload, relay on the target, and attempt to fire.

3-9 Preparing and Inspecting Sighting/Fire Control Equipment for Use.

a. TKN-3 Tank Commander's Periscope.
To check the operation of the TKN-3:

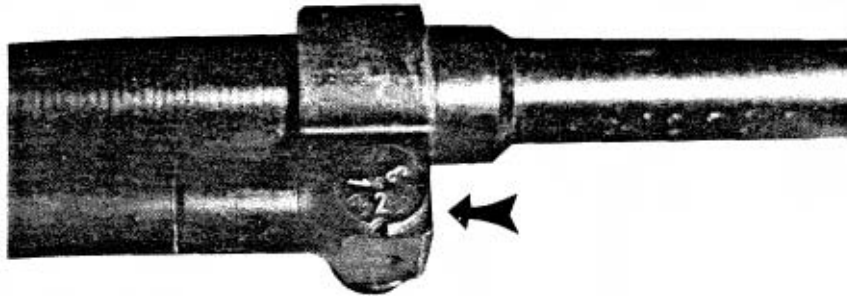


FIG. 3-82. PKT GAS CHAMBER INDICATOR

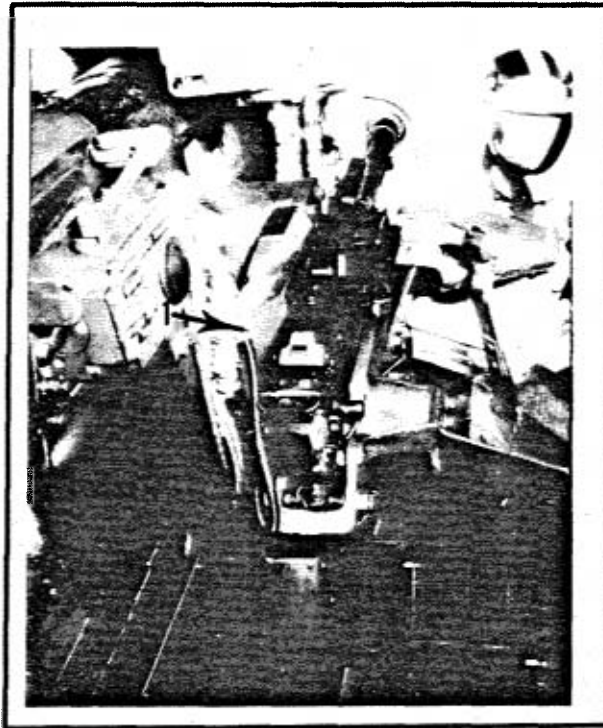


FIG. 3-83. PKT MOUNTED
1 SOLENOID CABLE

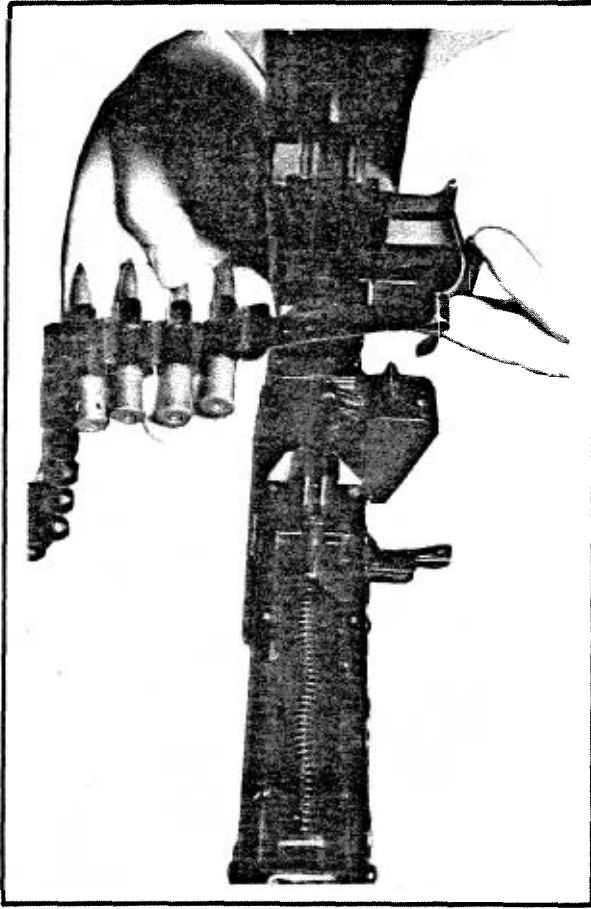


FIG. 3-84. INSERTING BELT

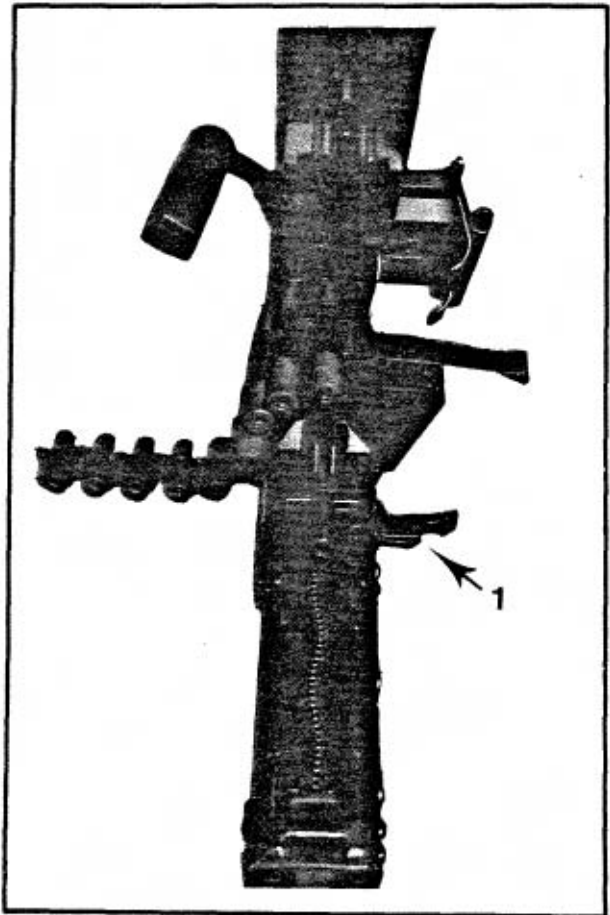


FIG. 3-85. ROUND IN PLACE
1 CHARGING HANDLE

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

(1) Place diaphragm and screen knobs in the "closed" (ZAKP) position.

(2) Place mirror control in night mode (H) (Fig. 3-86).

(3) Turn on TC's cupola power switch.

(4) Turn on TKN-3 power switch (Fig. 3-86).

(5) Move the diaphragm and screen knobs gradually until a greenish hue appears in the field of view along with an image of the terrain. Maintain minimal brightness. Do not continue operation in daylight for periods longer than 30 seconds.

(6) Return screen and diaphragm knobs to "CLOSED" (ZAKP) position and move the mirror control lever to "DAY" (A) mode.

(7) To check the TKN-3 at night, open screen and diaphragm knobs all the way and turn on the OU-3GK searchlight.

(8) To turn on the searchlight, the gunner flips the main searchlight toggle switch above the TSh2B-41U telescope. When the IR filter is installed on the searchlight, it should radiate a discernible amount of heat.

b. TPN 1-41-11 Infrared Periscope.

To Check the operation of the TPN 1-41-11 IR periscope:

(1) Wait until dark. Remove armor protective plate for the head of the TPN-1-41-11 on turret exterior.

(2) Attach IR power cable to the power connection on the periscope (Fig. 3-87).

(3) Turn on toggle switch on BT-6-26 power supply (Fig. 3-88).

(4) There should be a greenish hue field of view. Adjust for brightness with the intensity adjustment knob on the periscope's left side (Fig. 3-87). Turn on the L-2G searchlight and adjust periscope for clarity of vision.

3-10 OTHER TURRET PRE-OPERATION CHECKS

a. After the tank is started, turn on the turret ventilator with the control box on the turret ceiling or the one located in the driver's compartment (Fig. 3-89).

b. Check all internal fuel line (yellow) for evidence of leakage.

c. Turn on the turret rear light and vehicle identification light (Figs. 3-90, 3-91).

d. Check operation of intercom system.

e. Check operation of dome lights, quadrant elevation light and azimuth indicator light.

3-11 OPERATION OF THE GUN ELEVATION AND TURRET TRAVERSING MECHANISMS

a. General. The T-62 turret can be operated in both a stabilized and an unstabilized mode. The turret traverse mechanism is electrically operated. The gun elevation mechanism is electro-hydraulically operated. The T-62 also uses the standard mechanical manual elevation and traverse controls. There are several features that are unique to this system. The manual elevation and power elevation controls cannot be used simultaneously. This is attributable to the requirement the manual controls be mechanically disengaged when using the power controls. The same applies for the manual and power traverse controls. A certain sequence is also necessary to place the turret in and remove it from power operation. This sequence must be followed exactly. The tank commander has a turret traverse override but no means of overriding or even operating the main gun elevation mechanism.

b. Manual Operation. To use the manual controls:

(1) Remove the main gun from travel lock (Fig. 3-92). Stow the travel lock bar above the loader's turret wall ready rack in the bracket provided (Fig. 3-93).

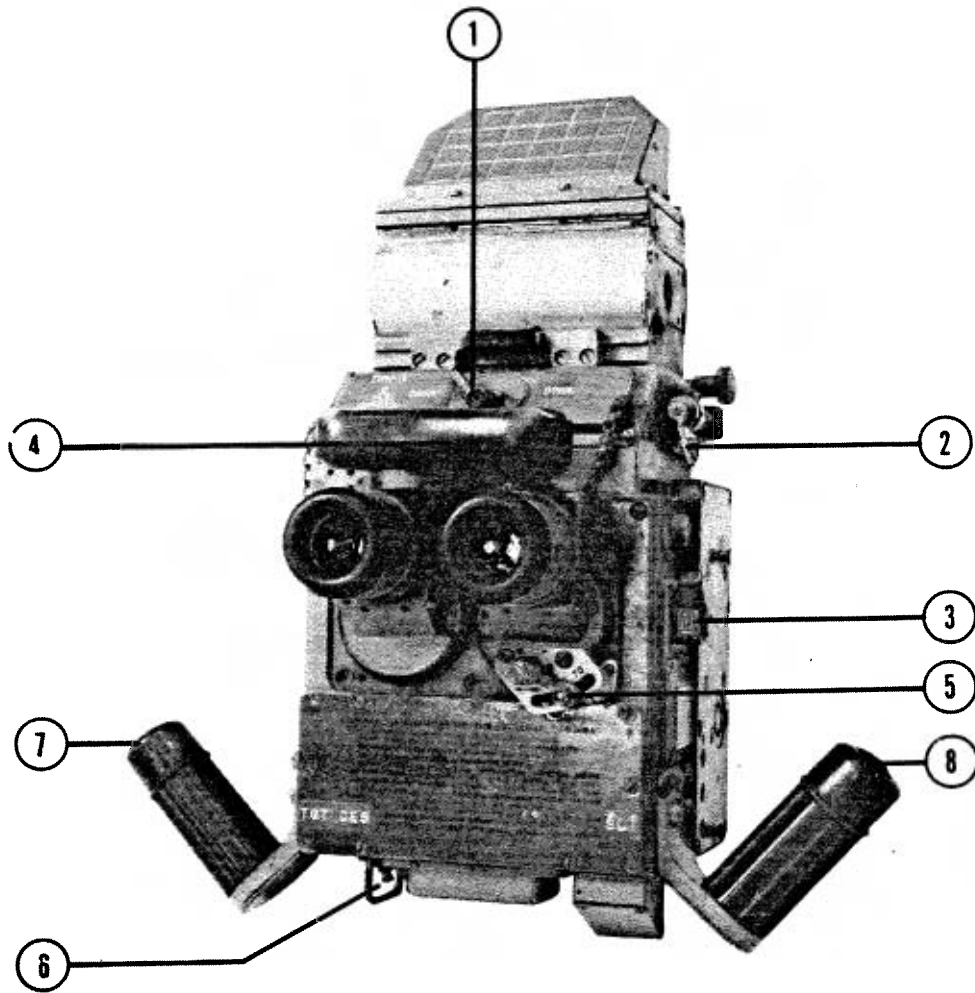


FIG. 3-86. TKN-3 PERISCOPE

- 1 SCREEN LEVER
- 2 DIAPHRAGM LEVER
- 3 DAY/NIGHT MODE SWITCH
- 4 HEADREST
- 5 EYE DISTANCE ADJUSTMENT
- 6 IR POWER SUPPLY SWITCH
- 7 TARGET DESIGNATE BUTTON
- 8 IR ON-OFF PUSH BUTTON

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

(2) Unlock the turret. (Fig. 3-94).

(3) Confirm that the manual controls are engaged. The manual traverse disengagement lever should be pointing away from the gunner (Fig. 3-95). The manual elevation disengagement lever should be to the left (Fig. 3-96).

(4) The gun can now be depressed/elevated and the turret traversed by rotating the respective handcranks.

c. Power Operation. There are three possible modes of power operation; unstabilized traverse-manual elevation (UNSTAB TRAV-MAN ELEV), unstabilized traverse-stabilized elevation (UNSTAB TRAV-STAB ELEV) and stabilized elevation-stabilized traverse (STAB ELEV-STAB TRAV).

(1) Unstabilized Traverse Manual Elevation. This mode is used in shop areas, assembly areas and other places where power traverse is desired. To place the turret in this mode:

(a) Start the vehicle.

(b) Place loader's safety in "SAFE" position (Fig. 3-97).

(c) Close and lock down driver's hatch.

(d) Unlock turret and remove gun from travel lock.

(e) Disengage manual traverse mechanism by pulling manual disengagement lever toward gunner's seat and down (Fig. 3-98). Rotate manual traverse handcrank to ensure disengagement.

(f) Move UNSTAB TRAV toggle switch to 12 o'clock position. A green light will illuminate to indicate power operation (Fig. 3-99).

(g) Depress loader's safety to "FIRE" position (Fig. 3-100).

(g) Depress loader's safety to "FIRE" position (Fig. 3-100).

(h) By moving the gunner's power control handgrips left or right, the turret can be traversed. Use the manual elevation handcrank for gun elevation.

(2) Unstabilized Traverse - Stabilized Elevation. This mode is used for tactical convoys where enemy contact is probable or imminent. To place the main gun in this mode:

(a) Repeat steps (a) through (d) for UNSTAB TRAV-MAN ELEV.

(b) Move stabilized elevation toggle switch (Fig. 3-99) to 12 o'clock position. A red light will illuminate on the gunner's controls to indicate system operation.

(c) Wait a minimum of 2 minutes to permit the stabilizer system gyros to warm up sufficiently.

NOTE: Never attempt to operate stabilizer system without waiting 2 minutes for gyro warm-up. Otherwise serious damage can result in the stabilization system.

(d) Disengage the manual elevation mechanism by pulling up on the disengagement lever knob (Fig. 3-101), and moving it to the right as far as it will go. Rotate the manual elevation handcrank to confirm manual elevation disengagement.

WARNING! If the manual elevation mechanism is disengaged prior to activating the STAB ELEV toggle switch, the main gun will drop rapidly, creating a danger to the personnel inside the turret or standing near the gun tube outside the tank. NEVER disengage manual elevation mechanism prior to activating STAB ELEV toggle switch.

(e) Disengage manual traverse mechanism with disengagement lever as previously described (Fig. 3-98).

