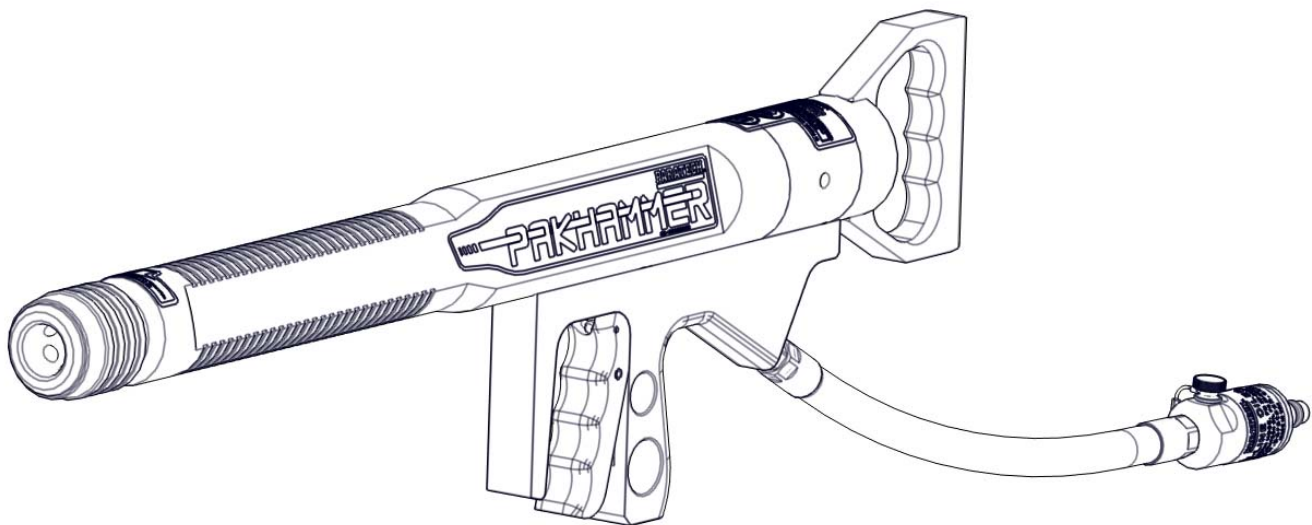




OPERATION AND MAINTENANCE MANUAL FOR PAKHAMMER



5 AUGUST 2014

PN 22-550096G2

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I-VALIDATION

Except as stated in II, the technical manual identified above has been satisfactorily validated in accordance with all requirements of the applicable contract. The technical manual is hereby certified to be accurate and complete, and the information, instructions, text, and illustrations conform in all respects to the applicable general and detailed specifications.

II - EXCEPTIONS

EXCEPTIONS

NONE

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1	05 AUG 2014	<p>Page 1-2 Figure 1-1 added new G2 regulator Page 6-2 Figure 6-1 and Page 7-2 and Page 7-3 Table 7-2 added index 51 Qty 4 PN 670572 HI-COLLAR 1/4 LOCK WASHER, SS, index 43 Qty (1) PN 550101 SET SCR 10-24 1/4 CP AS W/NYL was PN 550648 TUBE, Pilot, index 38 Qty (1) PN 550102 SET SCR #10-24 X 1/8" CP SS W/NYL was PN 895289 SETSCREW, Hex Socket Head #10-24 X 5/16", index 47 added taped hole #6-32 , index 48 PN 550091 Qty (2) was (1) SET SCR 6-32X3/16 CUP SS W/NYL was SETSCREW, Hex Socket Head #6-32 X 3/16"</p> <p>Page 6-6 6-5.1 DISASSEMBLY OF OILER AND HOSE ASSEMBLY was 6-4 DISASSEMBLY OF OILER AND HOSE ASSEMBLY</p> <p>Table 1-1 Page 1-1: 158 ft-lbs @ 50 psi to 876 ft-lbs @ 200 psi (214 N·m @ 3.44 bar to 1188 N·m @ 13.8 bar) was 27 ft-lbs @ 50 psi to 97 ft-lbs @ 200 psi (36.6 N·m @ 3.44 bar to 132 N·m @ 13.8 bar), @ 40 psi was SCFM, 8.5 scfm (241 l/m) was 1.17 scfm (31.63 l/m), 19 scfm (538 l/m) was 6.1 cfm (154 l/m), 1000-1100 was 600-720.</p> <p>Page 2-1: Deleted 5.2 cfm (137 l/m) at, 40 to 200 psi (2.8 bar to 13.8 bar) was 100 to 200 psi (6.9 bar to 13.8 bar).</p> <p>Page 3-1: 1050 blows per minute at a 200 psi pressure with consumption of 19 scfm (538 l/m) was 720 blows per minute at a 100 psi pressure with consumption of 6.1 cfm (173 l/m).</p> <p>Page 6-1: Remove set screw (38) and (43). Was Remove set screw (38).</p> <p>Page 6-5: install the screws with lock washers (51) was install the screws.</p> <p>Page 6-6: install setscrew (38) and (43) was install setscrew (38)</p>	SIGNATURE ON FILE

FOREWORD

This technical manual conforms to Military Specifications MIL-M-38784, General Style and Format Requirements, MIL-M-7298 Commercial Equipment Technical Manual and MIL-M-15071 Equipment and Systems Content Requirements for Technical Manuals. The manual contains description, operating instructions, theory of operation, scheduled maintenance recommendations, troubleshooting, corrective maintenance and parts lists for the Pakhammer manufactured by Paratech Incorporated, 1025 Lambrecht Road, Frankfort, Illinois 60423-1648.

All pertinent data relative to the Pakhammer is contained herein without specific reference to other publications. Refer to the table of contents for the arrangement of the contents within this publication.

This manual consists of one volume managed in seven chapters as follows:

Chapter 1 - General Information and Safety Precautions

Chapter 2 – Operation

Chapter 3 - Theory of Operation

Chapter 4 - Scheduled Maintenance

Chapter 5 – Troubleshooting

Chapter 6 - Corrective Maintenance

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SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures, and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

Keep the work area clean when maintaining or repairing the Pakhammer.

Personnel not directly involved in operation or maintenance of the Pakhammer should keep a safe distance from the work area.

Operation of the Pakhammer by unauthorized personnel or minors is prohibited.

Use the proper tool bit for each application.

Do not force the tool bit during operation of the Pakhammer.

Wear proper apparel and safety goggles.

Use a respirator in contaminated environments.

During operation, do not over reach. Keep stable footing and balance at all times

Do not carry the Pakhammer by the oiler hose.

The following warnings and cautions appear in the text of this manual, and are repeated here for emphasis:

WARNING

Never point the Pakhammer toward yourself or other personnel. Serious injury or possible death could result (Page 2-1)

WARNING

Springs (40) are compressed within the cylinder (47) and upon removal of all four screws (25) may project the shuttle valve assembly (26 through 31) and/or piston assembly (33 through 36) rearward with sufficient force to injure personnel. (Page 6-3)

WARNING

Dry cleaning solvent (P-D-680 Safety or Stoddard's Solvent) is potentially dangerous. Avoid repeated or prolonged breathing of vapors and skin contact with the liquid. Do not use near an open flame, arcing equipment or other ignition sources. Always use eye protection and protective clothing.

Serious injury could occur if compressed air is directed against the skin. Do not use compressed air unless the pressure is/has been reduced to 30 psi (2.06 bar) or less. When working with compressed air, always use chip guards, eye protection and other protective equipment. (Page 6-4)

CAUTION

Do not "trigger" (operate) the Pakhammer unless the tool bit is held **firmly** against the work surface as shown in the depictions of Figure 2-1. Damage to the Pakhammer will result.

**CHAPTER 1
GENERAL INFORMATION AND SAFETY PRECAUTIONS**

1-1 SAFETY PRECAUTIONS.

Refer to the Safety Summary preceding Chapter 1, General Information and Safety Precautions, for safety precautions necessary for the protection of personnel and equipment.

1-2 INTRODUCTION.

This technical manual provides instructions for the operation, maintenance, repair, and parts support for the Pakhammer manufactured by Paratech Incorporated, 1025 Lambrecht Road, Frankfort, Illinois 60423-1648.

1-3 EQUIPMENT DESCRIPTION.

The Pakhammer is a portable, pneumatic impact tool designed for forcible entry (piercing, cutting, and breaking) during firefighting and rescue operations. The Pakhammer is also designed for medium duty breaking/breaching of masonry walls digging/tunneling operations. The Pakhammer employs operating pressures of 40 to 200 psi (pounds per square inch) (2.8 to 13.8 bar) depending upon the material to be broken, cut or penetrated. Operating air can be obtained from any air source such as an air compressor or a SCBA (self-contained breathing apparatus) air cylinder. Conservation of operating air is achieved through air utilization only on the power stroke with virtually no air loss. An integrated spring retracts the piston on the return stroke. The 5.214 inch (132.44 mm) stroke provides very high impact energy for the size and weight of the Pakhammer. The Pakhammer is designed to use 0.475" (12.07 mm) shank diameter tools made from S-7 tool steel.

1-4 RELATIONSHIP OF UNITS.

Refer to figure 1-1 for a pictorial illustration of the Pakhammer components, the relative size of each component and the interconnection between components.

1-5 REFERENCE DATA.

Reference data pertaining to the Pakhammer are summarized for quick reference in table 1-1.

1-6 EQUIPMENT, ACCESSORIES AND DOCUMENTS SUPPLIED.

1-6.1 EQUIPMENT SUPPLIED. Data pertaining to the dimensions and weight of the Pakhammer are presented in table 1-2.

1-6.2 ACCESSORIES. Accessories are required for operation of the Pakhammer. Refer to Chapter 2 for their use and table 7-3 for their identification.

