



STYLE 3467 ROOF TURRET
12/24 VOLT DC
INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS
INTENDED USE

The roof turret is designed to operate mounted on a vehicle with a 12 VDC or 24 VDC electrical system (must specify). The vehicle system must be capable of providing 85-120 psi air pressure to operate the discharge valve and nozzle pattern control movement of the turret.

Operation of the turret is generally controlled from a remote location (inside the cab) with a joystick and bank switch. The following instructions are provided to assist in obtaining the best possible performance from the unit. Read and understand the instructions before proceeding.

PRODUCT RATINGS

Mass: Turret - 200 lbs. Control Box - 10 lbs.
Operating Pressure: 190 psi
Min. psi: 100 psi
Max Pressure: 250 psi
Pipe Connection: 4" or 5" victaulic depending on frame type

INSTALLATION

The turret is intended to be installed on a support plate (type 1, frame above roof with top inlet) (type 2, frame flush with roof with top inlet) (type 3, air transport) (type 5, frame above roof with rear inlet) in a variety of roof top designs and flows with either aspirated or non-aspirated nozzles with easy to use controls from inside the truck cab. Mounting plate type also determines quantity of screws used in installation, victaulic inlet location and size for water inlet supply. Prior to installation drain truck air system.

1. Install four eyebolts in tapped holes at each corner of turret plate top
2. Attach hoist to eyebolts and lift turret to cab
3. Install gasket
4. Attach turret to roof of truck
5. Install screws, with washers and nuts thru turret and roof
6. Install roof turret supply line and seal onto Victaulic inlet
7. Inside cab install joystick cable to circuit board
8. Install power cable
9. Connect drain hose to valve drain assembly
10. Install air lines to connector for air regulator
11. Install false ceiling (headliner) using 1/4" turn screws.

WARNING SUMMARY

WARNING

Make sure the manual discharge valve handle is disengaged from the valve linkage and secured in the up (stowed) position prior to moving the DISCHARGE VALVE/PATTERN/ RATE switch to the AIR position. Failure to do this could cause the valve handle to swing down when air power is restored, possibly causing Injury.

WARNING

Keep a firm grip on the manual turret control handle when either or both of the turret locking pins have been removed and the turret is discharging water.

WARNING

Make sure the manual turret control handle is removed and stowed in its mounting clip before operating the turret under electrical power. If not removed, it can swing down, possibly causing injury.

WARNING

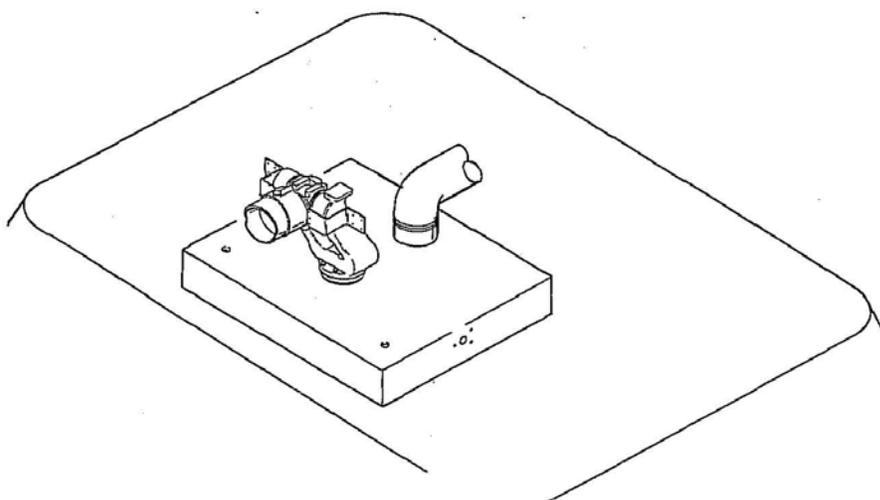
To avoid injury, keep personnel clear of area below turret during removal.

