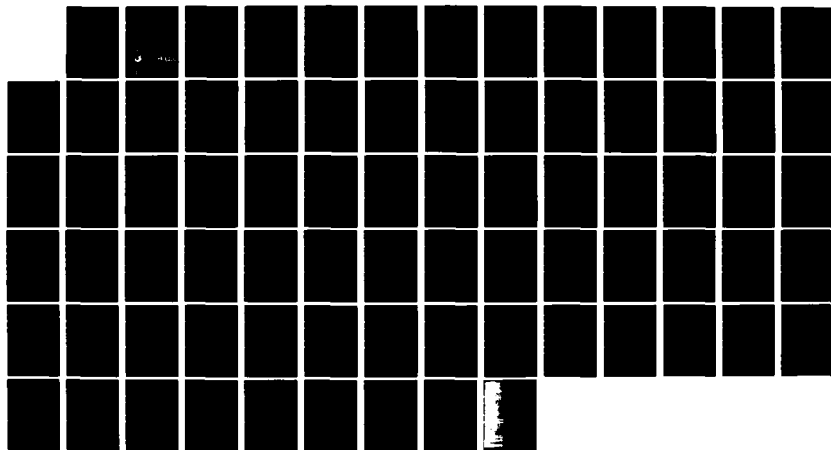


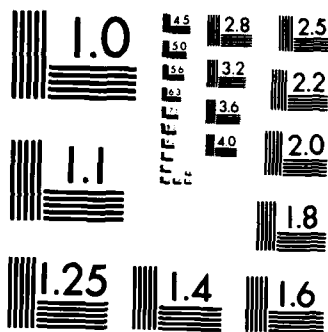
AIR TRANSPORTABLE AS32/P-4 CRASH RESCUE VEHICLE(U)
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AFESC/ESL-TR-81-14 F08635-79-C-0286

FEECON CORP WESTBOROUGH MA J GAGLIARDO ET AL. MAR 83

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ESL-TR-81-14

AIR TRANSPORTABLE AS32/P-4 CRASH RESCUE VEHICLE

MR. JOHN GAGLIARDO
MR. JAMES O'REGAN
MR. JOSEPH WALKER
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FEECON CORPORATION
ONE WALKUP DRIVE
WESTBORO MA 01581

MARCH 1983

FINAL REPORT
SEPTEMBER 1979 - MAY 1980

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Fire Suppression Firefighting Vehicles Fire Extinguishing Agents Firefighting Nozzles		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The objective of this project was to develop an alternate turret configuration on the AS32/P-4 (P-4) which enables the vehicle to be air transported without disassembling the fire suppression system. Four Air Force P-4 vehicles were modified, tested, and evaluated. Modifications consisted of removing the roof turret and associated components. The original bumper turret was replaced by a large capacity (800 GPM) non-air-asperating turret. This large capacity turret can be operated either hydraulically or manually. Four fire tests were conducted comparing the original configuration with the modified configuration.		

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The modification proved to be highly successful. The non-air-aspirating turret was shown to have twice the effective discharge range. The modified vehicles can be air transported on a C-130 aircraft without disassembly of the fire suppression system.

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PREFACE

This report was prepared by the Feecon Corporation, 1 Walkup Drive, Westboro, MA 01581, under Contract Number FO 8635-79-C-0286 and Job Order Number 2505-4007 with the Air Force Engineering and Services Center, Engineering and Services Laboratory, Tyndall Air Force Base, FL 32403. The work described in this report was completed in May 1980.

The information contained herein describes the modification and testing of the P-4 for air transportability. This work was performed at the Feecon Corporation and at Westover Air Force Base, MA. Project Officer was Captain Anthony J. Kwan, AFESC/RDCS.

This report has been reviewed by the Public Affairs Office (PA) and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

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SECTION I

INTRODUCTION

1. OBJECTIVE

The objective of this project was to develop an alternate turret configuration on the AS32/P-4 which enables the vehicle to be air transported without disassembling the fire suppression system.

2. BACKGROUND

The AS32/P-4 vehicle is designed to be transportable on C-130 aircraft. However, all of the components on the roof must be removed before the vehicle can enter the aircraft. Trained vehicle maintenance mechanics are required to remove the turret, prepare the vehicle for shipment and return the vehicle to its configuration upon arrival. Without the roof turret, the vehicle cannot operate its fire suppression system. Also, repeated roof turret removal and replacement increase the chances of damage to the turret.

3. APPROACH

In January 1979, a Statement of Work (SOW), P-4 Air Transportability, was prepared for the design and testing of a 400/800 gpm bumper turret. An AS32/P-4 fire vehicle from Charleston Air Force Base, S.C., was sent to the Feecon Corporation to be modified for air transportability. The truck was tested by Feecon personnel in Westboro, MA and was driven into a C-130 at Westover Air Force Base.

All testing was done in accordance with the SOW for P-4 Air Transportability dated 4 January 1979. Tests were performed by J. E. Gagliardo, R. M. Bosse and N. Beausoleil, from 22 April to 14 May 1980.

SECTION II

TEST SUMMARY

The results of these tests are tabulated in the Test Summary. The turret ground patterns for both Foam and Water in the straight-stream and maximum-dispersed discharge patterns are shown in Table 1.

The turret met all requirements of the SOW for P-4 Air Transportability, dated 4 January 1979.

The trip to Westover Air Force Base (60 miles) on April 22, 1980 qualified as the road test. At Westover Air Force Base, the vehicle was driven into a C-130 without having to remove anything from the roof. However, the rear lights just cleared the aircraft.

The Air Force requested the rear lights be lowered, and also noted that the hydraulic directional handle was twisting while being operated. The lights have been lowered by 1 inch. The handle is now pinned in place so that it no longer twists.

The Air Force also requested that the front beacon light be operated at night to see if glare would hinder the driver's vision. Night operation of the front beacon did not produce sufficient glare to hinder the driver's vision.

More details on testing and modifications required by the SOW are presented in subsequent sections.

TABLE 1. 1st ARTICLE TEST P-4 AIR TRANSPORTABILITY BUMPER TURRET CONTRACT
F08635 79 C 0286 FEECON PART NUMBER 00798010

TEST	SPEC. PAR OF SOW	SPEC. REQ.	PASS	FAIL
Roof Turret Capping	4.1.2	Watertight	X	
Bumper Turret Removal	4.1.3	Remove and retain parts of original bumper turret	X	
Bumper Turret Horizontal Rotation	4.2.3.3	170°	X	
Vertical Movement	4.1.4	15° below 60° above horizontal		
Discharge Capacity Dual Rate	800 GPM & 400 GPM	Fog - Straight Stream- Fog - Straight Stream-	X X	
Internal Piping	4.2.3.2 5.1.5	Piping shall be installed to allow normal operation of new turret and no leakage	X	
Bumper Turret Directional Control	4.1.6	Single Control Lever Capable of being operated with one hand	X	

TABLE 1. 1st ARTICLE TEST P-4 AIR TRANSPORTABILITY BUMPER TURRET CONTRACT
F08635 79 C 0286 FEECON PART NUMBER 00798010 (CONTINUED)

TEST	SPEC. PAR OF SOW	SPEC. REQ.	PASS	FAIL
Turret Controls	4.1.7	Controls shall be easily accessible to the equipment operator and driver. Directional Control Lever shall have push button discharge interrupt button. The discharge valve shall remain open in case of failure.	X	
Agent Discharge Water	4.1.9 4.2.3.5 & MIL-T-83235; Para 3.12. 9.4.1	45° Cone Angle in Max. Fog 150 foot range min.	X	
Foam	4.2.3.4	6.0-6.6% Proportioning 160 foot range min. 80 ft x 30 ft fog pattern.	X	
Air Transportability	4.1.10	Fit in C-130 without disassembly		
Beacon/Siren Assembly Relocation	4.1.11	Relocate to allow for air transportability without removal	X	

TABLE 1. 1st ARTICLE TEST P-4 AIR TRANSPORTABILITY BUMPER TURRET CONTRACT
F08635 79 C 0286 FEECON PART NUMBER 00798010 (CONCLUDED)

TEST	SPEC. PAR OF SOW	SPEC. REQ.	PASS	FAIL
Roof Hatch Handle	4.1.12	Modify for Air Transportability		
Water Tank Vent Redesign	4.1.13	Modify for Air Transportability Sealability on a 20° Angle	X	
Foam Tank Vent Redesign Examination of Product	4.1.14 4.2.3.1	Inspect for proper installation adjustment and serviceability	X	
Mechanical Checks	4.2.3.6	Inspection of installation and components for damage and undue wear after testing	X	
Road Test	4.2.3.7	Drive over uneven terrain for 5 miles at 15 MPH	X	
Loading Demonstration	4.2.3.8	Drive into C-130	X	

Modifications required as a result of testing 4-2-80
 Lower Rear Lights one inch to clear C-130
 Test Front Beacon Light at night for a glare on the windshield that would hinder the driver's vision
 Pin Hydraulic Directional Control Handle to prevent twisting

Testing was completed 5-14-80

SECTION III
FACTUAL DATA

1. TEST APPARATUS

<u>ITEM</u>	<u>MAKE</u>
Stop Watch	Heuer
Refractometer	American Optical
1900-Gallon Calibrated Tank	
11-inch Diameter Pans x 4 inches high	
100-foot Tape Measure	

2. TEST PROCEDURE

The discharge capacity test was conducted by discharging the bumper turret for 3 minutes. The P-4 water tank had been filled with water. The amount of water discharged was determined by measuring the amount of water needed to refill the water tank. The water tank was refilled by drafting out of the 1900-gallon calibrated tank (see calculations for determination of actual discharge rate).

The pattern tests for agent system foam discharge and agent water system discharge were conducted by discharging the bumper turret along a measured grid for specific lengths of time (30 seconds for all foam tests and 1 minute for all water tests). The grid consisted of several 112-inch diameter pans at pre-measured points. The amount of discharge collected in each pan during the run was measured to determine the coverage per square foot. The effective pattern was determined to be the area in which the application rate was at least 0.2 gpm.

The modified vehicle was driven 60 miles to Westover Air Force Base, then into a C-130, without having to remove anything from the roof.

3. CALCULATIONS

Discharge Capacity

High Flow - Fog

1900-Gallon Tank Calibrations

Tank Diameter = 72 inches

Gallons/Feet = Area x Height (in inches)