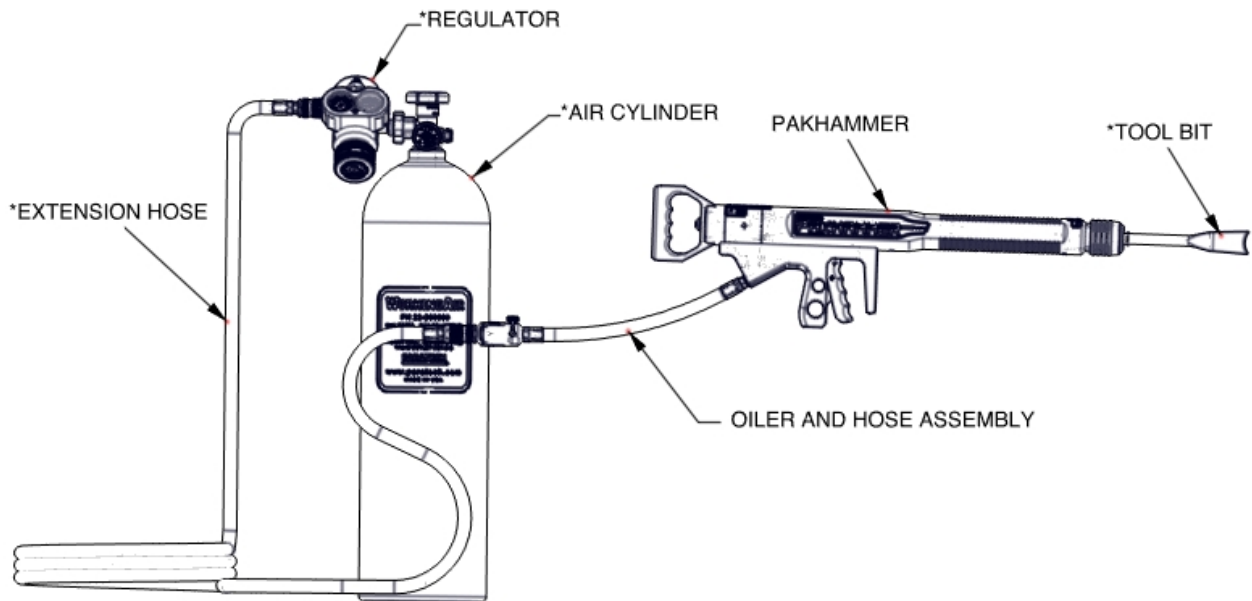
1-6.3 DOCUMENTS SUPPLIED. No documents other than this publication are required as supporting literature for the Pakhammer.

Table 1-1. Reference Data

Manufacturer.....	Paratech, Incorporated 1025 Lambrecht Road Frankfort, IL 60423-1648
CAGE Code.....	30978
Pakhammer	
Part Number.....	550500G2
Overall Length (Approx.).....	27.00" (685.8 mm)
Overall Width (Approx.).....	7.78" (197.6 mm)
Overall Thickness.....	2.23" (56.64 mm)
Overall Weight.....	11.1 lbs. (5.03 kg)
Operating Conditions	
<u>Power Output:</u>	
158 ft-lbs @ 50 psi to 876 ft-lbs @ 200 psi (214 N-m @ 3.44 bar to 1188 N-m @ 13.8 bar)	
<u>Operating Pressure:</u>	
40 to 200 psi (2.8 to 13.8 bar)	
<u>Air Consumption @ 40 psi</u>	
8.5 scfm (241 l/m)	
<u>Air Consumption (@ 200 psi):</u>	
19 scfm (538 l/m)	
Blows/Minute (Approximate).....	1000-1100
Piston Stroke.....	5.124" (132.44 mm)
Cylinder Bore.....	1.188" (30 mm)
Hose Size.....	3/8" (9mm)

Table 1-2. Dimensions, Weights and Volumes

Quantity	Item Name or Nomenclature	CID Number RIC Number or Unit Number	Dimensions in Inches (Millimeters)		Overall Weight in Pounds (Kilograms)		Volume in Cubic Feet (Meters)	
			Uncrated	Crated	Uncrated	Crated	Uncrated	Crated
1	Pakhammer	550500G2	27.0 long (685.8)	28.0 long (711.2)	11.1 (5.03)	11.75 (5.33)	0.052 (0.001)	.583 (0.017)
			7.78 wide (197.6)	6.0 wide (152.4)				
			2.2 thick (55.9)	6.0 high (152.4)				



*Denotes not supplied with part number 550500G2 Pakhammer. Ordered and supplied separately.

Figure 1-1. Pakhammer

CHAPTER 2 OPERATION

2-1 INTRODUCTION.

The Pakhammer is a portable pneumatic tool, utilized by a single operator and designed for forcible entry (piercing, cutting, and breaking) during firefighting and rescue operations. It may be activated from any air source (air compressor or air cylinder) capable of supplying 40 to 200 psi (2.8 bar to 13.8 bar).

2-2 PREPARATION FOR USE.

- a. Remove the Pakhammer from its storage container. If the oiler and hose assembly is not connected, firmly attach the oiler and hose assembly to the Pakhammer handle. Do not carry the Pakhammer by the oiler hose. Verify the lubricant level in the oiler is proper (one-half full). If necessary, fill the oiler half-full with Marvel®, Air Tool Oil, Turtle Wax, P.O. Box 247, Westmont, IL 60559-0247 (Paratech PN 550291).
- b. Select the proper tool bit for the specific work to be accomplished. The tool bits are 0.475" (12.07 mm) shank diameter made from heat treated S-7 tool steel. Pull back the tool retainer release ring, insert the tool bit fully into the retainer body and the release the release ring. The release ring should be in the fully forward position.
- c. The Pakhammer is designed to operate on air pressures between 40 and 200 psi (2.8 to 13.8 bar). For maximum efficiency, use only the operating pressure to accomplish the task. Excessive pressure can actually hinder the actual operation and result in excessive operator fatigue. Refer to table 2-1 for starting point pressures and recommended tool bits. Adjust the air supply pressure regulator for the desired pressure. Do not exceed the maximum operating pressure of 200 psi (13.8 bar). Connect the air supply to the oiler and hose assembly and turn on the air supply line valve to apply air pressure to the Pakhammer.

2-3 CONTROLS AND INDICATORS.

The only control on the Pakhammer is a trigger lever located in the pistol grip handle. Pull the spring loaded trigger lever to start operation. Release the trigger lever to stop operation.

2-4 APPLICATIONS (Refer to Figure 2-1).

- a. General air impact hammer – use in rescue or industry.
- b. Rescue/forcible entry – breaks doors, locks, padlocks, hasps.
- c. Extrication – from automobiles, trucks, buses, transportation accidents.
- d. Rescue from entrapped environments – earthquakes, collapse.
- e. Crash rescue from aircraft – cut skins, spars, canopies.
- f. Crash firefighting – piercing application for dispensing extinguishing agents.
- g. Damage control – access to compartments through watertight doors, heavy sheet metal.
- h. Breaks and punches holes – concrete, asphalt.

2-5 NORMAL OPERATING PROCEDURE.

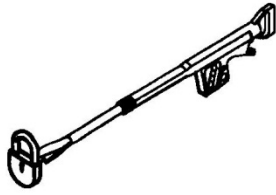
WARNING

Never point the Pakhammer toward yourself or other personnel. Serious injury or possible death could result.

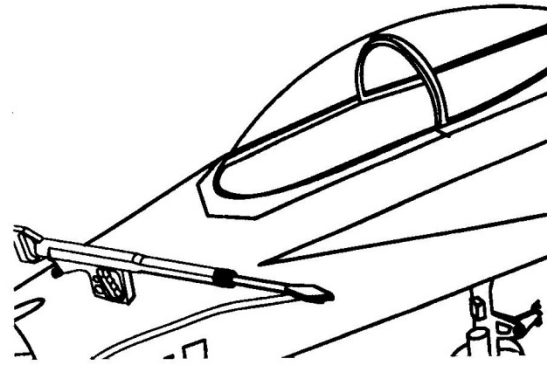
CAUTION

Do not "trigger" (operate) the Pakhammer unless the tool bit is held **firmly** against the work surface as shown in the depictions of Figure 2-1. Damage to the Pakhammer will result.

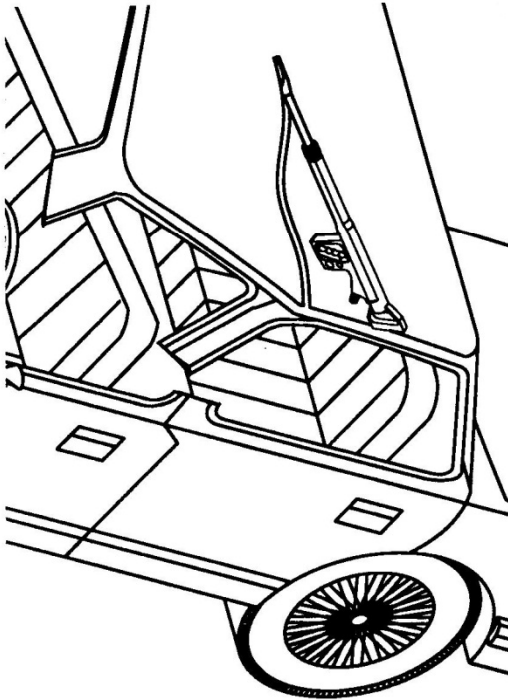
- a. With the tool bit installed, hold the Pakhammer **firmly** against the work surface as shown in the depictions of Figure 2-1.
- b. Pull the trigger lever to operate the Pakhammer. If "recoil" (Pakhammer backs off work surface) is experienced, reduce the operating pressure until the Pakhammer can be held firmly against the work surface.