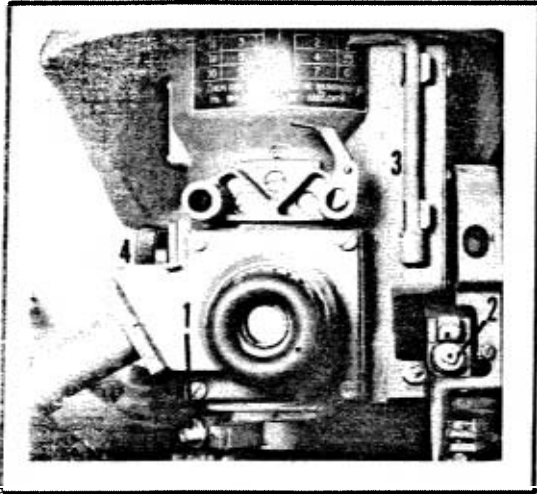


FIG. 3-87. TPN 1-41-11 PERISCOPE
 1 AZIMUTH ADJUSTMENT
 2 ELEVATION ADJUSTMENT
 3 ADJUSTMENT WRENCH
 4 INTENSITY KNOB

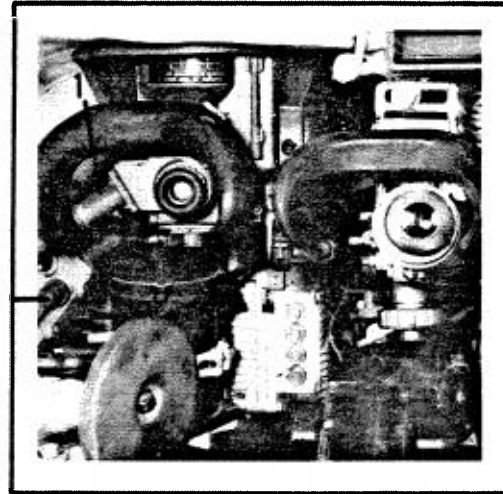


FIG. 3-88. PERISCOPE AND TELESCOPE
 IN TANK
 1 IR POWER CONNECTION
 2 IR POWER UNIT BT-6-26

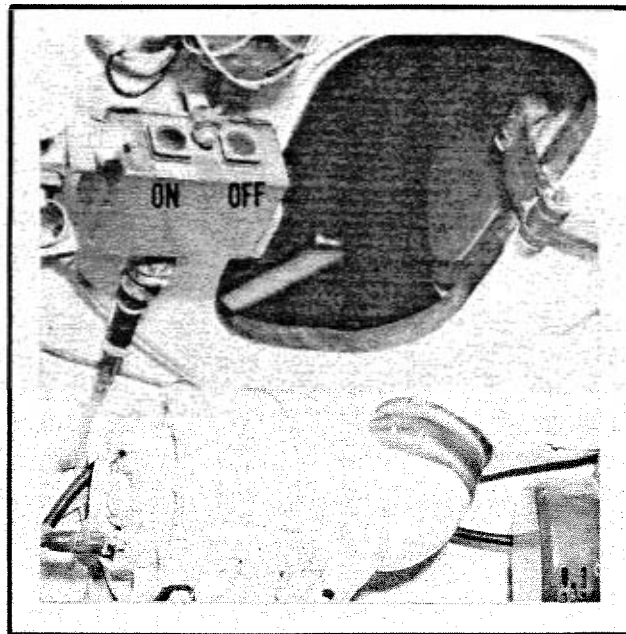


FIG. 3-89. VENTILATOR AND CONTROL BOX



FIG. 3-90. TURRET LIGHTS

- 1 MARKER LIGHT**
- 2 IDENTIFICATION LIGHT**

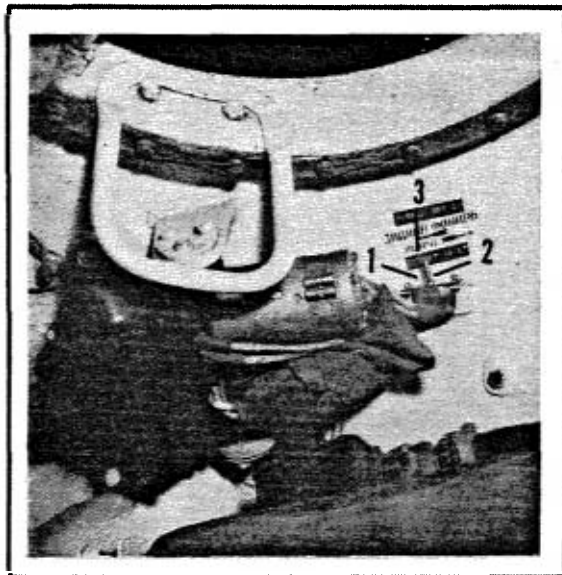


FIG. 3-91. TURRET LIGHT SWITCH

- 1 MARKER LIGHT ON**
- 2 ID LIGHT ON**
- 3 OFF**

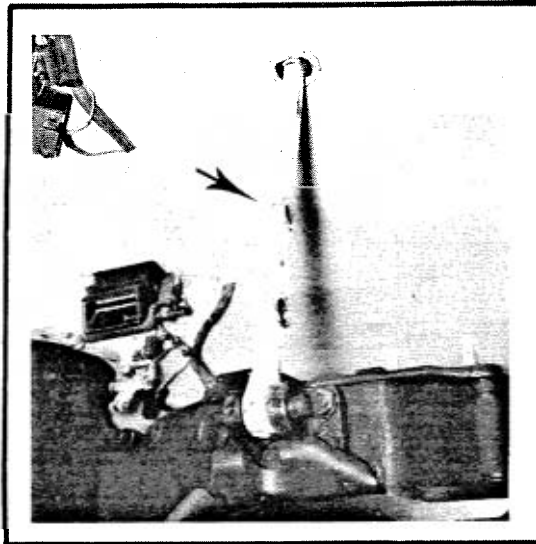


FIG. 3-92. TRAVEL LOCK

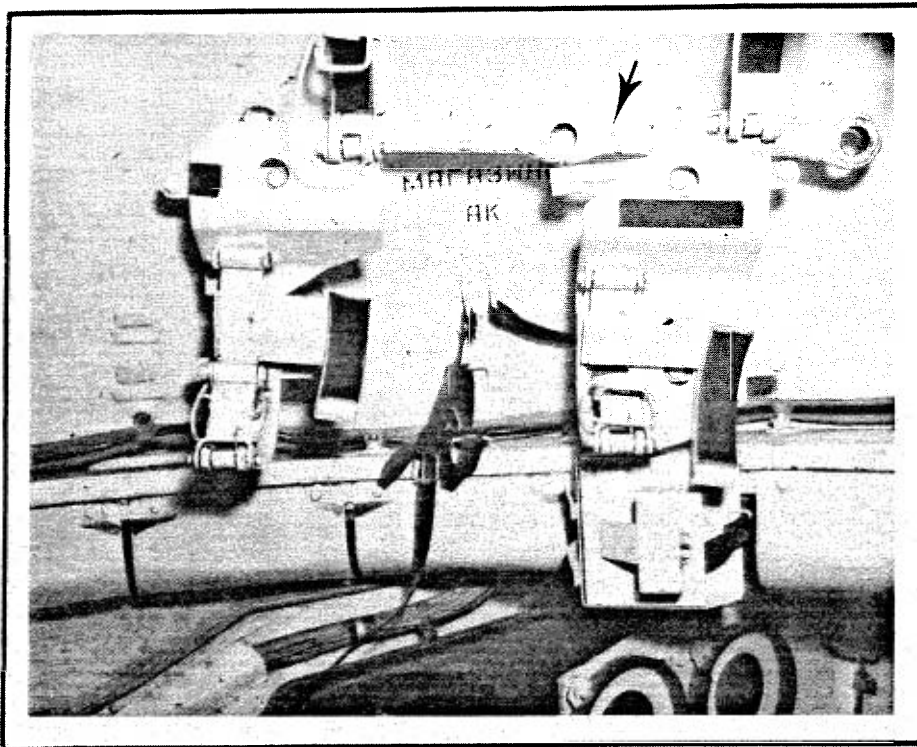
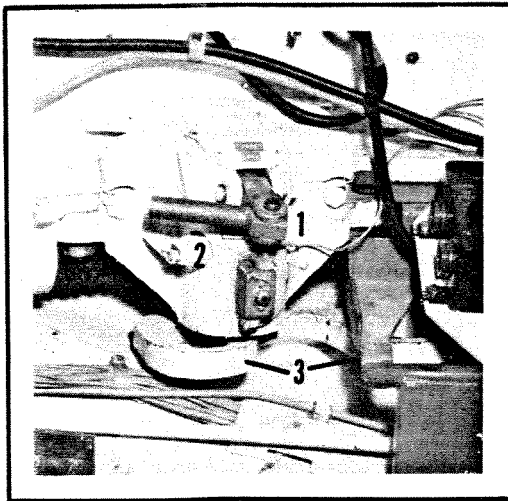


FIG. 3-93. TRAVEL LOCK STOWED



- 1 HANDLE
- 2 SECURING HANDLE
- 3 RECEPTACLE

FIG. 3-94. TURRET RING LOCK

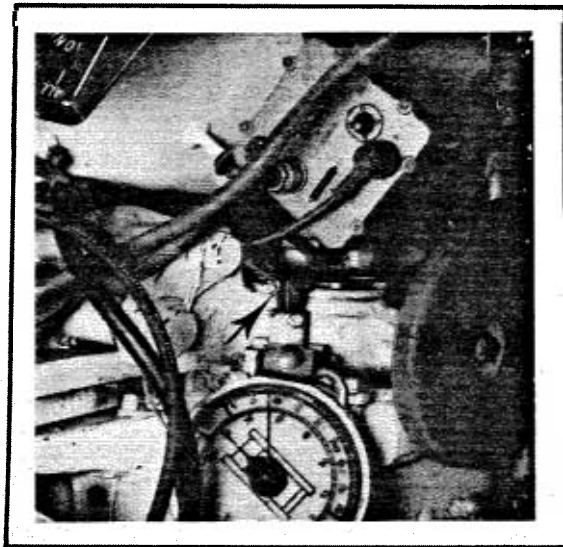


FIG. 3-95. MANUAL TRAVERSE
DISENGAGEMENT LEVER



FIG. 3-96. GUNNER'S CONTROLS

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

(f) Move UNSTAB TRAV toggle switch to 12 o'clock position. Green light will illuminate to indicate system operation.

(g) Depress loader's safety switch to "FIRE" position (Fig. 3-100).

(h) The turret may now be power operated for traverse and elevation. The gun is only stabilized in the vertical plane.

(3) Stabilized Traverse-Stabilized Elevation. Full stabilized operations are used for combat engagements. In a movement to contact, the crew might have the turret in the UNSTAB TRAV-STAB ELEV mode and simply flip the STAB TRAV switch for full stabilized operations. To have full main gun stabilization:

(a) Repeat steps (a) through (e) for the UNSTAB TRAV-STAB ELEV mode.

(b) Move STAB TRAV switch to 12 o'clock position.

WARNING! NEVER turn STAB TRAV switch on before STAB ELEV switch otherwise serious damage to the stabilization system could result. The UNSTAB TRAV switch may be turned on if desired.

(c) Depress loader's safety to "FIRE" position. The main gun is now fully stabilized in both axes.

(4) Tank Commander's Traverse Override. The TC has the capability to override the gunner's turret traversing control. This override is accomplished with the use of the TC's TKN-3 target designate sight (Fig. 3-102) mounted in his hatch. To use the override:

(a) The turret must be in the power traverse mode.

(b) Turn on the TC cupola power switch (Fig. 3-103).

(c) Unlock the TC's cupola (Fig. 3-102).

(d) Using the hand grips on the TKN-3, move the sight and cupola until the target has been identified in the sight picture.

(e) Depress button on left hand grip (Fig. 3-102). Turret will slew at maximum speed to align with TC's sight picture. Release the button when the gun is generally aligned with the TKN-3. Do not continue to depress the button after the turret is aligned with the TKN-3.

d. Ceasing Power Operation. There is also a specific sequence for ceasing power operation when it is no longer needed. To return to manual operation:

(1) Place loader's safety on "SAFE" position.

(2) Re-engage manual elevation mechanism by lifting disengagement lever knob and moving the lever to the left and locking it down. Rotate manual elevation handcrank back and forth to facilitate re-engagement.

(3) Move STAB ELEV switch to 6 o'clock position. Red light will go out.

(4) Move UNSTAB TRAV and/or STAB TRAV switch to 6 o'clock position.

(5) Re-engage manual traverse mechanism by lifting disengagement lever and pushing up and away from gunner's seat.

(6) The turret can now be manually operated.

3-12 BORESIGHTING

a. TSh2B-41U Telescope/115 mm Main Gun. To boresight the gunner's telescope:

(1) Place the tank on level ground.

(2) Remove the external protective glass cover for the telescope.

(3) Affix thin wire cross-hairs on gun muzzle at prescribed marks.



FIG. 3-97. "SAFE"

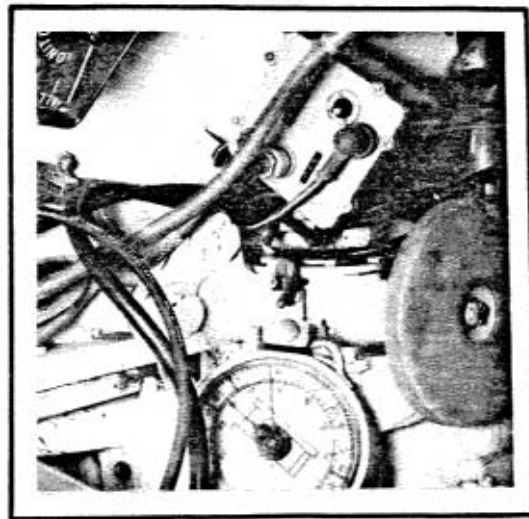


FIG. 3-98. MANUAL TRAVERSE DISENGAGED

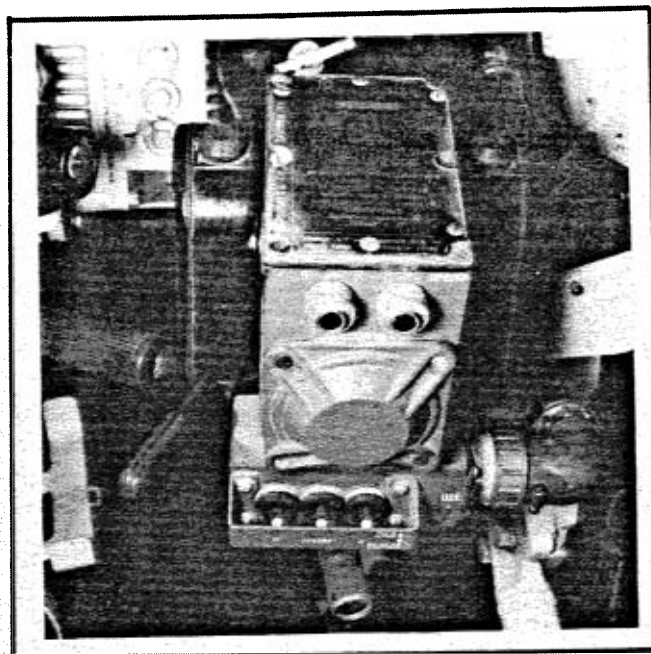


FIG. 3-99. GUNNER'S CONTROLS

- 1 STABILIZED ELEVATION
- 2 STABILIZED TRAVERSE
- 3 UNSTABILIZED TRAVERSE

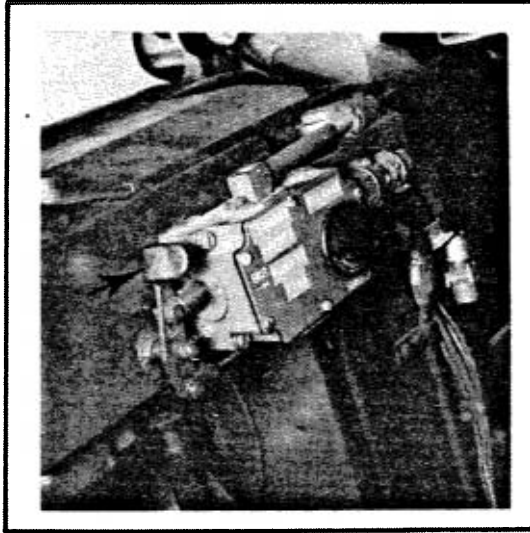


FIG. 3-100 "FIRE"

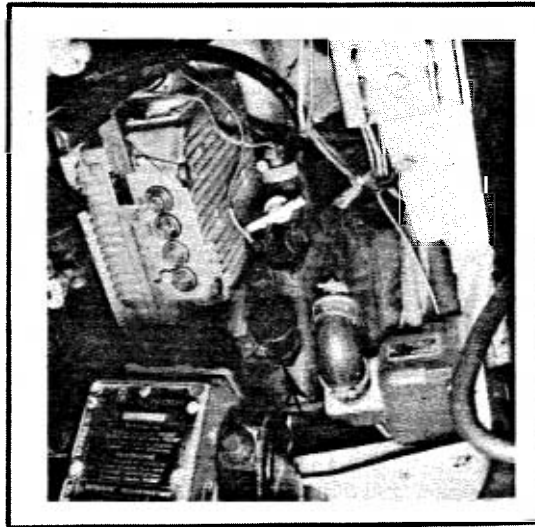


FIG. 3-101 MANUAL ELEVATION DISENGAGED

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

(4) With the gun breech closed, remove the firing pin mechanism with special tool provided (Fig. 3-105). Place grooved end into breech well, push in and rotate 90°. Mechanism can now be removed.

(5) Select a well-defined object approximately 1600 meters from the tank.

(6) Move the gun tube until the muzzle's cross-hairs are on the upper left corner of the target as seen through the breech well opening.

(7) Looking through the sight, rotate range knob (Fig. 3-106) underneath telescope until the horizontal range line is aligned with the range scale zeros on the ammunition reticles (Fig. 3-108).

(8) If the main aiming point is off-center, take the adjusting wrench and rotate the azimuth adjusting screw first until the main aiming point is aligned with the sighting object (Fig. 3-107). Then, to adjust for elevation, rotate the range knob to place the main aiming point on the sighting object. Rotate the elevating adjusting screw with the adjusting wrench until the range line is in alignment with the range scale zeros (Fig. 3-107).

b. 7.62 mm PKT Coaxial Machine Gun.

The PKT (or SGM for older tanks) machine gun is boresighted with the same procedures outlined for the TSh2B-41U/115 mm main gun. There are two differences. The PKT barrel is mounted without the receiver group and the sighting object should be at an approximate range of 400 meters rather than 1600 meters.

c. TPN 1-41-11 Infrared Periscope. The gunner's IR periscope is boresighted only after the TSh2B-41U telescope has been boresighted. To boresight the TPN 1-41-11:

(1) Select an object 700 meters from the tank. Place a flashlight at this location.

(2) Rotate the TSh2B-41U telescope range knob until range line is aligned with range scale zeros.

(3) Place telescope main aiming point on the selected object aiming point.

(4) Turn on TPN 1-41-11's IR power supply BT-6-26 (Fig. 3-98) and adjust for minimum brightness with the intensity knob on the periscope's left side (Fig. 3-87).

(5) If the arrow in the periscope reticle does not coincide with the object aiming point, adjust for azimuth by turning the azimuth boresight screw with the attached wrench (Fig. 3-87). Adjust for elevation by turning the elevation boresight screw (Fig. 3-87). Make adjustments until periscope aiming point (arrow) corresponds to object aiming point.

d. TKN-3 Tank Commander's Periscope.

The TKN-3 tank commander's sight is boresighted after the TSh2B-41U and TPN 1-41-11 sights have been boresighted. To boresight the TKN-3:

(1) Select a well-defined object 1000 meters from the tank.

(2) Lock the TC's hatch.

(3) Rotate range knob on TSh2B-41U until range line is in alignment with the range scale zeros. Place apex of main gun aiming point on selected target object.

(4) If the TKN-3 is properly mounted, the center cross-hairs will line up with the selected target object. If off-center, loosen the four mounting bolts that secure the sight frame to the TC hatch (Fig. 3-109) and by moving the frame and TKN-3 simultaneously, position the cross-hair center on the target object and retighten the mounting bolts.

e. TC OU-3GK Searchlight. For proper viewing with the TKN-3 under night conditions, the TC's IR searchlight must be boresighted with the TKN-3. This requires

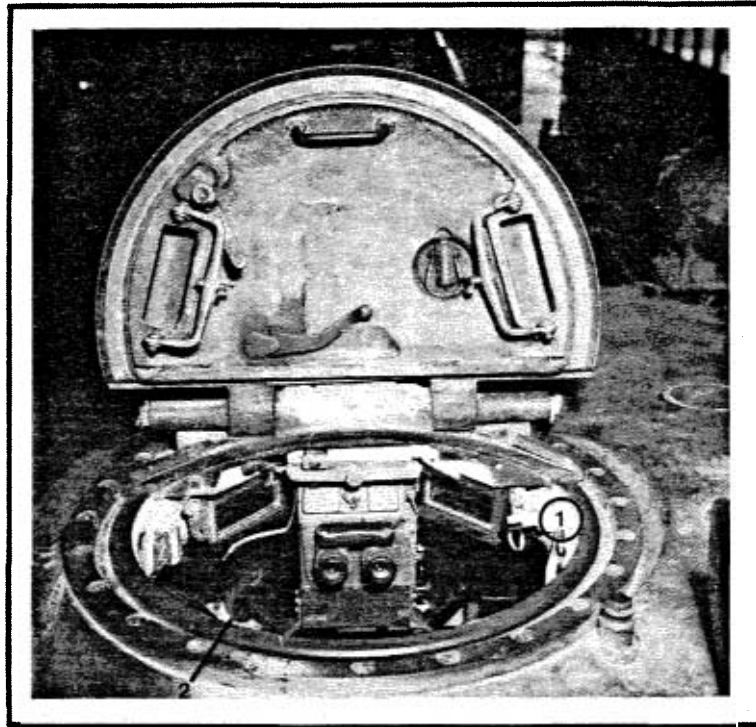


FIG. 3-102. TKN IN HATCH

1 CUPOLA LOCK

2 OVERRIDE BUTTON

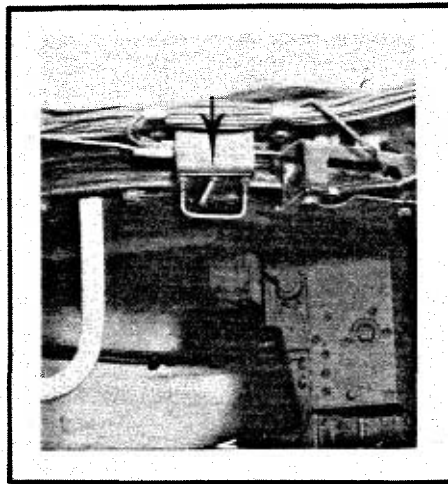


FIG. 3-103. CUPOLA POWER SWITCH

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

another person to make adjustments to the searchlight as instructed by the observer. To boresight the OU-3GK:

(1) Select an object 400 meters from the tank and mark it with a flashlight.

(2) Turn on TC's turret power switch (See Fig. 3-103).

(3) Place day/night mode switch on "night" position---"H" as it appears on the lever (See Fig. 3-109).

(4) Turn on the IR power switch on left base of TKN-3 (See Fig. 3-86).

(5) Adjust illumination intensity with diaphragm and screen levers (See Fig. 3-109).

(6) Aim TKN-3 center of view on flashlight.

(7) If the searchlight beam does not coincide vertically with the TKN-3, loosen lock nuts of searchlight rod sleeve until the beam is aligned with sighting direction and tighten lock nuts.

(8) If the searchlight beam does coincide horizontally with the TKN-3, loosen the 4 searchlight pivot plate nuts (Fig. 3-110), rotate the searchlight horizontally to align the beam with TKN-3's field of view and tighten pivot-plate nuts.

f. L-2G Searchlight (Main). To boresight the L-2G IR searchlight with the gunner's TPN-1-41-11 IR periscope:

(1) Select an object about 700 meters from the tank and position a flashlight there.

(2) Turn on searchlight with SLT power switch above telescope (See Fig. 3-26).

(3) Turn on TPN 1-41-11 IR periscope after removal of metal protective cover.

(4) Place aiming point apex on object target with turret manual controls.

(5) If the searchlight beam does not coincide horizontally with the TPN 1-41-11's field of view, loosen bracket mounting bolts (Fig. 3-111) and turn horizontal adjusting bolts until the brightest part of searchlight beam is centered on target object.