231 Cubic Inches/Gallons

$$= \frac{(72 \text{ in})^2 \times 12 \text{ in}}{4} = 211.5 \text{ gal/ft}$$

231 Cubic Inches/Gallons

Gallons of Water Discharged from 1900-Gallon Tank

Water Level Dropped

$$3.9 \times 211.5 = 829 \text{ Gallons}$$

$$\text{Discharge Time} = 1.0 \text{ Minutes}$$

$$\text{Discharge Rate} = \frac{829 \text{ Gallons}}{1 \text{ Minute}}$$

$$= 829 \text{ gpm}$$

Low Flow - Straight Stream

Water Level Dropped 2.05

$$2.05 \times 211.5 = 433 \text{ Gallons}$$

$$\text{Discharge Time} = 1.0 \text{ Minutes}$$

$$\text{Discharge Rate} = \frac{433 \text{ Gallons}}{1.0 \text{ Minutes}}$$

$$= 433 \text{ gpm}$$

High Flow - Straight Steam

Water Level Dropped 3.99

$$1.86 \times 211.5 = 844 \text{ Gallons}$$

$$\text{Discharge Time} = 1.0 \text{ Minutes}$$

$$\text{Discharge Rate} = \frac{844 \text{ gallons}}{1.0 \text{ Minutes}}$$

$$= 844 \text{ gpm}$$

Low Flow - Fog

Water Level Dropped 1.86

$$1.86 \times 211.5 = 393 \text{ Gallons}$$

$$\text{Discharge Time} = 1.0 \text{ Minutes}$$

$$\text{Discharge Rate} = \frac{393 \text{ Gallons}}{1.0 \text{ Minutes}}$$

$$= 393 \text{ gpm}$$

5. BUMPER TURRET DISCHARGE PATTERNS

a. P-4 400/800 N.A. Bumper Turret Discharge Pattern

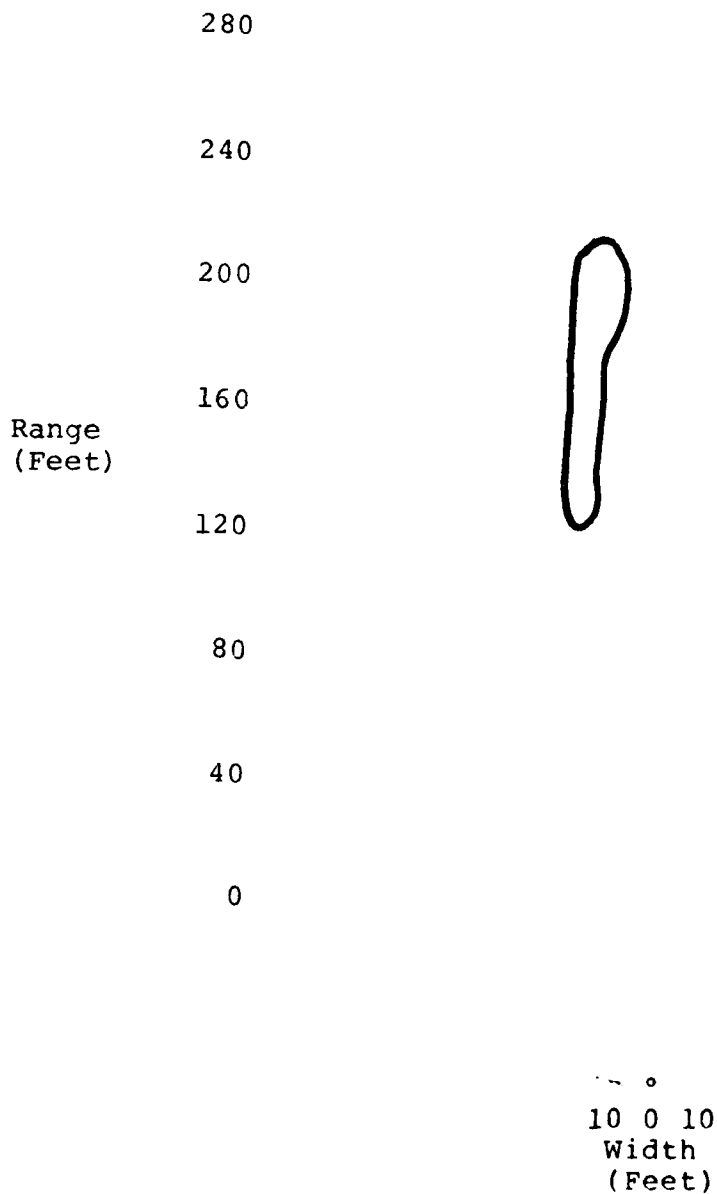
Water Discharge

Turret Pressure 240 PSI

Flow - 433 gpm

Straight Stream

Scale - 1/4 in = 10 ft



b. P-4 400/800 N.A. Bumper Turret Discharge Pattern

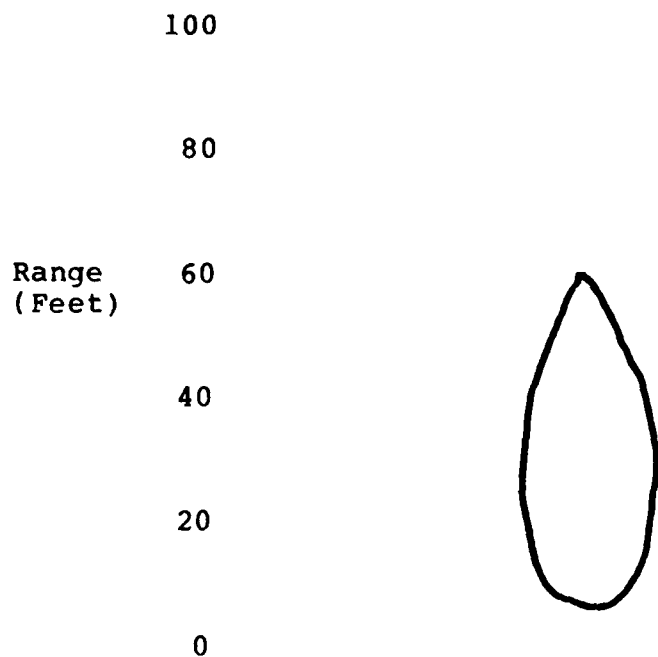
Foam Discharge

Turret Pressure 240 PSI

Flow - 393 GPM

Fog Pattern

Scale - 1/4 in = 5 ft



c. P-4 400/800 N.A. Bumper Turret Discharge Pattern

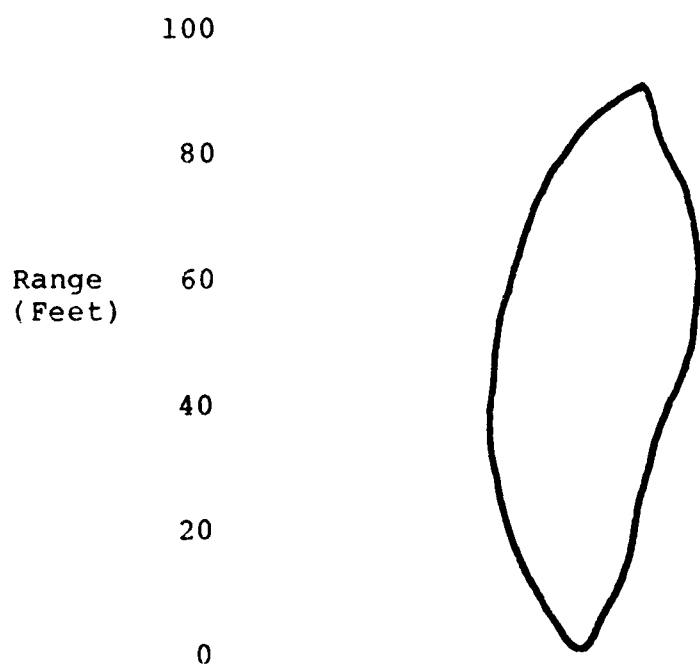
Foam Discharge

Turret Pressure 210 PSI

Flow 829 GPM

Fog Pattern

Scale - 1/4 in = 5 ft



d. P-4 400/800 N.A. Bumper Turret Discharge Pattern

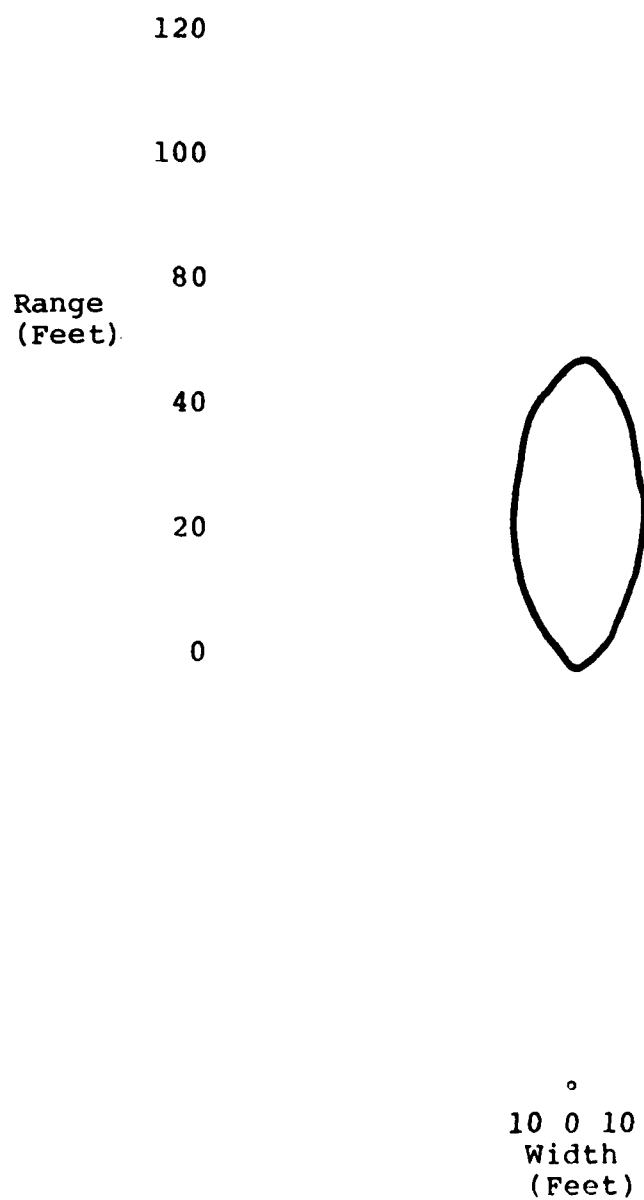
Water Discharge

Turret Pressure 240 PSI

Flow 393 GPM

Fog Pattern

Scale - 1/4 in = 5 ft



e. P-4 400/800 N.A. Bumper Turret Discharge Pattern

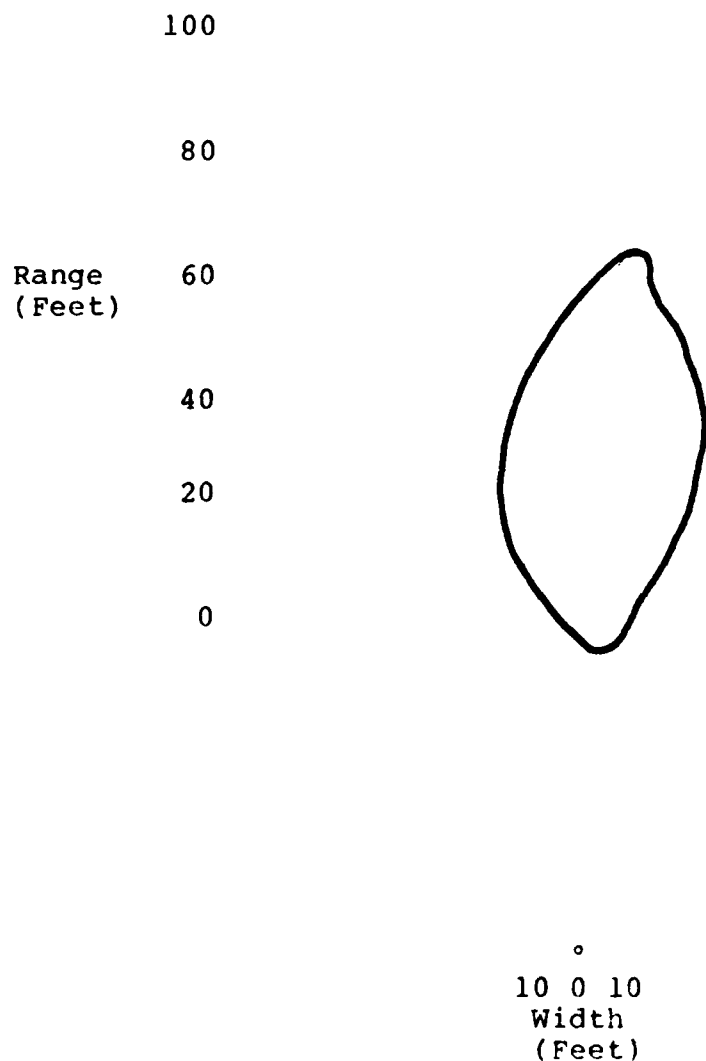
Water Discharge

Turret Pressure 210 PSI

Flow 829 GPM

Fog Pattern

Scale -1/4 in = 5 ft



f. P-4 400/800 N.A. Bumper Turret Discharge Pattern

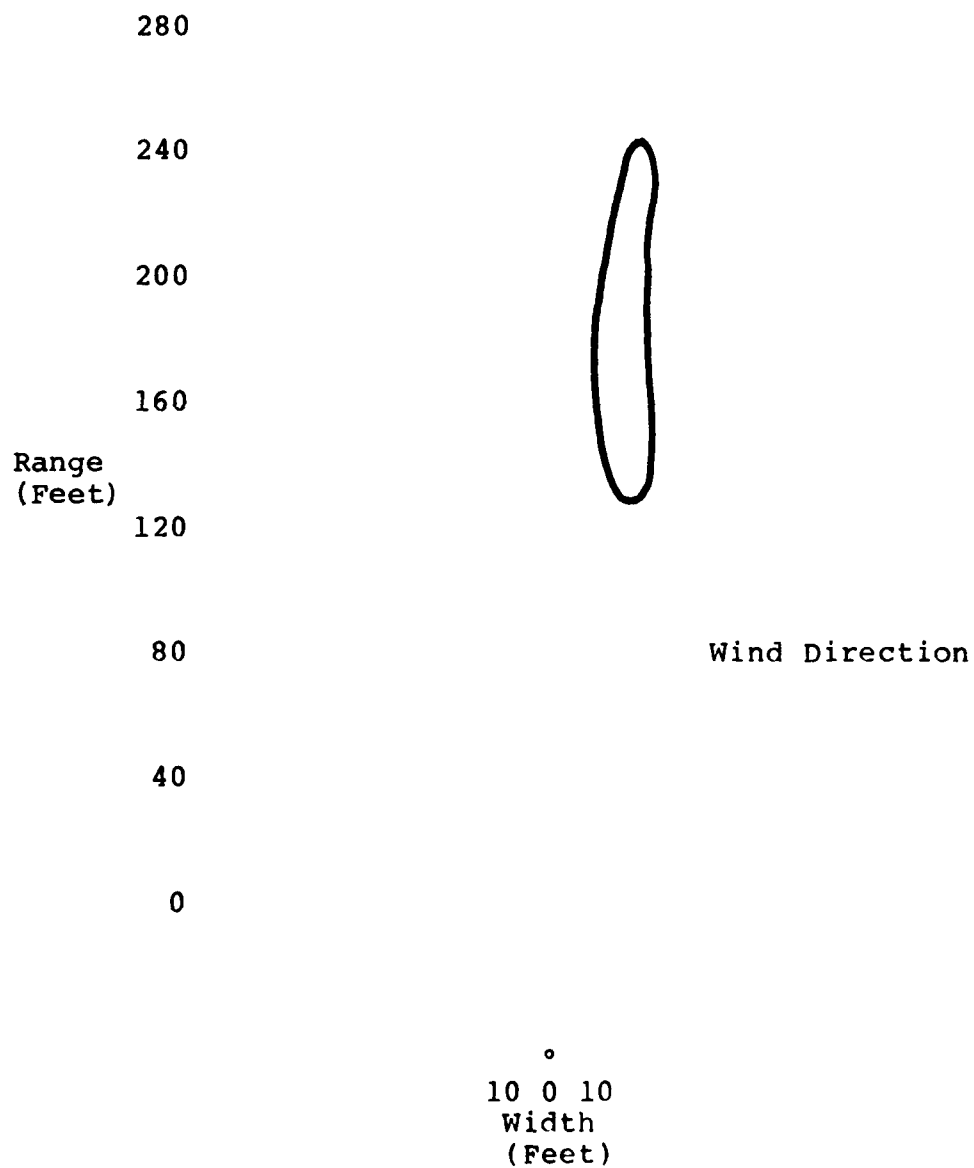
Water Discharge

Turret Pressure 210 PSI

Flow 843 GPM

Straight Stream

Scale - 1/4 in = 10 ft



g. P-4 400/800 N.A. Bumper Turret Discharge Pattern

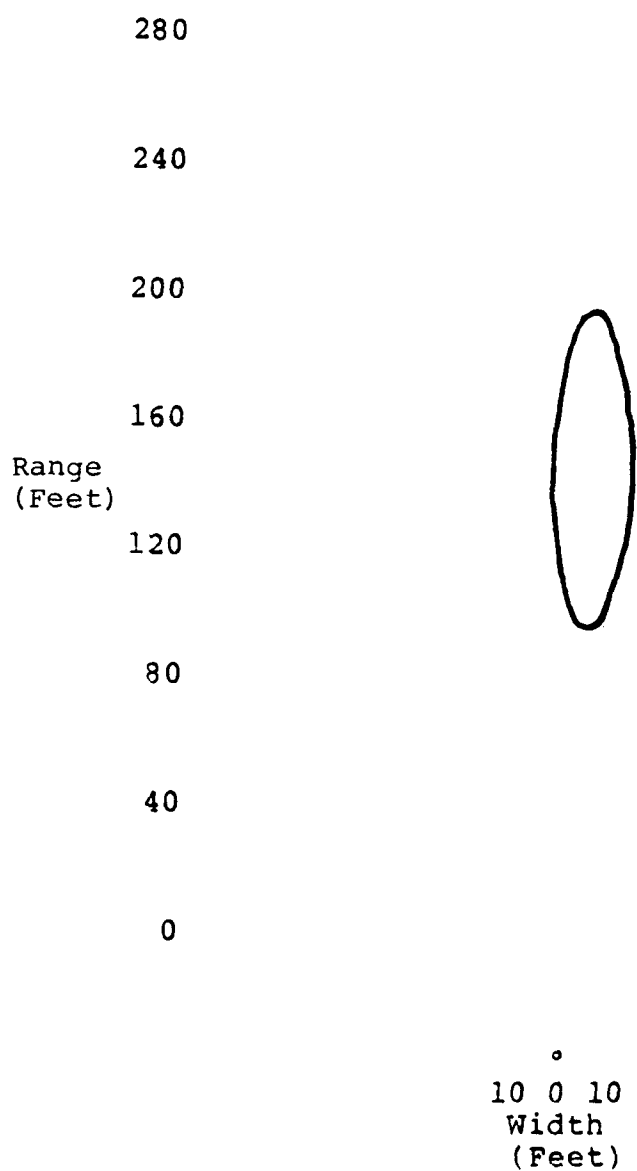
Foam Discharge

Turret Pressure 240 PSI

Flow 843 GPM

Straight Stream

Scale - 1/4 in = 10 ft



h. P-4 400/800 N.A. Bumper Turret Discharge Pattern

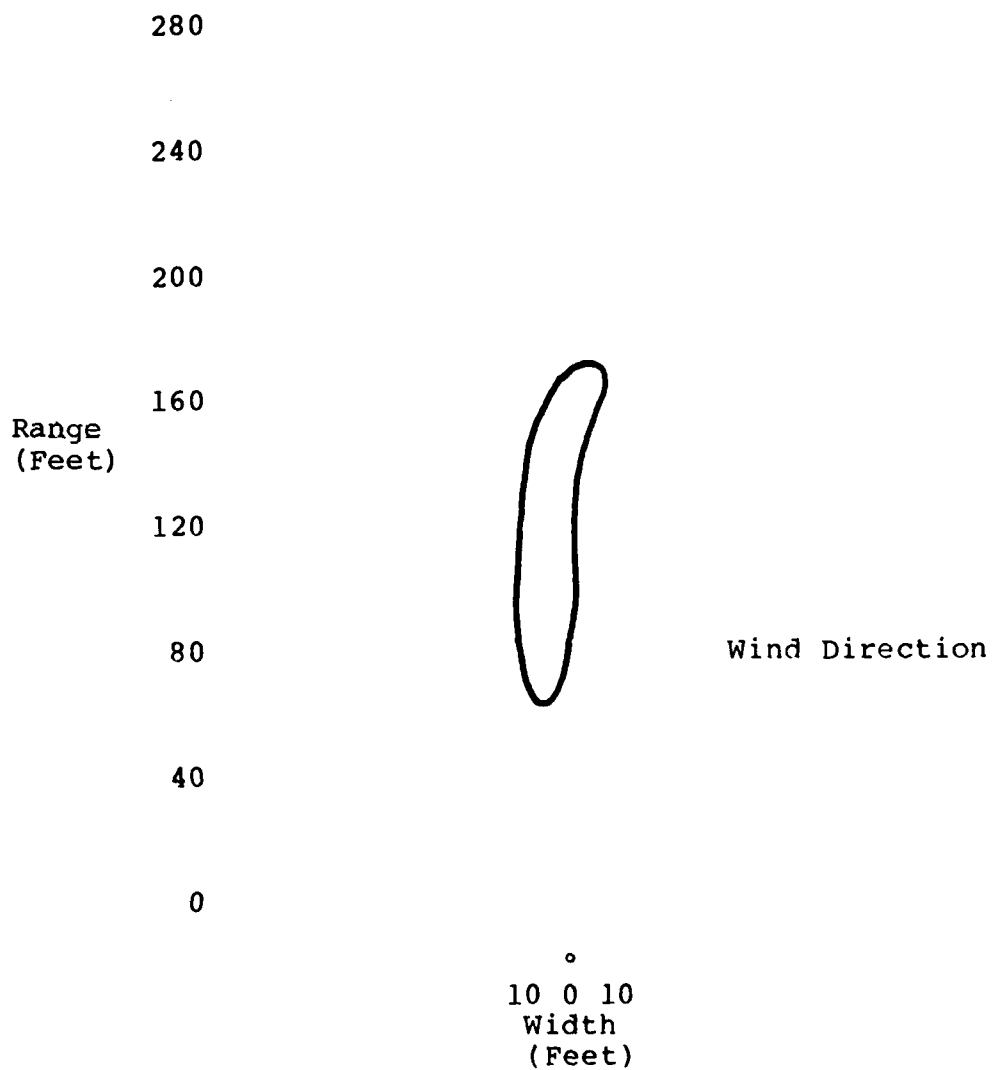
Foam Discharge

Turret Pressure 240 PSI

Flow 433 GPM

Straight Stream

Scale - 1/4 in = 10 ft



SECTION IV

P-4 AIR TRANSPORTABILITY MODIFICATION

1. REMOVAL OF ELECTRICAL COMPONENTS

- a. Remove FM transmitter and speaker wire from the rear.
- b. Remove the public address and siren amplifier from wire cluster and speaker wires from amplifier.
- c. Remove the speaker and mounting bracket from windshield wiper linkage cover.
- d. Remove amplifier mounting bracket.
- e. Remove switch mounted to bumper turret shutoff valve.

2. REMOVAL OF BUMPER TURRET

- a. Remove bumper turret locking cable housing from inside turret cover plate.
- b. Remove two inside cover plates.
- c. Disconnect the lines for the windshield flush (copper tubing) and windshield wash (rubber hose) at the tee connectors.
- d. Remove handle on bumper turret.
- e. Outside the truck, remove the turret locking linkage and nuts from cable and pull cable free from turret mounting plate.
- f. Outside the truck, remove the hold-down brackets for windshield flush on either side of the turret cover.
- g. Remove all the screws holding the cover on and remove cover.
- h. Inside the truck, disconnect the bumper turret feedline by unbolting the flange from base of turret, disconnecting the two block hoses attached to feedline's 45° elbow, and swinging hose into cab.
- i. Remove bolts from the bumper turret mounting bracket and remove the turret from truck.