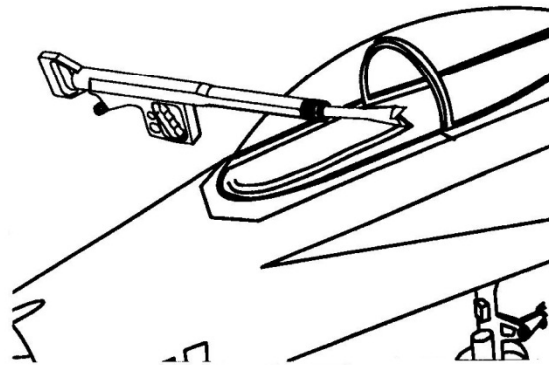
**BREAKING PADLOCK
(TOOL BIT D)**



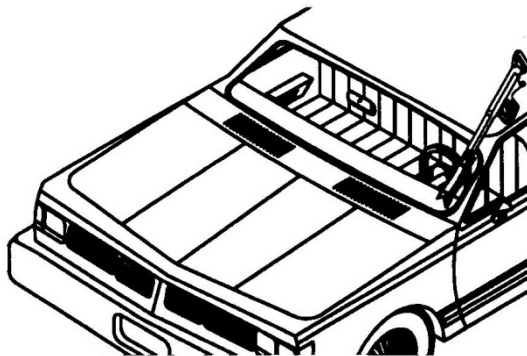
**CUTTING AIRCRAFT SKIN
(TOOL BITS C, F OR I)**



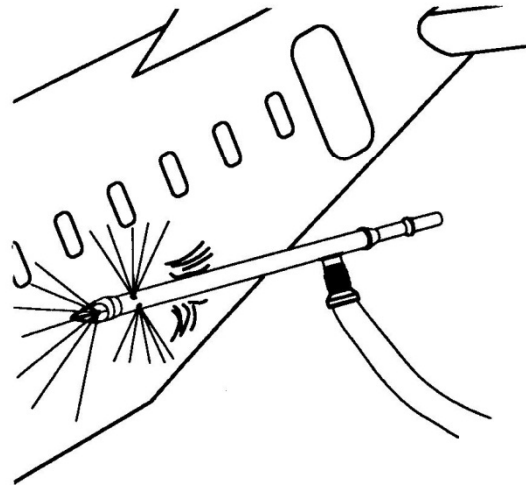
**CUTTING DOORPOSTS AND ROOF, THEN PEELING
BACK ROOF (TOOL BITS E, F OR L)**



**CUTTING AIRCRAFT CANOPY
(TOOL BITS C, F, I OR L)**

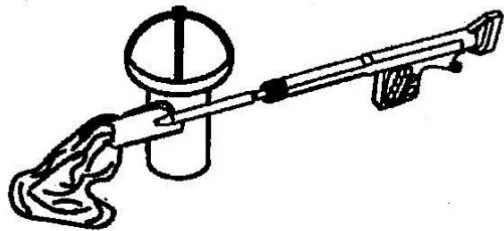


**CUTTING WINDSHIELD
(TOOL BIT I)**

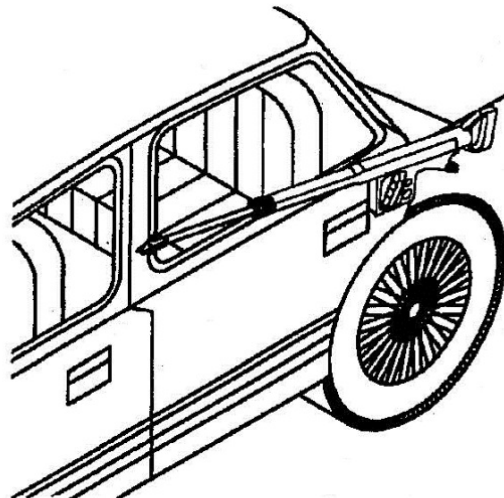


**PIERCING AIRCRAFT SKIN AND EXTINGUISHING FIRE
(TOOL BITS J OR K) *SEE NOTE**

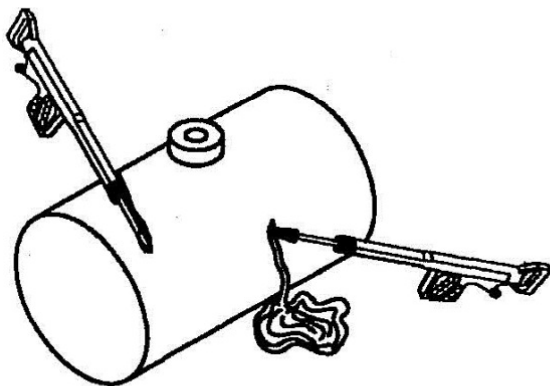
Figure 2-1. Typical Applications



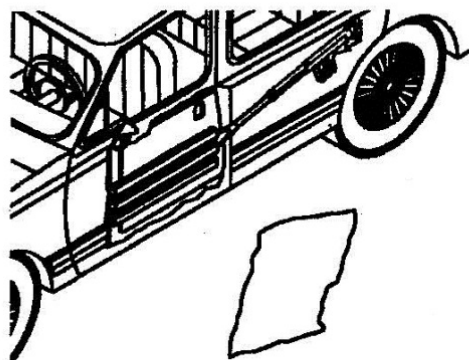
BREAKING ICE FROM FROZEN HYDRANT
(TOOL BIT H)



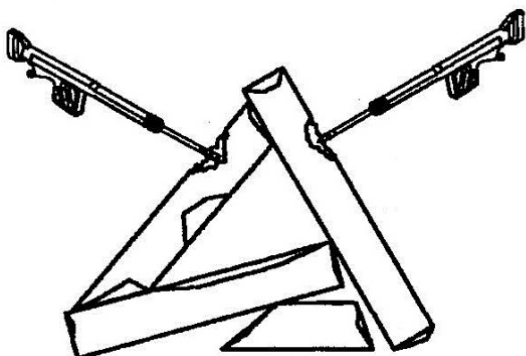
CUTTING DOORPOST
(TOOL BITS B OR C)



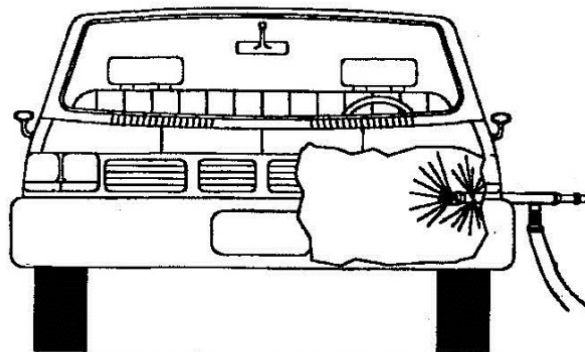
CUTTING TANK (TOOL BITS C, E OR F) AND
PLUGGING LEAK (TOOL BIT G)



CUTTING DOORLOCK
(TOOL BIT L)



BREAKING CONCRETE
(TOOL BIT A OR C)



PIERCING QUARTERPANEL AND EXTINGUISHING
ENGINE FIRE (TOOL BIT J OR K) *SEE NOTE

Figure 2-1 Typical Applications - Continued

- c. During operation, check periodically to determine if a fine misting of oil is present in the air exhausting from the cylinder ports.
- d. To stop the Pakhammer operation, release the trigger lever.

Note: When using the piercing applicators, penetrate the work surface BEFORE connecting the hose. This will prevent damage to the hose coupling from Pakhammer vibration.

2-6 SHUTDOWN.

- a. At the conclusion of its use, shut off the external air supply.
- b. Hold the tool bit against a working surface and pull the trigger lever to dissipate air in the supply line.
- c. Disconnect the air supply line from the oiler connection.
- d. Perform the after use maintenance specified in chapter 4 and stow the Pakhammer in its storage case in a dry environment.

Table 2-1. Operating Pressure and Tool Bit Recommendations

APPLICATION	RECOMMENDED PRESSURE		TOOL BIT (See Table 2-2)
	PSI	BAR	
Breaking concrete	125 – 200	8.6 – 13.8	A, B
Breaking hollow concrete block	100 – 150	6.9 – 10.3	A, B, H
Breaking car door hinges	150 – 200	10.3 – 13.8	B, L
Breaking locks	100 – 200	6.9 – 13.8	B, D, L
Breaking padlocks	125 – 200	8.6 – 13.8	D
Cutting light sheet metal	75 – 150	5.2 – 10.3	C, E, F, L
Cutting metal containers and tanks	75 – 200	5.2 – 13.8	C, E, F, I, L
Cutting sheet metal ducts	100 – 200	6.9 – 13.8	C, E, F, I, L
Cutting automobile door posts	100 – 150	6.9 – 10.3	B, C, I, L
Cutting aircraft skin	75 – 150	5.2 – 10.3	C, F, I, L
Cutting aircraft canopies	50 – 200	3.5 – 13.8	C, F, I, L
Cutting ship watertight doors	100 – 200	6.9 – 13.8	C, E, F, I
Popping rivets	75 – 200	5.2 – 13.8	B, H
Breaking ice	50 – 75	3.5 – 5.2	A, B, H
Breaking frozen earth	50 – 100	3.5 – 6.9	A, B, H
Shattering castings	100 – 200	6.9 – 13.8	A, B
Plugging leaks	50 – 150	3.5 – 10.3	G
Piercing aircraft skin/canopies	75 – 170	5.2 – 11.7	A, J, K
Piercing watertight doors	125 - 200	8.6 – 13.8	A, J, K

Table 2-2. Tool Bit Code (See Figure 2-2)

CODE	NOMENCLATURE	PARATECH PART NUMBER
A	Bullpoint	550586, 550588
B	Chisel	550582, 550583
C	Deep Panel Cutter	550590, 550591
D	Lock Breaker/Cutter	550596
E	Dual Cutter	550592
F	Dual Cutter with Bullpoint	550594
G	Plug Driver and Plug	550598, 550246
H	Spade/Scraper	550595
I	Heavy Duty Metal Cutter	550273
J	6" Piercing Applicator	550241
K	14" Piercing Applicator	550251
L	Curved Metal Cutter	550584