(6) If the searchlight beam does not coincide vertically with the TPN-1-41-11's field of view, turn vertical adjustment bolts on double-arm lever (Fig. 3-111) of bracket slotted shaft to align searchlight beam with field of view.

(7) Tighten lock nuts on adjusting bolts and bracket mounting bolts.

g. Gunner's Quadrant (Fig. 3-112). To boresight the gunner's quadrant:

(1) Place an M-1 quadrant on gun breech parallel to axis of gun.

(2) Center M-1 quadrant bubble by rotating the manual elevation handcrank.

(3) Center gunner's quadrant bubble by rotating quadrant knob (Fig. 3-112).

(4) If zero graduation on collar is not opposite index, loosen set screw (Fig. 3-112) and rotate knob until zero is opposite index, and tighten set screw.

3-13 DIRECT FIRE OPERATION

Crew functions and duties on the T-62 are similar to those on the US M60 with some exceptions. These exceptions take into account the differences in turret operation.

a. Target Acquisition. Targets may be acquired by any crew member. The tank commander has the largest sector of responsibility for target acquisition as shown in Fig. 3-113).

Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

Using his TKN-3 target designator sight, he continually rotates his cupola looking for possible targets. The loader, using his rotational MK-4 periscope, performs the same function on the opposite side of the turret. The gunner and driver have the least visibility and focus primarily on the tank's immediate front. Any crew member spotting a target alerts the crew over the intercom and gives a bearing so that the turret can be traversed in that direction. This can be done by either the gunner or the tank commander. If the tank commander initially identifies the target, he will announce "Override, right/left" and press the override button on the TKN-3's left handgrip until the turret is generally aligned with his sight. The gunner announces, "Identified" upon initial sighting of the target.

b. Ranging. Ranging is a tank commander responsibility. He has two means of determining range. First, if the target height is approximately 2.7 meters (approx 8.9 feet) the TC can use the stadia range finder in the TKN-3 to determine (Fig. 3-114) range. Second, if the target height is substantially more/less than 2.7 meters, he can use the azimuth scale on the TKN-3 in conjunction with the formula to determine range. The

$$R = \frac{H}{A} \times 1000 \text{ where}$$

R = range to target in meters
H = target height
A = angle in mils at which target is sighted.

scale gradutions are 4 mils, so that the range to a target 3.2 meters high (M60A1 height) at an angle of 4 mils would be 800 meters. The gunner can also determine range if the TC is unable to do so. He has a stadia range finder in the lower right hand corner of the TSh2B-41U telescope (Fig. 3-115) and can use the lateral lead lines to determine range with the above formula.

The interval between these lines is two mils; the interval between the main aiming point and vertical line below it is also 2 mils.

c. Aiming. The TC gives the fire command. This fire command consists of:

ELEMENTS OF FIRE COMMAND	EXAMPLE
Warning	Gunner
Ammunition	Sabot/Heat/HE/ Coax
Target	Tank
Range	1600
Direction	12 o' clock
Command	Fire

NOTE: At this point, there should be a round already in the tube and the loader's safety depressed to the "FIRE" position. Otherwise, the turret cannot be power-operated.

The gunner responds "Identified" upon visual acquisition of the target. When the TC reports the range to the target, the gunner rotates the range knob (See Fig. 3-106) on the telescope until the black horizontal range line corresponds to the range scale for the ammunition being fired. This action imparts the superelevation necessary to successfully engage the target. If the main gun is not loaded, the loader loads the round ordered and pushes the loader's safety to the "FIRE" position. This permits the gunner to use his power controls to track the target. For a stationary target, the gunner will move his power controls until the main aiming point is centered on the target. For a moving target, he utilizes his lead lines on the horizontal scale.

d. Firing. To fire the 115 mm main gun, the gunner turns on the main gun switch (See Fig. 3-26). This will provide power to the automatic ejection system as indicated when the green light near the