3. ROOF TURRET REMOVAL

- a. Loosen the 1/4-turn fasteners around the outer edge of the roof turret control panel inside the cab and drop the panel down, giving access to the mechanism inside the panel.

b. Disconnect the cylinder piston rod from the rod end by loosening locknut and applying a wrench to the flats on the piston rod to unscrew rod from rod end.

c. Remove two long screws securing valve body.

d. Remove locknut from turret control shaft and remove gear from shaft.

e. Working from the cab roof, remove the screws securing the elevation control plate, and the flow rate and pattern control plates to the cab roof.

f. Unhook the large counterbalance springs on top of the turret barrels.

g. Remove the large locknut from the end of the turret head pivot shaft. Using a large socket wrench, remove hex locknut from shaft.

h. Remove two Woodruff keys from turret head pivot shaft. Using a large socket wrench, remove hex locknut from shaft.

i. Pull off the turret head and barrel assembly. The assembly can be handed down through the cab roof escape hatch, to a second man standing inside the cab.

j. Lift the turret body from the cab roof.

k. Remove roof turret locking control.

4. ROOF TURRET FEED DISASSEMBLY

a. Remove victaulic from inside of cab at roof.

b. On roof, remove cover on forward body compartment, exposing roof turret ration controller and remaining roof turret feed pipe.

c. Disconnect 4-inch victaulic coupling connecting feed pipe to controller by removing two attaching nuts and bolts.

d. The feed pipe can now be removed from inside the cab.

5. REMOVAL OF ROOF TURRET PIPE AND COVER

a. Release the hood latches from the turret pipe cover, and lift off the cover.

b. Remove four hexagon head bolts around the flange at each end of the pipe.

c. Lift off the pipe, being careful not to lose preformed packings under the flanges.

d. Install covers over roof turret pipe flanges. Covers are stored on cab roof.

e. The roof turret pipe and cover are stored on rear wall of cab, and secured by the rubber straps provided.

6. REMOVAL OF BEACON/SIREN ASSEMBLY

a. Remove the 14 screws which secure the base of the beacon/siren assembly to the top of the vehicle body.

b. Lift the beacon/siren assembly far enough to one side to gain access to the electrical leads underneath the unit.

c. Disconnect each lead at the quick-disconnect connector, and remove the beacon/siren assembly from the body.

7. REMOVAL OF WATER VENT

Remove the six bolts securing the rectangular vent flange and lift vent from truck.

8. REMOVAL OF FOAM VENT

a. Remove bolts holding support bracket and flange from foam tank.

b. Remove hose clamps from nipple drain.

c. Remove foam vent.

9. INSTALLATION OF WATER VENT

a. Place water vent with spring rods (long end) and ball into water tank vent opening.

b. Add stato-seals and flat washers and secure with existing bolts.

10. INSTALLATION OF FOAM VENT

a. Using existing bolts from the previous foam vent flange, place bolts through new flange, then through new gasket. Mount vent to flange on foam tank and secure with nuts and washers.

b. Remove hose from drain tube and slide it over foam drain nipple on truck. Then line up drain tube with drain hose and attach to nipple on tube. Secure both top and bottom hose clamps.

c. When the vent assembly is secured to the vehicle, seal where indicated with silicone rubber.

11. INSTALLATION OF FRONT BEACON LIGHT AND SPEAKER

The front beacon light and speaker are mounted on a single bracket. This bracket is mounted on the roof and bends downward between and above the left and right front windshields (see Figure 3).

a. Installation of Beacon Light and Speaker to Mounting Bracket.

(1) The speaker must be attached to the mounting bracket before the beacon light can be mounted. From the top of the bracket, drop four mounting bolts through the hole and hold the speaker up to the bottom of the bracket. Slide the bolts through the speaker bracket and secure so that the speaker is positioned forward of the truck. Make sure the wire lead from the speaker is long enough to connect to the speaker plug in the foam ladder compartment.

(2) Before mounting the beacon light, slide the two red wires through the grommet.

(3) The front beacon is then mounted on top of the bracket over the speaker, in the holes provided, using the three #8-32 bolts and attaching washers and locknuts.

b. Installation of Beacon and Speaker Mounting Bracket to Vehicle.

(1) The bracket mounts to the vehicle using five bolts and attaching nuts and washers. The back of the bracket uses existing bolt holes on roof with 5/8-inch long spacers, 1/4 - 20 x 1-3/4-inch long bolts, and attaching washers.

(2) The front of the bracket has two holes which can be used for a template. Drill through with a 9/32-inch clearance hole through the front roof gutter. Use 1/4 - 20 x 1-inch bolts and attach washers and nuts to finish, securing the bracket to roof.

(3) Connect one red wire from beacon to a ground on the mounting bracket. Connect the other lead to a longer length of single lead wire (see Figure 3).

12. INSTALLATION OF REAR BEACON

The rear beacon is attached to a mounting bracket (00786120) which is secured to the engine cover. This bracket is mounted between the spotlights on the rear of the truck.

a. Installation of Beacon Light to Mounting Bracket. Mount the beacon on the new light bracket in the same manner as it was mounted on the old bracket and secure, grounding one lead to base of beacon. Run the second wire through the grommet on mounting bracket.

b. Installation of Light Bracket to Vehicle.

(1) Locate centerline, L-R, on engine cover, approximately 1-1/2 inches from rear edge of engine cover position rear edge of bracket and center. Using mounting bracket as template inscribe four holes onto engine cover and drill through for 1/4-20 clearance. Then on center of four holes, drill one hole with 9/32-inch diameter grommet.

(2) One wire already being grounded, run the second wire through the grommet on engine cover. Make sure the wire extends long enough through cover to properly splice to longer wire provided. Run this wire as shown in illustration.

(3) With three loose leads now terminating at the forward body compartment cover on the roof, splice the front and rear beacon wires together, making a single lead. Connect this lead to the lead coming off the male quick-disconnect connector.

NOTE

The lead wires from the speaker should match up with the two lead wires from the male quick-disconnect connector. Make sure to use insulated wire connectors provided and further protect splices with electrical tape.

13. INSTALLATION of BUMPER TURRET

a. Increase clearance for bolts in mounting holes on bot om lip in front of truck.

b. Remove the old sealant around mounting surfaces in truck body.

c. Lift the turret and position to engage one bolt on side.

d. Place four bolts through bottom mounting holes adding nuts and washers. Begin to tighten so that the mounting plate rises, but leave it enough play to pivot.

e. Add the remaining side bolts but do not tighten until all are in place. Tighten bottom four bolts first.

f. Seal the joint where the mounting bracket and truck opening come in contact.

14. INSTALLATION OF BUMPER TURRET PIPING

The bumper turret uses the 4-inch ratio controller that previously fed the roof turret.

- a. Remove handrail support located between rear seats.
- b. On the roof, over the midsection, remove the cover exposing the 4-inch ratio controller.
- c. At the 4-inch ratio controller, connect a 90° victaulic elbow and position toward front of truck.
- d. Over the cab, install the cover plate with welded nipple and gasket to support the pipe hanger. Thread the top half of the hanger on the nipple.
- e. From inside the cab, slide the 4-inch victaulic pipe through the back wall between the seats until it is flush with the 4-inch elbow at the controller.
- f. Install the lower half of the pipe hanger and take up to facilitate the connection to the 4-inch victaulic elbow. Connect elbow to pipe.
- g. Connect 3-inch victaulic elbow to bottom of risen section.
- h. Remove recirculating hose tee from elbow on old bumper turret feedline, just upstream from shutoff valve.
- i. Attach recirculating hose tee onto new feedline shutoff valve assembly.
- j. Attach shutoff valve assembly to bumper turret base if not already attached.
- k. Connect welded feedline pipe to shutoff valve assembly piping.
- l. Rotate pipe until the back end is flush with the 3-inch victaulic elbow and the piping is resting against the floor drain valve guard.
- m. Tighten the victaulic and then tighten the pipe hanger so that the pipe is rigid.
- n. A few inches back from where the old bumper turret feedline comes through the floor, mark for drilling where a 4-inch "U" comes in contact with the floor. Make sure clearance is provided, with no obstructions underneath flooring of truck.

o. Remove pipe and drill clearance holes for "U" bolt.

p. Assemble the bumper turret foam shutoff switch to the bracket on the shutoff valve with the attaching screws and nuts. The valve handle should depress the button on the switch when in the shutoff position.

NOTE

For instructions on installing bumper turret tubing, see Figure 5.

SECTION V

P-4 AIR TRANSPORTABLE VEHICLE DESCRIPTION

The P-4 Air Transportable Vehicle is an AS/32 P-4 vehicle that has been modified so it can be driven into a C-130 aircraft without any disassembly. The foam and water vents have been redesigned so that they are no longer higher than the roof of the vehicle. The two rear flood lights have been lowered 1 inch. The beacon light has been relocated to a lower position between the two rear flood lights on the engine cover. The speaker has been relocated to the front of the truck above the windshield and installed just below another beacon light. The roof turret and feed pipe have been removed from the roof of the truck. The original P-4 Bumper Turret has been replaced by a larger capacity turret that is easier to operate.

1. HYDRAULIC BUMPER TURRET

The 400/800 N.A. Hydraulic Bumper Turret is a nonaspirating turret that mounts on the front of an AS/32 P-4 fire vehicle in place of the original P-4 Bumper Turret. The bumper turret can be operated either hydraulically or manually from inside the cab. The truck's 14-volt electrical system and 500 psi hydraulic system operate the turret's joystick control in the hydraulic mode.

On the discharge outlet of the turret is a sleeve. The sleeve slides up and down over the nozzle to vary the discharge pattern from a straight stream to a wide angle for pattern. The housing screw threads in and out to change the nozzle flow from 800 gpm to 400 gpm. The turret elevation can be varied from 60° above the horizontal to 15° below. The turret rotation can be varied from 85° to the left and right of the truck centerline.

The turret shutoff valve, located inside the cab, can be operated either hydraulically or manually. Either Aqueous Film-Forming Foam (AFFF) or water can be discharged from the turret.

2. TURRET CONTROLS

The turret controls are located inside the cab. The hydraulic directional control lever is located on the left-hand side of the turret. The lever controls the turret rotation and elevation. The button located on the lever handle is for interrupting the turret discharge. Two toggle switches are located just below the directional control lever. The upper switch operates the shutoff valve. The lower switch operates the bypass valve for the hydraulic system. A control plate is located to the right of the directional control lever and two toggle switches. On the control plate are a pressure gauge, two levers and two knobs. The pressure gauge reads the turret hydraulic pressure. The

lever just to the right of the gauge controls the discharge pattern. The lever to the right of the pattern control lever selects the flow rate of either 400 or 800 gpm. The 1/4-turn knob located just below the pressure gauge sets the turret in either the hydraulic or manual mode. The push-pull knob located just below the rate selector lever sets the shutoff valve in either the manual or hydraulic mode.

The turret shutoff valve is located to the right of the control plate. The manual shutoff handle is located on the top of the shutoff valve. Clipped to the turret feed pipe is the turret control handle. The turret control handle can be easily removed and installed into the turret handle holder for manual operation.

3. TURRET HYDRAULIC SYSTEM

The turret is powered by the truck hydraulic system. The system is activated by putting the agent selector in either the "Foam" or "Water" position. A bypass valve in the truck hydraulic system can be opened by a toggle switch to allow the oil to circulate when the bumper turret is not in hydraulic operation. The circulation of oil prevents the hydraulic pump from overheating. The turret shall have hydraulic pressure when the toggle switch is in the "ON" position.

SECTION VI
OPERATING PROCEDURES

1. HYDRAULIC OPERATION

- a. Set rate selector on desired flow.

Rate: High Flow - 800

Low Flow - 400

- b. Set pattern control for desired pattern.

c. Rotate "TURRET" decontrol valve, located on the lower left-hand corner of the control plate assembly, to the "hydraulic" position.

d. Push "DISCHARGE VALVE" decontrol valve, located to the right of the "TURRET" decontrol valve knob into the "HYDRAULIC" position.

e. Place "HYDRAULIC PRESSURE" toggle switch located below the hydraulic operating handle in the "ON" position.

f. Place agent selector (located on the equipment operator's control panel) in the desired position "FOAM" or "WATER." Hydraulic pressure system gauge located on the control plate assembly should indicate 500 psi.

g. Place the "DISCHARGE" toggle switch in the "ON" position to open the shutoff valve.

- h. Aim the turret by moving the joystick:

Forward for depression

Backward for elevation

Left for Left

Right for right.

i. To interrupt the turret discharge, depress the button on the joystick handle. Release the button to resume discharging.

j. Change flow rate, push in the rate selector and the shutoff valve will automatically close. Then move the selector to either the top of the slot for high flow or the bottom of the slot for low flow and release the lever to resume discharging.

- k. Adjust pattern selector for best fire control.

l. After fire suppression operation is completed, move discharge toggle switch to "CLOSE" position.

m. After returning to station, flush turret, proportioner, piping, handlines, etc., with plain water.

2. MANUAL OPERATION

a. Set rate selector on desired flow.

Rate: High flow - 800

Low Flow - 400

b. Set pattern control for desired pattern.

c. Rotate "Turret" decontrol valve, located on the lower left-hand corner of the control plate assembly to the "hydraulic" position.

d. Push "DISCHARGE VALVE" decontrol valve located to the right of the "TURRET" decontrol valve knob, into the "MANUAL" position.

e. Place "HYDRAULIC PRESSURE" toggle switch located below the hydraulic operating handle in the "OFF" position.

f. Pull the manual control handle from its stowed position on the feed pipe and slide into the handle holder on the turret (Figure 6).

g. Manually open discharge valve by rotating valve handle clockwise.

h. Aim turret with the manual control handle.

i. Adjust pattern control to the desired pattern for best fire control.

j. To change flow, close the discharge valve, then push in the rate selector and move to top for high flow or bottom of slot for low flow and release the lever. Then reopen the discharge valve.

k. After fire suppression operation is completed, shut off valve manually.

l. After returning to station, flush turret, proportioner, piping, handlines, etc., with plain water.

SECTION VII

MAINTENANCE AND TROUBLESHOOTING

1. PREVENTIVE MAINTENANCE

a. Thoroughly flush turret with plain water after each operation.

b. During periodic vehicle servicing, remove front and outside cover panels and check all mounting and nuts for tightness. Check all hydraulic connections for leakage. Check all wire connections for tightness.

c. Check all screws and nuts on nozzle for tightness.

d. All main turret seals are "O" rings as shown on parts identification drawings in the manual. When replacing "O" rings, lubricate and insert mating parts carefully to prevent cutting or damaging seals.

e. Periodically lubricate the two grease fittings in the nozzle assembly.

2. ROTATION ADJUSTMENT

a. Aligning the Turret and Manual Control Handle.

(1) Disconnect the chain by removing the clip from the master link and sliding the master link from the chain. Remove the chain from the column sprocket.

(2) Rotate the handle to point in the same direction as the turret.

(3) Reconnect the chain to the sprocket and reassemble the master link clip to the chain.

b. Aligning the turret and Rotation Actuator.

(1) Place the turret and Rotation Actuator.

(2) Rotate the turret to the driver's side as far as it can go.

(3) Loosen the four bolts that connect the rotation actuator to the mounting bracket and disengage actuator from the gear.

(4) From outside the cab, rotate the turret so that it is aiming about 5° off the front of the vehicle on the driver's side.

(5) Reengage the actuator with the gear and tighten the four actuator bolts.

(6) Manually rotate the turret completely to each side to be certain of a symmetrical 170°-rotation.

(7) If not, loosen the four actuator bolts again, disengage the actuator and rotate the turret so the gear moves one or two teeth in the correct direction and reengage the actuator, tighten the bolts and retest.

3. FLOW RATE SELECTOR ADJUSTMENT

The flow rate selector is designed to give two flow rates. High flow is preset @ 800 gpm and low flow @ 400 gpm. The flow is interrupted when the lever is with an electric switch. When the flow rate control handle is positioned in its slot, the control cable is pulled inward, bringing the tip housing screw inward. This allows the screw housing to move farther away from the tip button by a given distance, which is preset by button and linkage adjustment to give the high flow rate.

To achieve the low flow, the rate control handle is positioned down in its slot, pushing the screw outward, and turning the tip housing screw outward. This allows the screw housing to move closer to the tip button by a given distance, dependent upon the cable stroke.

a. High Flow Rate Adjustment.

(1) Place the low rate control handle in the downward position.

(2) From outside the vehicle, loosen the #8-32 socket setscrew that locks the cable to the cable control mount.

(3) Rotate the screw housing until it is 7/32 inch away from the bottom edge of the outside diameter of the button. If the 7-32 inch cannot be achieved without bending the cable too much, adjust the button.

(4) Lock the cable to the cable control mount with the #8-32 setscrew.

(5) Place rate selector cable in the "low flow" position.

(6) If the rate selector stroke is 1 3/8 inches, the low flow rate is correct. If the stroke is not correct, proceed to the "Low Flow Rate Adjustment procedures."

b. Button Adjustment.

(1) Remove button and attaching nut and lockwasher.

(2) Thread two nuts onto the shaft and lock them together so the shaft can be threaded in or out to achieve the 7/32 inch dimension.

