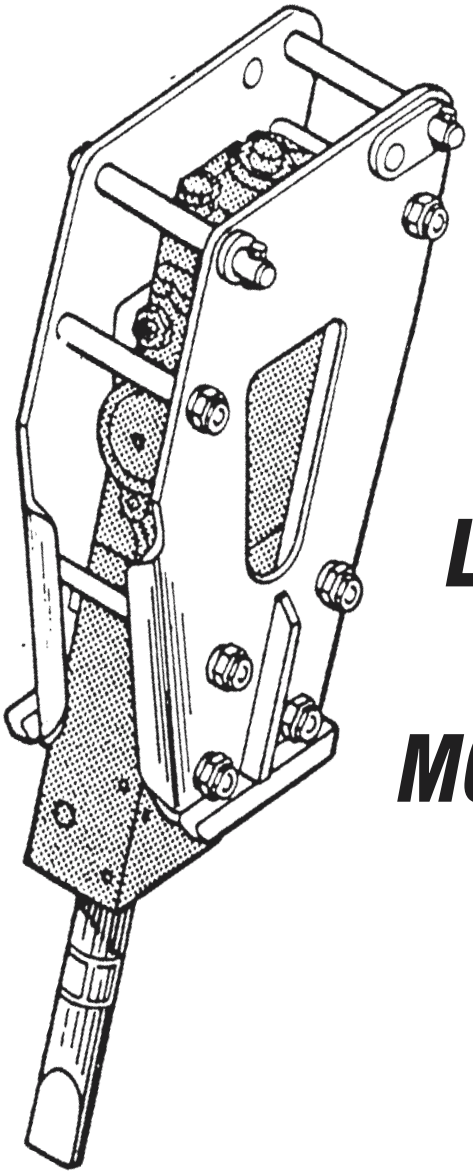
ALLIED
Construction Products, LLC

OPERATOR'S MANUAL

Manual Part No. 002037
June 16, 2003



HY-RAM HAMMERS

LIGHT & MEDIUM SIDE-PLATE MOUNTED MODELS

730
740
745

Allied Hy-Ram Light and Medium Models
730, 740, 745
Document Change Notice

Date	Page	Change
12-30-98	Throughout	Added Model 745
12-30-98	4-1	Revised Specifications
12-30-98	4-2, 4-3	Updated Dimension Dwgs.
12-17-99	4-1 thru 4-7	Revised Specs and Dimension Dwgs - Added Dimension Charts
8-16-00	2-2,2-3,2-4	Art
8-16-00	Chp 4	Specs & Dimensions
8-16-00	Throughout	Minor changes
2-16-01	Chp 4	Specifications
2-16-01	Chp 7	Additional WARNINGS
2-16-01	Throughout	Minor Editting Changes
10-16-01		Reprint
05-15-02	Chps 1, 5, 11	Updated Safety/Warranty Info Torque info
06-16-03	Page 4-1	Updated Technical Specs

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SECTION 1.0
INTRODUCTION

Hy-Ram Hammers Operator's Manual: Part Number 002037

This Operator's Manual is applicable to Light & Medium Side-Plate Mounted Models:

Models: 730, 740, 745

Years of Manufacture: 1985 and beyond

Serial Number(s)_____

This manual contains important information for the safe use and maintenance of the Allied Hy-Ram Light & Medium Side-Plate Mounted Models: Models 730, 740, 745

Read this manual thoroughly before installing, operating or servicing the HyRam. This manual must be easily accessible to operators, service and transport personnel. Store this manual in a convenient location.

Pay careful attention to all instructions and follow all governing regulations. Operation or service other than in accordance with these instructions may subject the Hy-Ram to conditions beyond its design capability. Improper operation, service or the use of non-Allied parts may result in Hy-Ram failure or personnel injury.

1.1 Safety Information

When using the Hy-Ram, safety procedures must be followed. See Section 5.0 for further safety guidelines.