**Fig. 3-105. Firing Pin
Extractor**

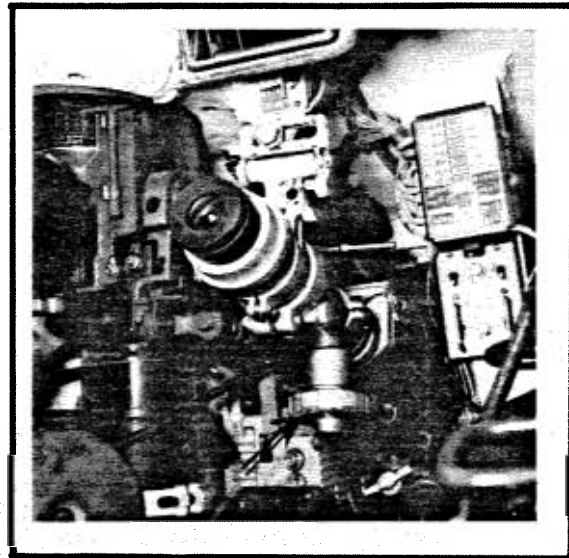


Fig. 3-106. Range Knob

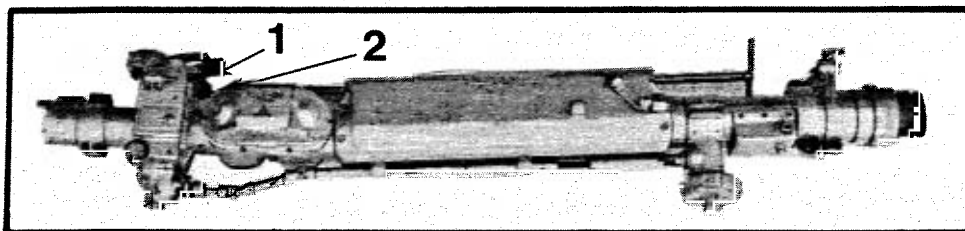


Fig. 3-107. TSh2B-4lu Telescope
1. Azimuth Adjustment 2. Elevation Adjustment

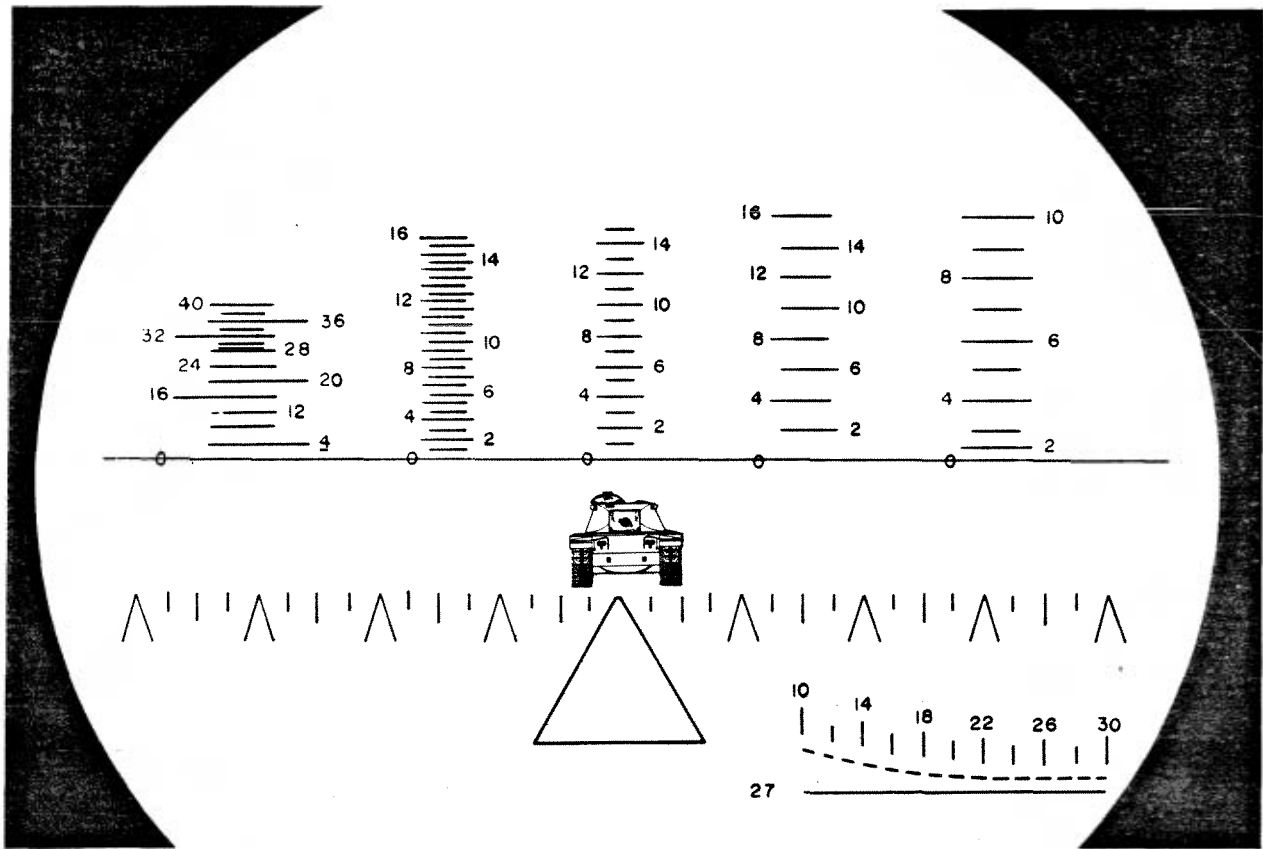


FIG. 3-108. TARGET PICTURE WITH RANGE O's

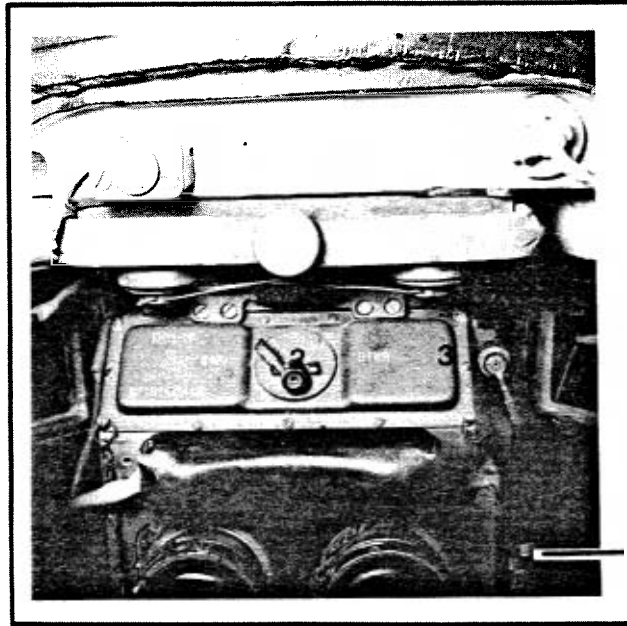


FIG. 3-109. TKN-3 MOUNTING BOLTS

- 1 DAY/NIGHT SWITCH
- 2 SCREEN SWITCH
- 3 DIAPHRARM SWITCH

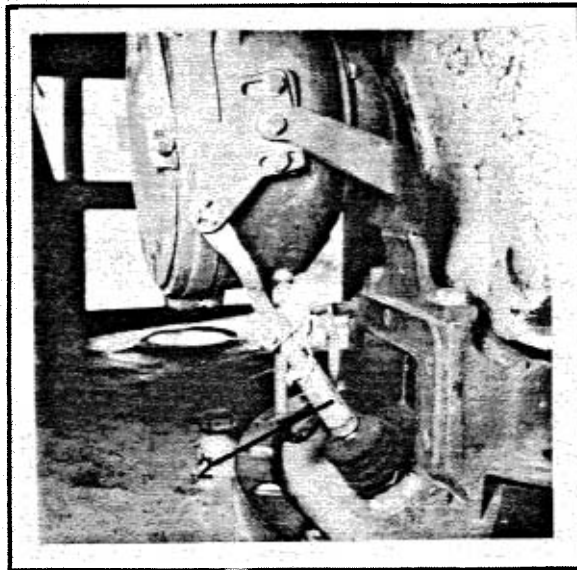


FIG. 3-110. OU-3GK ADJUSTMENT LINKAGE

- 1 PIVOT PLATE NUTS
- 2 ROD SLEEVE COUPLING

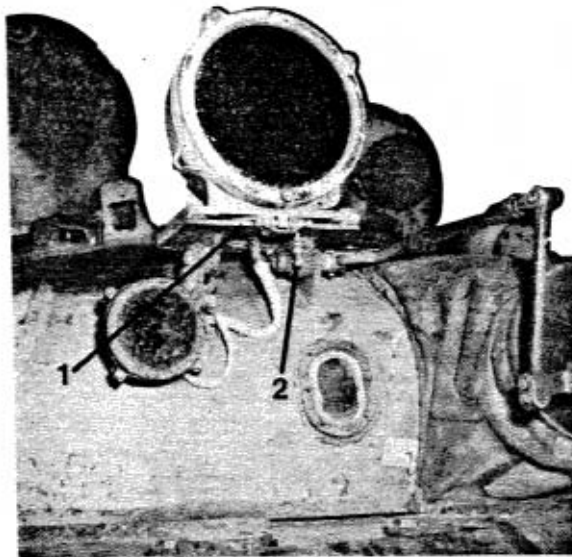


FIG. 3-111. L-2G ADJUSTMENT LINKAGE

- 1 HORIZONTAL ADJUSTMENT
- 2 VERTICAL ADJUSTMENT

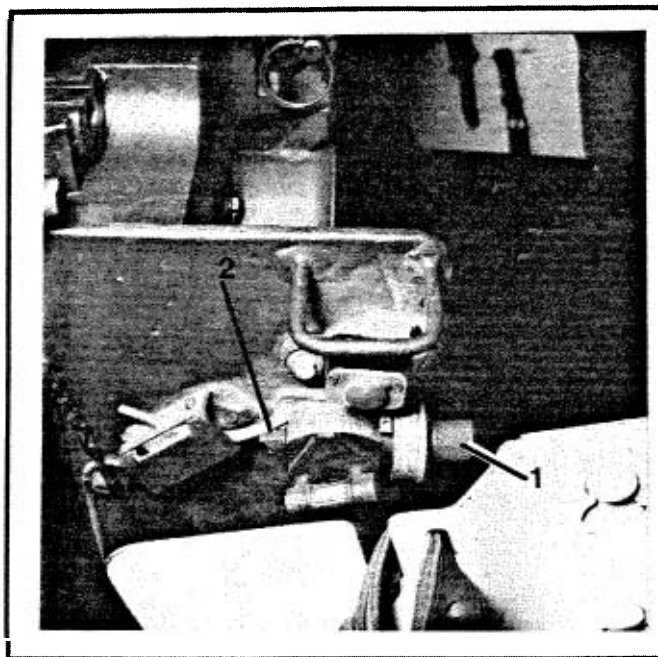


FIG. 3-112. GUNNER'S QUADRANT

- 1 QUADRANT KNOB
- 2 SET SCREW

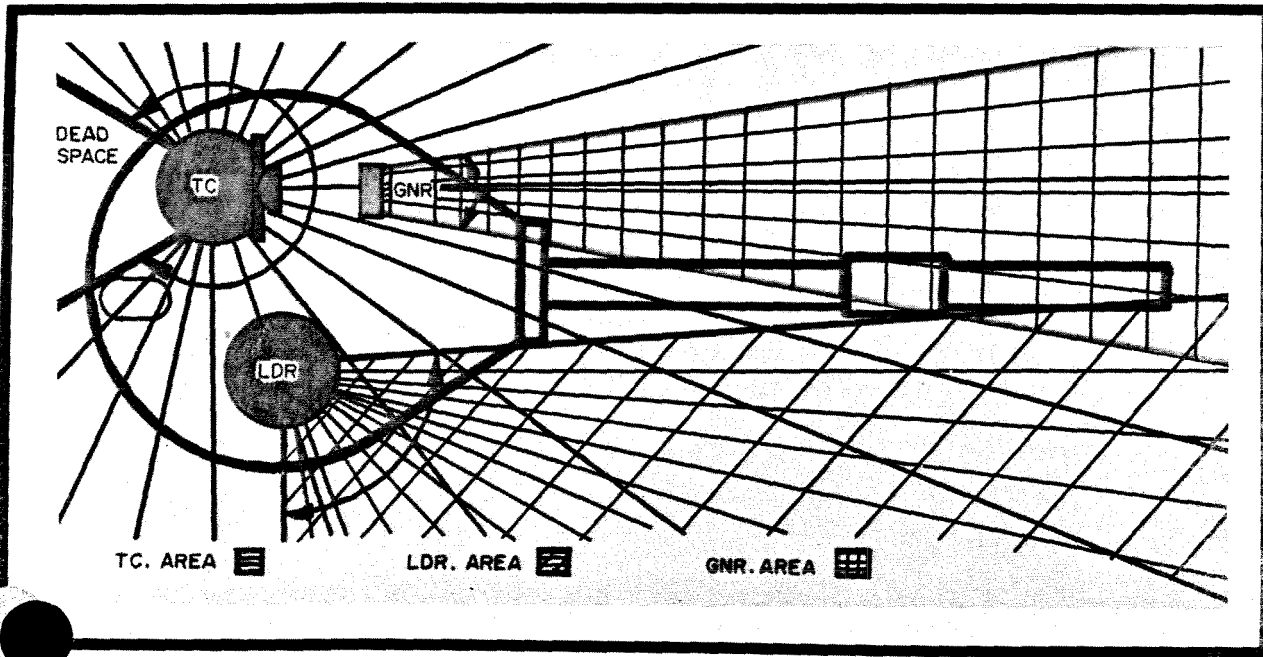


FIG. 3-113. CREW TARGET ACQUISITION SECTOR

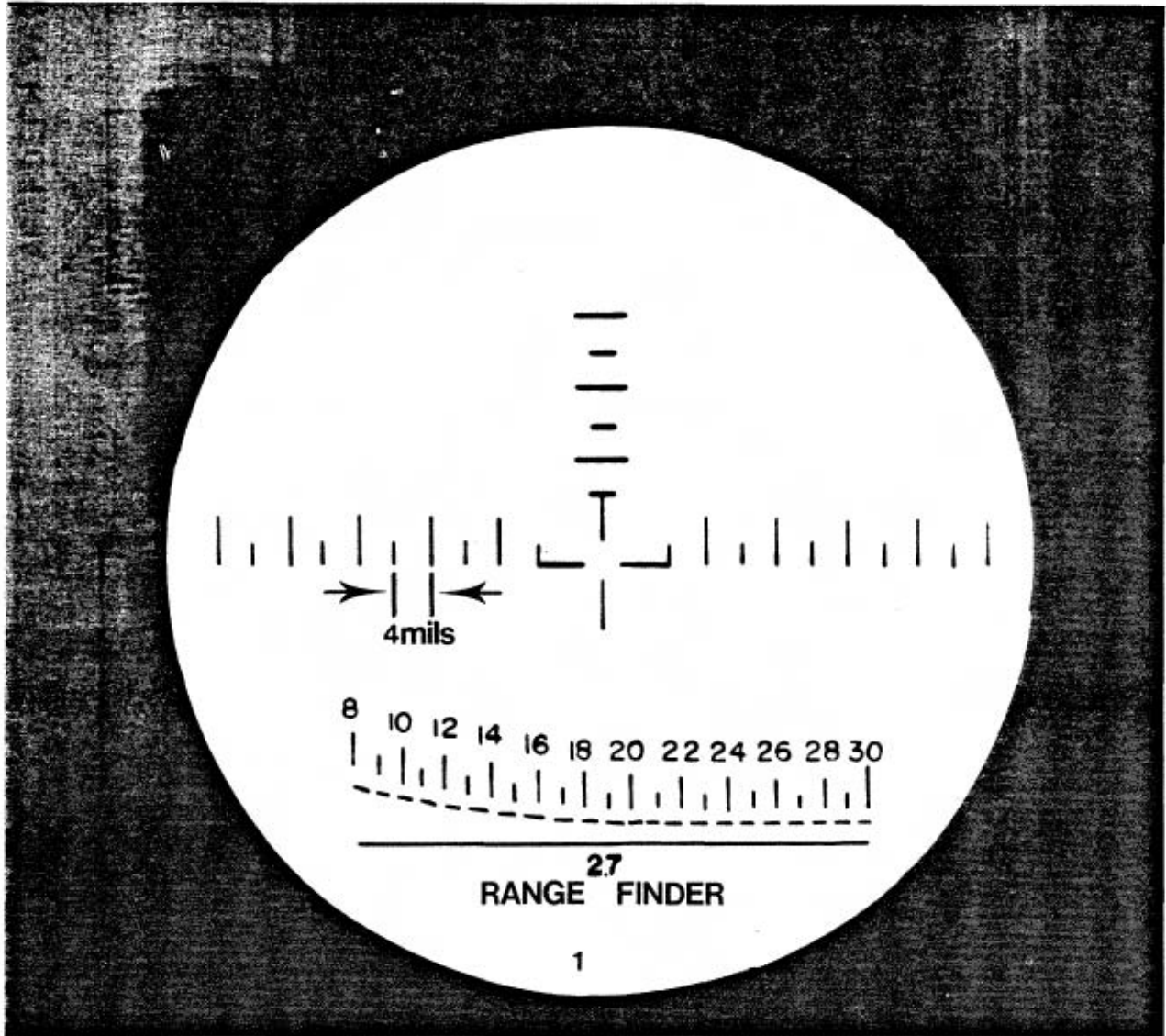
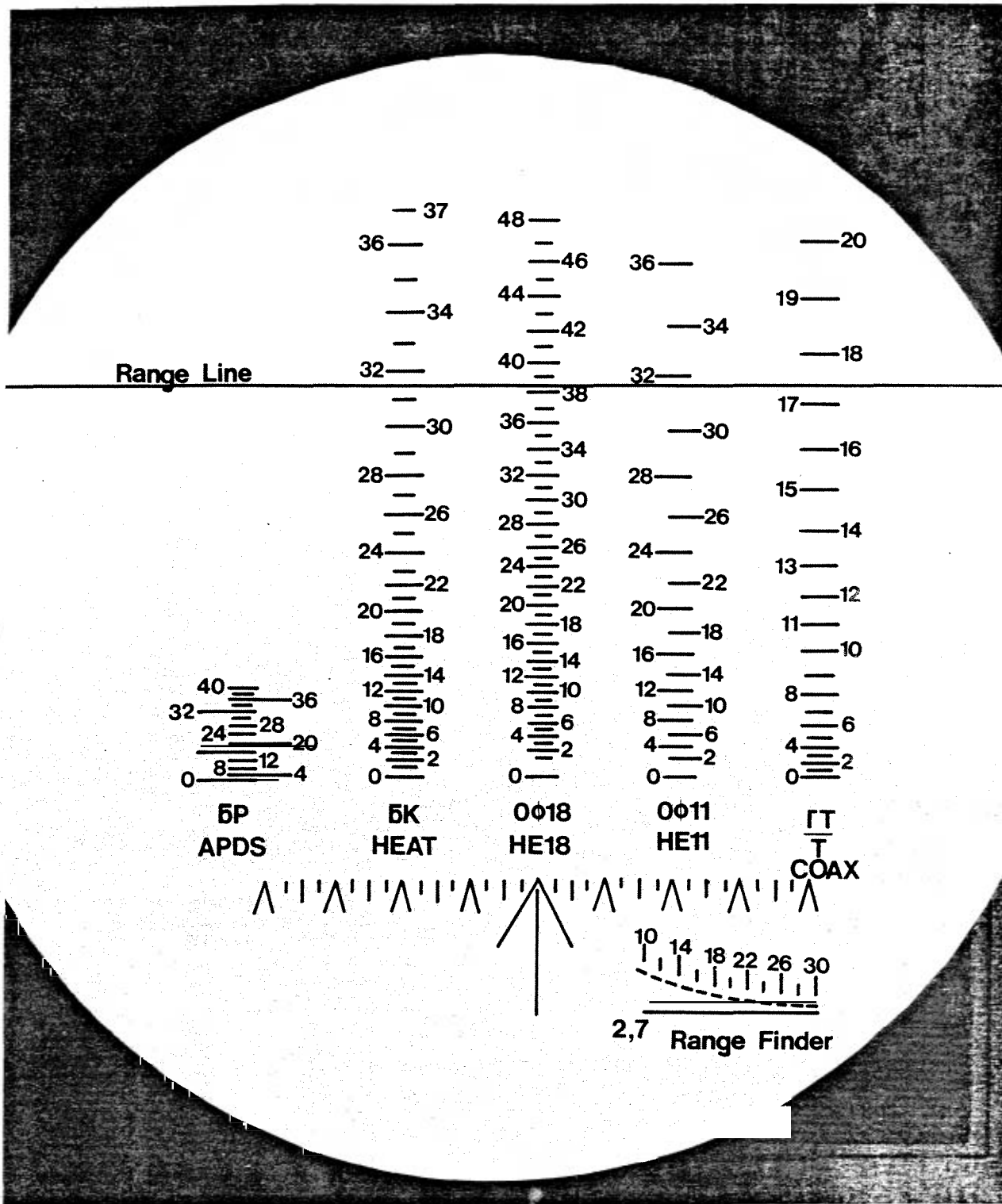


FIG. 3-114. TKN-3 TANK COMMANDER'S SIGHT RETICLE

FIG. 3-115 TSh2B-41u TELESCOPE RETICLE



Section II. OPERATION AND USE OF TURRET ARMAMENT AND FIRE CONTROL EQUIPMENT

automatic ejection system control box illuminates (See Fig. 3-57). The loader places the ejection selector switch on "automatic" (See Fig. 3-57) and checks to see if the ejection frame is out of travel lock. He insures the loader's safety is on "FIRE" and announces "UP" to the TC and gunner. When the gunner has properly aligned the sight on the target, he announces "READY" and the TC gives the command to fire. The gunner presses the electrical trigger button on the right handgrip of the gunner's controls (See Fig. 3-37). He can also fire the main gun with the trigger on the manual elevation hand-crank or the manual trigger in a well on the main gun (See Fig. 3-30). The gun will fire and, upon recoil, the breech will open, thrusting the shell casing back into the automatic ejection tray. When it strikes the electrical contact at the rear of the tray, the grippers seize the casing, the tray elevates, the ejection port hatch opens and the ejectors discard the casing by propelling it through the open hatch. The framework returns to its previous location and the port hatch closes. The gun will now assume a loading angle of 2°30' - 4°30' to facilitate the loading of the next round.

The loader takes the next round and guides it about halfway into the breech with his left hand. Then, with a vigorous shove, he slides it into the breech, moving his hand to the right to avoid the closing breech. At this point, the tank is the most vulnerable since all power operation is cut off until the loader has chambered the round and pushed the safety to the "FIRE" position. After he presses the safety to "FIRE", the gun, if in the stabilized mode, will return to its previous firing location.

e. Firing Malfunctions. If the gun fails to fire when the electrical triggers are depressed, depress the manual trigger. If it still fails to fire, recock the trigger with the cocking lever (see Fig. 3-29), and attempt to fire again. If this fails also, wait one minute, open the breech and remove the round. If the auto ejection system is out of operation, place selector switch on "manual" and by using the "OPEN-CLOSE" buttons on the ejection system control box, discard the casings through the ejection port hatch.

f. Safety. There are several safety rules to be observed when firing the main gun. The TC should have his protective shield mounted to protect him from the ejection frame. The loader must remember to stand clear of the breech and ejection frame when the gun recoils. If the recoil exceeds 430 mm, cease firing and have maintenance personnel inspect the counter-recoil mechanism. Always wait one minute before attempting to unload a round that failed to fire. Place the automatic ejection system selector switch on "Automatic" only when preparing to fire. Load the gun only after the ejection framework has lowered completely. Never attempt to function ejection mechanism by hand.

g. Night Firing. The TPN 1-41-11 IR periscope is the gunner's primary sight for night engagements. Used in conjunction with the L-2G main IR searchlight, this periscope enables the gunner to engage targets at 800 meters, the effective range of the searchlight. To place the TPN 1-41-11 into operation, see paragraph 3-9b. The TPN reticle (Fig. 3-116) is used for ranging, employing the formula.

H
 $R = \frac{A}{8} \times 1000$ meters. The distance between the arrow's apex and the lateral scale lines is 8 mils. The following table is used for firing:

	ARROW APEX	TOP OF LOWER LINE
SABOT	700 m	2000 m
HE-FRAG	100 m	550 m
COAX-PKT	150 m	450 m

For example, for a target 700 meters away and a SABOT round in the gun tube, use the apex of the arrow as a main aiming point. For soft targets at 450 meters, use the top of the lower line for aiming the PKT machinegun. The OU-3GK IR searchlight attached to the commander's hatch can also provide IR illumination for the TPN 1-41-11. Its effective range is 400 meters, which restricts the gunner's engagement range. The TC also uses his searchlight to assist the driver when driving under night IR conditions.

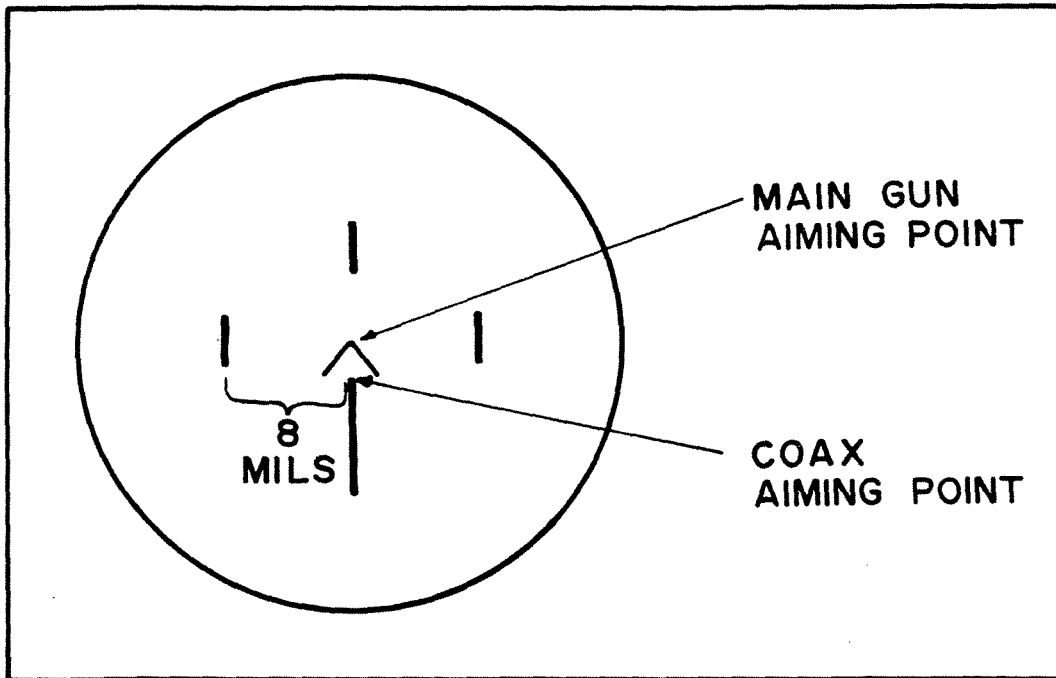


FIG. 3-116. TPN 1-41-11 GUNNER'S PERISCOPE RETICLE



CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. PARTS AND TOOLS

4-1 REPAIR PARTS

Repair parts are not supplied with or issued for replacement of parts that become worn, broken or otherwise unserviceable. Required parts for replacement within the scope of operator/crew maintenance functions will be requested through the installation maintenance facility. When the installation maintenance facility cannot provide the required part they will report this problem to the organization addressed in paragraph 1-1.

4-2 SPECIAL TOOLS AND EQUIPMENT

Special tools and equipment designed for operation, maintenance, repair and general use are issued with the vehicle. Special tools should not be used for purposes other than prescribed and when not in use, should be properly stowed. Issued tools and equipment are listed with the vehicle receipt document and are subject to recall with the vehicle. Missing, broken, or otherwise unserviceable tools or equipment will be fabricated locally or reported to the organization addressed in paragraph 1-1.

Section II. LUBRICATION

4-3 LUBRICATION INSTRUCTIONS

a. General. Any special lubricating instructions required for specific mechanisms or parts are contained in the pertinent section of this manual.

b. Service Intervals. Service intervals specified in Table 4-1, are for normal operation where moderate temperature, humidity and atmospheric conditions prevail.

TABLE 4-1 SERVICE INTERVALS

KEY	KM INTERVAL	HR INTERVAL	REMARKS
D	-	-	Daily - Required after operation.
W	-	-	Weekly - Required regardless of accrued hours of kilometer operation.
Q	-	-	Quarterly - Required every 90 days or at stated intervals whichever comes first.
S	2,000	100	Semi-annually - Required every 180 days or at stated intervals whichever comes first.
A	4,000	200	Annually - Required every 12 months or at stated intervals whichever comes first.

Section II. LUBRICATION

c. Lubrication Equipment. Each vehicle is supplied with a hand grease gun adequate for required vehicle lubrication. Clean this gun both before and after use. Operate lubricating gun carefully and in such a manner as to insure a proper distribution of the lubricant.

d. Points of Application. Vehicle lubricating fittings, oil filters, fuel filter, level devices, filler openings and drain plugs are shown in figures 4-1 thru 4-25 and

are referenced in Table 4-2, Vehicle Hull Lubrication Points and Interval Key. Vehicle hull top access plates are illustrated in figures 4-1 thru 4-4. Vehicle hull bottom access plates are illustrated in figure 4-5 thru 4-10. The lubrication points, in most cases, are marked RED for easy identification.

TABLE 4-2 VEHICLE HULL LUBRICATION POINTS AND INTERVAL KEY

INTERVAL KEY	FIGURE NUMBER	LUBRICATION POINT	TYPE LUBRICANT	REMARKS
D S*	4-11	Engine Oil	OE-50	Use dipstick to check engine oil level. Do not fill above the top mark (55 l). Change oil every 180 days, 2,000 kms or 100 hours of operation whichever comes first. (*Installation maintenance responsibility).
Q A*	4-12	Transfer Case	OE-50	Use dipstick to check transfer case oil level. The mid-mark measures between 142 and 144 mm. Never fill above the top of the mark. Change oil annually or when the unit is down for repair. (*Installation maintenance responsibility).
Q S	4-13	Road Wheels	GAA	Check road wheels for leaks, tire damage and mounting bolts. Use grease gun to semi-annually feed lubricant into the filling hole until fresh grease appears in second hole.
Q S	4-14	Idler Wheels	GAA	Check idler wheel for leaks, tire damage and mounting bolts. Use grease gun to semi-annually feed lubricant into the filling hole until fresh grease appears in the second hole.
W A*	4-15	Final Drive	OE-50	Check lubrication level and refill if necessary. Change the oil every 4,000 kms or annually (*Installation maintenance responsibility).
W	4-16	Drive Sprocket		Check mounting bolts.
Q A*	4-17	Transmission	OE-50	Check lubrication level and refill if necessary. Oil all shafts and linkages to the

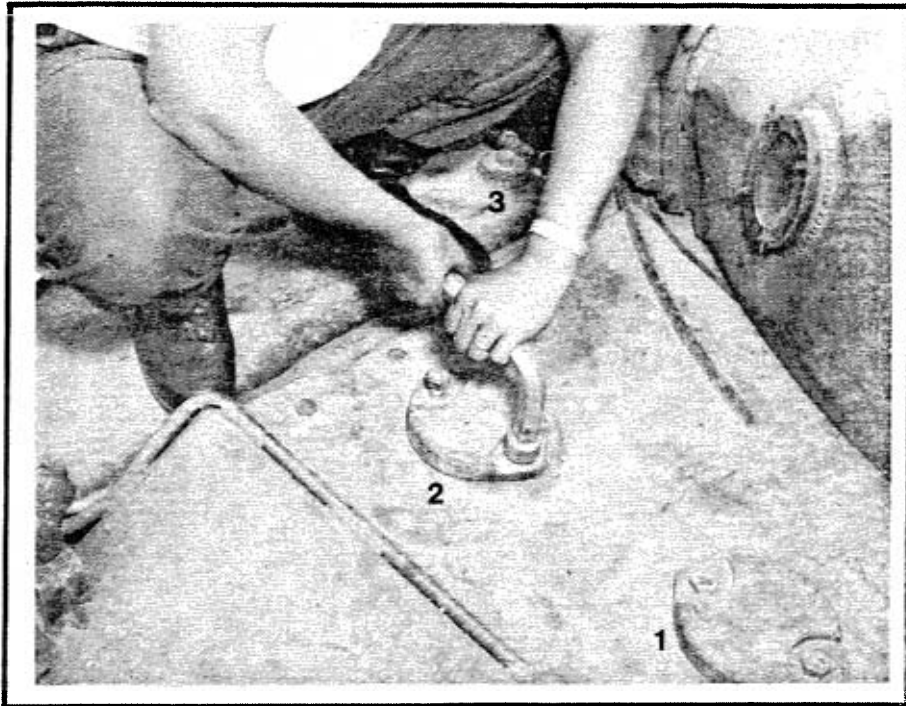


FIG. 4-1. FRONT FUEL TANK ACCESS PLATES
1 FRONT HONEYCOMB TANK 2 NOSE TANK
3 EXTERNAL FUEL TANK

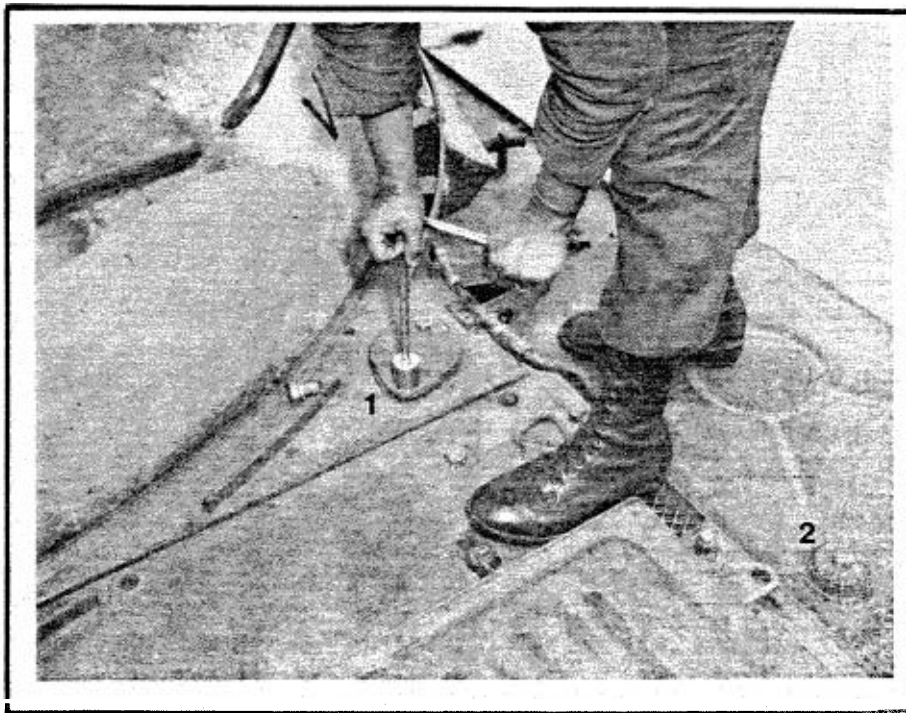


FIG. 4-2. REAR FUEL TANK ACCESS PLATES (HONEYCOMB) (1)
EXTERNAL FUEL TANK (2)



FIG. 4-3. REAR DECK ACCESS PLATES
1 POWER PLANT COMP.
2 POWER TRAIN COMP.