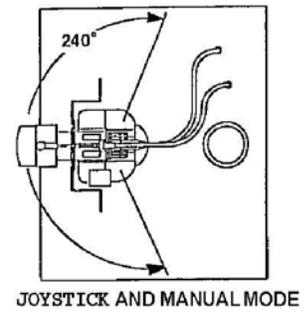
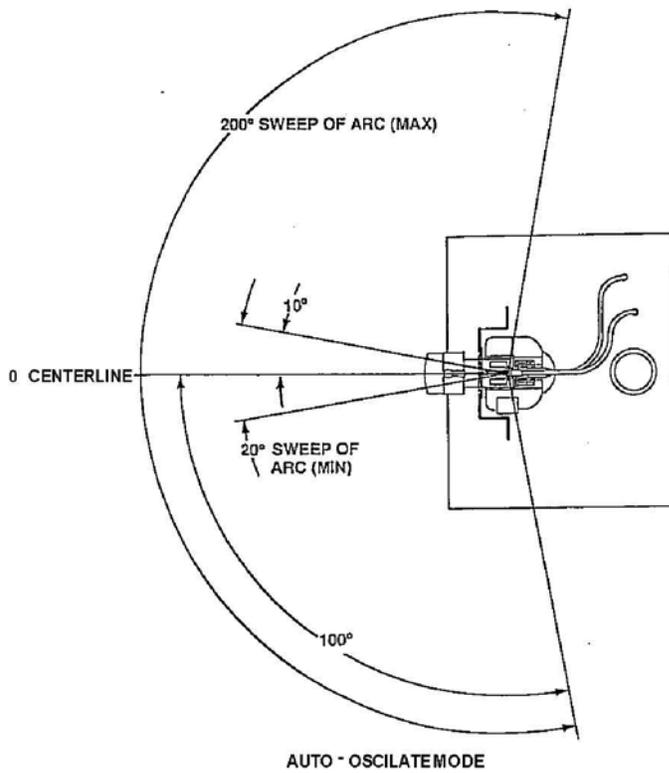
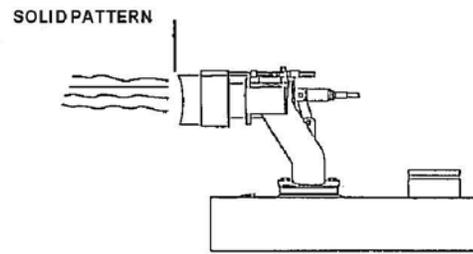
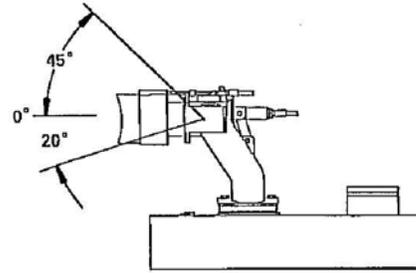
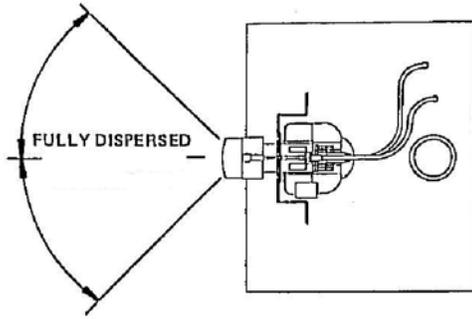
WARNING

Mechanisms in this turret can cause injury to personnel. Keep fingers, hands and tools clear of any moving parts when working on the turret. When working inside the turret, turn off any and all power (air and electric) supplies.

Operation and Operator Maintenance Instructions

The roof turret may be elevated to reach stated distances. Refer to Figure 1- 2 for roof turret travel limits and discharge patterns. The roof turret can be electronically controlled with a pistol-grip joystick located between the driver and the turret operator. The joystick has an index finger-operated button to open the turret discharge valve. Releasing the button closes the valve. A thumb-operated rocker switch on the joystick provides variable pattern control. The turret can also be positioned manually using a mechanical handle stowed next to the turret operator's seat. An azimuth and elevation indicator, pattern controls, and a manual shut-off valve are also connected to the turret through the cab roof.





OPERATION

1-3. GENERAL. This section provides instructions for operating the roof turret. Crewmembers must be thoroughly familiar with the contents of this section before attempting to operate the turret. The location of the roof turret control panel and joystick are identified in Figure 1-3.

1-4. ROOF TURRET INSTRUMENTATION. Roof Turret control and indicator layout and description are shown in Figure 1-4.