Pay particular attention to WARNINGS and CAUTIONS, identified with this symbol.

These instructions are important for personnel safety and full service life of the Hy-Ram. Follow them carefully.

1.2 Warranty Information

Warranty coverage of the Allied Hy-Ram depends on proper maintenance and operation of the Hy-Ram as detailed in this manual. Improper maintenance or operation shall void Hy-Ram warranty coverage. Immediately upon receipt of the Hy-Ram, read all Allied warranty documents delivered with the unit for a thorough understanding of warranty coverage.

Record the Hy-Ram Serial Number in the space provided above and in the Parts Manual.

1.3 Allied Product Policies

Allied reserves the right to make modifications to the design or changes to the specifications without prior notice.

In this manual, Allied recommends Hy-Ram applications, maintenance and service consistent with industry practices. Allied takes no responsibility for the results of actions not recommended in this manual and specifically the results of:

- Operation in non-recommended applications
- Incorrect operation
- Improper maintenance
- Use of service parts not approved or supplied by Allied.

These exclusions apply to damage to the Hy-Ram, associated equipment, and injury to personnel.

SECTION 2.0
OVERVIEW

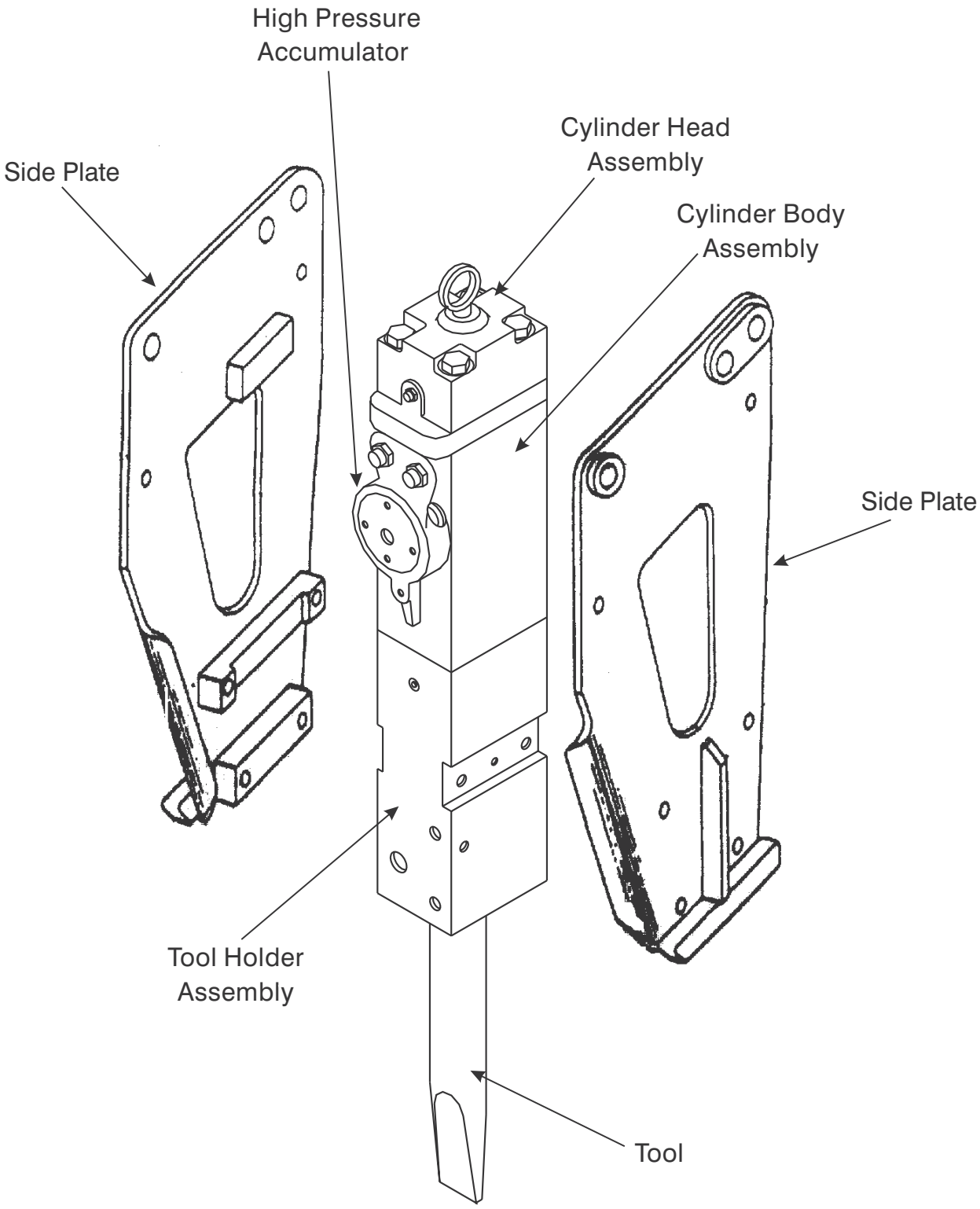

Figure 2-1. Typical Hy-Ram Main Components