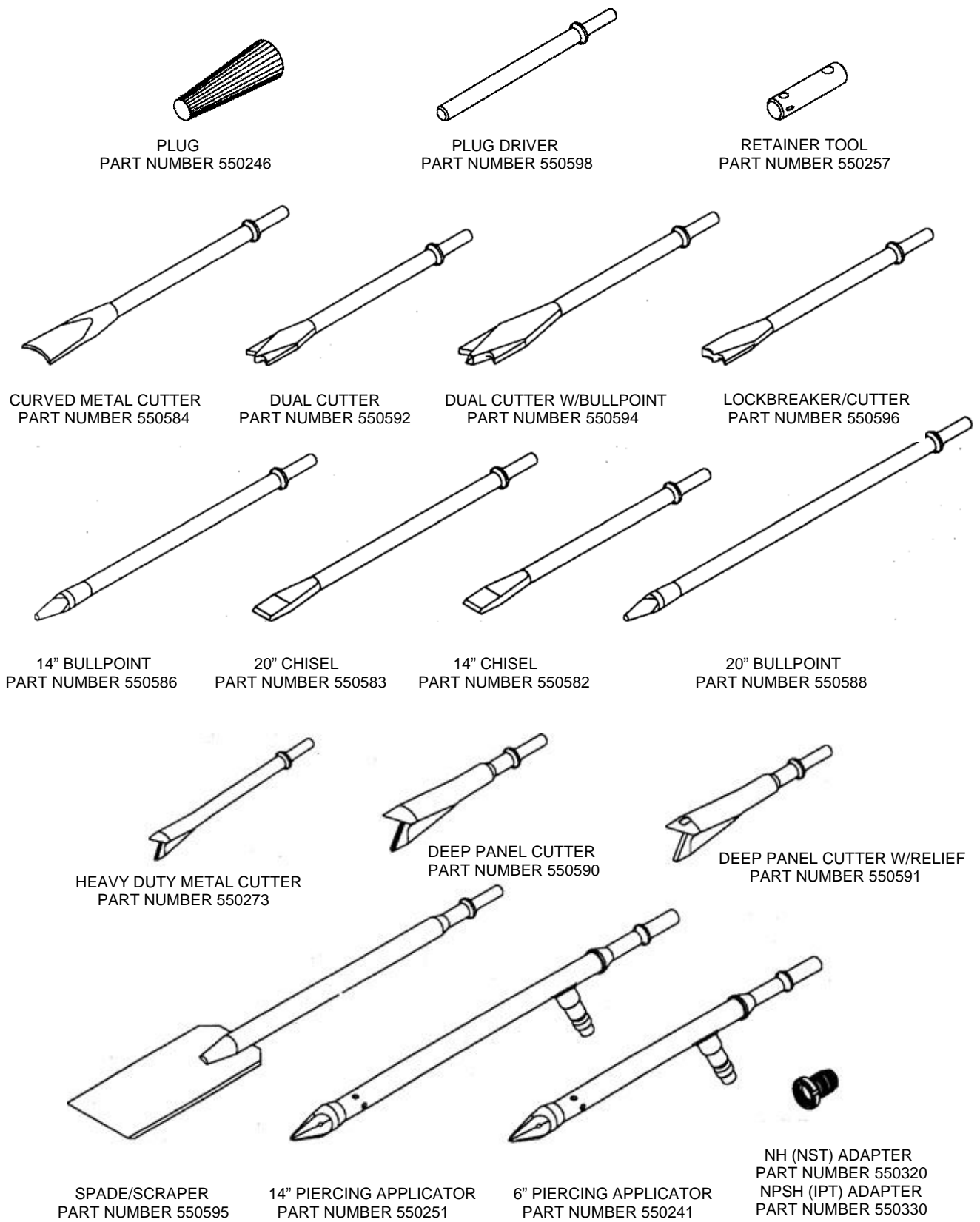


Figure 2-2. Tool Bits

CHAPTER 3 THEORY OF OPERATION

3-1. GENERAL.

This chapter contains a theory of operation for the Pakhammer enabling maintenance personnel to more effectively understand and troubleshoot the Pakhammer in the event of a malfunction. The cutaway illustration, figure 3-1, is to be used in conjunction with the following theory of operation.

The Pakhammer is a portable (lightweight, and easily handled and operated), pneumatic impact tool designed for forcible entry during rescue and firefighting operations. Operating air may be obtained from either an air compressor or air cylinder. By varying the pressure of the operating air, the impact force of the blows generated by the Pakhammer can be used for a variety of different purposes. The pressure range over which the Pakhammer will operate is 40 to 200 psi (2.8 to 13.8 bar) resulting in approximately 1050 blows per minute at a 200 psi pressure with consumption of 19 scfm (538 l/m).

3-2. GENERAL CONSTRUCTION.

The Pakhammer cylinder, handles, valve body and valve cover are fabricated from aluminum alloy. The piston rod and springs are fabricated from alloy steel. All fasteners are stainless steel. Components of the tool retainer assembly are hardened steel alloy.

3-3. THEORY OF OPERATION.

a. The Pakhammer is activated by pulling (squeezing) the trigger lever (part of the pistol grip handle) permitting external operating air to enter the handle assembly through the oiler and hose assembly threaded connection. As external operating air passes through the oiler,

a controlled volume of lubrication is picked up with the air to maintain continuous fog lubrication of the Pakhammer internal components during operation.

- b. Operating through a trigger link, the normally spring closed trigger valve plunger unseats permitting operating air to enter, through an air inlet passageway, the shuttle body chamber at the rear of the piston rod. The piston rod is restrained in a rearward position by two piston return springs. The compressed air at the rear of the piston rod propels the piston rod forward striking the installed tool bit to drive it forward while simultaneously driving the shuttle valve rearward to seal the exhaust ports in the shuttle valve body.
- c. As the piston rod is propelled forward and passes the pilot tube port, compressed air is conveyed through the pilot air passage to the rear of the shuttle valve driving it forward sealing the air inlet passageway to the rear of the piston rod while simultaneously opening the exhaust ports to evacuate any residual internal compressed air to the atmosphere.
- d. With no air pressure at the rear of the piston rod, the piston rod is returned to its rearward position by the piston return springs. The button at the rear of the piston rod contacts the shuttle valve and drives it rearward to again open the air inlet passageway to the rear of the piston rod and seal the exhaust ports in preparation for another operating cycle. This operating cycle will repeat until the trigger lever is released, seating the trigger valve plunger and sealing the air inlet port thereby preventing external operating air from entering the air inlet passageway.

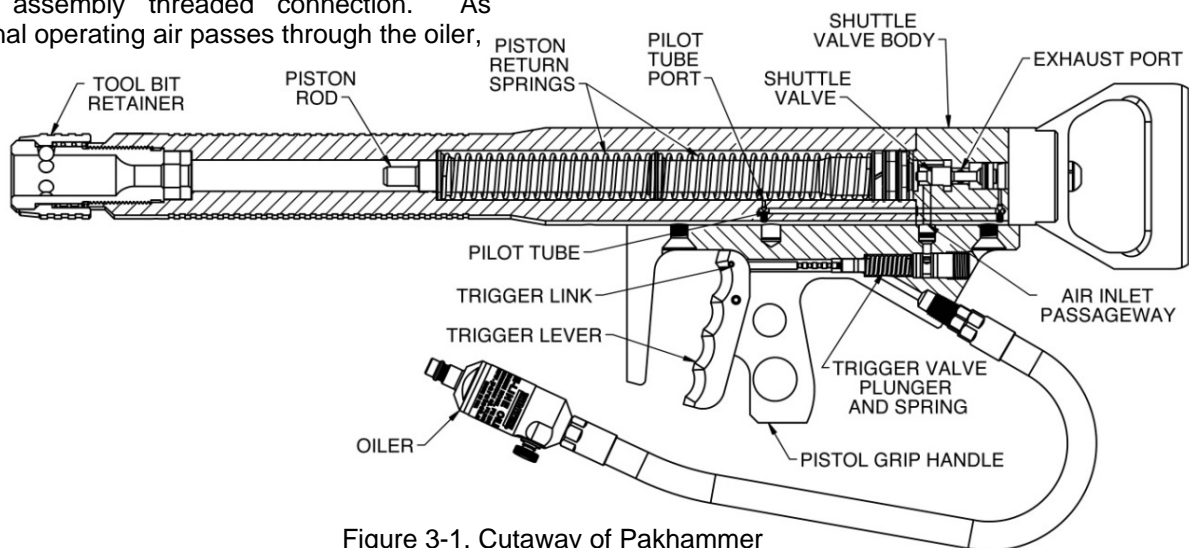


Figure 3-1. Cutaway of Pakhammer

CHAPTER 4 SCHEDULED MAINTENANCE

4-1 INTRODUCTION.

The Pakhammer requires little maintenance to ensure optimum performance. This chapter provides preventative maintenance procedures.

4-2 MAINTENANCE PLAN.

Preventative maintenance of the Pakhammer is accomplished in accordance with the Pakhammer maintenance schedule, table 4-1.

4-3 GENERAL MAINTENANCE.

4-3.1 GENERAL.

General maintenance shall be performed as detailed in this chapter using the maintenance schedule in table 4-1. This chapter will provide the step-by-step procedures that are necessary to verify that the Pakhammer is operating satisfactorily.

4-3.2 SURFACE CLEANING.

- a. Keep the exterior of the Pakhammer clean of all dirt and grit accumulations. Wipe exterior surfaces with a lint-free cotton machinery wiping towel lightly dampened with clean water. Then dry the surfaces thoroughly with clean, dry, lint-free cotton machinery wiping towels or low pressure compressed air. Compressed air may be used for cleaning in less accessible areas.