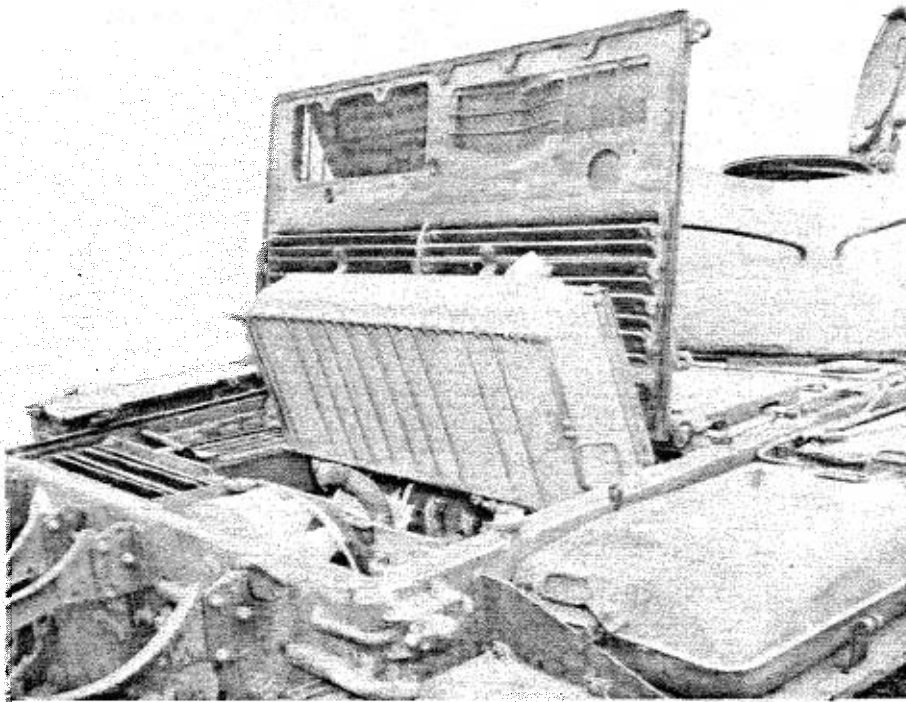


FIG. 4-4. POWER TRAIN ACCESS PLATE IN RAISED POSITION

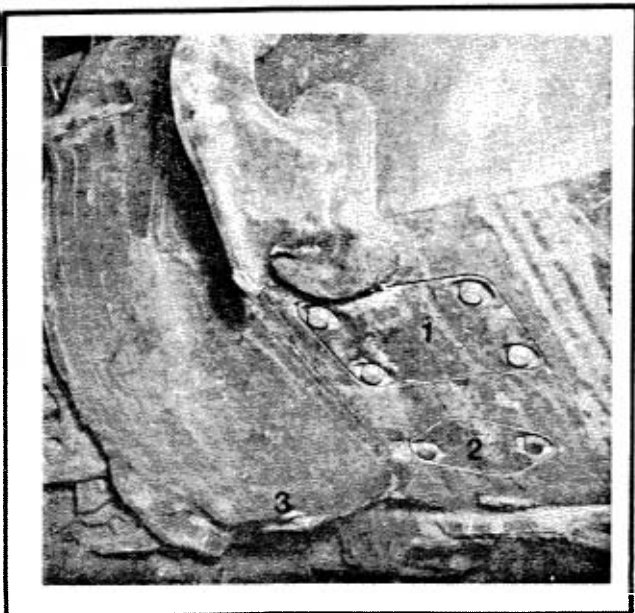


FIG. 4-5. HULL BOTTOM LEFT REAR
 1 ACCESS TO OIL TANK DRAIN AND OIL COOLER DRAIN
 2 ACCESS TO LEFT STEERING CLUTCH
 3 LEFT FINAL DRIVE DRAIN PLUG

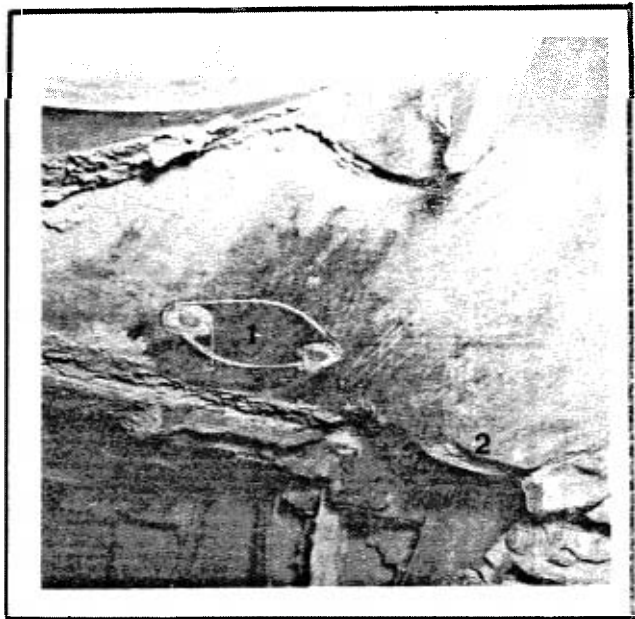


FIG. 4-6 HULL BOTTOM RIGHT REAR
 1 ACCESS TO RIGHT STEERING CLUTCH
 2 RIGHT FINAL DRIVE DRAIN PLUG

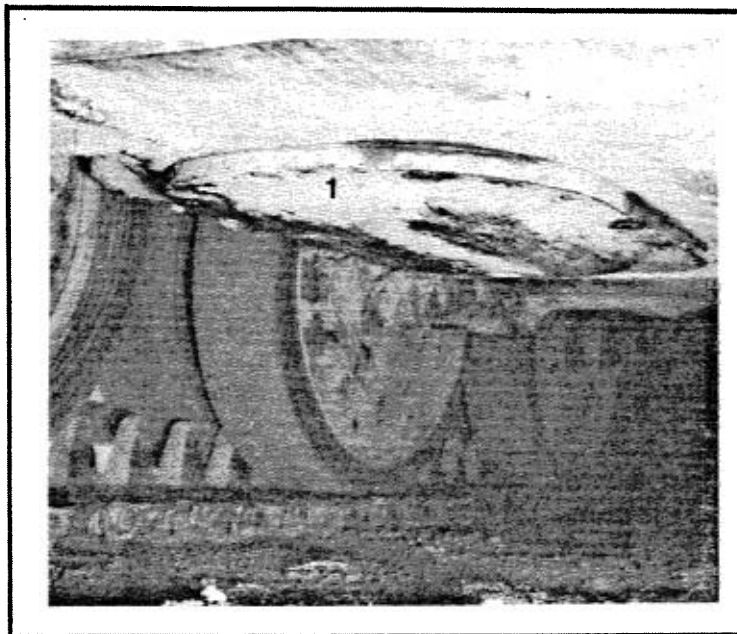
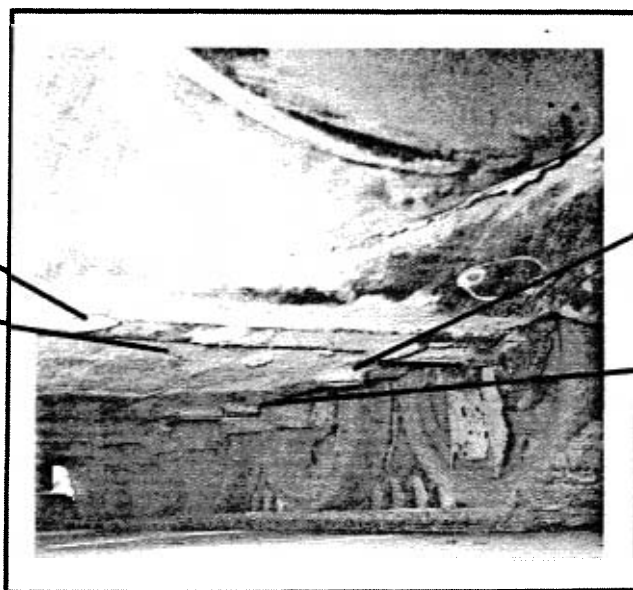


FIG. 4-7. HULL BOTTOM MID LEFT
 1 ACCESS TO ENGINE OIL SUMP DRAIN

TRANSMISSION
DRAIN PLUG
ACCESS PLATE

MASTER CLUTCH
ACCESS PLATE



TRANSFER
DRAIN PLUG
ACCESS PLATE

REAR HONEYCOMB
FUEL TANK
DRAIN PLUG
ACCESS PLATE

FIG. 4-8. HULL BOTTOM, RIGHT SIDE ACCESS PLATES

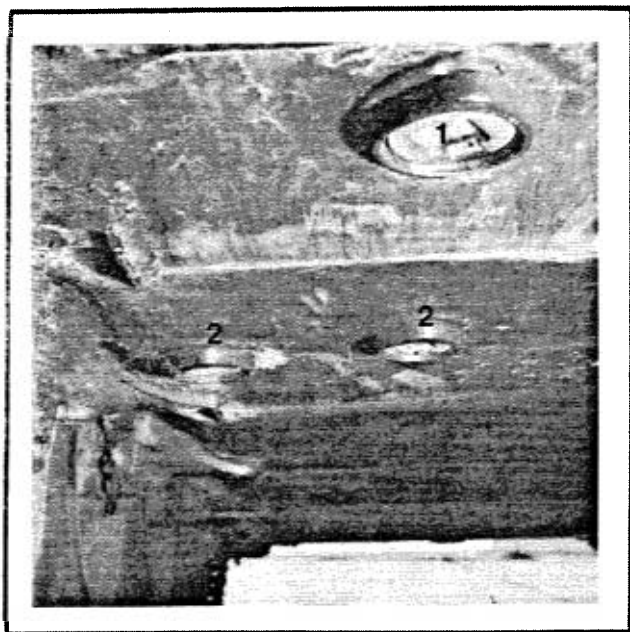


FIG. 4-9. HULL BOTTOM ACCESS PLATES FOR:
1 NOSE FUEL DRAIN PLUG
2 HONEYCOMB FUEL DRAIN PLUG

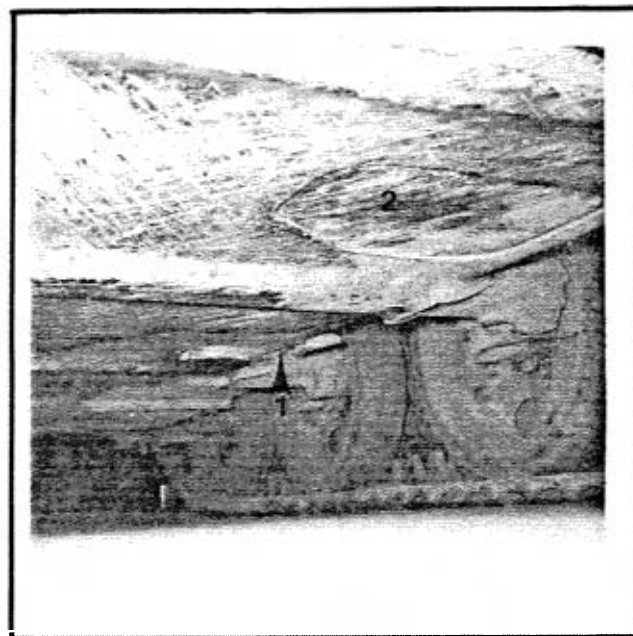


FIG. 4-10. HULL BOTTOM ACCESS PLATES FOR:
1 PRE-HEATER EXHAUST
2 CREW ESCAPE HATCH

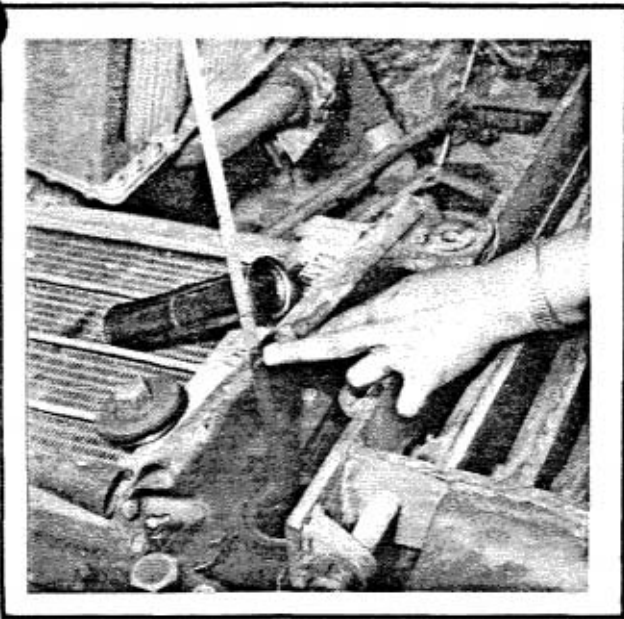


FIG. 4-11. ENGINE OIL CHECK

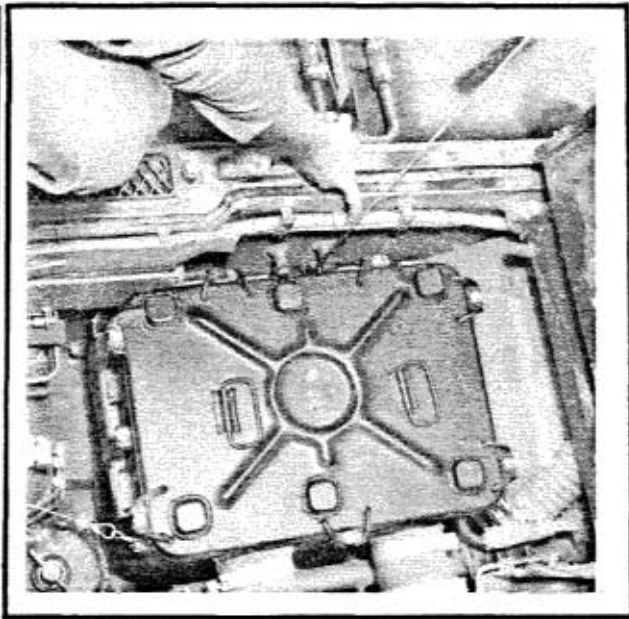


FIG. 4-12. TRANSFER CASE OIL CHECK

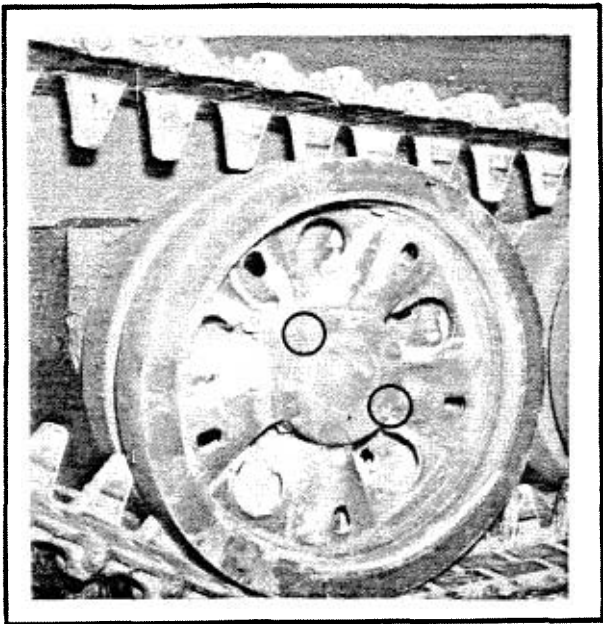


FIG. 4-13. ROAD WHEEL
RED BOLTS ARE LUBE POINTS

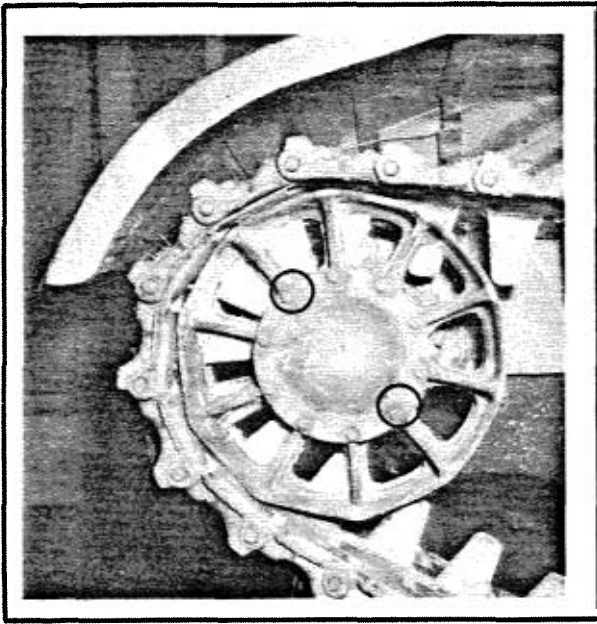


FIG. 4-14. IDLER WHEEL
RED BOLT HEADS ARE LUBE POINTS

TABLE 4-2 VEHICLE HULL LUBRICATION POINTS AND INTERVAL KEY (CONT.)

INTERVAL KEY	FIGURE NUMBER	LUBRICATION POINT	TYPE LUBRICANT	REMARKS
				transmission. Change oil every 4,000 kms or annually (*Installation maintenance responsibility).
Q		Bolts, securing access plates, deck plates, and threaded parts of plugs	OE-30	Clean and coat with a thin layer of oil.
Q		Battery Terminals	GAA	Clean battery terminals and apply a light coat of grease.
		Hatch covers, locking pins, tow hooks and engine louver shafts	OE-30	Use oil can to feed lubricant through hinges and pinshafts.
Q S		Hydraulic shock absorbers	50% Turbine oil and 50% transformer oil	Check tightness of shock absorber mounting bolts for seal leakage. Unscrew filler plug semi-annually. If lubricant fails to reach lower edge of filler hole, refill.
Q	4-18	Master Clutch and release mechanism	GAA	Use grease gun to feed 3 to 3.5 ounces of lubricant through the filling tube on the clutch housing.
Q	4-19,20	Steering Clutch		Use grease gun to feed 3 to 3.5 ounces of lubricant through the filling tube on clutch drum.
Q		All shafts, axles, levers and hinged joints.	OE-30	Use oil can to feed oil through the pivot points or filling holes.
W	4-21	Air Cleaner		Remove the three cartridges, wash with solvent and blow dry with compressed air.
Q	4-22	Fan Hub Bearing	GAA	Remove armor plate and use grease gun to feed 3.5 to 4 oz. of lubricant into filler point.
D	4-23	Compressed Air System		After each operation drain water and sediment from the compressed air system.