(3) Remove the two nuts and reassemble the button with the attaching nut and lockwasher.

c. Low Flow Rate Adjustment.

(1) Remove the bumper turret shroud. (See "Removal of Bumper Turret")

(2) Loosen the two 1/4-20-inch round head screws so that the deflector control arm link is free to pivot.

(a) To lengthen the stroke, slide the deflector control arm link away from the pivot.

(3) Once the 1 3/8-inch stroke is achieved, lock the deflector control arm link in place by tightening the two 1/4-20-inch round head screws.

(4) Reassemble the shroud.

4. SHUTOFF VALVE ADJUSTMENT

The shutoff valve is adjusted properly when the valve handle is depressing the bumper turret foam button in the "SHUTOFF" position. To adjust:

a. Remove handle and attaching nut and washer from the valve.

b. Hydraulically, close the shutoff valve.

c. Pull the gear and key from the stem adapter.

d. Manually close the valve. The 5/16-inch diameter roll pin in the stem adapter is at right angles to the feed pipe when the valve is closed.

e. Reassemble the key, gear, handle, and attaching nut and washer to the valve.

5. REMOVAL OF NOZZLE ASSEMBLY

a. From inside the cab, place the rate selector in "HIGH" flow position.

- b. Place the pattern control in "MAXIMUM FOG" position.
- c. Remove the stop pin from the shroud slot.
- d. Remove 3/8-inch socket setscrew that attaches the pattern control cable to the shroud and slide the shroud off the cable.
- e. Remove the outer nut, that attaches the pattern control cable housing to the cable control mount, from the cable housing. Pull the cable from the mount.
- f. Remove the 8-32-inch setscrew that attaches the rate selector cable to the swivel.
- g. Remove the four screws that attach the tip to the head. Slide the tip from the rate selector cable but be careful not to lose the swivel.

6. TURRET HEAD REMOVAL

- a. Remove the nozzle from the head.
- b. Remove the "E" ring and pin that attaches the elevation link to the rod end located on the head.
- c. Remove the six attaching 1/4-20-inch screws and bearing cap from the head.
- d. Remove the 3/4-16-inch nut and washer from the turret head end of the elevation shaft.
- e. Slide the head from the elevation shaft.

7. REMOVAL OF TURRET BODY

- a. Remove the nozzle assembly from the turret.
- b. Remove the head from the turret.
- c. Remove the pivot bolt from the elevation shaft.
- d. Remove the 1/4-12-inch socket setscrew from the 1 1/4-12-inch nut on the bottom of the rotation tube.
- e. Remove the 1 1/4-12-inch nut from the bottom of the rotation tube, being careful the body does not slide off.
- f. Remove four attaching screws, the key and end cap from the body keeping pressure on the body against the base.
- g. Slide body from the rotation tube and shaft.

8. REMOVAL OF TURRET BASE

- a. Remove the turret shroud cover.
- b. Disconnect the chain by removing the clip from the master link and sliding the master link from the chain. Remove the chain from the sprockets.
- c. Remove 3/8-16-inch socket setscrew that attaches the pattern control cable to the shroud.
- d. Unthread the outer nut that attaches the pattern control cable to the cable control mount.
- e. Pull the pattern control cable from the cable control mount.
- f. Remove #8-32-socket setscrew from the swivel pin and cable control mount.
- g. Remove the attaching screws and the rate selector control cable bracket from the nozzle. Slide the cable from the cable control mount and swivel pin.
- h. Remove the body with head and nozzle assembly from the base.
- i. Remove 3/4-16-inch nut that attaches the elevation arm assembly to the elevation rod.
- j. Remove the 1/4-20-inch socket setscrew from the 1 1/4-12-inch nut on the top of the rotation tube.
- k. Remove the 1 1/4-12-inch key, and base sprocket nut, from the elevation tube. This will allow the elevation shaft and tube to drop from the base.
- l. Remove the six 5/16-18-inch screws and locknuts that attach the elbow flange assembly and the base.
- m. Remove the four 3/8-16-inch bolts that attach the base to the turret mounting bracket.
- n. Remove the six 1/4-20-inch screws that attach the controls mounting bracket to the base.
- o. Loosen four screws that attach the turret mounting bracket to the support brackets. This should provide enough play to slide the base and gasket from between the two mounting brackets.

9. DISCHARGE NOZZLE REASSEMBLY

a. Examine the #155 "O" ring that fits between the head and nozzle and replace if it is damaged. Lubricate the "O" ring before placing it on the nozzle.

b. Assemble the nozzle and cable bracket onto the head with the attaching screws and lockwashers.

NOTE

The bracket is assembled onto the rate selector cable housing.

c. Thread one of the two cable locking nuts onto the rate selector cable housing.

d. Place the swivel into the hole of the cable mount and slide the rate selector cable through cable bracket hole. Thread the second locking nut onto the rate selector cable. Then thread the cable through the swivel.

e. Thread one of the two cable locking nuts onto the pattern selector cable housing.

f. Slide the pattern selector cable through the hole in the control cable mount. Thread the second cable locking nut onto the pattern selector cable housing and lock in place. Slide the shroud over the cable.

g. Follow the procedure for adjusting the pattern control.

h. Follow the procedure for adjusting the flow rates.

10. TURRET HEAD REASSEMBLY

a. EXAMINE the two #20 "O" rings that assemble onto the elevation shaft and replace if they are damaged.

b. Grease and slide the shaft (key-way end first) through the large opening of the body and through the 1-inch diameter hole so that the shoulder on the shaft is flush with the boss on the body. Be careful not to damage the "O" ring during assembly.

c. Assemble the key; cap four attaching 1/4-20-inch x 3/4-inch socket head screws and the 3/4-16-inch nut onto the shaft.

d. Examine the #34 LCP "O" ring that fits on the bearing seal for damage and replace if necessary.

- e. Assemble the bearing seal and "O" ring into the head.
- f. Slide the bearing over the bearing seal.
- g. Examine the #429 "O" ring for damage and replace if necessary. Slide the "O" ring onto the body. (Do not lubricate; dust seal only)
- h. Examine the #155 LCR "O" ring that fits in the head and body and replace if necessary. Lubricate and assemble onto the head.
- i. Assemble the bearing and head onto the body and elevation shaft.
- j. Assemble 3/4-16-inch nut and lockwasher onto the end of the elevation shaft. Tighten until the head locks to body and then back off until the head can be moved without too much force.
- k. Using the six attaching screws and lockwashers, assemble the bearing cap onto the head.
- l. From the top, assemble the rod end bearing into the leg of the head as far as it can go. Lock the rod end in place with the jam nut.
- m. Slide the elevation pin through the elevation link and rod end and attach with the two attaching "E" rings.
- n. Assemble the nozzle assembly onto the head (see "Nozzle Reassembly").

11. BODY REASSEMBLY

- a. Examine the 126 "O" ring on the rotation tube and replace if necessary. Lubricate the "O" ring.
- b. Examine the 1429 "O" ring that fits between the body and mounting bracket and replace if necessary. Slide over the body. Do not lubricate; dust seal only.
- c. Examine the #155 LCR "O" ring that fits between the base and body and replace if necessary. Assemble onto the body.
- d. Assemble bearing that fits between the base and body onto the body.
- e. Being careful not to damage the "O" rings, slide the body over the rotation shaft and tube and attach with the key; cap four attaching screws and 1 1/4-12-inch nut. Tighten the nut so that the body locks to the base and then back off until the

body can pivot without too much force. Lock the nut in place with the 1/4-20-inch socket setscrew.

f. Thread the 7/12-20-inch nut and pivot bolt onto the rotation shaft.

g. Slide the elevation pin through the elevation link and pivot bolt and attach with the two attaching "E" rings.

h. Assemble the head onto the body (see "Head Reassembly").

12. BASE REASSEMBLY

a. Examine the #34 LCR "O" ring that fits between bearing seal and base and replace if damaged. Lubricate and assemble onto the bearing seal.

b. Slide the bearing seal into the cavity in the base.

c. Slide the bearing over the bearing seal in the base.

d. Place the gasket and base between the two mounting plates. Attach the base to the turret mounting plate, using the four 3/8-16-inch x 1-inch screws and lockwashers.

e. Examine the "O" ring that assembles between the inlet flange and base and replace if damaged; lubricate and assemble with the flange, base, and attaching screws and nuts.

f. Using the six 1/4-20-inch screws and lockwashers, attach the control mounting bracket to the base.

SECTION VIII

CONCLUSIONS

The modification of the AS32/P-4 crash rescuer firefighting vehicle to a configuration which will allow the vehicle to be air transported on a C-130 aircraft, without disassembly of any equipment, was successful.

All requirements of the statement of work (SOW) for the air transportable P-4 were met or exceeded during the tests conducted. The roof turret and agent feed pipe was removed from the roof of the vehicle. The original bumper turret was replaced by a large capacity (800 GPM) non-air-aspirating turret. This large capacity turret can be operated either hydraulically or manually from inside the cab.

This system provides an air transportable fire suppression capability superior to the assembly/disassembly method previously available.

APPENDIX A
AS32/P-4 AIR TRANSPORTABILITY DRAWINGS

ITEM NO.	DESCRIPTION	QTY	REMARKS
1	1/4" DIA. X 1/2" LONG	1	
2	1/4" DIA. X 1/2" LONG	1	
3	1/4" DIA. X 1/2" LONG	1	
4	1/4" DIA. X 1/2" LONG	1	
5	1/4" DIA. X 1/2" LONG	1	
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7	1/4" DIA. X 1/2" LONG	1	
8	1/4" DIA. X 1/2" LONG	1	
9	1/4" DIA. X 1/2" LONG	1	
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90	1/4" DIA. X 1/2" LONG	1	
91	1/4" DIA. X 1/2" LONG	1	
92	1/4" DIA. X 1/2" LONG	1	
93	1/4" DIA. X 1/2" LONG	1	
94	1/4" DIA. X 1/2" LONG	1	
95	1/4" DIA. X 1/2" LONG	1	
96	1/4" DIA. X 1/2" LONG	1	
97	1/4" DIA. X 1/2" LONG	1	
98	1/4" DIA. X 1/2" LONG	1	
99	1/4" DIA. X 1/2" LONG	1	
100	1/4" DIA. X 1/2" LONG	1	

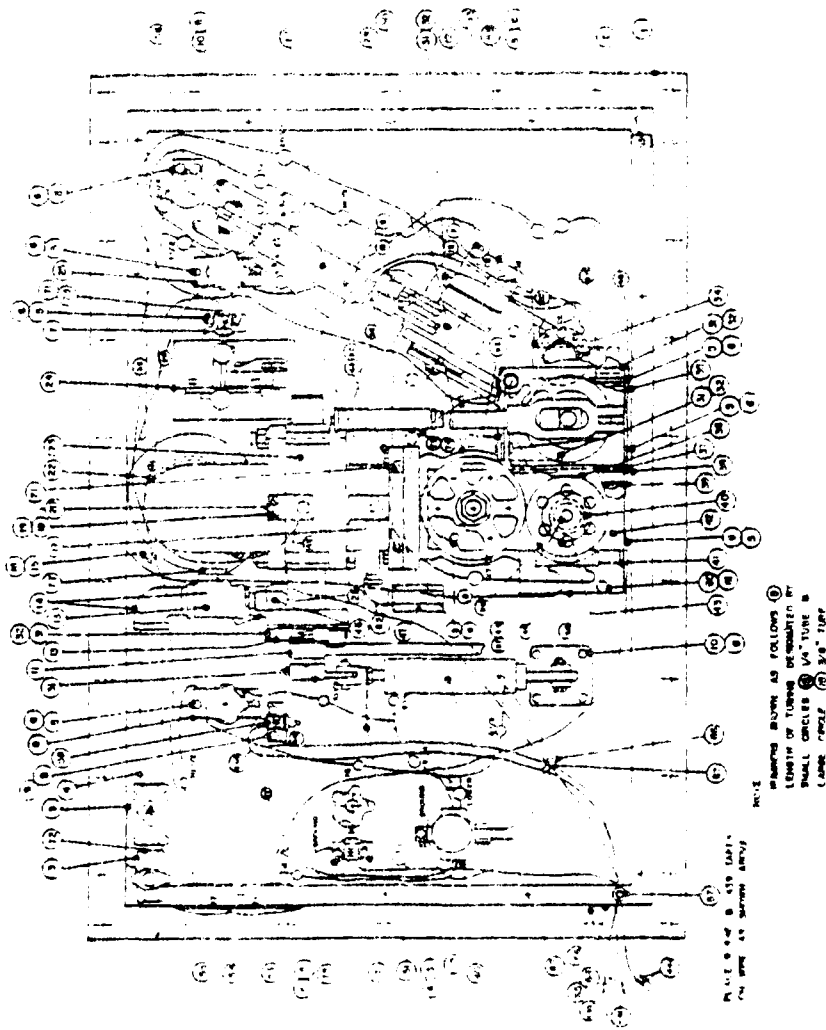


Figure 2 P-4 Bumper Turret Inner Panel Assembly

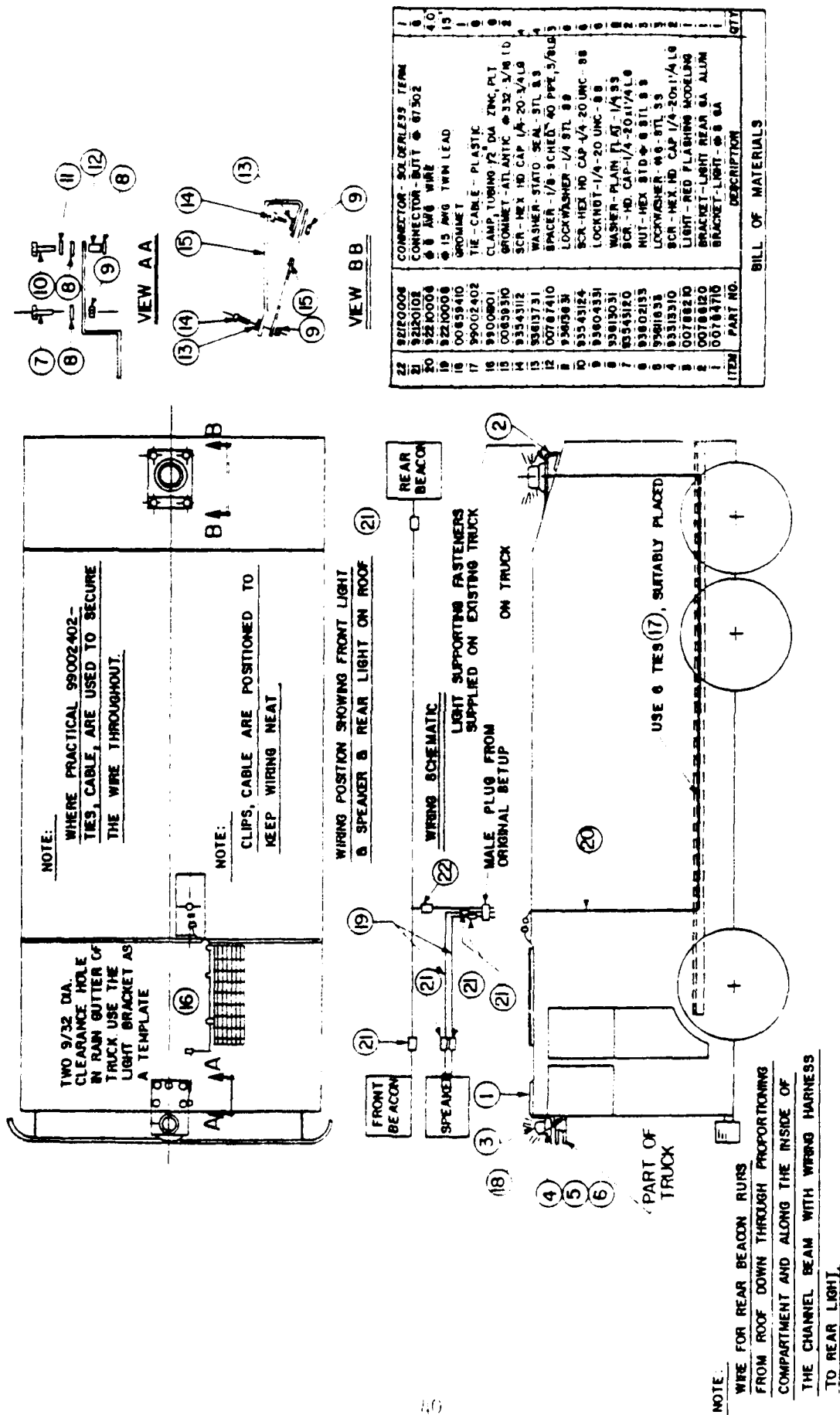
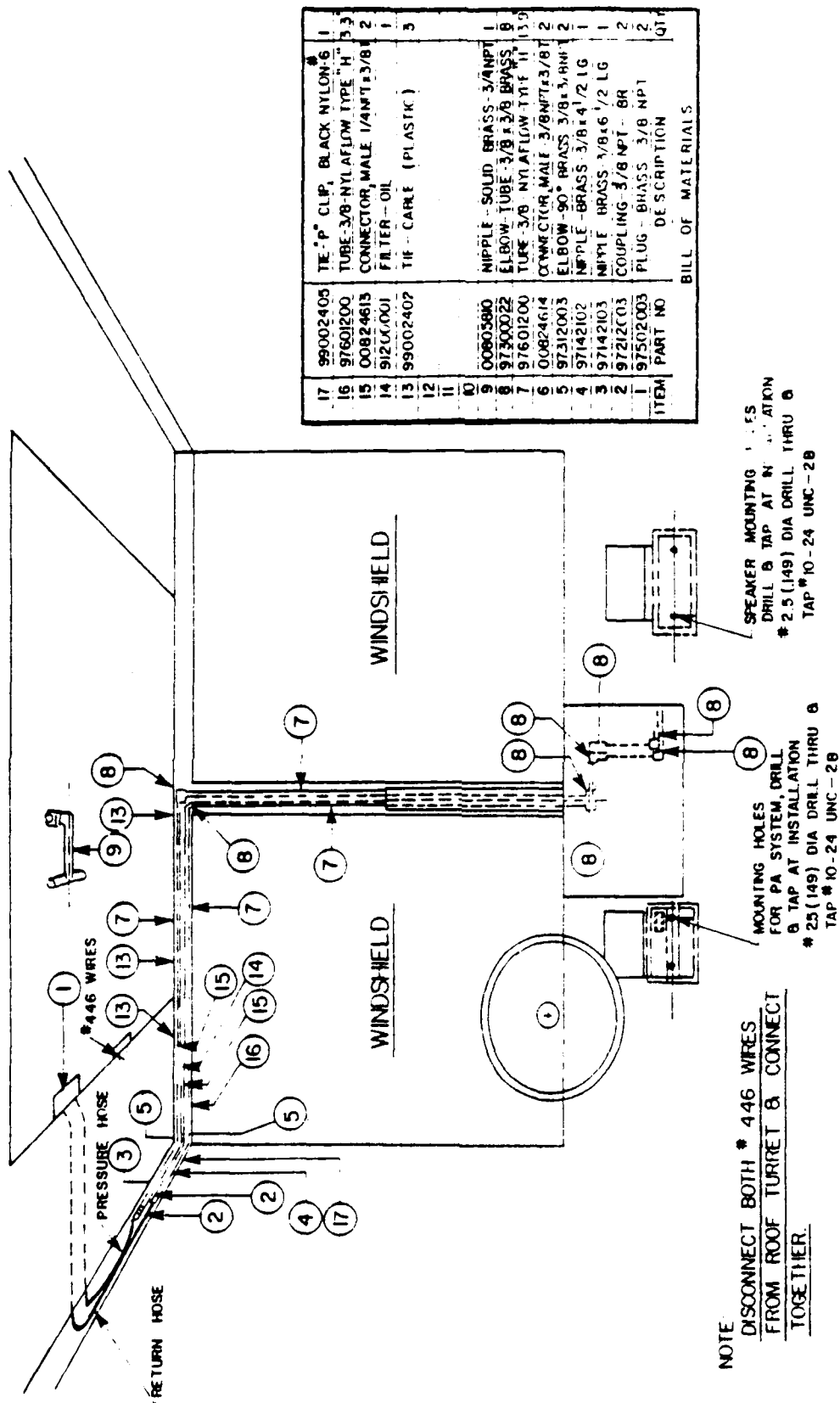