- b. If the Pakhammer has been operating in a dusty, abrasive environment or an environment when the tool retainer assembly is subjected to a damp or wet material, immerse the Pakhammer vertically with the tool retainer assembly facing down into a container of dry cleaning solvent (specification P-D-680, Safety or Stoddard's Solvent) and agitate the Pakhammer up and down in order to clean all debris out of the tool retainer assembly. When clean, apply a thin coating of Marvel®, Air Tool Oil, Turtle Wax, P.O. Box 247, Westmont, IL 60559-0247 (Paratech PN 550291) to the tool retainer assembly, pulling the release ring back and forth while applying the lubricant in order to assure lubrication of the spring and balls.

4-3.3 INSPECTION.

- a. Do not paint any components of the Pakhammer. Check for loose hardware and cracked or deformed parts. Check for o-ring seal leakage in a static (non-operating) and dynamic (during operation) condition.
- b. During operation, verify oil mist is present in the air coming out of the valve body exhaust ports. Also check for air leakage at juncture of handle and cylinder, handle and shuttle valve assembly, and shuttle valve assembly and cylinder. Any leakage of air or oil at these mating interfaces denotes either a loose connection (tighten hardware) or a defective o-ring seal that necessitates replacement.

Table 4-1. Maintenance Schedule

Frequency	Maintenance Requirement	Applicable Paragraph
During Use	Check for stalling and loss of power. Verify oil mist is present in the exhaust air. Check for air leakage at junction of handle and cylinder, handle and shuttle valve assembly, and shuttle valve assembly and cylinder.	4-3.3
After use	Clean all dust, dirt, and other debris from Pakhammer, verify all fasteners are secure, lubricate the tool retainer assembly and fill the oiler.	4-3.2, 4-3.3

CHAPTER 5 TROUBLESHOOTING

5-1 GENERAL.

This chapter contains troubleshooting data in the form of a conventional troubleshooting chart. Troubleshooting is required only when malfunctions are detected either during normal operation or during periodic servicing of the Pakhammer.

NOTE: WITHIN ONE YEAR OF PURCHASE DATE, REPAIRS MUST BE MADE BY THE MANUFACTURER OR WARRANTY (PAGE 7-4) IS VOID.

Refer to chapter 3 for a theory of operation that is helpful when used in conjunction with the Pakhammer troubleshooting guide given in Table 5-1. Refer to figure 6-1 for parts identified by index numbers.

Table 5-1. Troubleshooting

TROUBLE	PROBABLE CAUSE	REMEDY
Piston Stops Reciprocating.	Air supply interrupted.	Turn on air supply to Pakhammer. Check pressure at air supply. Check hose for bends and kinks.
	Damage to rear bumper (35).	Replace rear bumper.
	Broken main piston spring(s) (40).	Replace main piston springs as a set.
	Broken shuttle valve assembly (28 thru 32).	Replace shuttle valve assembly.
	Plugged holes in shuttle valve assembly, handle assembly (3 through 12) and/or cylinder (47).	Clean all air passages to assure free flow of air.
Piston Stalls - Slow Operation.	Piston rod (39) or or shuttle valve assembly frozen.	Warm Pakhammer and air supply with a heat gun.
	Lack of lubrication.	Fill oiler and hose assembly (49) 1/2 full

Table 5-1. Troubleshooting - Continued

TROUBLE	PROBABLE CAUSE	REMEDY
Loss of Power	Defective shuttle valve assembly (air leaks from exhaust port).	Replace shuttle valve assembly.
	Air supply pressure ports partially blocked (covered) or obstructed (dirty).	Unblock and/or clean air supply pressure ports.
	Leaks around piston assembly.	Replace forward o-ring seal (27) and U-cup seal (37).
	Damage to rear bumper (35).	Replace rear bumper.
	Worn piston spring (40).	If either spring is shorter than 7-1/8" (181 mm), replace both piston springs as a set.
	Dull tool bit.	Sharpen tool bit.
Tool Bit Stuck	Flange on tool bit is flared or otherwise damaged.	Replace tool bit and check for damage to balls (18) and release ring (17).
	Tool bit too soft.	Use proper tool bits for pressures being used.
	Tool bit not held against work when operating.	Do not operate Pakhammer without holding tool bit against work.
	Air pressure too high.	Reduce air pressure.

CHAPTER 6 CORRECTIVE MAINTENANCE

6-1 INTRODUCTION.

This chapter provides repair procedures for the Pakhammer. **NOTE: WITHIN ONE YEAR OF THE PURCHASE DATE, REPAIRS MUST BE MADE BY THE MANUFACTURER OR WARRANTY (PAGE 7-4) IS VOID.** If it is determined from table 5-1 that repairs are required, proceed with the following:

6-2 ADJUSTMENTS.

The only adjustment of the Pakhammer is the assembled distance, 5.120" (130 mm), between the front of trigger link (11, figure 6-1) and the back of trigger valve plunger (8). This adjustment is made only if operation commences with either no "triggering" or when the Pakhammer is "just barely triggered". Screw the trigger link into the trigger valve plunger until the 5.120" (130 mm) dimension is achieved. A minimum amount of trigger lever (4) play should be present before operation commences.

6-3 ALIGNMENT.

No alignment is required on any part of the Pakhammer.

6-4 PAKHAMMER REPAIR.

6-4.1 The following procedures describe one method of complete disassembly of the Pakhammer. Work in a clean area and place all disassembled parts on clean shop wipes. All parts subjected to any air passage should exhibit a film of lubricant. If clamping is required, use pads to prevent scratching/scoring/abrading the clamped parts. When repairing the Pakhammer, remove only those parts determined to be broken, cracked, deformed or otherwise damaged. During inspection, parts exhibiting any damage characteristics referenced herein should be replaced with the exception of minor thread damage repair, apply only the procedural steps that are applicable to the work to be performed. Prior to disassembly of the Pakhammer, unscrew the oiler hose assembly from the Pakhammer. Refer to figure 6-1 and proceed as follows:

6-4.2 DISASSEMBLY OF TOOL RETAINER ASSEMBLY.

- a. Install retainer service tool (15) into retainer body (21) by pulling back release ring (17), inserting the retainer service tool with the ball recesses entering the retainer body, and then release the release ring. Rotate the retainer service tool until balls (18) engage the recesses locking the retainer service tool in the retainer body.

NOTE

A thread sealant has been applied to retainer body (21) and set screw (38) and significant force is required for their removal. Heating the front of cylinder (47) with a heat gun (do not use a torch) will soften the thread sealant and facilitate removal of the retainer body and set screw.

- b. Remove set screw (38) and (43). Insert a tool bit through the hole in retainer service tool and unscrew retainer body (21) from cylinder (47). It may be necessary to hit the tool bit/rod with a hammer to turn the retainer body out of the cylinder.
- c. Remove release ring spring (16), release ring (17) and six balls (18). Front bumper (20) (Delrin) and front bumper washer (19) (steel) may adhere to retainer body (21) or they may remain in cylinder (47) recess. Remove them and note that the Delrin front bumper must be positioned between the retainer body and steel front bumper washer for proper assembly. Also note that the inside diameter chamfer on the steel front bumper washer is oriented toward the rear of the Pakhammer.
- d. Inspect release ring (17) inside diameter that engages balls (18) for an excessively worn or peened over condition. This generally indicates operation of the Pakhammer without exerting any force on the tool bit. Inspect the ball holes in retainer body (21) for enlargement and distortion. Inspect balls (18) for evidence of scoring, chipping, scratching or other similar damage. Check release ring spring (16) for distortion and a permanent set (loss of compression).

6-4.3 REMOVAL AND DISASSEMBLY OF HANDLE ASSEMBLY.

NOTE

A thread sealant has been applied to all fasteners necessitating the use of hexagon socket keys that are not worn and the application of significant force for their removal.

- a. Unscrew two hexagon socket screws (1) securing the handle assembly to cylinder (47).
- b. Drive out both spring pins (3 and 39) securing trigger lever (4) with pin punch and remove from handle (12).