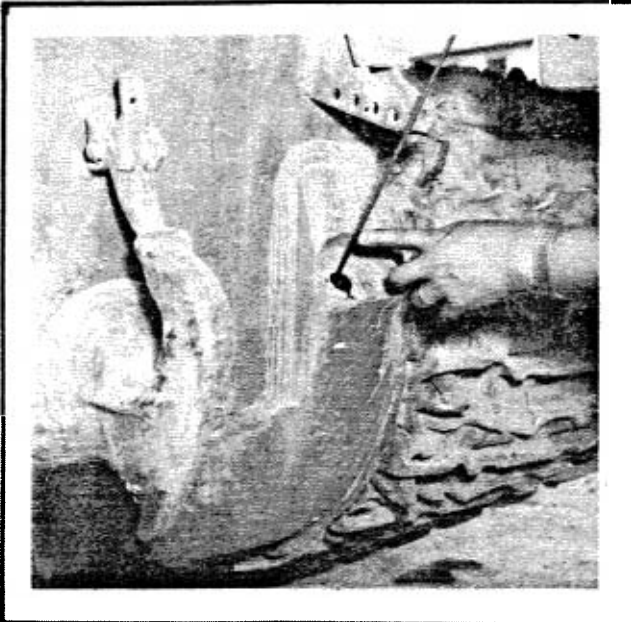


FIG. 4-15. FINAL DRIVE OIL CHECK

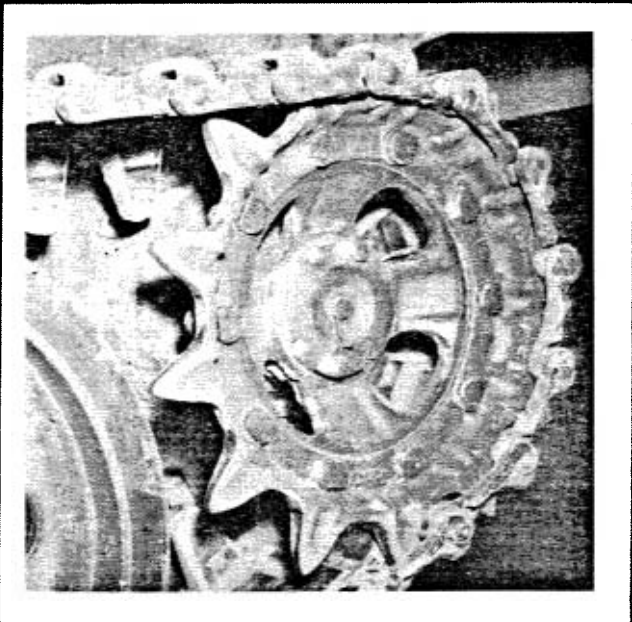


FIG. 4-16. DRIVE SPROCKET

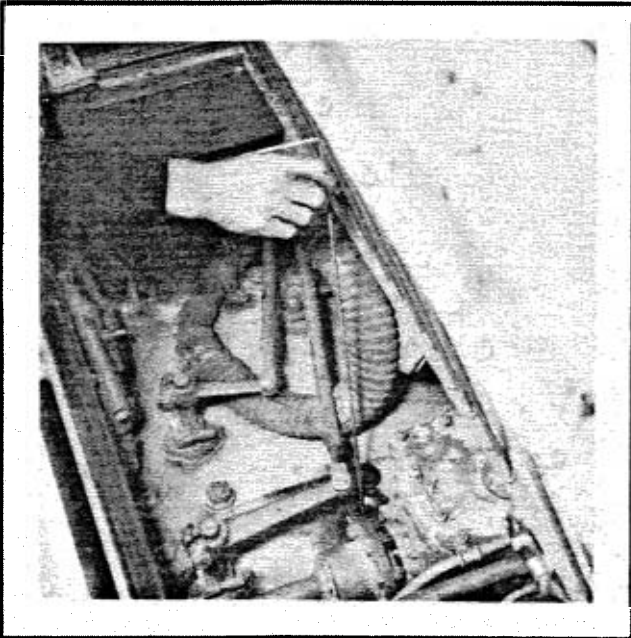


FIG. 4-17. TRANSMISSION OIL CHECK

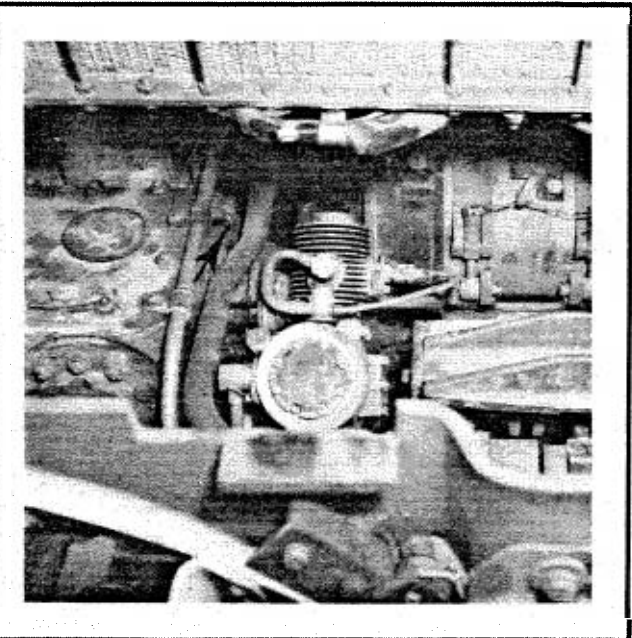


FIG. 4-18. MASTER CLUTCH LUBE POINT

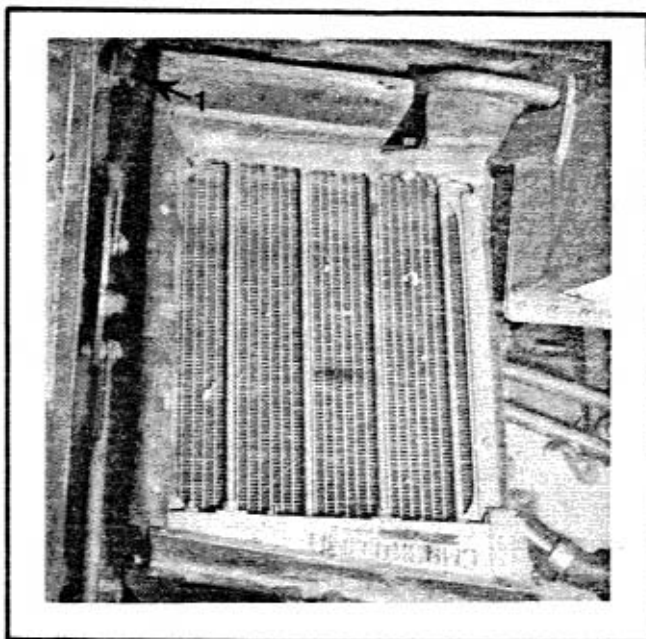


FIG. 4-19. ENGINE OIL COOLER AND LEFT STEERING CLUTCH LUBE POINT (1)

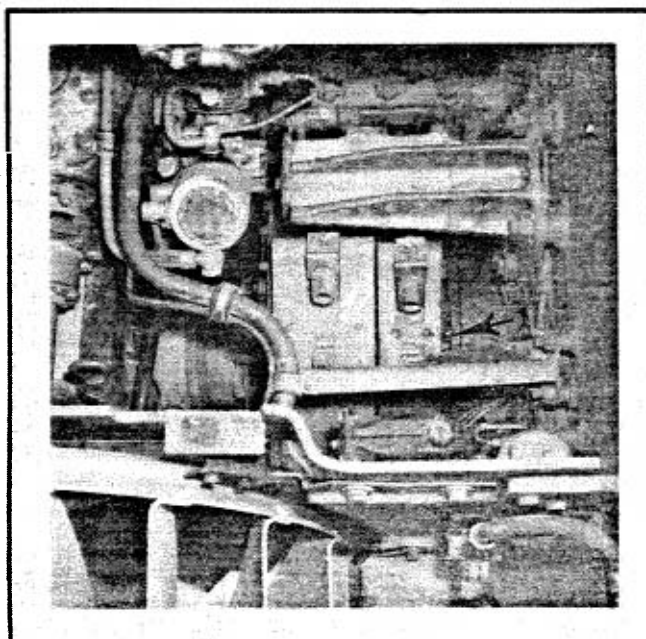


FIG. 4-20. RIGHT STEERING CLUTCH LUBE POINT (1)

TABLE 4-2 VEHICLE HULL LUBRICATION POINTS AND INTERVAL KEY (CONT.)

INTERVAL KEY	FIGURE NUMBER	LUBRICATION POINT	TYPE LUBRICANT	REMARKS
Q*	4-24	Coarse Fuel		Remove, wash with solvent and blow dry with compressed air (*Installation maintenance responsibility).
A*	4-24	Fine Fuel Filter		Remove, wash with solvent and blow dry with compressed air (*Installation maintenance responsibility).
A*	4-8,9	Fuel Tanks		Annually drain 4-5 liters from each tank to remove sediment (*Installation maintenance responsibility).
A*	4-25	Oil Filter		Remove and clean annually. (*Installation maintenance responsibility).

e. Installation Maintenance. The installation maintenance personnel are responsible for the lubrication points annotated in Table 4-2.

Furthermore, the installation maintenance personnel are responsible for those areas beyond the unit's capabilities.

Section III. PREVENTIVE MAINTENANCE SERVICE

4-4 GENERAL

Preventive maintenance (PM) is the systematic care, inspection and servicing of equipment to maintain it in a serviceable condition, prevent breakdowns and assure maximum operational readiness. Preventive maintenance is accomplished by the equipment operator. The operator's role in the performance of PM services are:

a. Perform daily services each time the equipment is operated.

b. Assist installation personnel in the performance of other scheduled periodic services, lubrication and required repairs.

4-5 RESPONSIBILITY

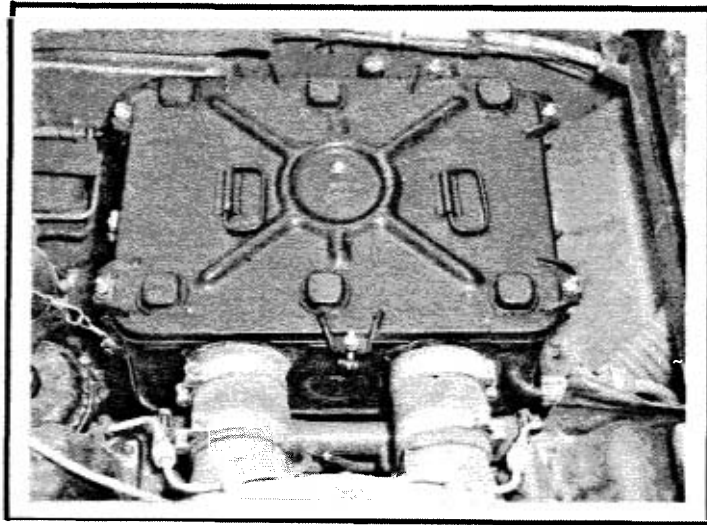
Users of this tank are responsible to their command to insure the tank is properly maintained in a serviceable condition and that it is properly cared for when in use.

4-6 RECORDING REPAIRS

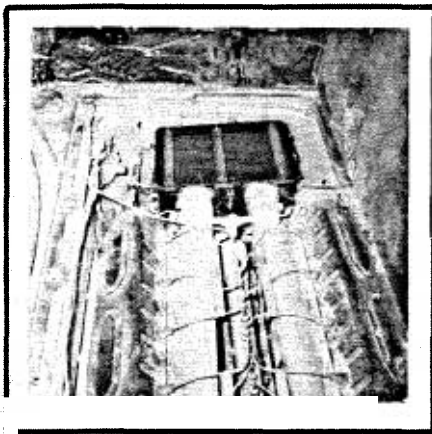
The equipment records system provides for recording repairs required and accomplished on specific items of equipment. This will include, but is not limited to, adjusting, cleaning and replacing parts. Deficiencies discovered before, during and after operation that cannot be corrected by the operator will be entered on DA Form 2404. Deficiencies immediately corrected by the operator are not recorded, except when such corrections are made by replacing parts. Deficiencies which constitute repairs for the installation maintenance facility will be recorded as installation maintenance.

4-7 PREVENTIVE MAINTENANCE BY OPERATOR AND CREW

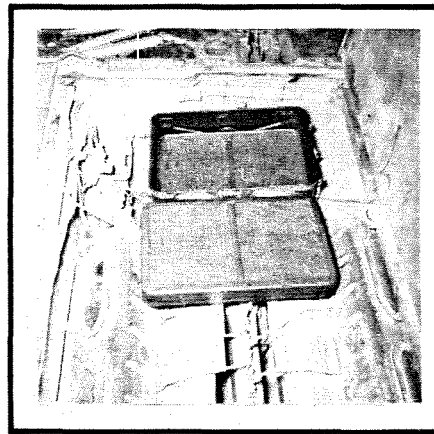
a. Purpose. To assure maximum operational readiness, it is necessary that the tank be systematically inspected at intervals every day it is operated so that defects may be discovered and corrected before



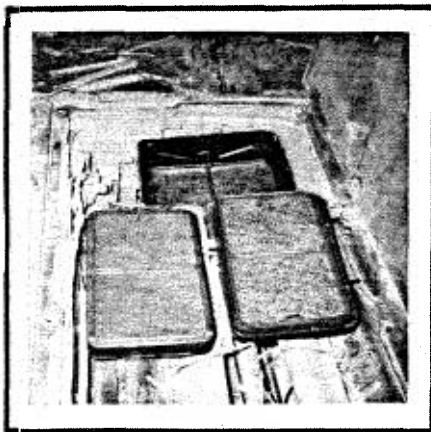
a. COMPLETE ASSEMBLY



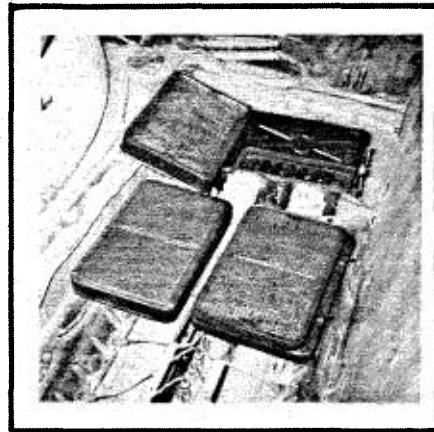
b. COVER OFF



c. 1st ELEMENT REMOVED



d. 1st AND 2d ELEMENT REMOVED



e. 1st, 2d AND 3d ELEMENT REMOVED

FIGURE 4-21 AIR CLEANER ASSEMBLY

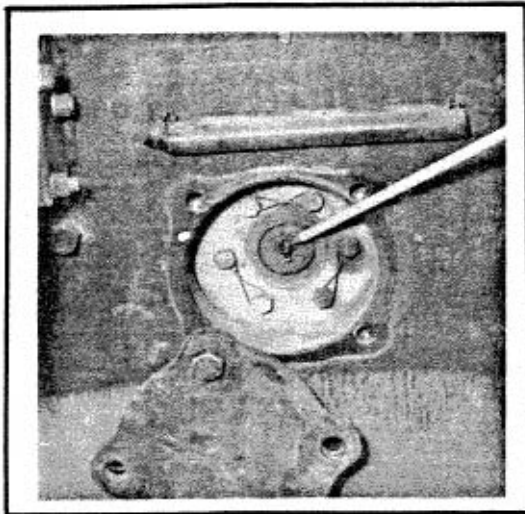


FIG. 4-22. FAN HUB BEARING LUBE POINT

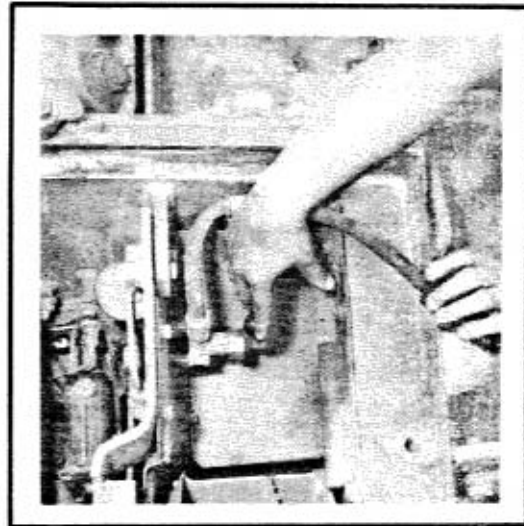


FIG. 4-23. COMPRESSED AIR SYSTEM
SEDIMENT DRAIN

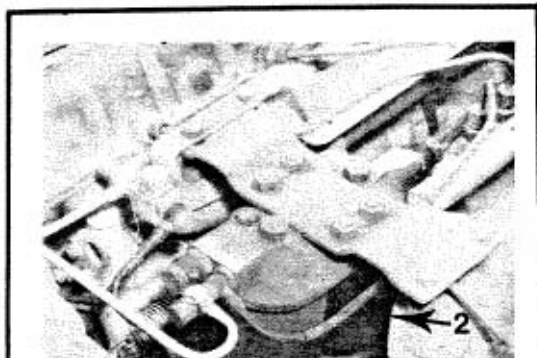


FIG. 4-24. FUEL FILTER
1 COARSE FILTER
2 FINE FILTER

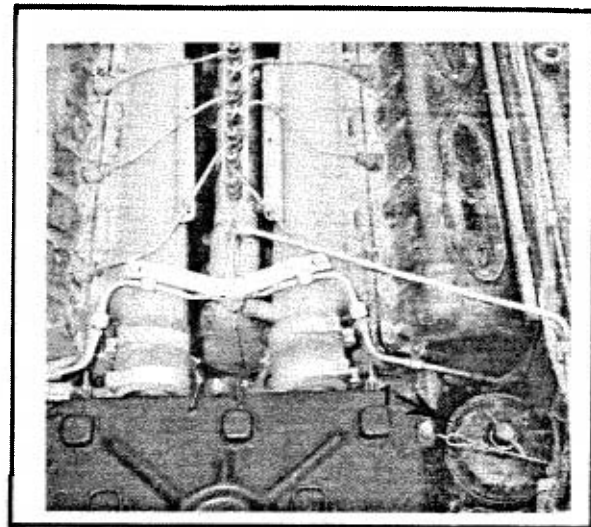


FIG. 4-25. OIL FILTER (1)

Section III. PREVENTIVE MAINTENANCE SERVICE

they result in serious damage or failure. Certain scheduled maintenance services will be performed at designated intervals. Any deficiencies discovered that cannot be corrected by the operator will be reported on DA Form 2404 and DA Form 2407 to the installation maintenance facility through the unit's maintenance facility.

b. Daily Preventive Maintenance (PM) Service. The tank will be inspected each day that it is operated. Definitions of these services appear in (1) through (3) below:

(1) Before-operation service. This is a brief service to ascertain that the tank is ready for operation. It is primarily a check to ascertain if conditions affecting vehicle readiness have changed since the last after-operation service.

(2) During-operation service. This service consists of detecting unsatisfactory performance. While driving, the crew should be alert for any unusual noises, odors, abnormal instrument readings, steering irregularities, or any other indications of tank malfunctions. Each time the brakes are applied, the vehicle is turned, or the gears are shifted should be considered a test and any unusual or unsatisfactory performance should be noted.

(3) After-operation service. This service consists of correcting, insofar as is possible, any operational deficiencies. Thus, the tank is prepared to operate in a minimum period of time.

Section IV. TROUBLESHOOTING

4-8 SCOPE

a. This section contains troubleshooting information for locating and correcting some of the troubles which may develop in this vehicle. Each symptom of trouble or malfunction given for an individual component or system is followed by a list of probable causes of the trouble and corrective actions necessary to remedy the malfunction.

b. This technical manual cannot cover all possible troubles and deficiencies that may occur under the many conditions of operation. If a specific cause of malfunction and corrective action are not addressed, proceed to isolate the system in which the trouble occurred and then notify your installation maintenance facility.

c. Troubleshooting is the systematic isolation of defective components by means of an analysis of affected systems, testing to determine the defective component and applying the remedies.

In most cases the operator can only note trouble symptoms by detecting strange or unusual noises or conditions and reporting these conditions to the installation maintenance facility through unit maintenance personnel.

d. Standard automotive theories and principles of operation apply in troubleshooting this tank. The operator must pay particular attention to any unusual noises and report them to the unit maintenance personnel if the remedy is beyond the responsibility of the operator or crew. The more symptoms of trouble that can be evaluated, the easier the isolation of the defect.

4-9 PROCEDURES

Table 4-3 lists possible malfunctions that may be experienced during the operation of this vehicle or its components. Each malfunction is followed by a list of probable causes that may be considered in determining the action necessary to correct the malfunction. Probable causes are listed in their order of probability and should be considered accordingly during troubleshooting.

TABLE 4-3 TROUBLESHOOTING THE HULL

MALFUNCTION	PROBABLE CAUSES	CORRECTIVE ACTION
<u>ENGINE</u>		
1. Engine fails to crank.	<ul style="list-style-type: none"> a. Master switch not <u>ON</u>. b. Air start system failure. c. Electric starter fails to gain required speed. 	<ul style="list-style-type: none"> a. Turn master switch on (para 2-4). b. Check air pressure in the cylinder (50 kg/sq cm is the minimum required). If air pressure is below 50 kg/sq cm use auxiliary electric start procedures (2-24r) and check compressor system. c. Check condition of batteries and charge if necessary.
2. Engine cranks but fails to start.	<ul style="list-style-type: none"> a. Fuel shut-off valve closed. b. Fuel tanks empty. c. Air in fuel lines. d. Fuel line clogged. 	<ul style="list-style-type: none"> a. Open fuel shut-off valve (para 2-6). b. Fill fuel tanks (para 1-3e). c. Bleed air from fuel lines (para 2-24m). d. Notify organizational/installation maintenance personnel.
3. Engine starts but operates erratically.	<ul style="list-style-type: none"> a. Air in fuel system. b. Clogged fuel filters. c. Air flow restricted through air cleaner. 	<ul style="list-style-type: none"> a. Bleed air from fuel system (para 2-24m). b. Notify organizational/installation maintenance personnel. c. Check for plugged air cleaner. Clean filter elements (Table 4-2).
4. Engine overheats as indicated by engine coolant temperature gauge.	<ul style="list-style-type: none"> a. Low coolant level. b. Defective water pump. 	<ul style="list-style-type: none"> a. Add coolant as required to bring level up to 30-40mm below filler neck (Table 2-1). a. Check circulation of cooling liquid. If none, notify organizational/installation maintenance personnel.