Figure 3 P-4 Speaker & Beacon Lights Wiring Assembly



ITEM	PART NO	DESCRIPTION	QTY
17	99002405	TE-P CLIP, BLACK NYLON-6	1
16	97601200	TUBE-3/8-NYLAFLW TYPE "H"	3
15	00824613	CONNECTOR, MALE 1/4" NPT 3/8"	2
14	91200001	FILTER-OIL	1
13	99002402	TIE-CABLE (PLASTIC)	3
12			
11			
10			
9	00803980	NIPPLE-SOLID BRASS-3/4" NPT	1
8	97300022	ELBOW-TUBE-3/8 3/8 BRASS	8
7	97601200	TUBE-3/8 NYLAFLW TYPE "H"	13
6	00824614	CONNECTOR, MALE 3/8" NPT 3/8"	2
5	97312003	ELBOW-90° BRASS 3/8 3/8 NPT	2
4	97142102	NIPPLE-BRASS 3/8 1/2 LG	1
3	97142103	NIPPLE-BRASS 3/8 6 1/2 LG	1
2	97212003	COUPLING-3/8 NPT-BR	2
1	97502003	PLUG-BRASS 3/8 NPT	2

BILL OF MATERIALS

Figure 5 P-4 Roof Turret Modification Kit

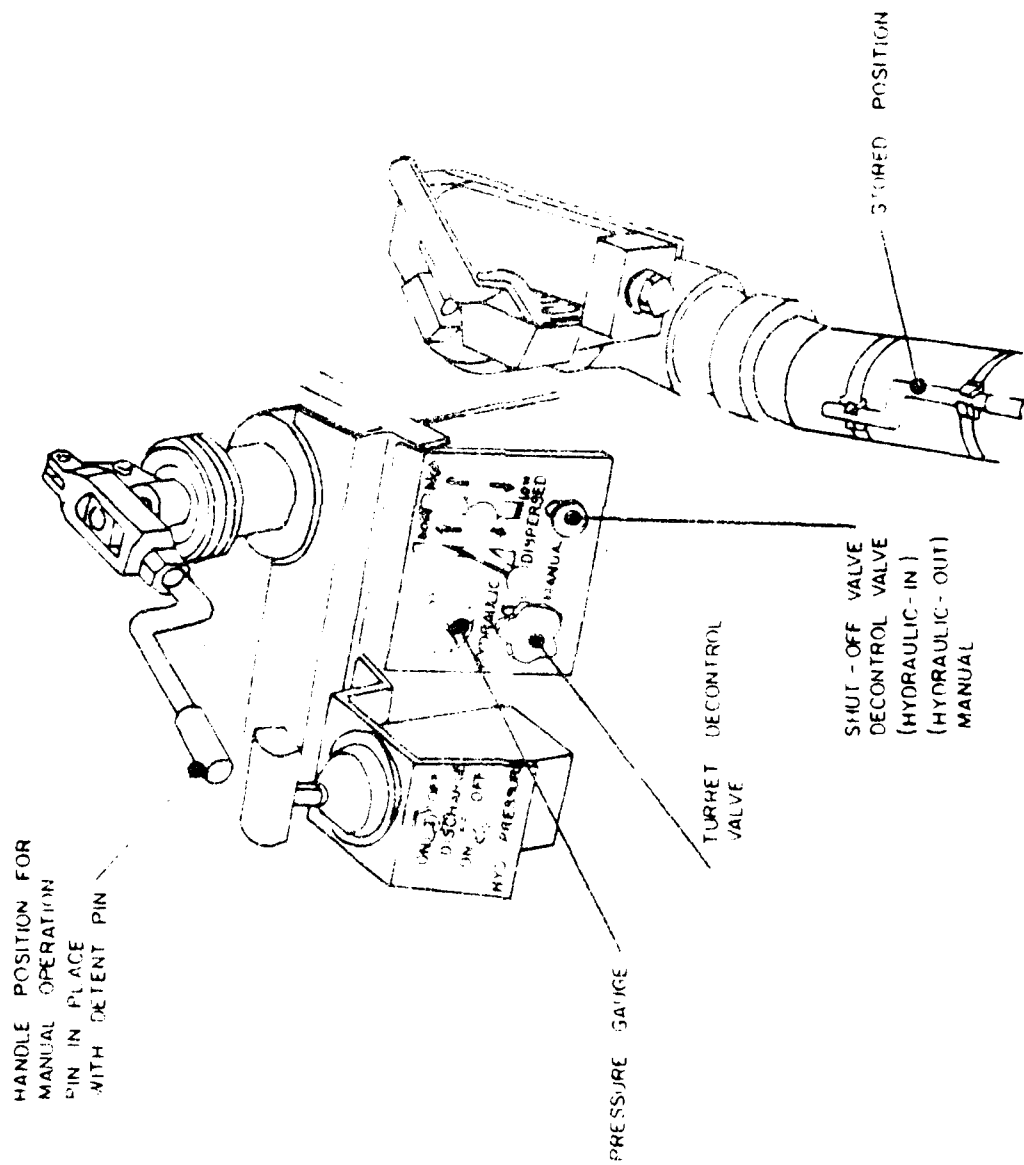
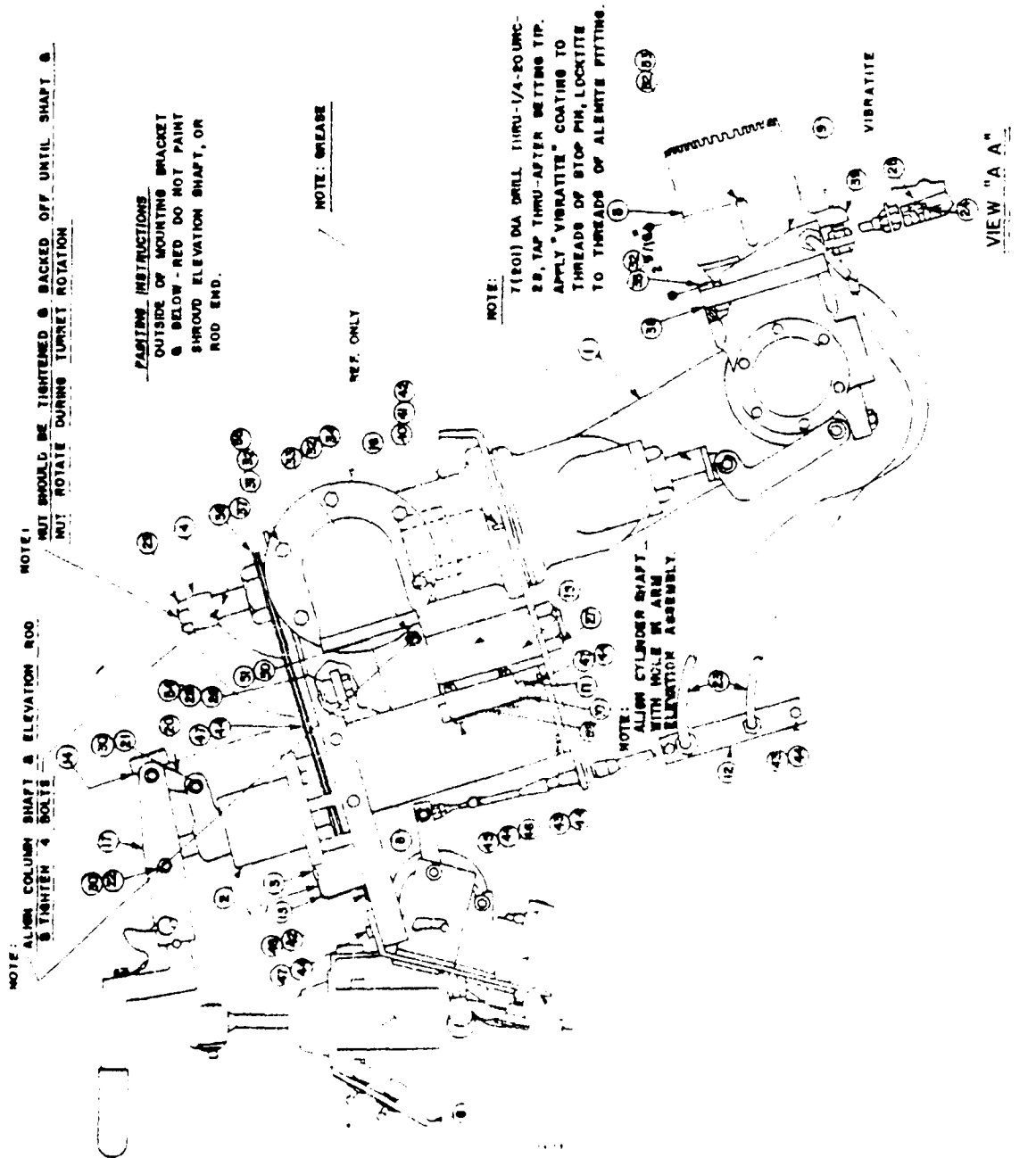
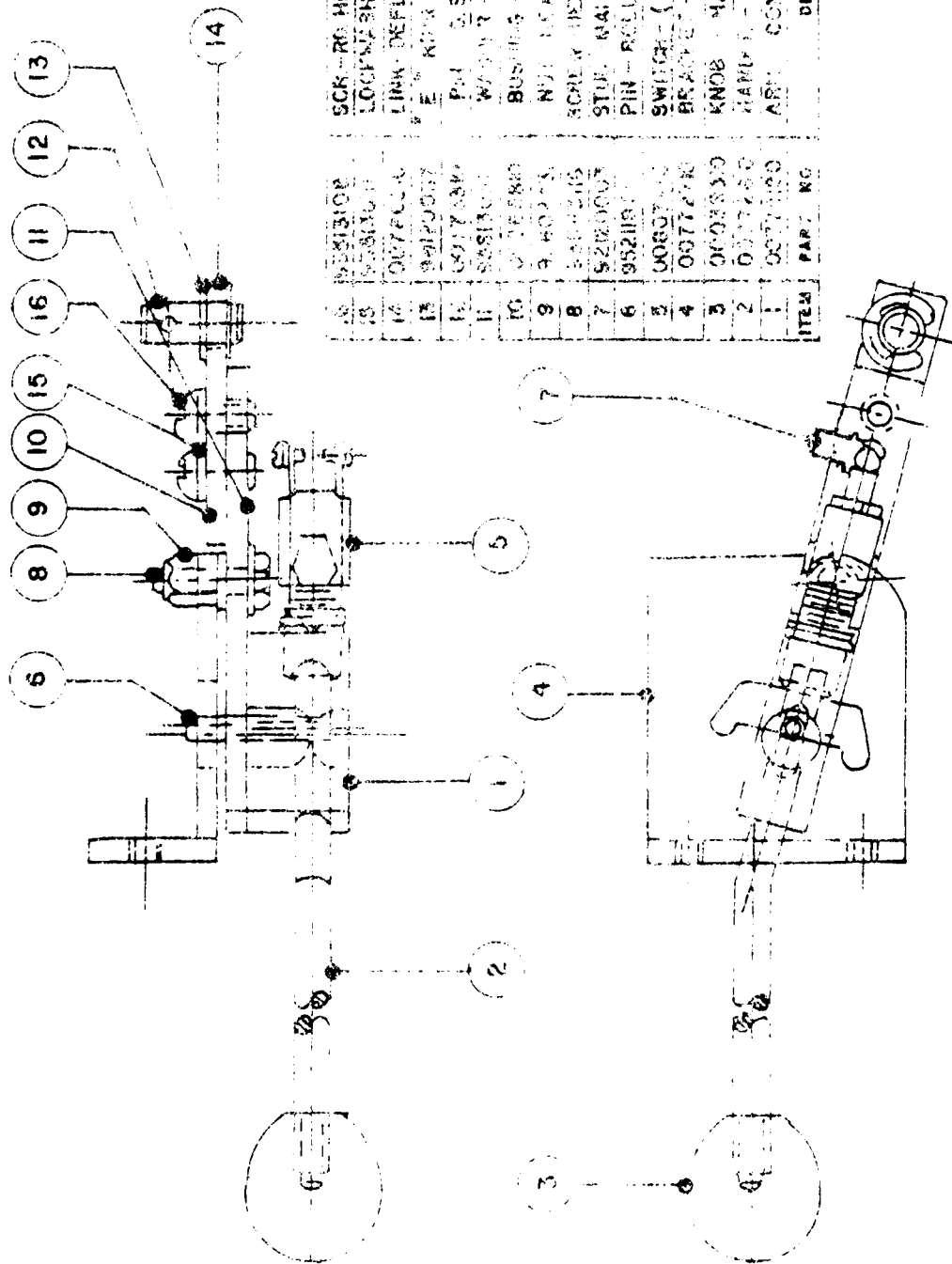


Figure 6 Turret Controls



ITEM	PART NO.	DESCRIPTION	QTY
1	0008010	IDENTIFICATION PLATE - MANFOLD	1
2	0008041	8/16 WASHER - FLAT	1
3	0008042	1/2 WASHER - FLAT	1
4	0008043	1/2 WASHER - FLAT	1
5	0008044	1/2 WASHER - FLAT	1
6	0008045	1/2 WASHER - FLAT	1
7	0008046	1/2 WASHER - FLAT	1
8	0008047	1/2 WASHER - FLAT	1
9	0008048	1/2 WASHER - FLAT	1
10	0008049	1/2 WASHER - FLAT	1
11	0008050	1/2 WASHER - FLAT	1
12	0008051	1/2 WASHER - FLAT	1
13	0008052	1/2 WASHER - FLAT	1
14	0008053	1/2 WASHER - FLAT	1
15	0008054	1/2 WASHER - FLAT	1
16	0008055	1/2 WASHER - FLAT	1
17	0008056	1/2 WASHER - FLAT	1
18	0008057	1/2 WASHER - FLAT	1
19	0008058	1/2 WASHER - FLAT	1
20	0008059	1/2 WASHER - FLAT	1
21	0008060	1/2 WASHER - FLAT	1
22	0008061	1/2 WASHER - FLAT	1
23	0008062	1/2 WASHER - FLAT	1
24	0008063	1/2 WASHER - FLAT	1
25	0008064	1/2 WASHER - FLAT	1
26	0008065	1/2 WASHER - FLAT	1
27	0008066	1/2 WASHER - FLAT	1
28	0008067	1/2 WASHER - FLAT	1
29	0008068	1/2 WASHER - FLAT	1
30	0008069	1/2 WASHER - FLAT	1
31	0008070	1/2 WASHER - FLAT	1
32	0008071	1/2 WASHER - FLAT	1
33	0008072	1/2 WASHER - FLAT	1
34	0008073	1/2 WASHER - FLAT	1
35	0008074	1/2 WASHER - FLAT	1
36	0008075	1/2 WASHER - FLAT	1
37	0008076	1/2 WASHER - FLAT	1
38	0008077	1/2 WASHER - FLAT	1
39	0008078	1/2 WASHER - FLAT	1
40	0008079	1/2 WASHER - FLAT	1
41	0008080	1/2 WASHER - FLAT	1
42	0008081	1/2 WASHER - FLAT	1
43	0008082	1/2 WASHER - FLAT	1
44	0008083	1/2 WASHER - FLAT	1