2.1 Introduction

The Allied Hy-Ram Model 730 is classified as a Light Series (LTS) hammer; Models 740 and 745 are classified as Medium Series (MDS). These models are designed for use on backhoes and excavators.

Depending on the hammer model, they are compatible with backhoes weighing 12,000 to 25,000 lbs. (5,000 to 11,000 kg) and excavators weighing 15,000 to 40,000 lbs. (7,000 to 18,000). The hammers can be installed on almost any hydraulic system and can be operated with pump capacities from 12 to 32 gpm.

The maximum operating pressure is 2000 psi (140 bar) for the Model 730, 2450 psi (170 bar) for Model 740 and 2600 psi (180 bar) for Model 745. Hammer impact energy is derived from nitrogen gas pressure in the head and hydraulic pressure (see Section 3.0 Theory of Operation).

Illustrations are representative of typical hammers. These illustrations are not to be used for repair or service.

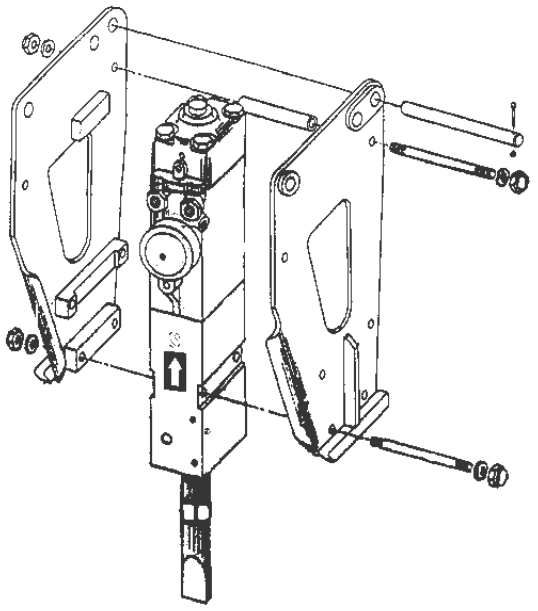

Figure 2-2. Typical Light/Medium Hy-Ram

2.2 Description of Assembly Groups

- **High-Pressure Accumulator**

  The high-pressure accumulator, integral to the cylinger casting, is located on the front of the cylinder. The accumulator guarantees maximum single blow force and protects the hydraulic system of the carrier. Refer to Section 11.2.11 Checking the High-Pressure Accumulator. Refer to Figure 2-3.