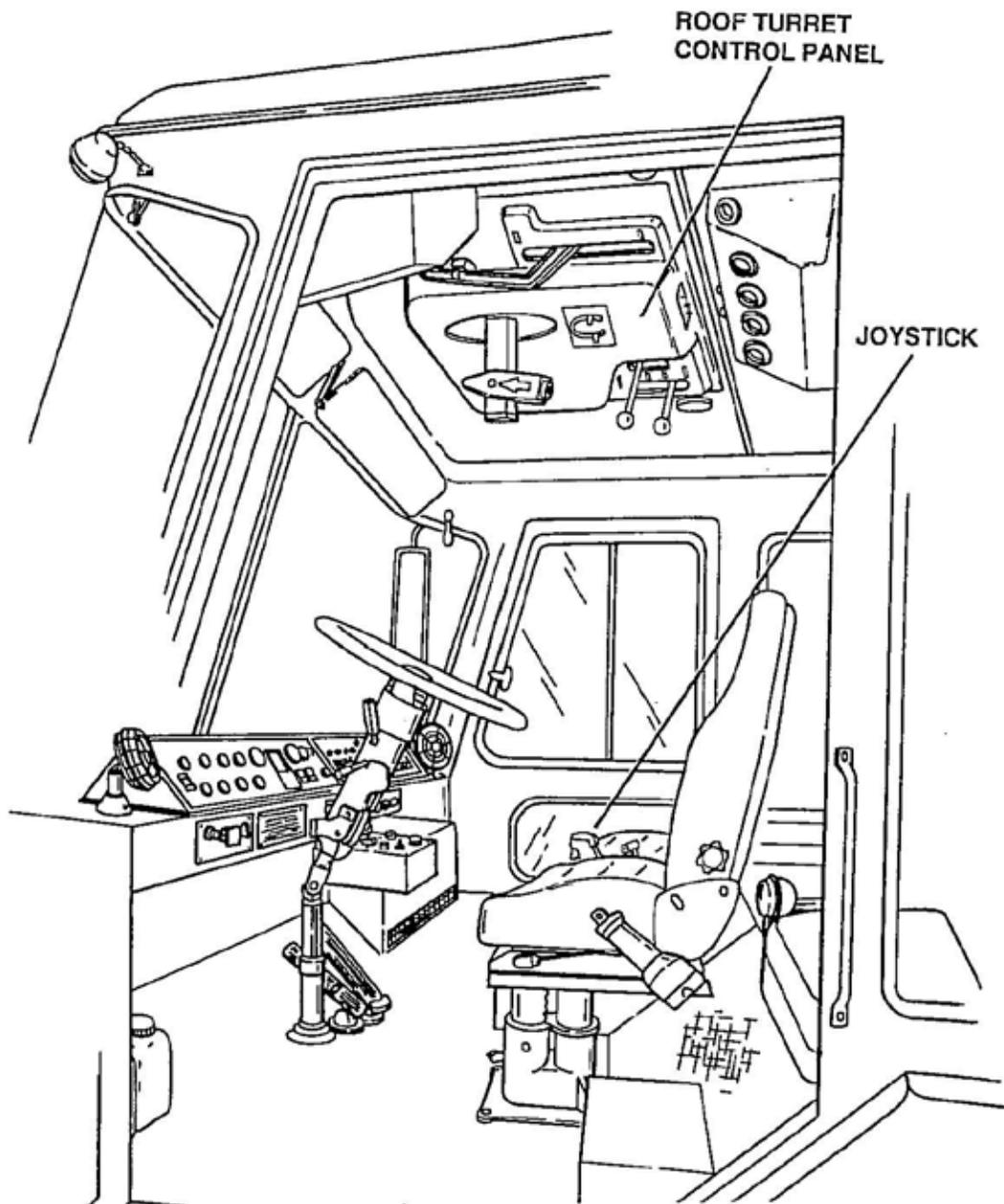
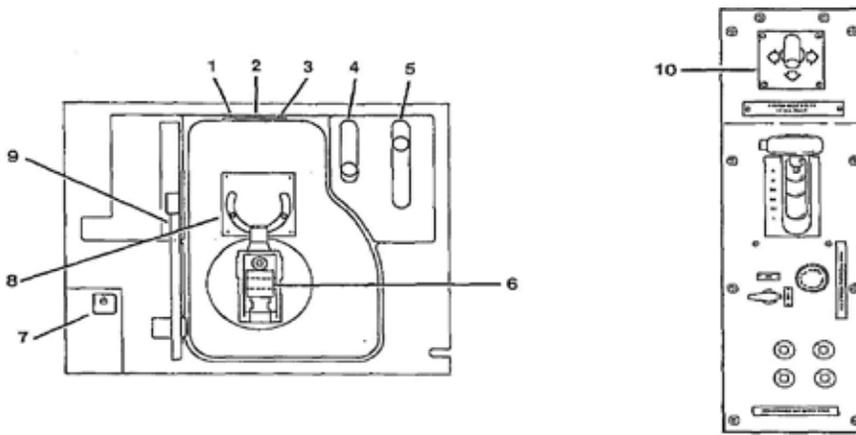


Figure 1-3. Roof Turret Control Panel and Joystick Locations.



1-4. Roof Turret Controls and Indicators and Joystick.

- *1. RATE Switch. Toggle used to select either HIGH GPM or LOW GPM turret discharge rate when in the air-operating mode.
- *2. OSCILLATION ON/OFF Switch. Toggle used to activate or deactivate turret auto-oscillation.
- *3. DISCHARGE VALVE Switch. Toggle used to OPEN or CLOSE agent discharge valve for continuous operation.
- * Switch back varies with optional features i.e. Dry chemical or foam
- 4. Manual Pattern Control. Lever used to manually adjust pattern of discharge stream between SOLID STREAM and DISPERSED.
- 5. Manual Rate Control. Lever used to manually select HIGH FLOW or LOW FLOW nozzle discharge rate.
- 6. Indicator/Manual Handle Holder. Fixture for holding handle used to aim turret during manual operation. Incorporates azimuth indicator
- 7. DISCHARGE VALVE/PATTERN/RATE Switch. Toggle used to select either AIR or MANUAL mode for controlling agent discharge, spray pattern, and discharge rate.
- 8. Oscillator Limit Arms. Mechanical stops used to set the left and right limits of the turret auto-oscillation sweep from 20° to 200°.
- 9. Manual Discharge Valve Handle. Handle used to manually OPEN and CLOSE the agent discharge valve. From the open position, the handle can be disengaged from the valve linkage and secured in the up (stowed) position.
- 10. Roof Turret Control. "Joystick" controller used in remote electrical operation of the roof turret. Provides left, right, elevate and depress aiming control, pattern control, and a discharge trigger switch.