Figure 7 Bumper Turret



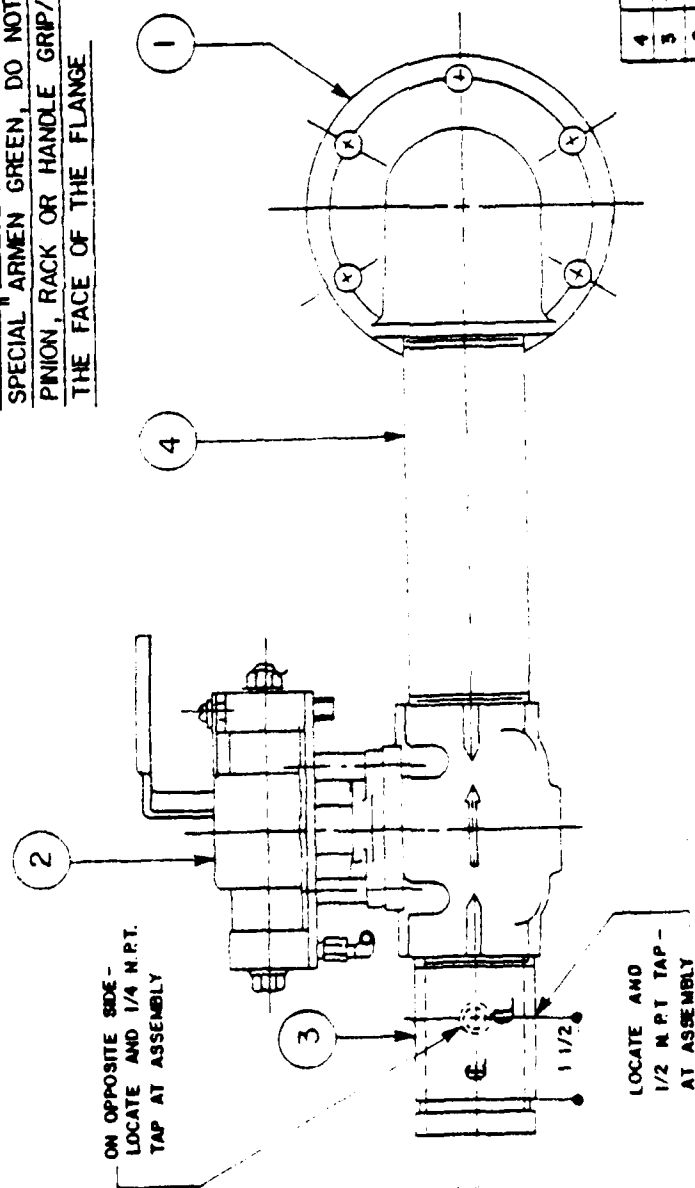
ITEM	PART NO	DESCRIPTION	QTY
1	0077000	ARM - CONTROL AGCY	1
2	0077000	HANDLE - CONTROL	1
3	0077000	KNOB - HANDLE (P4)	1
4	0077000	BRACKET - DISCHARGE CONT	1
5	0077000	SWITCH - (NORM OPEN)	1
6	352118	PIN - ROLL 3/16 x 1/2 L	2
7	5212000	STUD - NUT	1
8	5212000	SCREW - HEX 1/4 NUT 1/4 L	1
9	440200	NUT - LOCK F5NA-1A-20 1/2	1
10	0077000	BUSHING - ROR BRONZ	1
11	5212000	WASHER - 1/4 L	1
12	0077000	POI - 1/2	1
13	0077000	LINK - DEFLECTOR CONT ARM	1
14	0077000	LOOP - DEFLECT - 3/16 1/2 RING 1/4	2
15	0077000	SCR - ROLL 1/4-20 x 1/2 L	2

NOTES:

CONTROL SHOWN UPSIDEDOWN

Figure 8 Discharge Control Assembly

NOTE: — AFTER ASSEMBLY APPLY
ZINC CHROMATE PRIMER, THEN PAINT WITH
SPECIAL ARMY GREEN, DO NOT PAINT
PINION, RACK OR HANDLE GRIP/PIN OR
THE FACE OF THE FLANGE



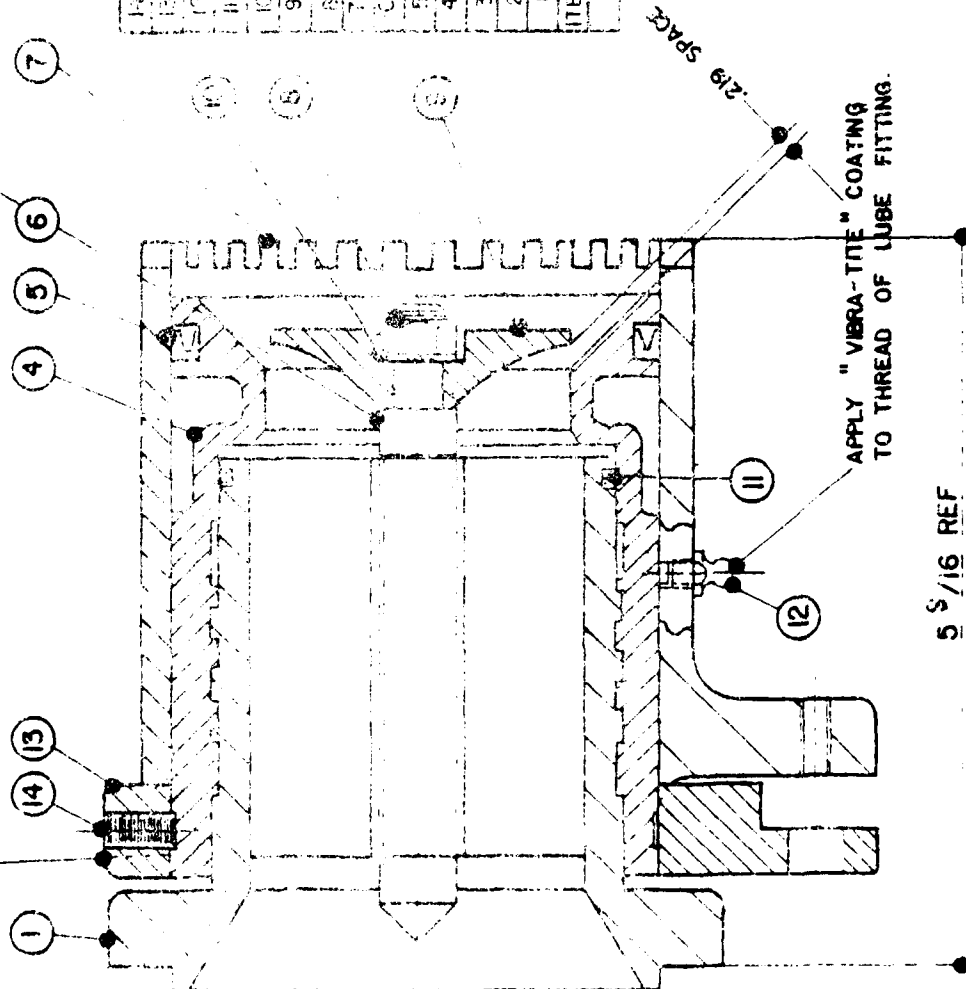
ITEM	PART NO.	DESCRIPTION	QTY
4	97141460	NIPPLE — 2 1/2" N.P.T. — D" 10	1
3	97121451	NIPPLE — 2 1/2" N.P.T. — 2 1/2" VICTAULIC 5' LB	1
2	00788630	VALVE — ASSEMB — 2 1/2" HYD TRUNNION	1
1	00788620	FLANGE ASSEMBLY	1
BILL OF MATERIALS			

Figure 9 Shutoff Valve Assembly

NOTE: BUILD THIS ASSEMBLY ONTO FINAL TURRET ASSEMBLY & NOT BEFOREHAND.

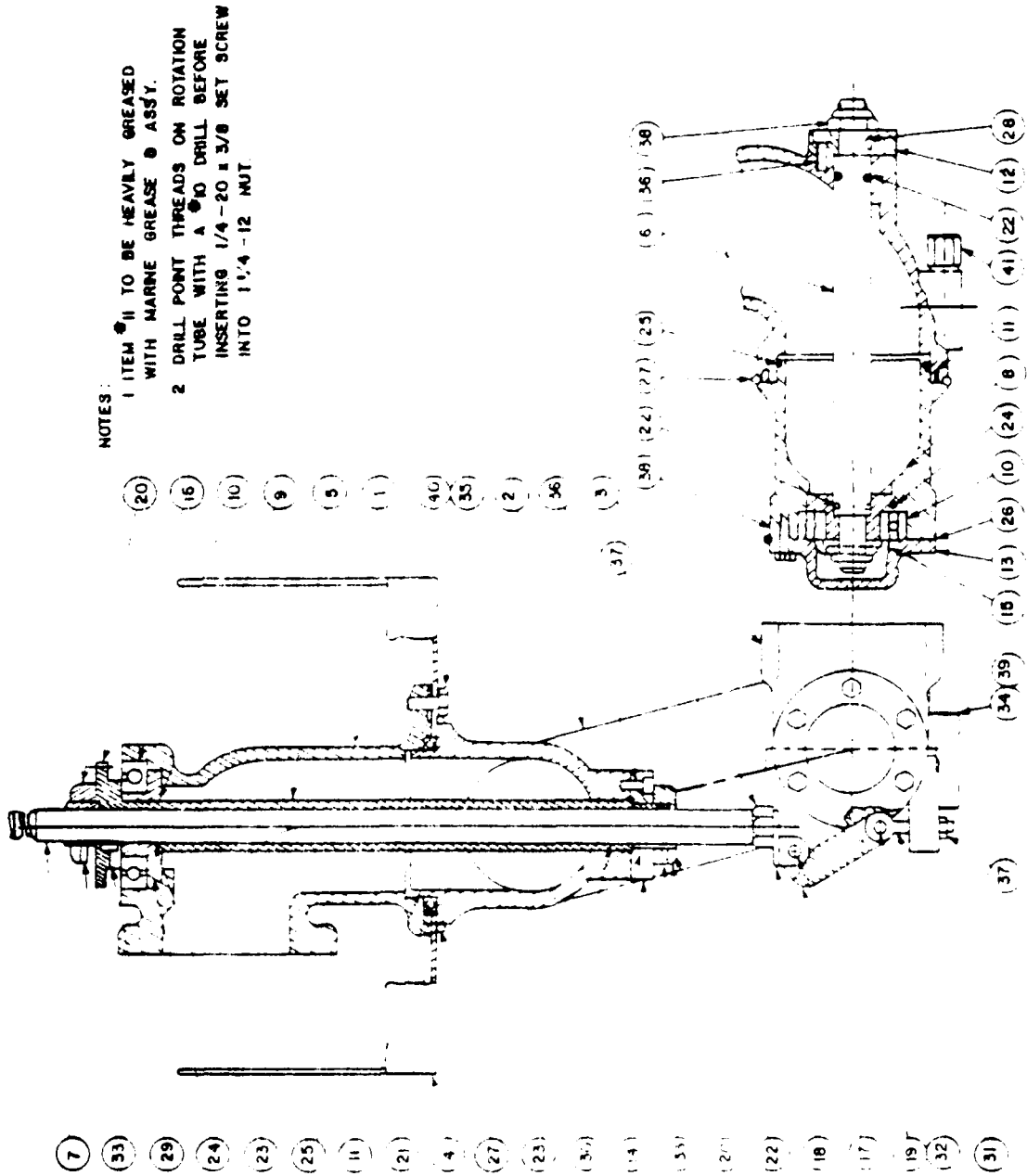
SHOWN 45° OUT OF POSITION.
APPLY "VIBRA-TITE" COATING
TO THREADS.

LOCKTITE SHAFT



ITEM	PART NO.	DESCRIPTION	QTY
1	00752220	1"	1
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

Figure 10 Nozzle Assembly



- NOTES:
- 1 ITEM #11 TO BE HEAVILY GREASED WITH MARINE GREASE @ ASSY.
 - 2 DRILL POINT THREADS ON ROTATION TUBE WITH A #10 DRILL BEFORE INSERTING 1/4-20 x 3/8 SET SCREW INTO 1/4-12 NUT.

ITEM	PART NO	DESCRIPTION	QTY
41	00074810	VALVE - DRAIN	1
40	93613635	LOCKWASHER - 3/8 SPLT SS	4
39	93613631	LOCKWASHER - 1/4 SPLT SS	6
38	93603448	NUT, ESNA - 3/4-16 PLT	2
37	93603244	NUT, HX JAM - 7/16-20 PLT	2
36	93603244	SCR HX HD - 1/4-20 x 3/4 SS	2
35	93603244	SCR HX HD - 3/8-16 x 1 1/2 SS	2
34	93603244	SCR HX HD - 1/4-20 x 3/4 SS	2
33	93603244	SCR HX HD - 1/4-20 x 3/4 SS	2
32	93603244	SCR SET SOC 1/4-20 x 3/4 PL	2
31	93603244	"E" RING B133-37 PLT	4
30	93603244	ROD END 7/16-20 MALE	1
29	93603244	KEY 3/16 SQ x 1/2 LG SS	1
28	93603244	KEY 3/16 SQ x 1/2 LG LA SS	1
27	93603244	KEY - 5 WOODRUFF SS	1
26	93603244	"O" RING - 4.8 Buna-N	2
25	93603244	"O" RING - 2.42 Buna-N	1
24	93603244	"O" RING - 1.89 LCR	1
23	93603244	"O" RING - 0.34 LCR	2
22	93603244	"O" RING - 0.28 Buna-M	2
21	93603244	"O" RING - 0.20 Buna-N	3
20	93603244	GASKET - BASE	1
19	93603244	NUT 1/4-12	2
18	93603244	PM ELEVATION	2
17	93603244	BOLT - PIVOT	1
16	93603244	LMK - ELEVATION	1
15	93603244	SPROCKET - BASE	1
14	93603244	WASHER	1
13	93603244	CAP - BEARING	1
12	93603244	CAP	1
11	93603244	BEARING KAYTON	2
10	93603244	BEARING	2
9	93603244	SEAL BEARING (BASE)	1
8	93603244	SEAL BEARING (HEAD)	1
7	93603244	RUC - ELEVATION	1
6	93603244	SHAFT - ELEVATION	1
5	93603244	TUBE - ROTATION ASSY	1
4	93603244	BRACKET - MOUNTING	1
3	93603244	HEAD	1
2	93603244	BODY	1
1	93603244	BASE	1