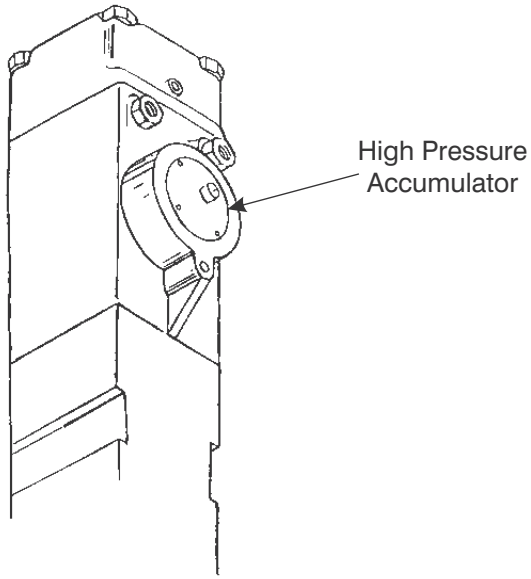

Figure 2-3. Typical High-Pressure Accumulator

- **Cylinder Head**

  The cylinder head is the upper hammer section.

  The nitrogen filling and measuring fitting for the precharge chamber is located on the front of the cylinder head. Fitting **G.**

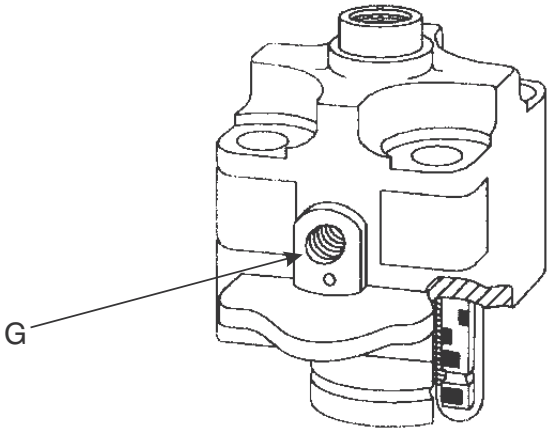

Figure 2-4. Typical Cylincer Head

- **Cylinder**

  The cylinder body is the center section of the hammer between the cylinder head and the tool holder.

  The hydraulic pressure connection is located on the front of the cylinder body. Connection **P**.

  The hydraulic return connection is located on the front of the cylinder body. Connection **T**

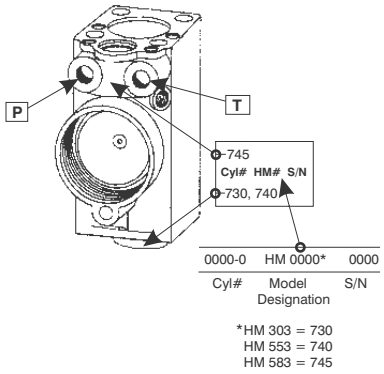

Figure 2-5. Typical Cylinder

- **Tool Holder**

  The tool holder holds the demolition tool in place with spring and retainer pins. The two tool bushings (upper and lower) are located in the tool holder.

  The cylinder head, cylinder and tool holder assemblies are connected with tension rods which pass through all three components.

  The lubrication fitting is located on the front of the tool holder. Refer to Section 8.5 for lubrication instructions.

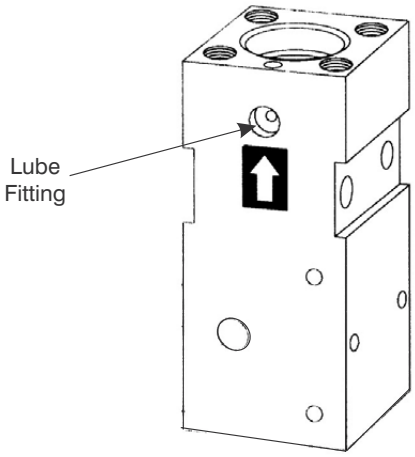

Figure 2-6. Typical Tool Holder

- **Piston**

  The piston reciprocates in the cylinder transferring its energy to the demolition tool upon impact. The upper end of the piston has an identification number which is explained in Figure 2-7.