NOTE

Maintain maximum engine RPM as practicable by modulating throttle and brake pedals for maximum flows.

1-5. OPERATION. Controls for operating the roof turret are located on the cab ceiling and center console (Figure 1-4). The roof turret has three basic operating modes: electronic joystick, auto-oscillating, and manual. Each mode is described separately below.

- a. Electronic Joystick Mode. in this mode, the turret is operated by means of a pistol-grip joystick control mounted on the center console.

CAUTION

When operating in the electronic joystick mode, the manual rate control lever must be fully placed in the low rate or high rate position. Operating the turret between these positions can cause the nozzle to slam into either low or high rate.

- (1) Ensure DISCHARGE VALVE/PATTERN/RATE switch on the roof turret control panel (7, Figure - 4) is in the AIR position.
 - (2) Set the RATE switch (1) to the desired discharge rate (750 or 1500 GPM).
 - (3) On the fire truck control panel, place the PUMP switch in the ON position. This will activate the agent pump. Associated green indicator light will illuminate. If foam is required, place FOAM switch at the ON position. Associated indicator will illuminate.
 - (4) Use the nozzle pattern rocker switch on the joystick control (Figure 1-5) to select the desired discharge pattern (either solid stream or dispersed).
 - (5) Use the joystick to aim the roof turret in the direction of application. Direct the turret up, down, right or left to obtain optimum fire control. An elevation/azimuth indicator (6, Figure 1-4) shows turret nozzle position.
 - (6) Activate agent discharge by pressing the "trigger" discharge switch on the joystick. This is a momentary switch; discharge will stop when the switch is re-released.
 - (7) When discharge is complete, secure the turret by placing the PUMP and FOAM switches on the fire truck control panel in the OFF position and use the joystick to position the turret pointing straight ahead.
- b. Auto-Oscillation Mode. In this mode, the turret oscillates automatically and continuously through an established arc as it discharges.

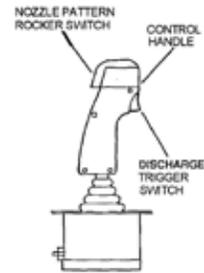


Figure 1-5. Joystick/Roof Turret Control.

- (1) Make sure manual turret control handle is disengaged and stowed. See WARNING above.
- (2) Perform steps (1) through (3) specified above for the electronic joystick mode.
- (3) Place DISCHARGE VALVE switch (3, Figure 1-4) in the OPEN position. The turret will discharge agent continuously.
- (4) Place OSCILLATION switch (2, Figure 1-4) in the ON position. Turret will begin oscillating through the set range of its arc.
- (5) Use the oscillator limit arms (8, Figure 1-4) to set the left and right limits of the sweep (20° to 200°)
- (6) Use the electronic joystick to direct the turret's elevation and depression to achieve optimum fire control.
- (7) When agent discharge is complete, place DISCHARGE VALVE switch (3, Figure 1-4) in the CLOSE position, place OSCILLATION switch (2, Figure 1-4) to OFF, and place PUMP and FOAM switches on the fire truck control panel in the OFF position. This will shut down the auto-oscillating mode. Use the electronic joystick to point the turret straight ahead.

- c. Manual Mode. In this mode, the roof turret is aimed and the agent discharge is controlled manually without power assist. This mode is normally used only when air and / or electrical power to the turret is lost. Refer to Figure 1-6.

NOTE

The oscillating limits and turret elevation may be changed anytime during the automatic mode of operation. Automatic oscillation can be stopped by turning off the oscillation switch, or by moving the joystick to either the left or right.

WARNING

Make sure that the manual discharge valve handle is disengaged from the valve linkage and secured in the up (stowed) position prior to moving the DISCHARGE VALVE / PATTERN / RATE switch to the AIR position. Failure to do this could cause the valve handle to swing down when air power is restored, possibly causing injury.