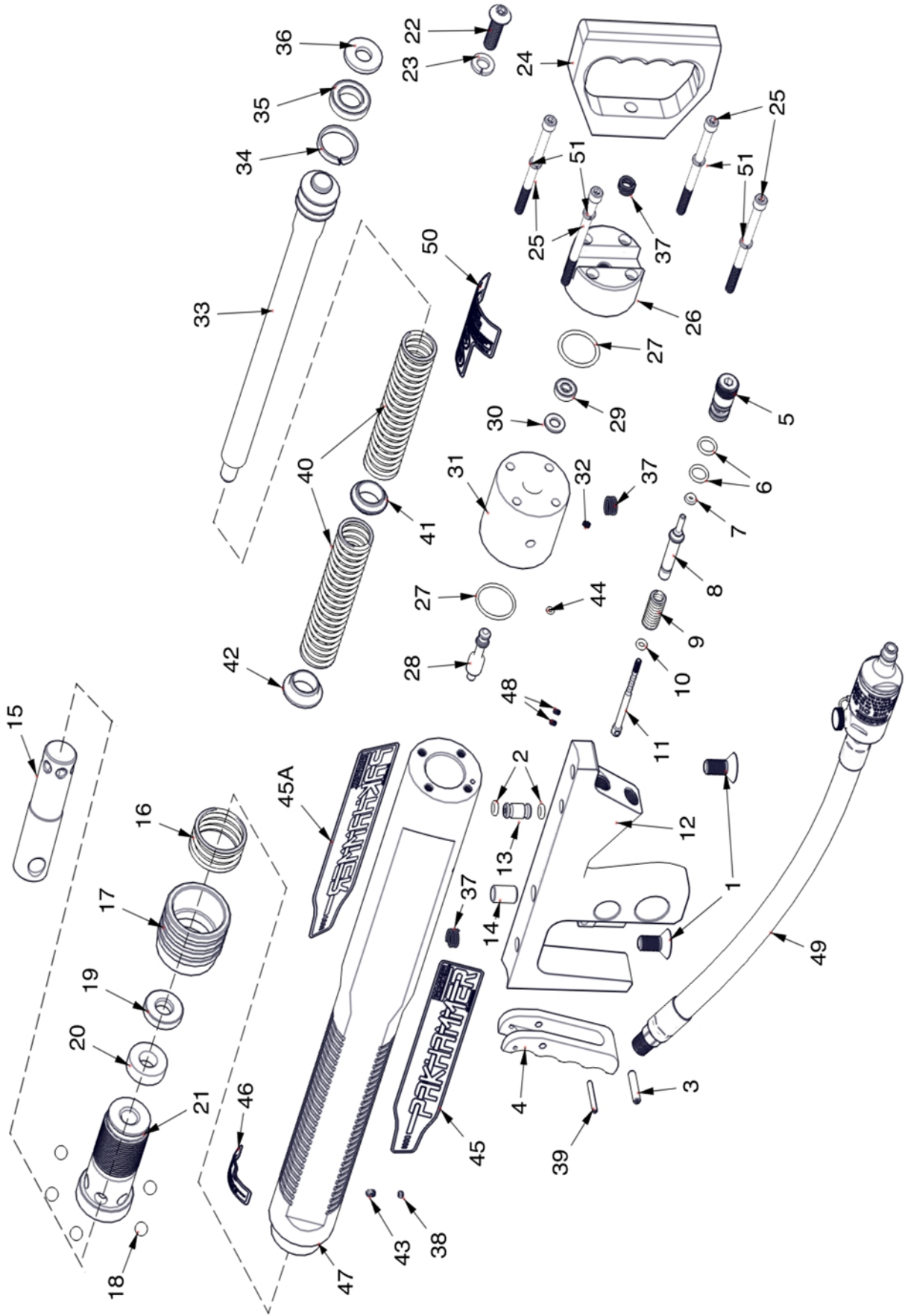


Figure 6-1. Pakhammer Exploded View

- c. If o-ring seal (2) and dowel tube (13) remain in the handle (12) or cylinder (47) recess, remove them and discard the seal only if a replacement is available. If a replacement is not available and the old seal is worn, cut or otherwise damaged, it may result in air leakage from between handle and cylinder but must be reused until a replacement becomes available.
- d. Unscrew trigger valve plug (5) and remove o-ring seals (6) from grooves in the trigger valve plug. Discard the seals only if replacements are available. If replacements are not available and the old seals are worn, cut or otherwise damaged, they may result in air leakage from between the trigger valve plug and handle (12) but must be reused until replacements become available.
- e. Press a small diameter rod into the hole in the front of handle (12) and carefully push trigger valve plunger (8) with attached trigger link (11) and trigger spring (9) out the back of the handle. If triggering of the Pakhammer was proper (very slight trigger pull with no release of air), do not disassemble the trigger valve plunger from the trigger link. If triggering was improper, measure and mark down the distance between the front of trigger link and the rear of trigger valve plunger to assure they are properly adjusted during reassembly. The dimension should be 5.120" (130 mm), but may vary slightly $\pm 1/16$ " (1.6 mm). If it is necessary to unscrew the trigger link from the trigger valve plunger, first heat the joint with a heat gun (not a torch) to soften the thread sealant.
- f. Remove trigger spring (9) and o-ring seals (7 and 10). Discard the seals only if replacements are available. If replacements are not available and the old seals are worn, cut or otherwise damaged, the front seal may result in air leakage from around the trigger lever (4) but must be reused until a replacement becomes available. If the rear seal (7) is worn, cut or otherwise damaged, Pakhammer operation may occur without triggering the Pakhammer. Inspect the trigger valve plunger for scoring, excessive wear and distortion that may result in erratic triggering operation. Check that the trigger link is not bent or the threads damaged. Inspect internal threads in handle (12) for damage such as battered, stripped or cross threads. Minor thread damage can be corrected with a threading tap.

6-4.4 REMOVAL AND DISASSEMBLY OF SHUTTLE VALVE ASSEMBLY.

NOTE

A thread sealant has been applied to all fasteners necessitating the use of hexagon socket keys that are not worn and the application of significant force for their removal,

- a. Remove screw (22) and lock washer (23) securing D handle (24) to valve cover (26); remove D handle.

WARNING

Springs (40) are compressed within cylinder (47) and upon removal of all four screws (25) may project the shuttle valve assembly (27 through 32) and/or piston assembly (33 through 36) rearward with significant force to injure personnel.

- b. Slit label (50) between valve body (31) and cylinder (47). **NOTE: CUT OR DAMAGED LABELS VOID ONE YEAR MANUFACTURER WARRANTY, PAGE 7-4.** Unscrew three of four screws (25) securing valve cover (26) to the valve body. While holding the valve body firmly against the cylinder, remove remaining screw (25) and slowly back off the valve body until the compressive spring force is released. Remove o-ring seal (27). Discard the seal only if a replacement is available. If a replacement is not available and the old seal is worn, cut or otherwise damaged it may result in air leakage from between the valve cover and valve body with a slight loss of power but must be reused until a replacement becomes available.
- c. Press push rod (28) out of valve body (31). Pull u-cup seal (29) and backup washer (30) out of the valve body recess. Note orientation of the u-cup seal and its location relative to the backup washer to facilitate their proper assembly. Discard the seal only if a replacement is available. If a replacement is not available and the old seal is worn, cut or otherwise damaged it may result in air leakage but must be reused until a replacement becomes available. If the seal is sufficiently damaged, it may cause improper shuttling and erratic or lack of operation.
- d. Setscrew (32) should not be removed from the valve body (1) unless air leakage is noted from around the setscrew.

6-4.5 REMOVAL AND DISASSEMBLY OF PISTON ASSEMBLY.

- a. Pull the piston assembly (33 through 36) out of cylinder (47). Inspect the [piston rod (33) for scoring along its length and distortion, fracturing and other similar damage at its tip.
- b. Note the location of wear ring (34), U-cup seal (35), and urethane piston bumper (36) relative to each other and the orientation of the U-cup seal to facilitate proper reassembly. Discard the seal only if a replacement is available. If a replacement is not available and the old seal is worn, cut or otherwise damaged, it may result in air leakage and diminished operation but must be reused until a replacement becomes available. If the seal is sufficiently damaged, it may result in excessive leakage around the piston rod and a complete lack of operation. Inspect the urethane piston bumper for crazing, excessive wear, fracturing and other similar damage.

6-4.6 DISASSEMBLY OF CYLINDER.

- a. Pull pilot tube (43) and o-ring seal (44) out of cylinder (47). Check that the pilot tube is not internally obstructed. Discard the seal only if a replacement is available. If a replacement is not available and the old seal is worn, cut or otherwise damaged, it may result in air leakage from between valve body (31) and cylinder (47) but must be reused until a replacement becomes available. Handle dowel pin (14) need not be removed unless visually damaged. Setscrew (48) should not be removed from the cylinder unless air leakage is noted from around the setscrew. Inspect internal threads in the cylinder for damage such as battered, stripped or cross threads. Minor thread damage can be corrected with a threading tap. Inspect the cylinder bore for scoring along its length.
- b. Pull springs (40) and spring guide bushing (41) out of the cylinder. Do not remove piston rod bushing (42) unless it is damaged. If removed, note orientation of the piston rod bushing to facilitate its proper reassembly. Inspect the springs for distortion and a loss of compression. If both are not the same length and at least 7-1/8" (181 mm) long, replace both springs and the spring guide bushing as a set. Inspect the spring guide bushing for excessive wear, flare out, fracturing or other similar damage.

- c. Do not remove labels (45, 45A, 46, or 50) from cylinder (47) unless their replacement is required. If required, the labels may be peeled off the cylinder. Be sure to clean off all adhesive residue.

6-4.7 CLEANING.

WARNING

Dry cleaning solvent (P-D-680 Safety or Stoddard's Solvent) is potentially dangerous.

Avoid repeated or prolonged breathing of vapors and skin contact with the liquid. Do not use near an open flame, arcing equipment or other ignition sources. Always use eye protection and protective clothing.

Serious injury could occur if compressed air is directed against the skin. Do not use compressed air unless the pressure is/has been reduced to 30 psi (2.07 bar) or less. When working with compressed air, always use chip guards, eye protection and other protective equipment.

- a. No special cleaning procedures are required to clean the disassembled parts of the Pakhammer. Cleaning may be accomplished by washing in a hot soap and water solution. Rinse the parts thoroughly with hot clean water and dry immediately with a clean cloth, shop wipes or compressed air. Exercise care not to scratch any polished surface.
- b. Stubborn deposits may be removed with a dry cleaning solvent (specification P-D-680, safety or Stoddard's Solvent) or equal and a soft bristle of wire brush. Clean thread sealant off part(s) by heating the part(s) with a heat gun (not a torch), applying solvent and scrubbing with a soft bristle of wire brush.
- c. After cleaning, apply a thin coating of Marvel®, Air Tool Oil, Turtle Wax, P.O. Box 247, Westmont, IL 60559 (Paratech PN 550291) to all internal surfaces and internal parts except seals (2, 6, 7, 10, 27, 29, and 44), balls (18), and piston springs (40). Grease all seals and balls with Chemplex 710 Silicone Grease, FUCHS Lubricants Company, Harvey IL. 60426.

6-4.8 REASSEMBLY OF CYLINDER.

- a. If piston rod bushing (42) was removed, install squarely into cylinder (47) in the same orientation noted during disassembly. The piston rod bushing should slide smoothly down the cylinder bore until it rests against its mating shoulder. Check that it is not cocked in the bore. Install both springs (40), with spring guide bushing (41) between the springs, down the cylinder bore.
- b. If setscrew (48) was removed, apply Henkel Corporation, Loctite 271, to the threads and install in cylinder (47). If Dowel pin (14) was removed, press into the cylinder. Insert pilot tube (43) into the cylinder until it bottoms and insert new o-ring seal (44) in its groove around the pilot tube bore.

6-4.9 REASSEMBLY AND INSTALLATION OF PISTON ASSEMBLY.