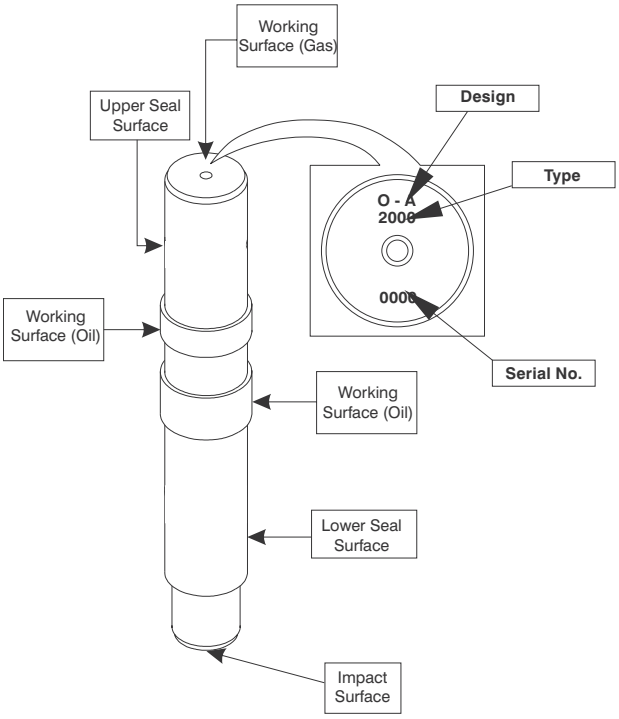

Figure 2-7. Typical Piston

SECTION 3.0
THEORY OF OPERATION

Figure 3-1 is a diagram of basic Hy-Ram operation illustrating how the piston is moved up and down to impact the demolition tool.

Up and down piston travel within the cylinder is controlled by hydraulic pressure above piston surface f2.

- When the pressure above surface f2 is low, the high pressure against surface f1 forces the piston up the cylinder. This movement also compresses the nitrogen gas, increasing pressure on piston surface f3.

- The upward piston movement causes a control valve (not shown) to shift position. This shift results in a high pressure above surface f2.

- When the pressure above surface f2 is high, the piston is forced downward. The nitrogen pressure against piston surface f3 also drives the piston downward with even greater force.

- Just before tool impact, the control valve shifts again. This shift results in a low pressure above surface f2.

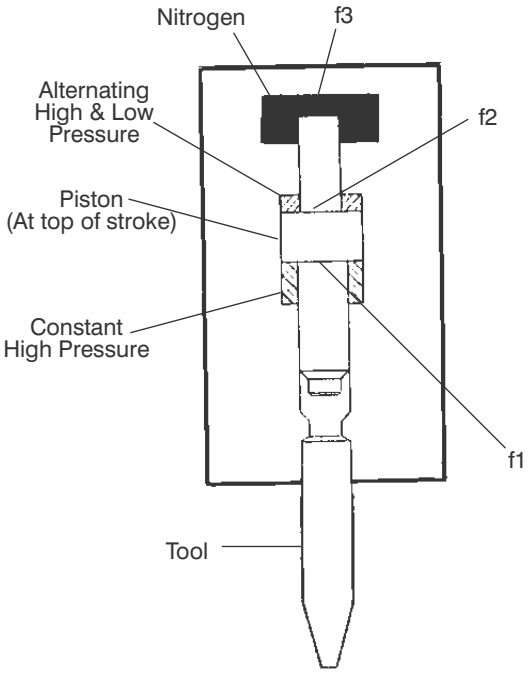

Figure 3-1. Hammer Block Diagram

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SECTION 4.0
TECHNICAL INFORMATION