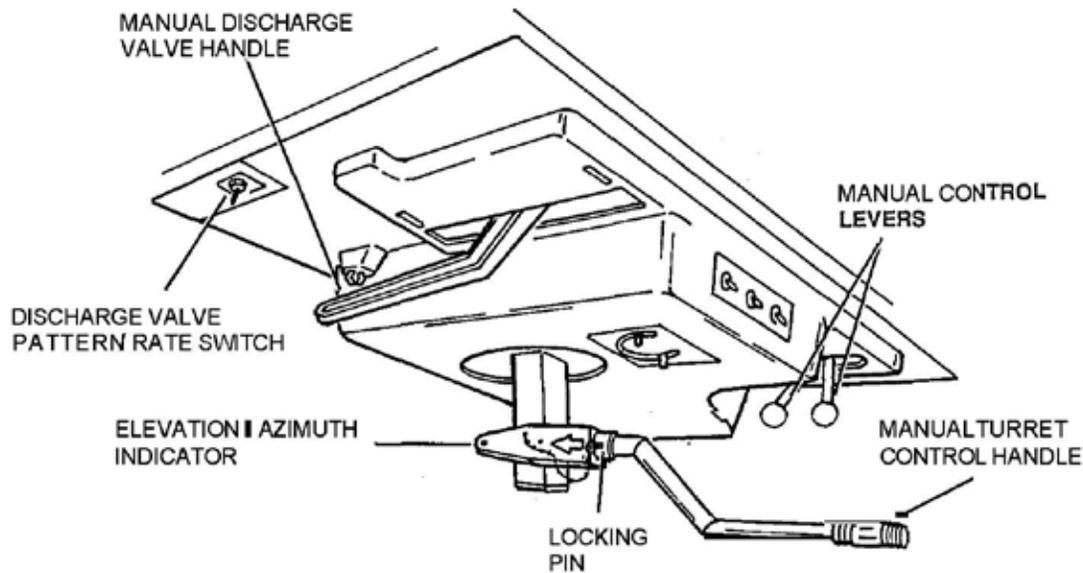


Figure 1-6 Roof Turret Manual Mode Controls.

NOTE

If electric power is available, the turret may still be rotated, elevated, or de-pressed by the joystick or rotated in the automatic oscillating mode. However, since manual control has been selected, the discharge valve, pattern control, and rate control must follow the manual procedure described below.

- (1) Place DISCHARGE VALVE / PATTERN / RATE switch (Figure 1-4) In the MANUAL position.
- (2) Remove the manual turret control handle from its stowed location next to the turret operator's seat and install in its holder. Remove elevation locking pin from right side above azimuth indicator. Align lock pinholes in handle and holder. Insert locking pin through manual turret control handle holes.
- (3) Remove the horizontal rotation lock pin and let hang.
- (4) Move the manual pattern control lever to select either SOLID STREAM-or DISPERSED pattern.

NOTE

In manual operation only, an intermediate pattern can be selected by placing the manual pattern control lever to any position between the two extremes.

- (5) Move the manual rate control lever to the LOW FLOW position. Remove the rate lock pin from the stowed position and insert through the three holes in the tension links and the manual rate control lever. Use the manual rate control lever to select the high or low nozzle discharge rate.
- (6) Place PUMP and FOAM (if required) switches on the fire truck control panel in the ON position.

WARNING

Keep a firm grip on the manual turret control handle when either or both of the turret lock pins have been removed and the turret is discharging water.

- (7) Keep a firm grip on the turret control handle while slowly pulling the manual discharge valve handle down to open the agent discharge valve and activate agent flow. Direct the flow using the manual control handle.

NOTE

From the VALVE OPEN position, the manual discharge valve handle can be disengaged from the valve and raised to a stowed position.

- (8) When discharge is complete, secure the turret by moving the manual discharge valve handle to VALVE CLOSE position, place the PUMP and FOAM switches on the fire truck control panel to OFF position, and use the manual control handle to point the turret straight ahead. Remove the control handle from its holder and secure it in its stowed location.

SECTION III OPERATOR INSPECTION AND MAINTENANCE 1-6.

1-7 OPERATOR INSPECTION. The operator inspections listed in Table 1-1 are to be performed daily at the beginning of each personnel change or after each use. Table 1-1 is intended to serve as a guide to maintaining the vehicle in proper readiness condition. The inspections enable operator / crew personnel to detect discrepancies before they lead to roof turret malfunctions. Any defect found must be reported to maintenance personnel.

Table 1-1.	
Operator Inspections Inspect roof turret for corrosion, damage, or other defects.	
NOTE	
•	Check operation of roof turret during training fires and / or as required by the Fire Department.
•	Check for proper gage and indicator readings while operating roof turret.
Check hose and cable for cuts, cracks, breaks, or damage. Check condition of the nozzle.	

1.7. TROUBLESHOOTING PROCEDURES. When a trouble or malfunction occurs, follow these steps. This sequence will help isolate the fault and permit a quicker repair.

NOTE
Isolate the problem completely before starting any remedial action.

- a. Duplicate the Problem. Repeat the steps that caused the trouble to occur, unless further damage will be caused. See paragraph 1-5 to be sure the correct operating procedures have been followed.
- b. Equipment Description. Read the descriptive paragraph 1-2. Learn how the equipment functions and how it is powered.
- c. Troubleshooting. Refer to the troubleshooting chart (Table 1-2). Look under the specific trouble listed in the chart. If the trouble is not listed, refer the truck to maintenance.
- d. Checkouts and Remedial Action. Perform the checkout procedures and remedial actions listed in the trouble shooting chart to isolate the problem. When the probable cause or remedial action is not obvious or if the trouble is not cured, refer the truck to maintenance.

TROUBLE	PROBABLE CAUSE	CHECKOUTS PROCEDURE AND REMEDIAL ACTION
Roof turret does not respond to electronic joystick control	1. Turret in manual mode	1. Place turret in electronic joystick mode. Refer to paragraph 1-5.
	2. Electrical System Fault	2. Refer to maintenance
Turret does not discharge	1. Pump and Foam switches off.	1. Turn pump and foam switches on.
	2. Turret discharge valve/ pattern/ rate switch is in manual position	2. Place turret in air mode. Refer to paragraph 1-5.