TABLE 4-3 TROUBLESHOOTING THE HULL (CONT.)

MALFUNCTION	PROBABLE CAUSES	CORRECTIVE ACTION
	c. Restricted air intake grill.	c. Clean air intake grill and insure engine cover handle is in the open position (para 2-21d).
	d. Radiator core clogged or defective coolant gauge.	d. Notify organizational/installation maintenance personnel.
CAUTION: Do not allow engine to operate for sustained periods if coolant temperature exceeds 105°C.		CAUTION: Change to a lower gear. If temperature fails to drop, cool down the engine and determine the cause.
5. Engine overheats as indicated by engine oil temperature gauge.	a. Low engine oil level.	a. Add oil as required (Table 2-1).
	b. Dirty oil cooler grill.	b. Clean the grill surface.
	c. Engine overloaded.	c. Reduce load.
	d. Oil temperature gauge or sending unit defective.	d. Notify organizational/installation maintenance personnel.
CAUTION: Do not allow engine to operate for sustained periods if oil temperature exceeds 110°C.		CAUTION: Change to a lower gear. If temperature fails to drop, cool down the engine and determine the cause.
6. Engine does not develop full power.	a. Restricted air cleaner.	a. Service air cleaner (Table 2-1). If elements are clean, notify organizational/installation maintenance personnel.
	b. Engine oil level too high.	b. Refer to Table 2-1.
7. Engine oil consumption excessive.	a. Engine oil level too high.	a. Refer to Table 2-1.
	b. Leaking oil lines or connections.	b. Check engine for external oil leaks. If leaks exist, notify organizational/installation maintenance personnel.

TABLE 4-3 TROUBLESHOOTING THE HULL (CONT.)

<u>MALFUNCTION</u>	<u>PROBABLE CAUSES</u>	<u>CORRECTIVE ACTION</u>
	c. Defective engine lubrication system.	c. Notify organizational/installation maintenance personnel.
8. Engine misfires.	a. Defective fuel or air intake system.	a. Notify organizational/installation maintenance personnel.
	b. Defective engine.	b. Notify organizational/installation maintenance personnel.
9. Engine fails to attain required oil pressure.	a. Engine oil level low.	a. Refer to Table 2-1.
	b. Air in oil system.	b. Check for oil leaks in front of the oil pump. Notify organizational/installation maintenance personnel.
	c. Clogged oil filter or oil pressure gauge defective.	c. Notify organizational/installation maintenance personnel.
<u>FUEL SYSTEM</u>		
10. Fuel consumption excessive.	a. Leaking fuel line connections or fuel tank.	a. Check fuel system for evidence of leakage. If leaks exist, notify organizational/installation maintenance personnel.
	b. Defective fuel system.	b. Notify organizational/installation maintenance personnel.
<u>CLUTCH</u>		
11. Clutch drags.	Excessive pedal clearance.	Idle engine, depress clutch pedal to fully release position, allow time for the clutch to stop. Shift transmission into first or reverse gear. If shift cannot be made without severe clashing of gears or, if after engagement of gears, there is jumping or creeping movement of the vehicle with clutch fully released, the clutch is dragging. Notify organizational/installation maintenance personnel.

TABLE 4-3 TROUBLESHOOTING THE HULL (CONT.)

<u>MALFUNCTION</u>	<u>PROBABLE CAUSES</u>	<u>CORRECTIVE ACTION</u>
12. Clutch slips.	Insufficient pedal free travel or worn clutch discs.	Notify organizational/installation maintenance personnel.
13. Clutch clatters.	Oil or grease on clutch discs.	Notify organizational/installation maintenance personnel.
14. Clutch does not disengage.	a. Defective clutch assembly. b. Improper clutch control linkage adjustment.	a. and b. Notify organizational/installation maintenance personnel.
15. Clutch air assist inoperable.	Electropneumatic valve defective.	Notify organizational/installation maintenance personnel.
<u>TRANSMISSION</u>		
16. Gears clash when shifting.	Improper clutch adjustment. b. Buildup of mud and dirt on one track.	Notify organizational/installation maintenance personnel. b. Clean track.
19. Final drive overheated and/or noisy.	a. Low oil level.	a. Fill to required level (Table 2-1).
20. Water in final drive.	Defective output seals or loose filler caps.	Notify organizational/installation maintenance personnel.
<u>TRACKS AND SUSPENSION</u>		
21. Tank pulls to one side.	Unequal track tension.	Check and adjust track tension (para 4-11).
22. Tank sags to one side.	Broken torsion bar.	Notify organizational/installation maintenance personnel.
23. Excessive noise in tracks or suspension.	a. Worn or broken road wheel bearings. b. Worn track pins or shoes.	a. Check hubs for excessive heat immediately after tank operation. If hub feels excessively hot, notify organizational/installation maintenance personnel. b. Check for worn or damage track pin or shoes and replace if necessary.

TABLE 4-3 TROUBLESHOOTING THE HULL (CONT.)

MALFUNCTION	PROBABLE CAUSES	CORRECTION ACTION
24. Track does not maintain proper tension.	Defective track adjustor.	Notify organizational/installation maintenance personnel.
25. Leaking road wheels, idler wheels, or shock absorbers.	Damaged or defective hub seals or gaskets.	Notify organizational/installation maintenance personnel.
26. Tank rides excessively hard.	One or more defective shock absorbers.	Notify organizational/installation maintenance personnel.

Section V. TRACK MAINTENANCE

4-10 GENERAL

Maintenance performed by the operator and crew on the track consists of checking and adjusting track tension, removing and installing track shoes to maintain track tension, disconnecting and connecting the track to replace a thrown track and inspection of track shoes for pins and pin wear.

4-11 TRACK TENSION

a. Checking track tension (Fig. 4-26).

(1) Track tension is considered normal if the upper run of each track is 60-80 mm above the 1st road wheel.

(2) In cases where the track is elongated and a normal tensioning cannot be achieved, remove one track pad from each track. Maximum number of track pads is 96; minimum number of track pads is 90.

b. Adjusting Track Tension (Fig. 4-27).

(1) Perform the track adjustment on level hard ground.

(2) Ensure that the idler wheel axle is not above the horizontal axis of the idler crank.

(3) Raise the front mud shield and lock in an upright position.

(4) Loosen the lock nut (small nut) by turning it counter-clockwise.

(5) Align special wrench over lock nut and adjusting nut (large nut) and turn clockwise to tighten the track or counter-clockwise to loosen the track until proper tension is attained.

(6) Remove special wrench and tighten lock nut (small nut).

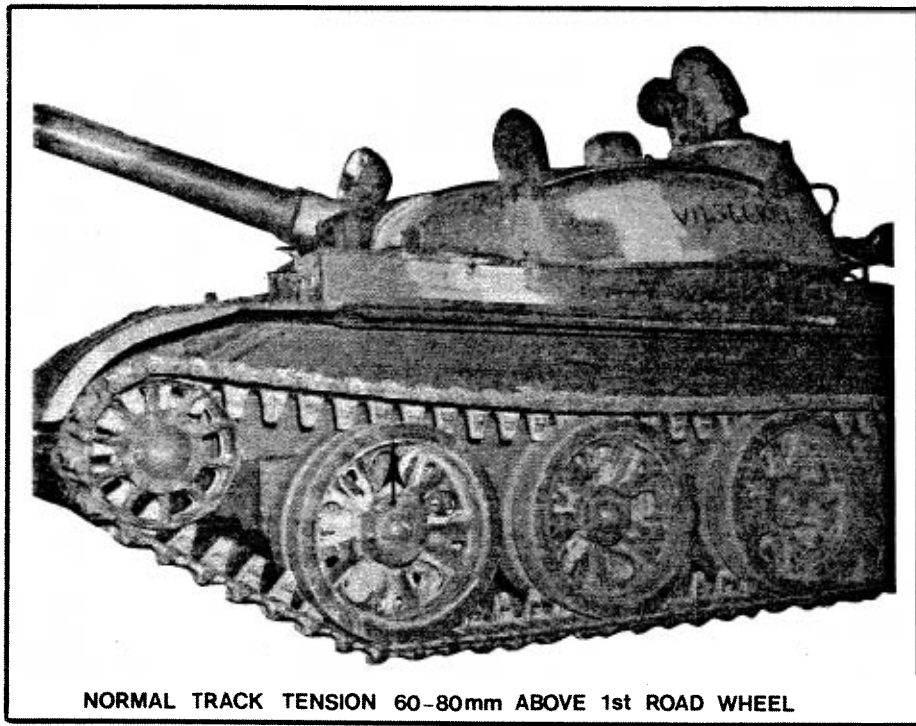


FIGURE 4-26 PROPER TRACK TENSION

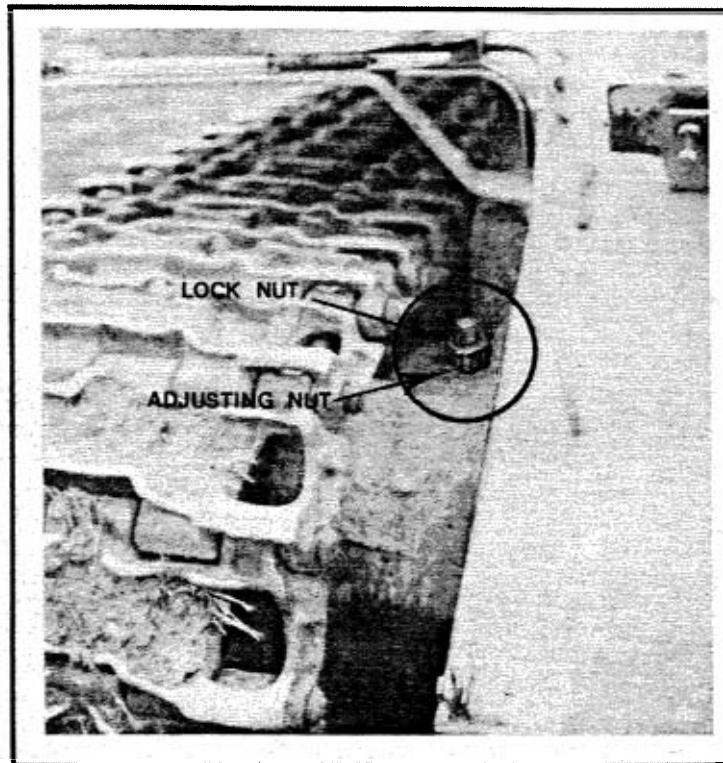


FIGURE 4-27 TRACK TENSION ADJUSTING NUT

APPENDIX A

A-1 Disassembly of the PKT (Fig. A-1)

- a. Place the machine gun on a flat surface with the muzzle pointed away from you.
- b. Ensure that the weapon is clear. Take the weapon by the electric trigger with the left hand. Depress the latch with the right thumb and open the receiver cover (Figs. A-2 and A-3). Raise the feed tray base and place the safety on "FIRE" (Fig. A-4).
- c. Pull the carrier block back to the rear with the retracting handle and ensure that the weapon is clear. To prevent damage to the bolt, carrier or receiver, gently release the carrier block with the retracting handle.
- d. To remove the guide rod and the main spring, hold the weapon with the left hand and push the guide rod with the right hand until its lug is disengaged from the hole on the rear receiver wall. Lift the rear of the guide rod and remove it together with the receiver main spring (Fig. A-5). Detach the main spring from the guide rod.
- e. To remove the carrier block and bolt, hold the weapon with the left hand and pull the carrier block to the rear as far as it will go. Raise the carrier block, and remove it and the bolt from the receiver (Figs. A-6 and A-7).
- f. Next, grasp the carrier block in the left hand with the bolt facing up, shift the bolt back and turn it to the right so that the guide lug disengages the shaped recess of the carrier block. Then, push the bolt forward, turn it to the right and detach it from the carrier block (Fig. A-8).
- g. Take the bolt in the left hand with the bolt channel pointed down and move the firing pin completely rearward. Then, move it forward by the lug with the right hand. Remove it from the bolt channel (Fig. A-9).
- h. Depress the retainer with a drift pin and push the electric trigger up so that the guide lugs disengage the receiver's vertical slots.
- i. To remove the barrel, move the barrel latch to the left. (Fig. A-10). Rotate the carrying handle forward and remove the barrel (Fig. A-11). The weapon is now fully disassembled (Fig. A-12).

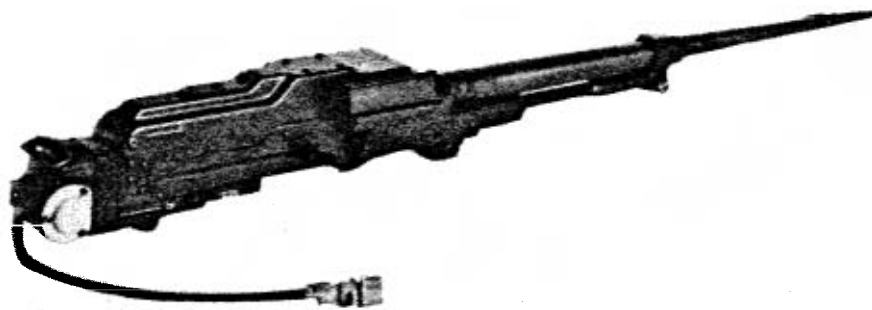


FIG. A-1. PKT COAXIAL MACHINEGUN

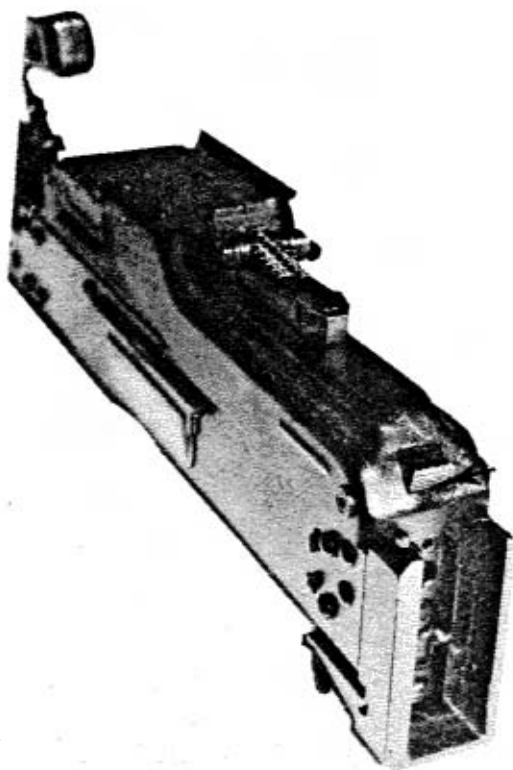


FIG. A-2. RECEIVER COVER LATCH

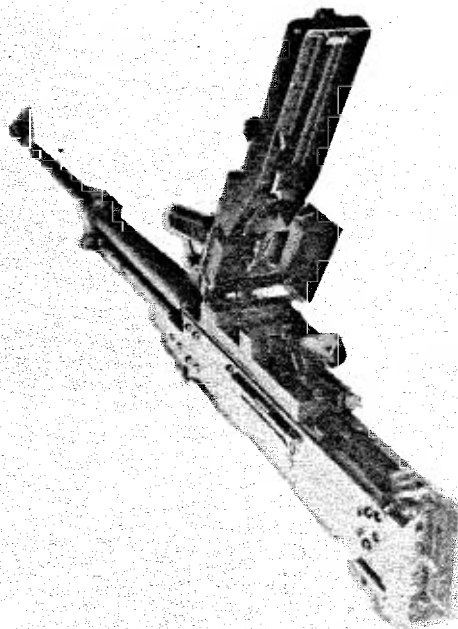


FIG. A-3. RAISED COVER

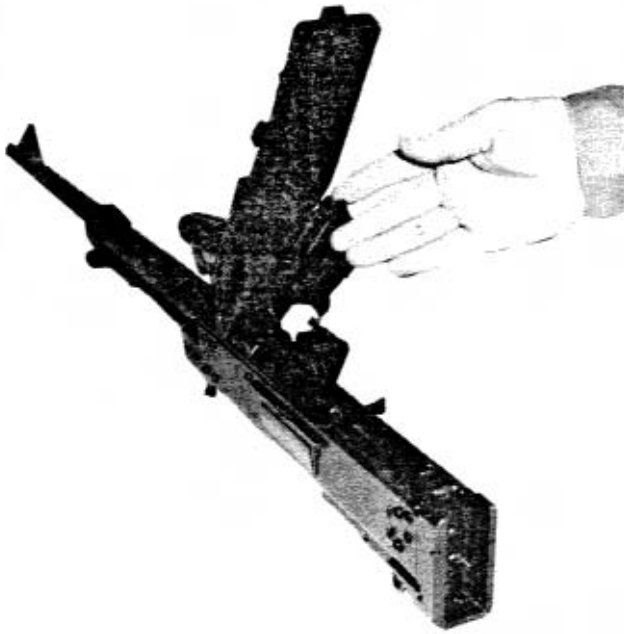


FIG. A-4. RAISED FEED TRAY

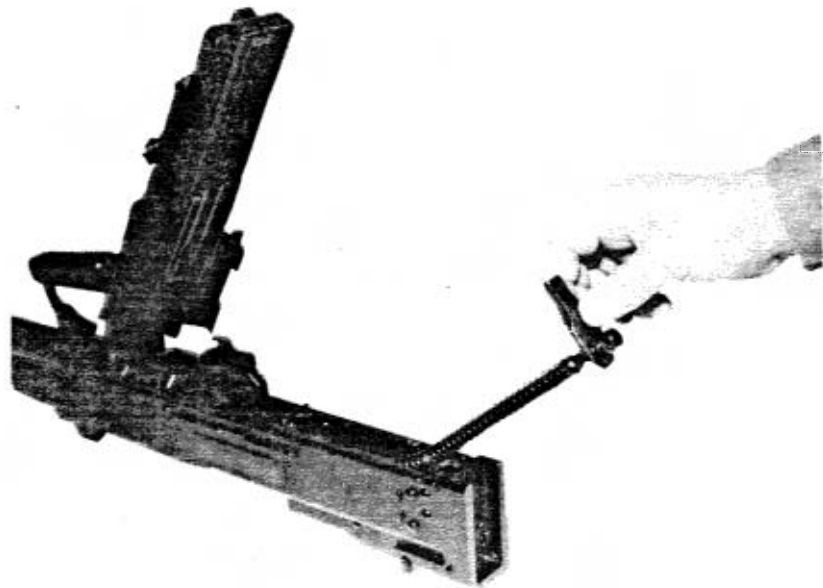


FIG. A-5. RECEIVER MAIN SPRING

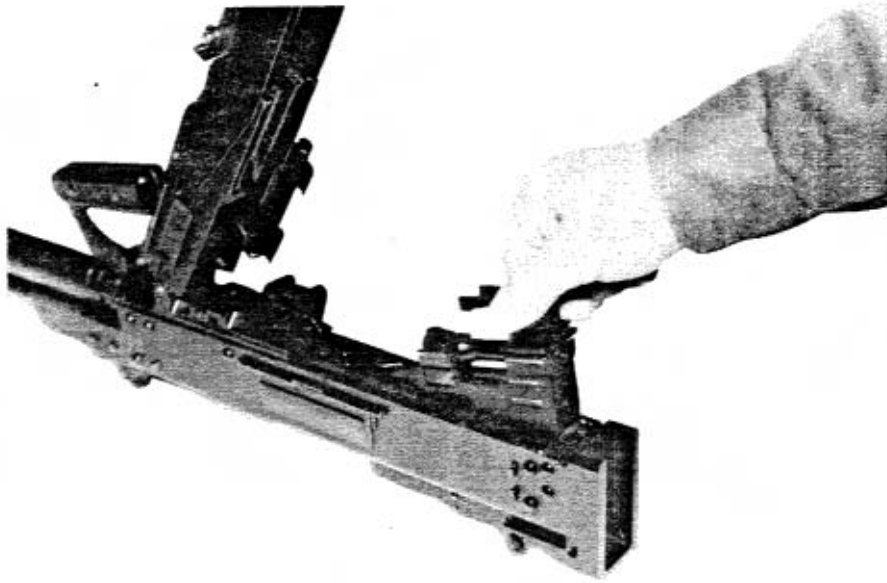


FIG. A-6. CARRIER BLOCK RAISED

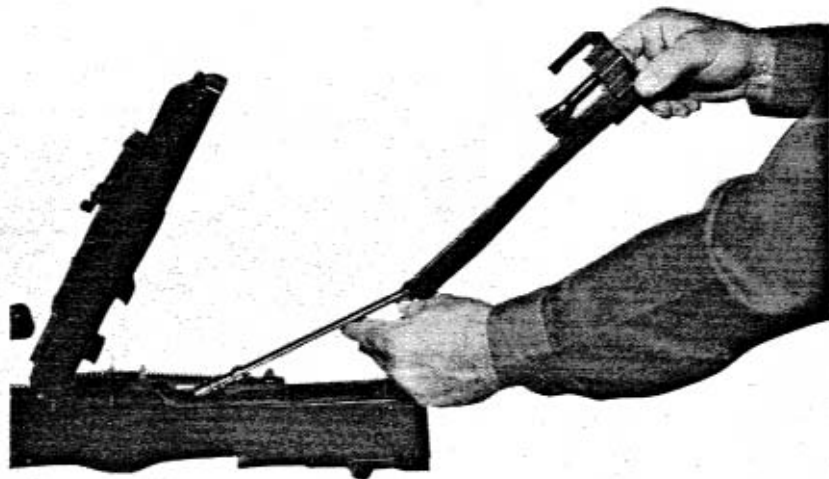


FIG. A-7. CARRIER BLOCK AND BOLT REMOVED



FIG. A-8. BOLT REMOVED FROM CARRIER BLOCK

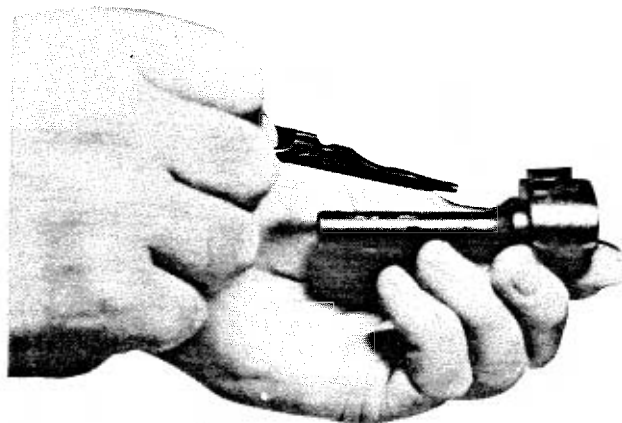


FIG. A-9. FIRING PIN REMOVED

A-2. Assembly of the PKT.