4.1 Technical Specifications

Technical Specifications				
Hy-Ram Model		**730**	**740**	**745**
Frequency Range	blows per minute	400 - 1150	350 - 800	350 - 800
Hydraulic Flow	gpm (lpm)	12 - 22 (45 - 85)	18 - 32 (70 -120))	18 - 32 (70 - 120)
Hydraulic Operating Pressure	psi (bar)	1600 - 2000 (110 - 140)	1750 - 2450 (120 - 170)	1750 - 2600 (120 - 180)
Hydraulic Relief Pressure	psi (bar)	2300 (159)	2750 (190)	2900 (200)
Pressure* in Nitrogen Precharge Chamber	psi(bar) psi(bar)	154 (10.6) 180 (12.5)	141 (9.7) 165 (11.5)	168 (12) 195 (13.5)
Pressure in Accumulator	psi (bar)	725 (50)	725 (50)	725 (50)
Working Weight**	lbs. (kg)	865 (386)	1600 (726)	1600 (726)
Working Length	Dimension D on Dimension Charts and Drawings			
Demolition Tool Diameter Working Length	Std. in. (mm) in. (mm)	Cross Cut 3.15 (80) 18 (457)	Cross Cut 3.94 (100) 23 (533)	Cross Cut 3.94 (100) 23 (533)
Carrier Weight Class Backhoe Excavator	1000 lbs. 1000 kg	12 - 25 (5 -11) 15 - 30 (7 - 14)	16 - 25 (7 -11) 20 - 40 (9 - 18)	16 - 25 (7 -11) 20 - 40 (9 - 18)
Hydraulic Hose Size	in. (mm)	3/4 (19)	1 (25)	1 (25)

*First value at 70°F (21°C), second value at 150°F (65°C).

**Includes side plates and tool.

NOTE

For decal descriptions and locations, refer to the Parts Manual for each individual model covered in this operator's manual.

4.2 DIMENSIONS

The dimensions listed in Table 4-1 below are illustrated in the drawing on the next page.Each dimension is indicated by a letter on the drawing. Table 4-1 lists these letters, each dimension and an explanation of the dimension.

Table 4-1. Dimensions of 730 Hy-Ram

Letter	Dimension in. (mm)	Decscription
A	65.8 (1670)	Hammer length
B	12.3 (311)	Hammer width
C	18.0 (348)	Tool length
D	63.3 (1608)	Hammer working length - stick pin to tool tip.
E	10.3 (260)	Mounting width
F	19.0 (483)	Hammer depth
G	10.6 (268)	Stick pin to link pin length
H	3.15 (80)	Tool diameter