GENERAL MAINTENANCE INSTRUCTIONS

2-4. INTRODUCTION.

This section provides instructions for preparing a new or reconditioned roof turret for operation. Also included are instructions for inspecting the turret after shipment.

2-5 INSPECTION PRIOR TO USE

Each turret has received a thorough inspection and complete operational check prior to shipment from the manufacturer. Regardless of precautions taken, some damage may occur to turret during shipment. It is therefore necessary to make a complete visual inspection upon receipt of the turret.

CAUTION

Due to the critical nature of the service for which this turret is intended, no turret should be placed in service if there is any doubt or evidence of improper or inadequate function of any of the components.

1. Inspect turret for shipping damage.
2. Check turret for freedom of operation and proper installation.
3. Check all external inlet connections to see that they are in place and secure.
4. After making all other visual checks, check system for proper operation.

2-6. IN USE INSPECTION.

Table 2-2 lists all inspection intervals. Daily inspections are to be performed by the operator.

2-7. MAINTENANCE PROCEDURES

During periodic vehicle servicing, check all mounting and flange bolts and nuts for tightness. Check all air and water connections for leakage.

NOTE

Refer to lubrication chart for further information.

2-8. LUBRICATION

Lubricate turret every six months, 1000 miles, or 200 hours of vehicle operation (whichever comes first). Clean fittings before lubricating. Table 2-3 lists lubricants required and their service intervals.

Inspection	Inspection Intervals			
	Daily	Periodic		Safety
	Or after Each Use	3 Months 100 Hrs. 200 miles whichever comes first	6 months 200 hrs. 500 miles whichever comes first	Annual 400 hours 1000 miles whichever comes first.
Inspect all piping, fittings and connections for leaks, damage, or corrosion.				X
Check mounting hardware for security and condition.			X	
Inspect roof turret for corrosion, damage, or wear. Replace as needed	X			
Operate roof turret. Check all discharge patterns for water and foam	X			

Table 2-2. Inspection Intervals

Table 2-3. Lubrication.

Lubricant Key				
Intervals	Type of Lubricant	Temperature ranges and lubricant specifications		
		32°F and above	0°F to 32°F	0°F to -40°F
1000 miles 200 Hrs 6 months	Grease, Automotive and Artillery	Lubriplate Low Temp	Lubriplate Low Temp	Lubriplate Low Temp

NOTE:

- LUBRICANT KEY Lubrication recommendations are based on an expected duty cycle of 2000 mi. or 400 hours of operation per year.

2-9. TROUBLESHOOTING. TYPE OF LUBRICANT

When a problem occurs, the following sequence will help in identifying the fault.

- a. Repeat the steps that caused the trouble to occur, unless further damage will be caused. Refer to Chapter 1 to be sure the correct operating procedures have been followed.
- b. Read the appropriate descriptive paragraphs to learn how the equipment functions and how it is powered.
- c. Refer to the specific trouble listed in Table 2-4.

- d. if the defective equipment is part of the electrical air systems, refer to the schematic drawings, Appendix B in this manual to identify the appropriate circuit and its components.
- e. Perform the checkout procedure and remedial actions listed in the troubleshooting charts to isolate the trouble. When the repair or replacement procedure is not obvious, refer to the table of contents in front of this manual to find the proper paragraph.

2-10. GENERAL REPAIR PROCEDURES.

This paragraph describes general procedures that apply to all parts of this manual. To avoid repetition, these procedures will not be described in specific maintenance paragraphs.