- a. Assemble piston U-cup seal (35), bumper (36), and wear ring (34), (oriented the same as noted during disassembly - "U" faces the bumper on the piston. Note: Lubricate the U-cup before installation with Marvel®, Air Tool Oil, Turtle Wax, P.O. Box 247, Westmont, IL 60559 (Paratech PN 550291).
- b. Install the piston assembly through springs (40), spring guide bushing (41), piston rod bushing, (42) and into cylinder (47). The assembled piston should slide freely back and forth within the cylinder assembly. Note: Lubricate the piston and bushings before installation with Marvel®, Air Tool Oil, Turtle Wax, P.O. Box 247, Westmont, IL 60559 (Paratech PN 550291).

6-4.10 REASSEMBLY AND INSTALLATION OF THE SHUTTLE VALVE ASSEMBLY.

- a. If setscrew (32) was removed, apply Henkel Corporation, Loctite 271, to the threads and install in valve body (31).
- b. Insert push rod (28) into valve body (31). Press backup washer (30) and new U-cup seal (29) (oriented the same as noted during disassembly – "U" faces toward back of gun) onto the push rod. Lubricate the U-cup before installation with Marvel®, Air Tool Oil, Turtle Wax, P.O. Box 247, Westmont, IL 60559 (Paratech PN 550291).

- c. Insert new o-ring seals (27) in their grooves in valve body (31) and valve cover (26).
- d. Apply Henkel Corporation, Loctite 271, to the threads of screws (25) and with holes in the valve cover (26), valve body (31) and cylinder (47) aligned, install the screws with lock washers (51) and tighten evenly to 15 foot-pounds (20.4 N-m).
- e. Install D handle into slot in valve cover. Apply Henkel Corporation, Loctite 271, to screw (22) threads. Secure the D handle in position with the screw and lock washer (23). Torque the screw to 20 foot-pounds (27.2 N-m).
- f. If label(s) (45, 45A, 46, or 50) were removed, remove backing and press onto cleaned surface of cylinder (47) to adhere in place.

6-4.11 REASSEMBLY AND INSTALLATION OF HANDLE ASSEMBLY.

- a. Assemble new o-ring seals (7 and 10) in their grooves in trigger valve plunger (8). Slide trigger spring (9) over the trigger valve plunger. If trigger link (11) and the trigger valve plunger were disassembled, Henkel Corporation, Loctite 271, to the threads of the trigger link and screw into the trigger valve plunger until an overall length dimension of 5.120" (130 mm) (end-to-end) is achieved.
- b. Install trigger valve plunger (8) with assembled trigger link (11) into handle (12). Install spring pin (39) through upper hole in trigger lever (4), hole in the handle, hole in the trigger link and then out through the handle and trigger lever. It may be necessary to press the trigger valve plunger forward within its recess to properly position the hole in the trigger link. Pin the trigger lever to the handle with a second spring pin (3).
- c. Insert new o-ring seals (6) into their grooves in trigger valve plug (5) and carefully screw the trigger valve plug into handle (12). Do not apply a thread sealant to the trigger valve plug threads. Check through handle hole where dowel tube (13) is installed to be sure the front o-ring seal (6) does not distort and tear/abrade as the trigger valve plug is screwed into the handle. It may be necessary to press a small dowel rod down the hole to restrain the o-ring seal within its groove.

the handle, torque to 20 foot-pounds (27.1 N·m), pull the trigger lever to be sure there is a minimum amount of trigger play present before actual "triggering" occurs. If too much or too little trigger play is present, it is necessary to disassemble the trigger mechanism, alter the overall 5.120" (130 mm) length dimension as required and then reassemble the trigger mechanism.

- d. Install new o-ring seal (2) in its groove in dowel tube (13) and install the dowel tube in handle (12). Apply Henkel Corporation, Loctite 271, to the threads of screws (1) and secure the handle assembly to cylinder (47) with the screws. Torque the screws to 25 foot-pounds (34 N·m).
- e. Apply Teflon sealing tape to the threads of the oiler and hose assembly. Screw oiler and hose assembly (49) into handle (12) and torque to 25 foot-pounds (34 N·m).

6-4.12 REASSEMBLY AND INSTALLATION OF TOOL RETAINER ASSEMBLY

- a. Insert front bumper washer (19) (chamfer side first) into cylinder (47) and then front bumper (20).
- b. Insert balls (18) into holes in retainer body (21). To retain the balls in the retainer body it may be necessary to apply a small amount of Chemplex 710 Silicone Grease, FUCHS Lubricants Company, Harvey IL. 60426.
- c. Install release ring (17) and release ring spring (16) over retainer body (21). Apply Henkel Corporation, Loctite 271, to the threads of the retainer body and then screw the retainer body onto cylinder (47).
- d. Install retainer service tool (15) into retainer body (21) by pulling back release ring (17), inserting the retainer service tool with the ball recesses entering the retainer body, and then release the release ring. Rotate the retainer service tool until balls (18) engage the recesses locking the retainer service tool in the retainer body. Insert a tool bit through the hole in the retainer service tool and firmly tighten the retainer body into cylinder (47). Pull back the release ring and remove the retainer service tool.
- e. Install setscrew (38) and (43) hand tight into the cylinder (47) using Henkel Corporation, Loctite 271, on the threads.

6-5 OILER AND HOSE ASSEMBLY REPAIR

6-5.1 DISASSEMBLY OF OILER AND HOSE ASSEMBLY.

- a. After the oiler and hose assembly has been unscrewed from the Pakhammer, unscrew connector (1, Figure 6-2) from ferrule.
- b. Only if hose (3) or either ferrule (2) is damaged and necessitates replacement should the ferrules be removed from the hose. If removal is necessary, hold hose firmly and unscrew the ferrule(s) (left hand thread).
- c. Unscrew fill screw (part of full screw and cable assembly) (5) from housing (6) and drain oil from the housing.
- d. If the fill screw and cable assembly are damaged, carefully pry drive screw (4) out of the housing.
- e. Unscrew housing (6) from inlet (12). Remove and discard o-ring seals (7 and 8) only if replacements are available. If replacements are not available and the old seals are worn, cut or otherwise damaged, they may result in oil leakage from between the housing and inlet but must be reused until replacements become available. Inspect the housing and inlet for damaged or worn threads, cracks and other similar damage that may result in oil leakage. Inspect the inlet for wear or damage to the quick disconnect end.
- f. Unscrew filter screw (9), carefully pull out filter disc (10) and o-ring seal (11). Discard the filter disc and o-ring seal only if replacements are available. If replacements are not available the old filter disc and o-ring seal must be reused until replacements become available. Be sure the orifice in the filter disc is clear and not obstructed. Clean as required.

6-5.2 REASSEMBLY OF OILER AND HOSE ASSEMBLY.

- a. Insert new o-ring seal (11) and new filter disc (10) in recess in inlet (12) and secure in position with filter screw (9).
- b. Install new o-ring (7 and 8) in recesses in inlet (12). Screw housing (6) onto the inlet being careful not to displace the o-ring seals.
- c. If drive screw (4) was removed, install drive screw through the eyelet on fill plug and cable assembly (5); carefully drive into housing (6).

d. If ferrule(s) (2) were removed from hose (3), screw ferrule(s) fully into hose (left hand thread) and then back off approximately one turn. Screw oiler housing fully into one ferrule (right hand thread) and connector (1) into the other ferrule. Apply pipe thread sealing tape (Teflon) onto the connector screw threads and then screw the connector onto the Pakhammer handle. Torque connector to 25 foot-pounds (34 N·m).

e. Fill oiler housing $\frac{1}{2}$ full of Marvel[®], Air Tool Oil, Turtle Wax, P.O. Box 247, Westmont, IL 60559 (Paratech PN 550291). To assure proper fill level, hold the oiler horizontal with the fill hole to the side (3 or 9 o'clock position). Fill until oil just comes out of the fill hole and firmly install the fill set screw.

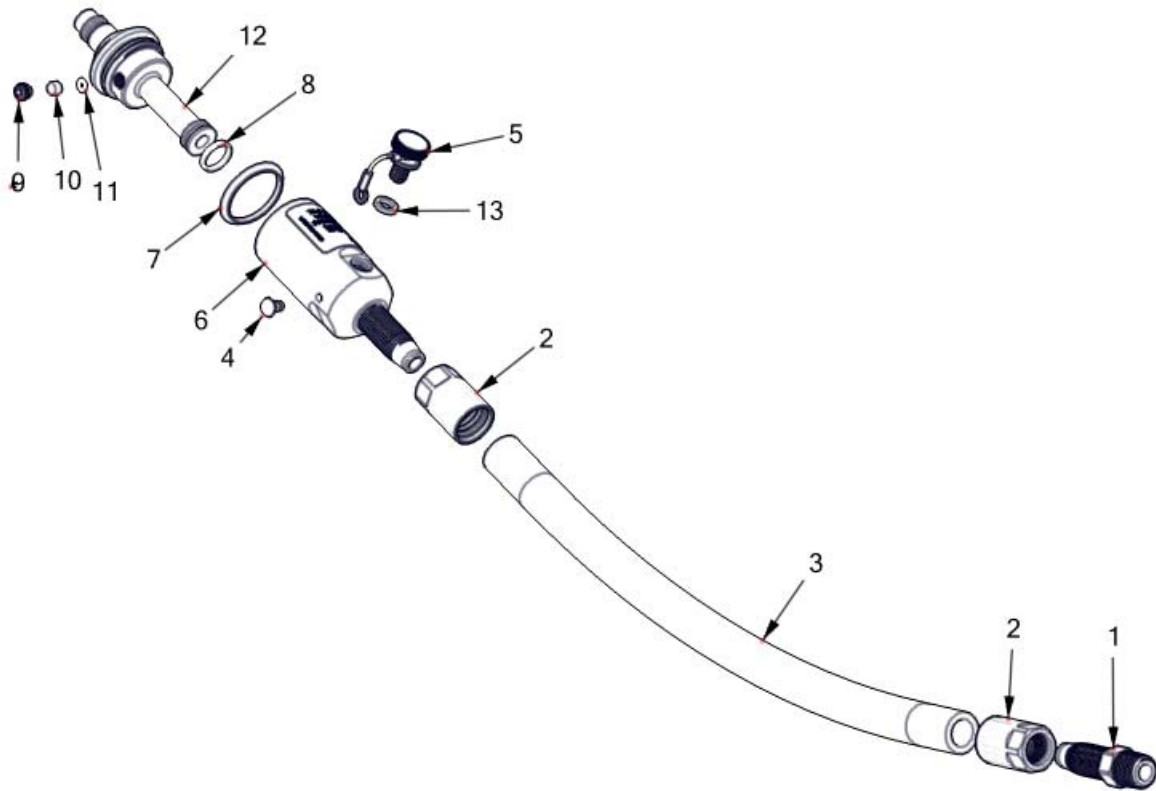


Figure 6-2. Oiler and Hose Assembly, Exploded View

CHAPTER 7 PART LIST

7-1 INTRODUCTION.