a. Open the receiver cover, lift the feed block base and move the barrel latch to the left as far as it will go (Fig. A-13). Fit the barrel into the receiver (Fig. A-14), align the chamber sleeve with the gas piston tube and pull the barrel rearward (Fig. A-15). Secure the barrel by moving the barrel latch to the right and turning the carrying handle to the left.

b. Align the electric trigger housing's guide lugs with the receiver's vertical slots. Depress the lock and push the electric trigger down as far as it will go. The lock should enter the receiver hold.

c. Hold the bolt with the left hand and insert the firing pin's front end in the bolt channel and push it forward into the bolt (Fig. A-16).

d. Take the carrier block in the left hand and the bolt in the right hand. Insert the cylindrical part of the bolt into the carrier block channel by directing the firing pin lug into the ejection lug slot. Move the bolt rearward and rotate it to the left. Push the bolt forward (Fig. A-17).

e. Take hold of the carrier block by the feeding extractor with the right hand so that the right thumb holds the bolt forward. Hold the weapon with the left hand and push the electric trigger. Insert the carrier block with the gas piston into the receiver (Fig. A-18) and place the carrier block in the fully forward position (Fig. A-19).

f. With the right hand, take the guide rod and slip the main spring onto it so that the first coil of the main spring enters the circular groove of the guide rod. While holding the rear of the weapon with the left hand, insert the guide rod with the main spring into the carrier block channel (Fig. A-20). Compress the main spring and push the guide rod forward and down as far as it will go. Insert the guide rod lug into the hole in the receiver rear wall and close the cover.

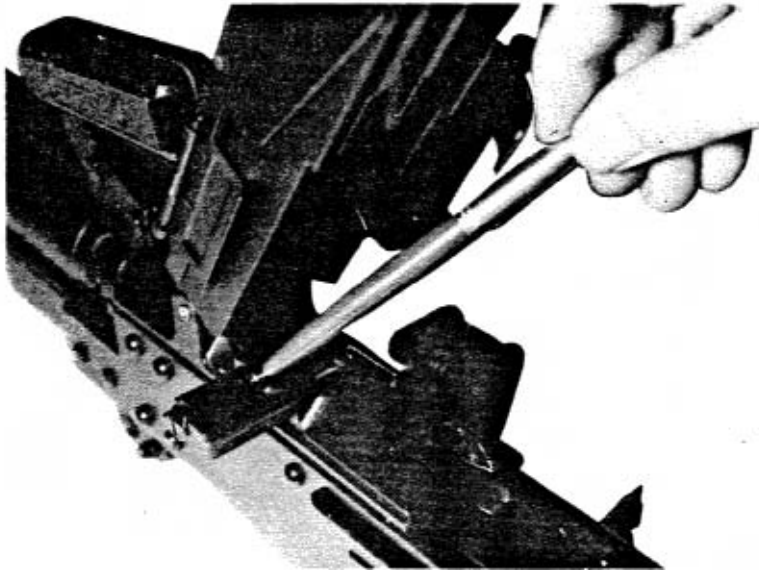


FIG. A-10. BARREL LATCH MOVED TO THE LEFT

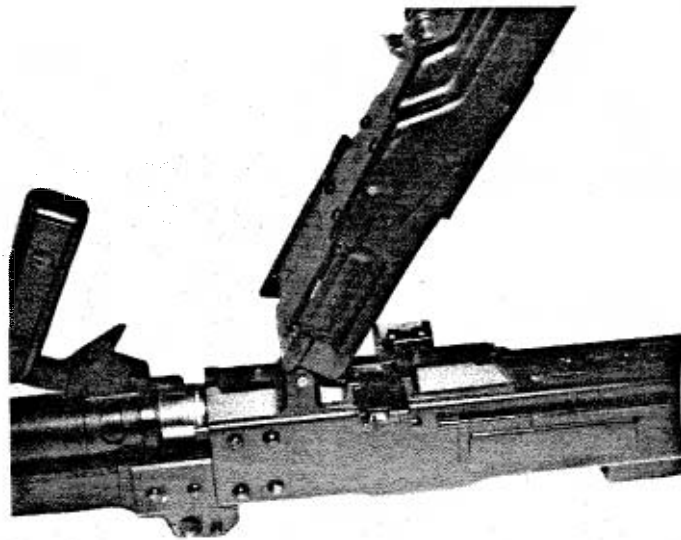


FIG. A-11. BARREL DISENGAGED

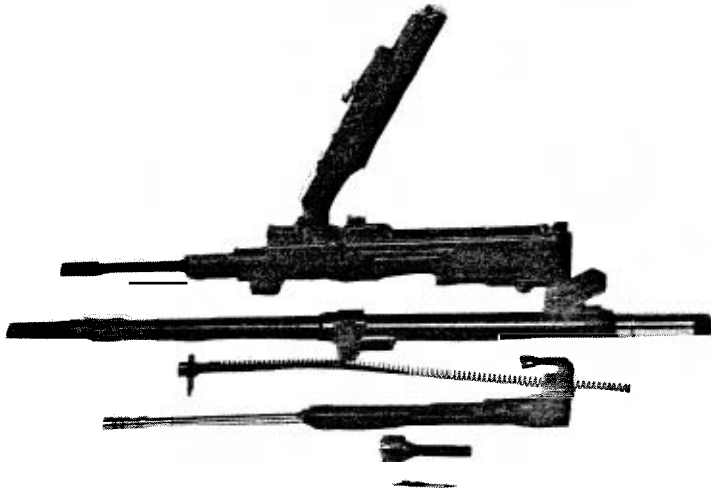


FIG. A-12 PKT DISASSEMBLED

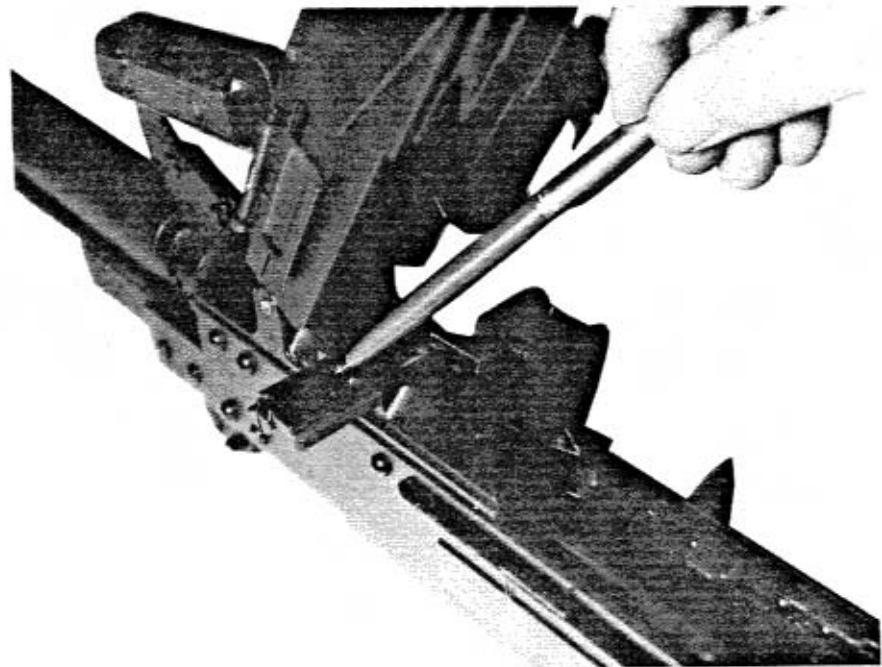


FIG. A-13 BARREL LATCH

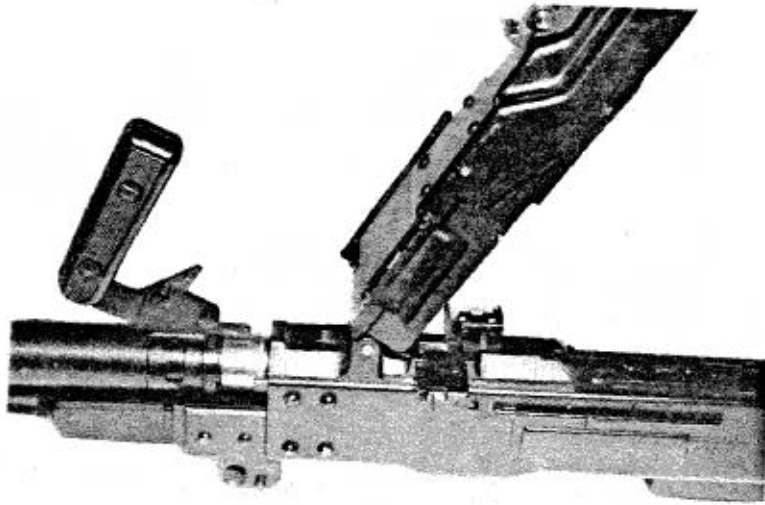


FIG. A-14. BARREL BEING FITTED INTO RECEIVER GROUP

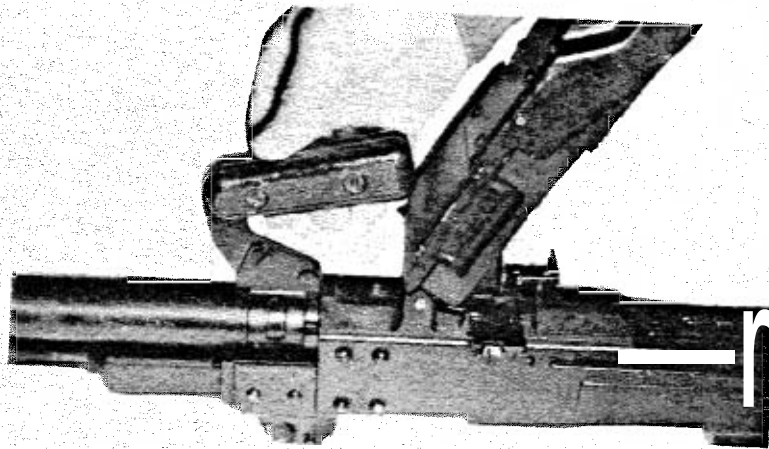


FIG. A-15. BARREL IN POSITION

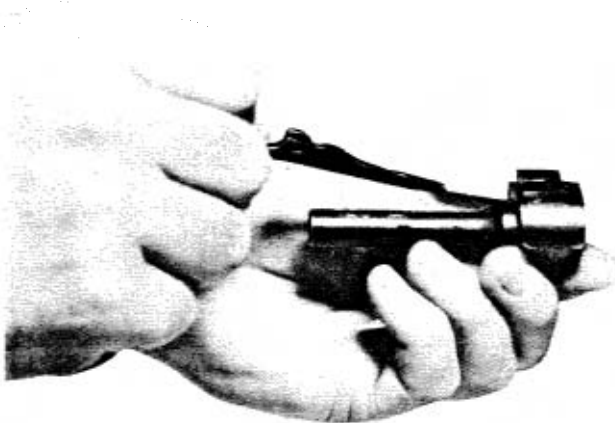


FIG. A-16. INSERTING FIRING PIN INTO BOLT

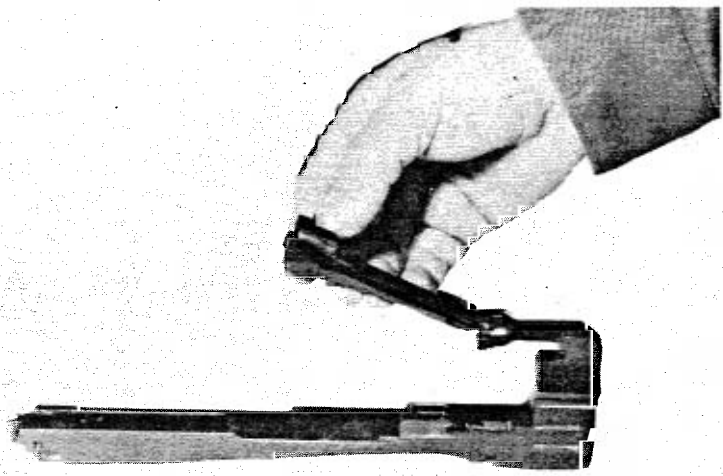


FIG. A-17. INSERTING BOLT INTO CARRIER BLOCK

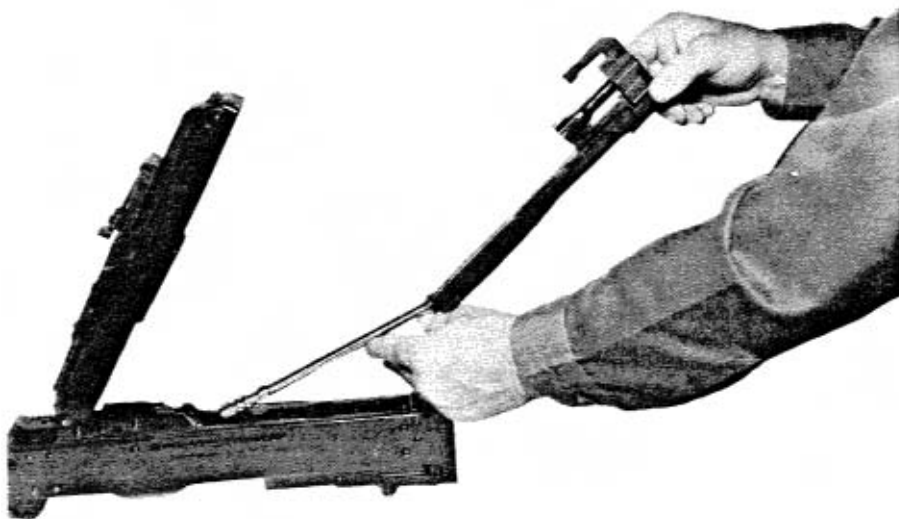


FIG. A-18. INSERTING CARRIER BLOCK AND GAS PISTON INTO RECEIVER

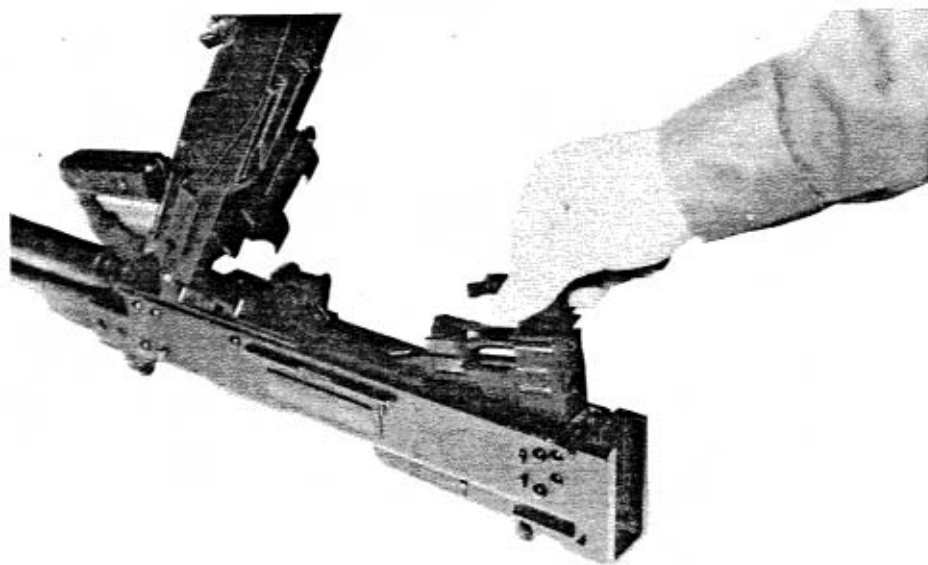


FIG. A-19. CARRIER BLOCK IN FOWARD POSITION

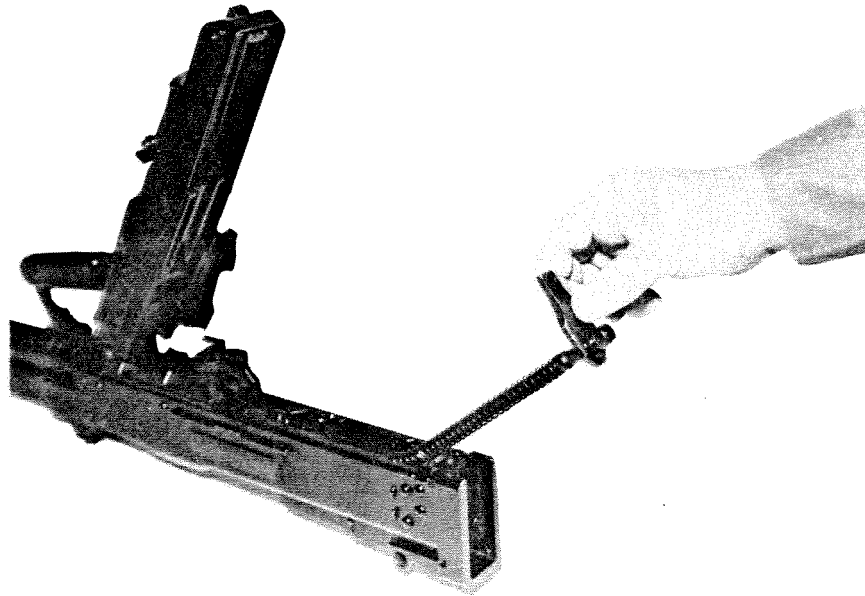


FIG. A-20 INSERTING MAIN SPRING



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