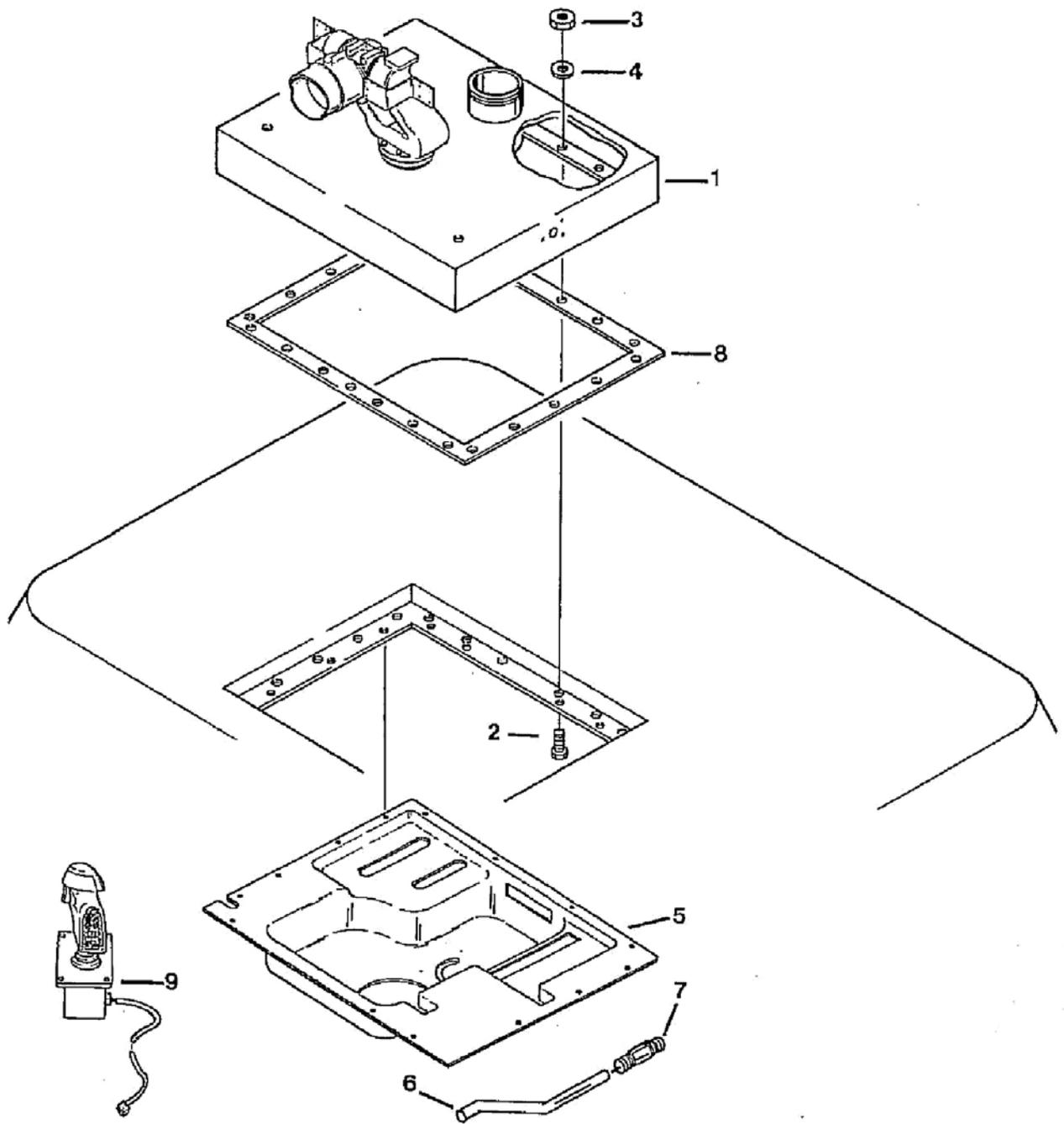
a. General Removal Instructions.

- (1) Troubleshooting. Before removing any item, refer to troubleshooting table to isolate problems to a particular component or part.
- (2) Preparation. Before removing any part of electrical, pneumatic, or agent systems, make certain system is not energized or pressurized. Relieve all pressure from air system. Insure that all controls are in OFF position before starting any removal procedure.
- (3) Removal. Make sure there is enough clearance to remove part. Disassemble roof turret or adjacent parts as necessary to provide working clearance.
- (4) Lifting. Use a chain hoist, jack, or other aid when lifting heavy parts. Lifting device should be positioned and attached to part to remove all strain from mounting hardware before part is removed. TROUBLE No roof turret rotation.
- (5) Identification. Identify all parts of similar shape with tags or other markings. This will make proper reassembly easier. Be sure to identify mating ends of electric and air lines as they are disconnected.
- (6) Position of Valves. Before removing valve handles, mark or sketch their position when open and closed. This will help during assembly.
- (7) Salvage Value. Assemblies that are re-moved, even though defective, should be treated as valuable items. Some parts can be rebuilt for future use.