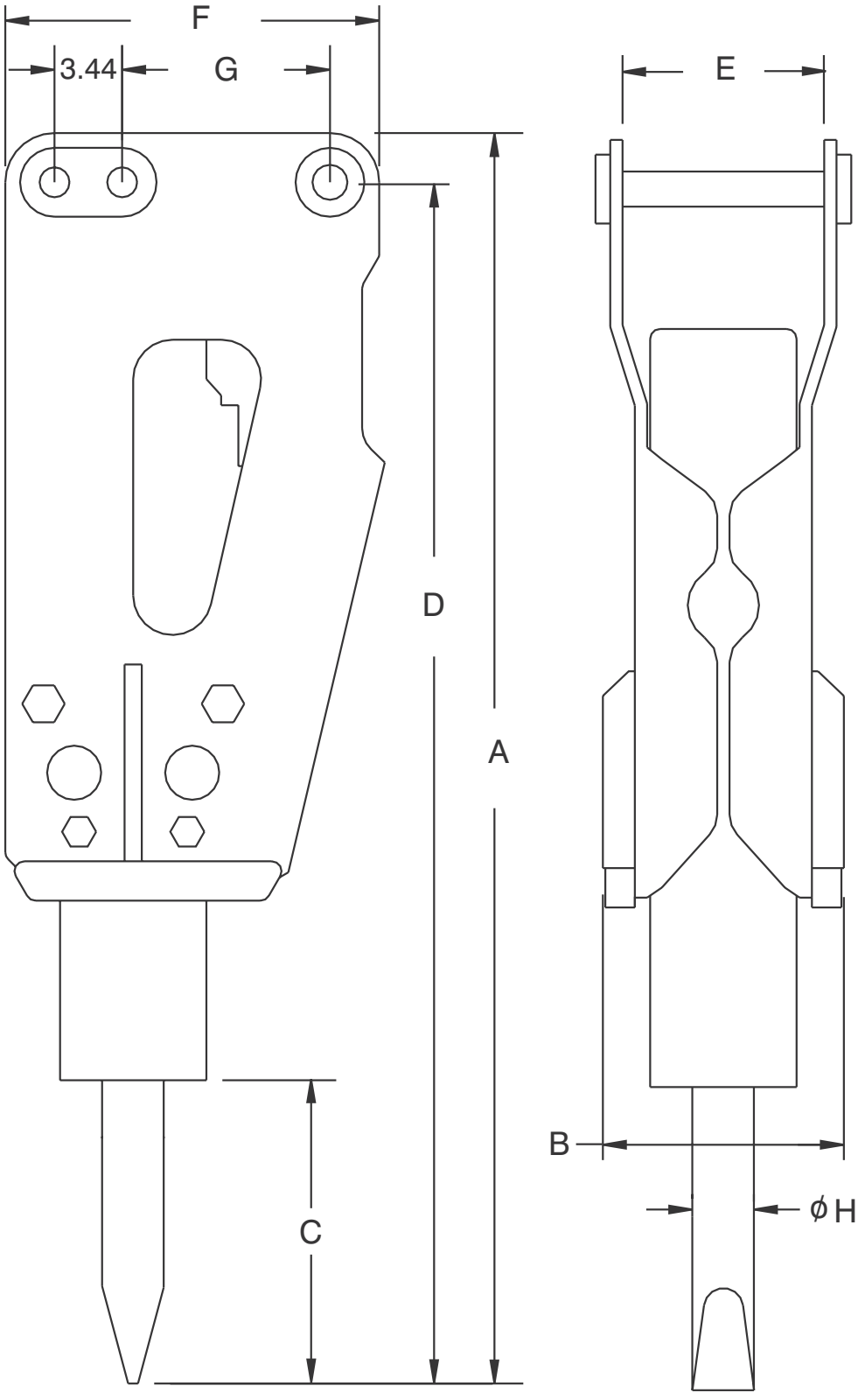

Figure 4-1. Dimension Drawing - Model 730

The dimensions listed in Table 4-2 below are illustrated in the drawing on the next page.Each dimension is indicated by a letter on the drawing. Table 4-2 lists these letters, each dimension and an explanation of the dimension.

Table 4-2. Dimensions of 740 Hy-Ram

Letter	Dimension in. (mm)	Decscription
A	79.3 (2013)	Hammer length
B	15.8 (400)	Hammer width
C	21.0 (546)	Tool length
D	76.8(1951)	Hammer working length - stick pin to tool tip.
E	11.0 (279)	Mounting width
F	21.5 (546)	Hammer depth
G	14.0 (356)	Stick pin to link pin length
H	3.94 (100)	Tool diameter