Figure 11 Base Body Assembly

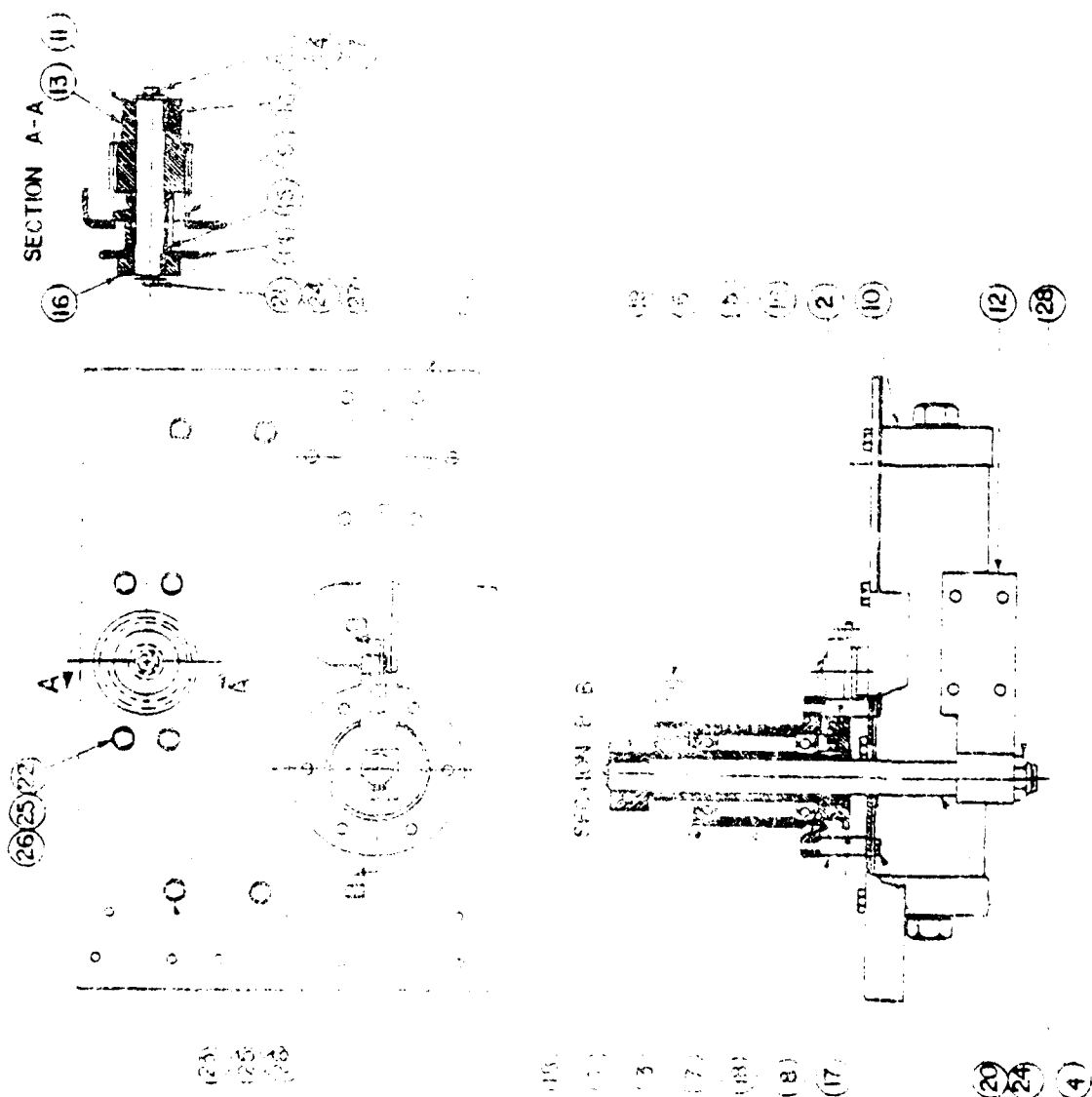


Figure 12 Mounting Bracket Assembly

20	34002430	MIT. BRN	3/4 16 84
21	34002430	DISC. ROTAC	
22	34002430	ASSEMB. KIT	3/4 16 84
23	34002430	DISC. ROTAC	3/4 16 84
24	34002430	DISC. ROTAC	3/4 16 84
25	34002430	DISC. ROTAC	3/4 16 84
26	34002430	DISC. ROTAC	3/4 16 84
27	34002430	DISC. ROTAC	3/4 16 84
28	34002430	DISC. ROTAC	3/4 16 84
29	34002430	DISC. ROTAC	3/4 16 84
30	34002430	DISC. ROTAC	3/4 16 84
31	34002430	DISC. ROTAC	3/4 16 84
32	34002430	DISC. ROTAC	3/4 16 84
33	34002430	DISC. ROTAC	3/4 16 84
34	34002430	DISC. ROTAC	3/4 16 84
35	34002430	DISC. ROTAC	3/4 16 84
36	34002430	DISC. ROTAC	3/4 16 84
37	34002430	DISC. ROTAC	3/4 16 84
38	34002430	DISC. ROTAC	3/4 16 84
39	34002430	DISC. ROTAC	3/4 16 84
40	34002430	DISC. ROTAC	3/4 16 84
41	34002430	DISC. ROTAC	3/4 16 84
42	34002430	DISC. ROTAC	3/4 16 84
43	34002430	DISC. ROTAC	3/4 16 84
44	34002430	DISC. ROTAC	3/4 16 84
45	34002430	DISC. ROTAC	3/4 16 84
46	34002430	DISC. ROTAC	3/4 16 84
47	34002430	DISC. ROTAC	3/4 16 84
48	34002430	DISC. ROTAC	3/4 16 84
49	34002430	DISC. ROTAC	3/4 16 84
50	34002430	DISC. ROTAC	3/4 16 84
51	34002430	DISC. ROTAC	3/4 16 84
52	34002430	DISC. ROTAC	3/4 16 84
53	34002430	DISC. ROTAC	3/4 16 84
54	34002430	DISC. ROTAC	3/4 16 84
55	34002430	DISC. ROTAC	3/4 16 84
56	34002430	DISC. ROTAC	3/4 16 84
57	34002430	DISC. ROTAC	3/4 16 84
58	34002430	DISC. ROTAC	3/4 16 84
59	34002430	DISC. ROTAC	3/4 16 84
60	34002430	DISC. ROTAC	3/4 16 84
61	34002430	DISC. ROTAC	3/4 16 84
62	34002430	DISC. ROTAC	3/4 16 84
63	34002430	DISC. ROTAC	3/4 16 84
64	34002430	DISC. ROTAC	3/4 16 84
65	34002430	DISC. ROTAC	3/4 16 84
66	34002430	DISC. ROTAC	3/4 16 84
67	34002430	DISC. ROTAC	3/4 16 84
68	34002430	DISC. ROTAC	3/4 16 84
69	34002430	DISC. ROTAC	3/4 16 84
70	34002430	DISC. ROTAC	3/4 16 84
71	34002430	DISC. ROTAC	3/4 16 84
72	34002430	DISC. ROTAC	3/4 16 84
73	34002430	DISC. ROTAC	3/4 16 84
74	34002430	DISC. ROTAC	3/4 16 84
75	34002430	DISC. ROTAC	3/4 16 84
76	34002430	DISC. ROTAC	3/4 16 84
77	34002430	DISC. ROTAC	3/4 16 84
78	34002430	DISC. ROTAC	3/4 16 84
79	34002430	DISC. ROTAC	3/4 16 84
80	34002430	DISC. ROTAC	3/4 16 84
81	34002430	DISC. ROTAC	3/4 16 84
82	34002430	DISC. ROTAC	3/4 16 84
83	34002430	DISC. ROTAC	3/4 16 84
84	34002430	DISC. ROTAC	3/4 16 84
85	34002430	DISC. ROTAC	3/4 16 84
86	34002430	DISC. ROTAC	3/4 16 84
87	34002430	DISC. ROTAC	3/4 16 84
88	34002430	DISC. ROTAC	3/4 16 84
89	34002430	DISC. ROTAC	3/4 16 84
90	34002430	DISC. ROTAC	3/4 16 84
91	34002430	DISC. ROTAC	3/4 16 84
92	34002430	DISC. ROTAC	3/4 16 84
93	34002430	DISC. ROTAC	3/4 16 84
94	34002430	DISC. ROTAC	3/4 16 84
95	34002430	DISC. ROTAC	3/4 16 84
96	34002430	DISC. ROTAC	3/4 16 84
97	34002430	DISC. ROTAC	3/4 16 84
98	34002430	DISC. ROTAC	3/4 16 84
99	34002430	DISC. ROTAC	3/4 16 84
100	34002430	DISC. ROTAC	3/4 16 84

APPENDIX B

AS32/P-4 AIR TRANSPORTABILITY BILL OF MATERIALS

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980 - 10

ITEM P/N	SUB. ASSY.	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00718040					007890-30	TURRET BUMPER ASS 800 GPM HYD	1
					007702-30	BASE BODY ASSY	1
					997100030	BRACKET ASSY. - M76.	1
					007688-20	TRIM-FLEXIBLE	1
					007832-20	ARM-ELEV. ASSY.	1
					008110-20	NOZZLE N.A. 400/800	1
					007723-40	VALVE CONTROL ASSY.	1
					007289-20	PLATE ASSY.- CONTROL	2
					007787-20	BRACKET-SUPPORT	2
					007788-20	BRACKET-CABLE	1
					008109-10	BRACKET-MANIFOLD	1
					007834-10	MANIFOLD	2
					007833-30	BRACKET-CONTROL-CABLE	1
					007823-20	COVER DRIVE CHAIN	1
					008048-20	PLATE-COVER	1
					008004-10	CYLINDER-ELEVATION	1
					007878-20	SOLENOID-4-WAY 24V	1
					007945-30	HANDLE ASSY	1
					007946-20	TUBING ASSY	1
					008087-10	WIRING ASSY	1
					008078-10	LMK	1
					008074-10	STUD	2
					008032-10	CABLE	1
					004788-10	SWREL	2
					933894040	SCR SET SOC. 8-32 x 1/4	1
					936032180	NUT-JAM 1/2-13 PLT	2
					936030000	NUT-ESNA THN 1-14 PLY	1
					936130460	LOCKWASHER 1/2 3PLT PLT.	1
					936034480	NUT ESNA 3/4-18 PLY	1
					936034420	NUT ESNA 5/16-24 PLY	6
					936442320	SCR HEX 5/16-18 1/2 PLY	8
					936130320	LOCKWASHER 5/16 3PLT 38	14
					936442120	SCR HEX HD 5/16-18 1/2 PLY	4
					936130430	WASHER FLT. 5/16 PLY	4
					936542200	SCR. SOC. HD. 5/16-18 1/4 PLY.	4

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB ASSY	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00718040 (CONT.)					942041000	CHAIN - 35	2.5
					000607-10	LINK - MARTIN	1
					93303180	6 RING 3/32 x 4 x 4-3/16	1
					933043080	SCR. W. 80C. 3ET CONE PT 3/8-16	1
					932181100	SCR. SLOTTED RD. NO. 10-32 5/8	2
					933110980	WASHER PLAT 1/4 10 88	2
					933156410	LOCKWASHER - 3PLY 10 10	2
					933441080	SCR. HEX. HD. CAP 1/4-20-1/2 L8	4
					93318310	LOCKWASHER SPLIT 1/4 88	2
					933441240	SCR. HEX. HD. CAP 1/4-20-1/2 L8	4
					933041310	MUT. HEX 1/4-20 UNC - 88	4
					933441100	SCR. HEX. HD. CAP 1/4-20-5/8 L8	11
					932143080	SCR. SLOTTED RD. NO. 10-32 5/8 L8	3
					007634100	NAMER PLATE - ALUM	1
					933041380	NUT HEX 5/16 - 18 88	1
					007831-10	PIN - STOP	1
					007843-10	FITTING - ALUMITE	1
					933150350	1/2 WASHER - PLAT	2
0078040					929190420	5/16 WASHER - PLAT	6
					008100-10	IDENTIFICATION PLATE - NAMPOLD	1
	0078030				007802-40	BASE - BODY ASSEMBLY	1
					008028-40	BASE	1
					008391-20	BODY	1
					007716-40	HEAD	1
					007773-20	BRACKET - MOUNTING	1
					008660-20	TUBE - ROTATION ASST.	1
					007707-20	SHAFT - ELEVATION	1
					008182-20	ROD - ELEVATION	1
					00822-20	SEAL - BEARING (HEAD)	1
					000070-10	SEAL - BEARING (BASE)	1
					84010030	BEARING	2
					000008-10	BEARING - KAYDON	2
					000048-20	CAP	1
					001099-10	CAP - BEARING	1

P-4 AIR TRANSPORTABILITY CONVERSION KIT
BILL OF MATERIAL
PART NO. 007980-10

ITEM P/N	SUB. ASS'Y	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00718040	00788030					BASE BODY ASS'Y	
	(CONT.)					WASHER	1
					000044-10	ROCKET - BASE	1
					00224-10	LINK-ELEVATION	1
					007709-20	BOLT-PIVOT	1
					007708-10	PIN-ELEVATION	2
					00106-10	NUT 1/8-18	2
					001728-10	WASHER-BASE	1
					002178-20	"O" RING - 080 BUNA-N	2
					008300200	"O" RING - 080 BUNA-N	2
					008300800	"O" RING - 084 LCR	2
					008310340	"O" RING - 165 LCR	2
					008310800	"O" RING - 242 BUNA-N	1
					008302400	"O" RING - 288 BUNA-N	2
					008304200	KEY - 3 WOODRUFF S.S.	1
					008306000	KEY 3/16 SQ x 1/4 LG S.S.	1
					008306000	KEY 3/16 SQ x 1/2 LG S.S.	1
					008307010	ROD END 7/16 - 20 MALE	1
					008307010	"O" RING 8/32 - 37 PLY	4
					008307020	SCR KEY SOC 1/4-20 x 3/8 PLY	2
					008311120	SCR HEHD 7/4-20 S/4 S.S.	2
					008313160	SCR H XHD 3/8-16 S.S.	4
					008313120	SCR SOC HD 1/4-20 S/4 S.S.	2
					008313440	NUT H2 JAN 7/16-20 PLY	2
					008314160	NUT 28NA 3/4-16 PLY	2
					008316910	LOCKWASHER 1/4 SPLIT S.S.	6
					008316980	LOCKWASHER 3/8 SPLIT S.S.	4
					00831710	VALVE-DR	1
00718040	00788030	00777320				TUBE - ROTATION	
					007779-10	BEARING - GUIDE	1

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB ASSY	1ST SUB	2ND SUB	3RD SUB	INDIVIDUAL P/N	DESCRIPTION	QTY
00715040	00770230				TURRET BUMPER AFF 800GPM HYD		
					BRACKET ASSY - MTG		
					BRACKET - MTG		
					SPROCKET - COLUMN		
					COLUMN - BASE		
					SHAFT - COLUMN		
					TUBE - COLUMN		
					BLOCK - SWIVEL		
					BEARING		2
					SPACER		6
					000369-10		
					000601-10		
					007703-10	BEARING - SUPPORT ASSY	
					007775-20	ACTUATOR ASSY-HYD	
					007706-10	SHAFT-DRIVE	
					002295-20	ARM - COLUMN	
					007781-10	GEAR	
					007778-10	SPROCKET	
					940140210	BEARING	2
					938020030	KEY 3/16 SQ 1 3/4 LG SS	4
					981101250	RET RING 510-125	4
					981002350	RET RING N5000-225	2
					981100750	RET RING 5100-75	2
					935441320	SCR HX HD 1/4-20 1 1/2 PLT	6
					935431080	SCR HX HD 1/4-20 1 1/2 SS	2
					935432100	SCR HX HD 5/16-18 1 1/2 SS	2
					935432140	SCR HX HD 5/16-18 1 1/2 SS	4
					936136310	LOCKWASHER 1/4 SPLIT SS	4
					936136320	LOCKWASHER 5/16 SPLIT SS	6
					936136330	WASHER-FLY 5/16 SS	6
					00083810	DISC-ROTAC	2
					936034380	NUT ESNA 3/4-16 SS	2
00715040	00770230	0077520			ACTUATOR HYD ASSY		
					TUBE-CYLINDER		
					PISTON RACK		
					HUVA CUP		
					110" RING 2-5/8 x 2-3/4 x 1/16		2

P-4 AIR TRANSPORTABILITY CONVERSION KIT
BILL OF MATERIAL
PART NO. 007980-10

ITEM P/N	SUB. ASS'Y	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY.
00718040	00770230	00777880	(CONT.)		008304-20	ACTUATOR, HYD. ASS'Y	1
					936136480	LOCK WASHER 3/4 SPLIT.	2
					93601180	NUT HEX 3/4-16 CAD. PLT.	2
					007777-10	ROD PISTON	1
					93601180	HOUSING 3/4x3/16x3/32	2
					93603800	TUNNEY SUBPUMP APP. 800 GPM HYD.	1
					00783220	NOZZLE NA 400/600	1
					007832-20	YIP	1
					007832-20	HOUSING SCREW	1
					007832-11	NOVA CAPS 1/2x4x1/4	1
00718040	00811020				007832-10	SHAFT-BUTTON	1
					007832-30	SLEEVE	1
					936041230	NUT 3/8-16 ST. STL.	1
					007832-10	BUTTON	1
					936136380	LOCK WASHER 3/8 SPRING	1
					936136380	"O" RING 3/8x3/16x3/32-18	1
					007832-10	PISTON-ALUMINUM LUB. (3016)	1
					007832-10	HOUSING-CONTROL CABLE	1
					936136380	FOR 100' HYD. CUP PL. 5/16-18-1/2	1
					00811020	TUNNEY SUBPUMP APP. 800 GPM HYD.	1
00718040	00811020				007765-20	VALVE CONTROL 8-WAY	1
					007765-20	BRACKET 8-WAY VALVE	1
					007861-10	BLOCK TERMINAL	1
					007861-10	SWITCH TOGGLE RUTLER HAMMER	1
					936136380	TERMINAL SOLDERLESS STUD	1
					936000080	ELBOW 1/8 NPTx3/8 TUBE	1
					00811020	SCREW	1
					936136380	SCR. R. PL. 5/16-18-1/2	1
					936041240	NUT HEX 3/8-22 B.B.	1
					007861-10	PLATE-NAME	1

PART NO. 007980-10

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P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980 - 10