Table 2.4. Troubleshooting

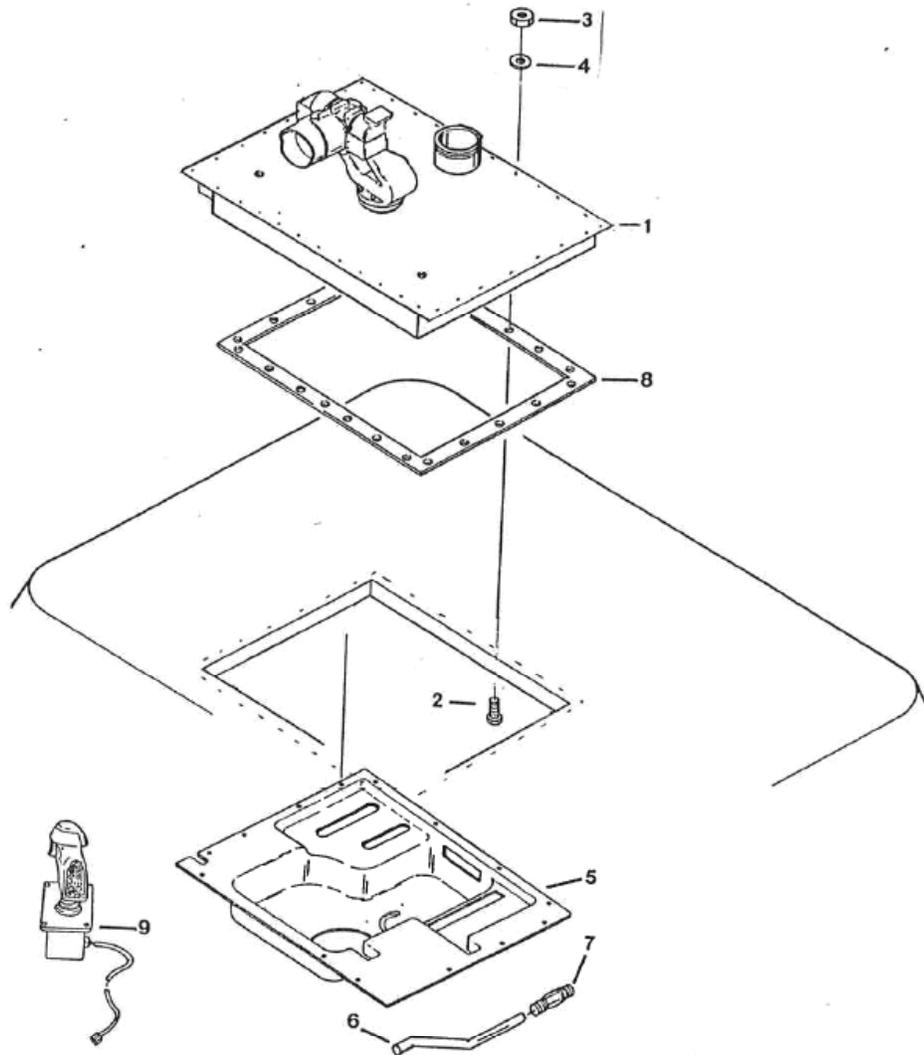
Trouble	Probable Cause	Checkout Procedure and Remedial Action
Roof turret fails to discharge	1. Insufficient air pressure	1. Ensure inlet air pressure is at least 100 PSI and turret regulator is adjusted to 80 PSI
	2. Defective discharge switch on joystick or false ceiling control	2. Replace defective switch
	3. Fault in joystick circuit	3. Perform joystick electrical analysis. Refer to Table 2-5
	4. Defective 4-way solenoid valve	4. Replace solenoid valve
	5. Defective wiring	5. Repair or replace wiring
	6. Defective discharge valve	6. Repair or replace valve
Roof turret discharges intermittently or continuously	1. Defective discharge switch	1. Replace Switch
	2. Defective wiring	2. Repair or replace wiring
	3. Defective discharge valve	3. Repair or replace valve
	4. Defective 4-way solenoid valve	4. Replace solenoid valve

Trouble	Probable Cause	Checkout Procedure and Remedial Action
Roof turret leaking water	1. Defective gasket between turret and roof	1. Replace gasket
	2. Worn seals or O-rings within turret	2. Repair Turret
No roof turret rate change	1. Inadequate air supply	1. Repair leaks or restrictions
	2. Defective rate air control	2. Replace rate air control valve
	3. Rate cable not properly connected or adjusted	3. Connect/adjust rate cable
No roof turret pattern control response	1. Inadequate air pressure	
	1. Repair leaks or restrictions.	
	2. No electrical power	2. Check electrical connections to turret
	3. Pattern sleeve O-Rings require lubrication	3. Lubricate pattern sleeve O-Rings
	4. Pattern cable not properly connected or adjusted.	4. Connect/adjust pattern cable
	5. Pattern cylinder solenoid valves defective	5. Replace solenoids
No roof turret elevation or depression	6. Fault in joystick control	6. Performs joystick electrical analysis. Refer to Table 2-5.
	1. No electrical power	1. Check electrical connections to turret
	2. Elevation pin not engaged	2. Engaged elevation pin
	3. Linkage at rear of head binding	3. Correctly position linkage and replace or shim the depression limit spacer at bottom of elevation shaft.
	4. Fault in joystick circuit	4. perform joystick electrical analysis. Refer to table 2-5
	5. Motor or gear box defective	5. Repair or replace motor or gear box
No roof turret rotation		
	1. No electrical power	1. check electrical connections to turret
	2. Rotation pin is not engaged	2. Engage rotation pin
	3. Fault in joystick circuit	3. Perform joystick electrical analysis. Refer to table 2-5.
No roof turret oscillation	4. Motor or gear box defective	4. Repair or replace motor or gear box
	1. No electrical power	1. Check electrical connections to turret
	2. Defective oscillation switch	2. Replace oscillation switch
	3. Excessively high current draw on rotation motor (15 amp)	3. Remove obstruction blocking turret movement.



1. Roof Turret Assembly	4. Washer	7. Grip
2. Screw	5. Ceiling	8. Gasket
3. Nut	6. Handle	9. Joystick

TYPE 1 TURRET VIEW
Figure 2-2 Roof Turret Installation



- 1. ROOF TURRET ASSEMBLY
- 2. SCREW
- 3. NUT

- 4. WASHER
- 5. CEILING
- 6. HANDLE

- 7. GRIP
- 8. GASKET
- 9. JOYSTICK

Figure 2-2. Roof Turret Installation.

TYPE 2 TURRET VIEW



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