This chapter lists all parts that are contained in the Pakhammer. The parts list is used to identify and locate all repair parts, including all attaching hardware supplied. The parts should be ordered by part number when ordered from Paratech Incorporated, 1025 Lambrecht Road, Frankfort, Illinois 60423-1648.

7-2 LIST OF MAJOR COMPONENTS.

A list of the major components by the Manufacturer's Model or Identification Number is provided in Table 7-1.

Table 7-1. List of Major Components

CID, RIC Or Unit Number	Quantity	Component Name	Page No.
550610	1	Handle Assembly	7-2
550030	1	Oiler & Hose Assy.	7-2
550640	1	Shuttle Valve Assy.	7-2
550660	1	Piston Assy.	7-2
550670	1	Tool Retainer Assy.	7-2

7-3 PARTS LIST TABLES.

Pakhammer parts are listed in tables 7-2 and 7-3, with major sub-assemblies listed in table 7-1. The tables contain five columns which are described below:

7-3.1 FIGURE AND INDEX NUMBER COLUMN.

This column shows the figure and index number of each part listed. Tables 7-2 and 7-3 relate to illustrations contained in chapter 6; figure numbers 6-1 and 6-2 respectively. Table 7-4 is a manufacturer code to name list. The index numbers which identify the individual parts are separated from the figure numbers by a hyphen. Index numbers in each table run consecutively.

7-3.2 DESCRIPTION COLUMN.

The DESCRIPTION column describes each part (by noun name and modifiers) in sufficient detail for clarity. Descriptions are successively indented to the right to show assembly and part relationship.

7-3.3 QUANTITY COLUMN.

Quantities specified in the QUANTITY column are the total number of each part required per assembly.

7-3.4 CAGE COLUMN.

The assembly and parts are identified by a five digit code. These code numbers are in accordance with Federal Supply Cataloging Handbook H-4-1. A cross reference between these codes and the manufacturer's is shown in table 7-4.

7-3.5 PART NUMBER COLUMN.

The part number column contains an identifying number for each part listed. Vendor numbers are shown where applicable.

7-4 LIST OF MANUFACTURERS.

A list of all manufacturers' code numbers used in the parts list is shown in table 7-4. These codes are in accordance with Federal Supply Cataloging Handbook H-4-1.

Table 7-2. Pakhammer Parts List

Figure and Index Number	Description	Quantity	CAGE	Part Number
6-1-	PAKHAMMER.....	1	30978	550500G2
-1	· SCREW, Hex Socket Flat Head 3/8-16 X 7/8"	2	30978	550081
-2	· SEAL, O-ring.....	2	30978	890941
	· HANDLE ASSEMBLY.....	1	30978	550610
-3	· · Pin, Spring 5MM X 25 MM CONNEX.....	1	30978	550613
-4	· · LEVER, Trigger.....	1	30978	550614
-5	· · PLUG, Trigger Valve.....	1	30978	550016
-6	· · SEAL, O-ring.....	2	30978	550174
-7	· · SEAL, O-ring.....	1	30978	550185
-8	· · PLUNGER, Trigger Valve.....	1	30978	550018
-9	· · SPRING, Trigger.....	1	30978	550116
-10	· · SEAL, O-ring.....	1	30978	550148
-11	· · LINK, Trigger.....	1	30978	550022
-12	· · HANDLE.....	1	30978	550612
-13	· TUBE, Dowel.....	1	30978	550516
-14	· PIN, Dowel.....	1	30978	550013
	· RETAINER ASSEMBLY.....	1	30978	550670
-15	· · TOOL, Retainer Service.....	1	30978	550257
-16	· · SPRING, Release Ring.....	1	30978	550119
-17	· · RING, Release.....	1	30978	550574
-18	· · BALL, 11/32" Diameter, Chrome Steel.....	6	30978	550077
-19	· · WASHER, Front Bumper.....	1	30978	550568
-20	· · BUMPER, Front.....	1	30978	550139
-21	· · BODY, Retainer.....	1	30978	550672
-22	· SCREW, Cap Button Head, 3/8" X 1.25".....	1	30978	550088
-23	· WASHER, Lock 3/8".....	1	30978	796088
-24	· HANDLE, D.....	1	30978	550554
-25	· SCREW, Hex Socket Cap Head 1/4" X 3.75".....	4	30978	550080
-26	· COVER, Valve (for D-Handle).....	1	30978	550553
-27	· SEAL, O-ring.....	2	30978	550183
	· VALVE ASSEMBLY.....	1	30978	550640
-28	· · PUSH ROD.....	1	30978	550544
-29	· · SEAL, U-cup.....	1	30978	550133
-30	· · WASHER, Backup.....	1	30978	550546
-31	· · BODY, Valve.....	1	30978	550642
-32	· · SETSCREW, Hex Socket Head #6-32 X 3/16".....	1	30978	550091
	· PISTON ASSEMBLY.....	1	30978	550560
-33	· · ROD, Piston.....	1	30978	550662
-34	· · WEAR RING, Piston.....	1	30978	550665
-35	· · SEAL, U-cup.....	1	30978	550134
-36	· · BUMPER, Piston.....	1	30978	550138
-37	· HELICOIL, 3/8"-16 X .375.....	3	30978	550052
-38	· SET SCR #10-24 X 1/8" CP SS W/NYL.....	1	30978	550102
-39	· Pin, Spring 1/8" X 1" SS.....	1	30978	015539
-40	· SPRING, Main Piston.....	2	30978	550113
-41	· BUSHING, Spring Guide.....	1	30978	550559
-42	· BUSHING, Piston Rod.....	1	30978	550558
-43	· SET SCR 10-24 1/4 CP AS W/NYL.....	1	30978	550101
-44	· SEAL, O-ring.....	1	30978	550143

Table 7-2. Pakhammer Parts List - Continued

Figure and Index Number	Description	Quantity	CAGE	Part Number
-45	· LABEL, Left Pakhammer.....	1	30978	550633
-45A	· LABEL, Right Pakhammer.....	1	30978	550634
-46	· LABEL, Attention.....	1	30978	550431
-47	· CYLINDER.....	1	30978	550656
-48	· SET SCR 6-32X3/16 CUP SS W/NY.....	2	30978	550091
-49	· OILER AND HOSE ASSEMBLY (See Table 7-3).....	1	30978	550030
-50	· LABEL, Read INSTR.....	1	30978	550432
-51	· HI-COLLAR 1/4 LOCK WASHER, SS.....	4	30978	670572

Table 7-3. Oiler and Hose Assembly Parts List

Figure and Index Number	Description	Quantity	CAGE	Part Number
6-2-	OILER AND HOSE ASSEMBLY (See 49, Table 7-2..... for reference to next higher assembly)	1	30978	550030
-1	· CONNECTOR, Pipe to hose, 1/4" NPT X 3/8" Hose.....	1	30978	890674A
-2	· FERRULE.....	2	30978	890624
-3	· HOSE, Air, 3/8" Diameter X 12".....	1	30978	550028
	· OILER.....	1	30978	550008
-4	· · SCREW, Drive.....	1	30978	891188
-5	· · FILL SCREW AND CABLE ASSEMBLY.....	1	30978	891170
-6	· · HOUSING.....	1	30978	891163
-7	· · SEAL, O-ring.....	1	30978	550182
-8	· · SEAL, O-ring.....	1	30978	550174
-9	· · SCREW, Filter.....	1	30978	891176
-10	· · DISC, Filter.....	1	30978	891172
-11	· · SEAL, O-ring.....	1	30978	550143
-12	· · INLET.....	1	30978	891167
-13	· TETRASEAL (Included on Screw and Cable..... Assembly PN 891170, Index Number -5)	1	30978	891207

Table 7-4. Code to Name List

CAGE	Manufacturer's or Vendor's Name and Address
30978	Paratech Incorporated, 1025 Lambrecht Road, Frankfort, Illinois 60423-1648

Each **Pakhammer** or component thereof, manufactured by Paratech Incorporated, has been thoroughly inspected and properly adjusted before shipment to insure the highest quality and the greatest possible reliability.

Paratech Incorporated (hereinafter referred to as "Seller") hereby warrants the **Pakhammer** or component thereof to the original retail buyer only against defects in material and workmanship under normal use and service for a period of one year from the date of purchase. This warranty shall constitute the sole warranty of the Seller with respect to the **Pakhammer** or component thereof. **THE SELLER HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** The Seller neither assumes nor authorizes any other person to assume for it any other obligations or liabilities in connection with the sale or use of this product.

Should there be any defects in the material or workmanship of the **Pakhammer**, buyer should return the defective product to the factory for inspection with shipping prepaid within one year from the date of purchase. If inspection shows that the **Pakhammer** or a component thereof is defective and that such defects were not caused by negligence, misuse, accident or unauthorized service, the product sold hereunder will be repaired or replaced at the option of the Seller, without charge, FOB at the factory, Frankfort, Illinois.

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