ITEM P/N	SUB	ASSY	1ST SUB	2ND SUB	3RD SUB	INDIVIDUAL P/N	DESCRIPTION	QTY
00718040	0072340						TURRET BUMPER AFF 800CPMHTD	
							PLATE CENTRAL ASSY	
						007234-30	BRACKET-CONTROL	1
						007234-20	PLATE-CONTROL NAME	1
						007234-20	VALVE-DECONTROL ASSY	1
						007234-10	GAUGE-8" PAGE	1
						007234-20	DIRECTIONAL CONTROL ASSY	1
						007234-20	CONTROL-LEVER-GUAG-FOAM	1
						007234-20	VALVE-DECONTROL ASSY	1
						93814120	SCR. RD HD PHILL 1/4-20-3/4 LG.	4
						938133080	SCR. RD HD PHILL 8-32-1/4 LG.	3
						938148080	SCR. RD HD PHILL 10-24-1/4 LG.	2
						007234-10	BRACKET-CONTROL	1
						007234-10	WASHER-1/4 S.S.	2
						938130310	NUT HEX 1/4-20 UNC-2B S.S.	2
						938131030	SCR. RD HD PHILL 1/4-20-1/4 LG.	2
						938131240	SCR. RD HD PHILL 1/4-20-1/2 LG.	2
						938021890	NUT HEX 8-32 UNC-2B	2
						938041810	NUT HEX 1/4-UNC-2B	2
						938138410	LOCKWASHER 7/8 S.P.R.	2
						938110330	LOCKWASHER 8-32 S.P.R.	2
						938110310	LOCKWASHER 10-24 S.P.R.	2
						007234-10	"E" RING TRUARC 8133-28	2
						007234-10	LINK DEFLECTOR CABLE ALUM.	1
	0072340	00733820					VALVE-DECONTROL ASSY	
						007234-30	DECONTROL VALVE ASSY	1
						938141180	SCR. RD HD 1/4-20-3/4 LG. PLT.	1
						007234-10	KNOR	1
						978000010	ELBOW 1" x 3/8 TUBE	6

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB ASSY	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY.
00718040	00772340	00738520	00739120		000224-20	DECONTROL VALVE ASSY	1
					002382-20	BODY VALVE DECONTROL	1
					000081-10	SHAFT VALVE DECONTROL	1
					96130300	SPRING LATCH	1
					933948040	BALL 5/32 DIA. S.S.	1
					933948040	SCR SET 1/4-20-1/4 L.S. P.T.	1
					933118120	PIN ROLL 5/32 DIA. 3/4 L.S.	1
					933118070	PIN ROLL 5/32 DIA. 3/4 L.S.	1
					933300320	10" RING 1/2 OD 1 3/4 ID 2 1/4 L.S.	2
					933100300	RING NET 6100-80	2
					007741-20	DISCHARGE CONT ASSY	1
					007723-10	ARM CONTROL ASSY	1
					000383-10	MAIN CONTROL	1
					007727-10	WASER HANDLE (P-4)	1
00718040	00772340	00776520	00774180		006074-10	BRACKET DISCHARGE CONT	1
					933118200	SWITCH NORM. OPEN	1
					933100090	PIN ROLL 3/16 XI 1/4 L.S.	1
					933431160	STUD - MALS	2
					93322430	SCR HI HD MACH 1/4-20-1 1/8	1
					002383-10	NUT HEX ERNA 1/4-20-R.C.	1
					933130310	BUSHING BOR. BRONZ	1
					007728-10	WASER 1/4 R.S.	1
					933100370	PIN S.S.	1
					007383-10	11/2 RING TRIARC 8132-27	2
					933130310	LINK-DEFLECTOR CONTROL	1
					933131300	LOCKWASER SPLIT RING 1/31	2
						SCR. RD HP 1/4-20 UNG 1/2 L.S.	2
						CONTROL ARM ASSY	1
00718040	00772340	00776520	00774180		007723-10	ARM-DEFLECTOR CONTROL	1
					007731-10	LOCK-CONTROL	1
					007742-10	NUT - TAC	1

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB. ASSY	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00718040	00772340	00772820				DECONTROL VALVE ASS'Y	
					007728-20	DECONTROL VALVE	
					930021030	KNOB	
					973000080	MALE ELBOW 1/8NPT x 3/8 TUBE	4
00718040	00772340	00772820	00773020			DECONTROL VALVE	
					007724-10	BODY-DECONTROL	
					007728-10	SHAFT DECONTROL	
					981920370	"E" RING 8144-57 STEEL PLT	
					934110330	W/O FLAT WASHER	
					932938040	SCREW 3/16" x 3/4" DIA 3.8	
					933010960	W/O RING 3/16" x 3/32	
					000091-10	SPRING LATCH	2
					941303080	BALL 3/32 DIA 3.8	
					938138080	SCREW RD HD 10-32 x 3/8 L4	
					934154380	W/O LOCKWASHER	
						TURRET BUMPER AFF 800CPM HYD.	
	00098620					STROKE CYL 3" (ELEVATION)	
					000980-10	PISTON ROD	
00718040					000811-10	RED WIPER SEAL	
					000892-10	HOOD	
					000893-10	ROD BEARING	
					000894-10	END SEAL	2
					000895-10	CYLINDER BODY	
					000896-10	PISTON	
					000897-10	PISTON SEAL	
					000898-10		
					000899-10	CAP	
					000900-10	PISTON RETAINING NUT	
					001001-10	PISTON TO RED SEAL	
					001002-10	BUSHING	

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB. ASS'Y	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00718040	00794820					TURRET BUMPER AFFX 800 GPM HYD.	
					007576-20	HANDLE ASS'Y	1
					007576-20	HANDLE HOLDER	1
					008811-10	HAND GRIP	1
					930120070	PIN - DETENT ASS'Y (ANFST)	1
00718040	00794830				930148120	SCR. BR. HD. 10-24 UNC-3/4	1
					930163880	LOCK WASHER 10 S.S.	1
					930129300	PIN - ROLL 1/4 X 1 1/4	1
						TURRET BUMPER AFFX 800 GPM HYD.	
						TUNING ASS'Y	
00718040	00794820				977700010	VALVE - NEEDLE 3/4 X 3/8	2
					977000020	CONNECTOR - STR 1/8 NPT 3/8	12
					973000070	ELBOW 1/4 NPT 3/8	2
					973000220	ELBOW - UNION 3/8 X 3/8	2
					972130180	CONNECTOR 1/8 NPT 1/8 NPT	2
					971000040	CONNECTOR 1/8 NPT 1/4	2
					971090020	TEE 3/8 X 3/8 X 3/8	2
					974001000	TUNING - HYD. 3/8 DIA 27	27
					974001000	TUNING - HYD. 1/4 X 9	9
					974000080	ELBOW 1/8 NPT 3/8 TUBE	2
					971420000	CLOSE NIPPLE 1/8	1
						TURRET BUMPER AFFX 800 GPM HYD.	
						WIRING - DIAGRAM	
					922100060	WIRE 28A	20
					921200010	TERMINAL SRDS 14-RB 25 D1	6
					921200050	RING - CONNECTOR FOR 8 ROUND	2
					921200110	TERMINAL CONNECTOR	2

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB. ASSY.	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00800130						KIT-ROOF TURR. MODIFICATION P-4	
					978020030	PLUG-GRASS-3/8 NPT	2
					971200030	COUPLING 3/8 NPT BR.	2
					971421030	NIPPLE 3/8 x 1/2 L.G. BR.	1
					971421020	NIPPLE 3/8 x 1/2 L.G. BR.	1
					973120030	ELBOW 90° BR. 3/8 x 3/8 NPT	2
					008248-14	CONNECTOR-MALE TUBE 3/8 Th 3/8	2
					974012000	TUBE 3/8 NYLAPLOW TYPE N	13.8
					973000220	ELBOW TUBE 3/8 x 3/8 BR.	8
					008088-10	NIPPLE SOLID BR. 3/4 NPT	1
					990024020	TIE-CABLE(PLASTIC)	3
					913000010	FILTER-OIL	1
					008248-18	CONNECTOR MALE STRT. BR. 1/4 x 3/8	2
					976012000	TUBE 2/8 NYLAPLOW TYPE N	8.3
					990084080	TIE "P" CLIP, BLACK NYLON 6	1
						WIRING ASSY P-4 SPEAKER BEACON	
						LIGHTS	
					007847-10	BRACKET LIGHT 200A 3E CAP	1
					007891-20	BRACKET LIGHT REAR 6A ALUM	1
					99313100	SCR. NO. 10 PHILW 6-32-8/8 L8	3
					993116-330	LOCK WASHER 20-3YL 8.3	3
					934021330	NUT H. 8 YDN-3E 3YL 8.3	3
					935431500	SCR. NO. 10 CAP 1/4-20 x 1 1/4 L8	2
					934130310	WASHER PLAIN FLAT 1/4 x 3.3	6
					936043310	LOCKNUT 1/4-20 UNC 3.3	6
					934331240	SCR. H. NO. CAP 1/4-20-1 1/2 L8	3
					936116310	LOCK WASHER 1/4 STL 3.3	3
					007874-10	SPACER 1/8 SCHD 40 M1956/8 L8	3
					936137310	WASHER STAY-O-SEAL STL 3.3	4
					934431120	SCR. NO. 10 1/4-20-3/4 L8	4
					008695-10	BRACKET LIGHT 200A 3E CAP	2
					990018010	CLAMP TUBING 1/4 DIA. ZINC PLY	6
					990024020	TIE - CABLE-PLASTIC	6
					007882-10	LIGHT-RED FLASHING MOD. L83	1

P-4 AIR TRANSPORTABILITY CONVERSION KIT
BILL OF MATERIAL
PART NO. 007980-1Q

ITEM P/N	SUB. ASS'Y	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY.
00800130 (CONT.)						WIRING ASS'Y P-4 SPEAKER & BEACON LIGHTS	
					008994-10	GRONNET	1
					92100080	18 AWG TWN LEAD	18
					92100080	18 AWG WIRE	40
					92101020	CONNECTOR BUXT 87802	8
					92100080	CONNECTOR SOLDERLESS TERMINAL	1
						VENT ASS'Y WATER	
					007763-20	COVER ASS'Y	1
					007767-20	PLATE VENT	1
					007799-10	ROD - SPRING RET.	2
					007749-10	GASKET - FLOAT	1
					007765-20	GASKET - COVER	1
00778930					007763-20	GASKET - VENT	1
					007763-10	BALL 2 1/2 DIA	1
					963010240	SPRING - COMPRESSION S.S.	6
					819004370	MIT WREN 2 1/8-11 S.S.	1
					819004370	WASHER PLT 5/16 S.S.	1
					966167820	STAT-O-SEAL 9/16 S.S.	6
					966167470	STAT-O-SEAL 5/8 PLT	2
					966020010	WIRE 048 DIA. ST 8 PL	1
						VENT ASS'Y	
					007768-20	TUBE DRAIN	1
					007764-20	VENT ASS'Y	1
					007761-10	CAP - VENT	1
					007763-10	PLUG - VENT	1
					007763-10	BALL - VENT	1
					007763-10	GASKET - FLANGE	1
					007763-10	GASKET - PLUG	1
					007768-10	NOSE - DRAIN	1
					966104000	CLAMP - HOSE 2-1/8-3"	3
					966003220	O RING - O32 8MM IN	1
					966123370	RNG RET 8100-2573.3	1
					966022080	RING RET 8000-2068.8	1
					966112320	PIN ROLL 1/8 DIA. x 2 LG. S.S.	1
					007764-10	SPRING - VENT	1

PART NO. 007980-10

ITEM P/N	SUB. ASSY	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY.
00776850	00779430				VENT ASSY		
					VENT ASSY		
					FLANGE-VENT		1
					VENT-FOAM		1
					PIPING ASSY		
00768920					PIPE ASSY		1
					CLAMP AEROSOL		2
					TUBING HYD NYLAFLOW 3/8 DIA.		1.250
					ELBOW 90° 3/4" VIC ALU C		1
					ELBOW RHD 8-180 HPSO ML-4" X 3" IN A		1
					ELBOW 90° 4" VIC		1
					PIPE 4" NPT x 4 VIC .30" LG.		1
					HANGER ASSY PIPE		1
					PIPE 3" NPT x 3 VIC 48" LG.		1
					PLUG 2 M.I.		2
					SHIM 1/4" BOLT PIPING STL CAD		1
					COUPLING RHD 3/21/2 VIC NO 780		1
					COUPLING 3/4" VIC STYLE NO 78		2
					LOCKWASHER 1/2 SPLIT ST. STL		2
					WASHER 1/2 ST. STL		2
					MUN BOLY 3-8 1/4 LG 1/2-13 ALL THDS		1
					PIPING SHUT-OFF VALVE ASSY		1
					"GOURING BUNA-N 4-1/8 x 4-3/8 E/S		1
					NUT MSL/2-13 UNC 2BS3		2
					ELBOW 1/4 NPT MALE x 3/8 TUBE		1
					CLINCHP		2
					BRACKET		2
					SCREW 1/2 RD. HD. STL ST.		2
					LOCK NUT 3/8-10-24 UNC-2B		2
					7/14 ROOD		2
					CLOSE NIPPLE 1/8		1
					COUPLING		1
					ELBOW 3/8 1/2 NPT - 3/8 STL		1

P-4 AIR TRANSPORTABILITY CONVERSION KIT
BILL OF MATERIAL
PART NO 007980-10

ITEM P/N	SUB. ASSY	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY.
00798020	00802820					PIPING ASSY	
					007980030	PIPING-SHUT-OFF VALVE ASSY	1
					007984-10	FLANGE ASSY	1
					007984-10	VALVE ASSY 2 1/2 HYD TRUNNION	1
00798020	00802820				007984-10	NIPPLE 2 1/2 NPT 10' LG	1
					007984-10	NIPPLE 2 1/2 NPT 10' LG	1
					007984-20	FLANGE	1
					007987-10	ELBOW - FLANGE	1
00798020	00802820	00798430				VALVE ASSY 2 1/2 HYD TRUNNION	
					007984-20	VALVE IN-LINE	1
					007987-20	PLATE-MOUNTING CYL	1
					007984-10	STEM - ADAPTER SS	1
					007984-10	SPACER	4
					007984-20	ACTUATOR	1
					008028-10	GEAR (HYD TRUNNION VALVE)	1
					93802820	KEY-WOODRUFF 3/8	1
					008028-10	HANDLE (2 1/2 HYD TRUNNION)	1
					008028-10	GRIP-VINYL	1
					007984-20	GUARD - GEAR	1
					007984-10	SPACER - SWITCH	1
					007984-10	BRACKET - SWITCH	1
					938244400	SCR. BOLT FLT. NO CAP 7/16-14	4
						UNG 2A-21/218 CAD PL	
					938131120	SCR. RD. NP 1/4-20 UNC 2A-2 1/4 LG	8
					938131120	LOCKWASHER 1/4-20 UNC 2A-2 1/4 LG	8
					938032470	NUT. JAM 5/8-11 UNC-28	1
					938130470	WASHER 5/8 ID	1
					938131200	PIV ROLL 5/16 DIA. 2 1/4 LG 2 1/4 LG	1
					938430400	SCR. PAN HD SELF TAP 2 1/4 LG 2 1/4 LG	4
					938128180	PIV. ROLL 1/4 DIA. 2 1/4 LG 2 1/4 LG	2
					973000000	ELBOW BR. 90° 1/8 NPT 2 1/2 TUBE	2
					971420000	NIPPLE 1/8 2 CLOSE BRASS	1
					971201800	COUPLING 1/8 NPT BRASS	1
					977000020	CONNECTOR STRG 1/8 NPT 2 1/2 LG	1

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB. ASSY	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00798580	00802320	00798630	00851920		008319-20	VALVE ASSY. 2-1/2 HYD. THRUHORN	
					008321-20	ACTUATOR	
					008323-10	TUBE - CYLINDER	1
					008778-10	PISTON W/CK	1
					008778-10	ROD CYLINDER	1
					008778-10	CAP - END	2
					008778-10	MUNA CUP	2
					008778-10	O-RING - OIE BUNA-N	2
					008778-10	O-RING - OBI BUNA-N	2
					008778-10	O-RING - 206 BUNA-N	1
					008778-10	NUT. HEX. JAM 1/2-20	3
					008778-10	LOCKWASHER INT 1/2	2
					008778-10	SEAL - STATO - 1/2	2
00798580	00791420				007915-20	VALVE ASSY. 2-1/2 HYD. THRUHORN	1
					007915-20	HANGER ASSY - PIPE	1
					007915-20	MOUNT ASSY HANGER	1
					007915-20	SADDLE 4" STY/2 2-1/2" TAP	1
					007915-20	BASKET	1
					008447240	SCR. HEX. HD. 5/8-11 x 1 1/2 PLY.	4
					008447240	NUT HEX. 5/8-11 PLY.	4
					008447240	LOCKWASHER 5/8 SPLIT PLY	4
00798580	00791420	00791320			007912-20	HANGER ASSY - PIPE	1
					007912-20	MOUNT - HANGER	1
					007912-20	PLATE - MOUNT	1
					007912-20	NIPPLE - MOUNT	1
00805810						COVER - BASE	1
00804710						BASKET - B/ 2 COVER	1
00804380						PLATE, COVER - CONTROL BRACKET	1
00804380						BASKET - CONTROL BRK COVER PLT	1

P-4 AIR TRANSPORTABILITY CONVERSION KIT

BILL OF MATERIAL

PART NO. 007980-10

ITEM P/N	SUB. ASSY	1ST SUB.	2ND SUB.	3RD SUB.	INDIVIDUAL P/N	DESCRIPTION	QTY
00303710						COVER- CABLE HOUSING	1
00803210						GASKET -CABLE HOUSING COVER	1
00803510						PLATE, COVER - ROOF LOCK	1
00804910						GASKET -ROOF LOCK COVER PLT	1
00803680						PLATE - FEEDLINE	1
00805110						GASKET - FEED, LNE PLATE	1
93543120						SCR. HX. HD. CAP 1/4- 20 x 1-1/4 LG. SS.	6

END

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