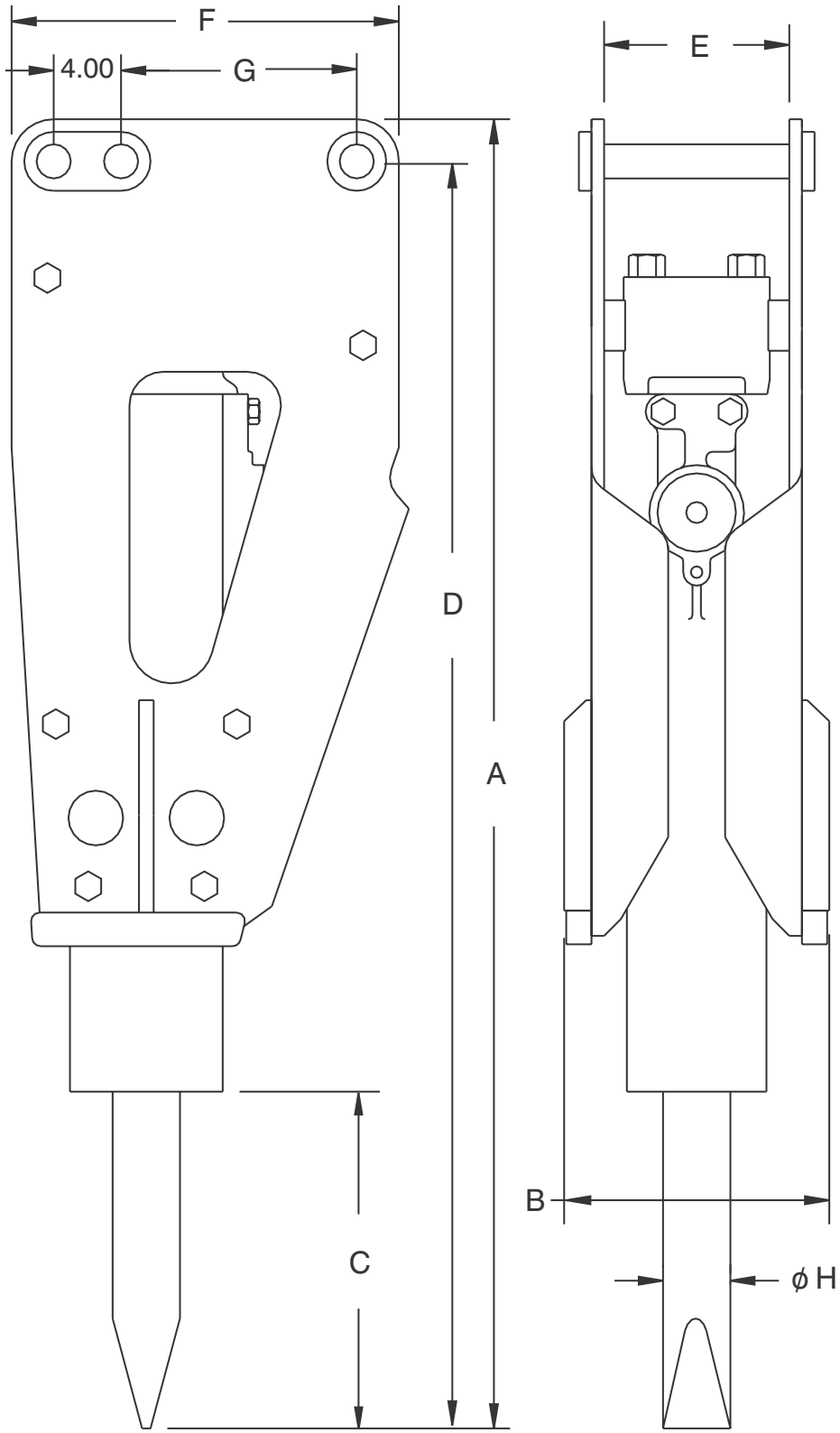

Figure 4-2. Dimension Drawing - Model 740

The dimensions listed in Table 4-3 below are illustrated in the drawing on the next page.Each dimension is indicated by a letter on the drawing. Table 4-3 lists these letters, each dimension and an explanation of the dimension.

Table 4-3. Dimensions of 745 Hy-Ram

Letter	Dimension in. (mm)	Decscription
A	79.3 (2013)	Hammer length
B	15.8 (400)	Hammer width
C	21.0 (546)	Tool length
D	76.8(1951)	Hammer working length - stick pin to tool tip.
E	11.0 (279)	Mounting width
F	21.5 (546)	Hammer depth
G	14.0 (356)	Stick pin to link pin length
H	3.94 (100)	Tool diameter

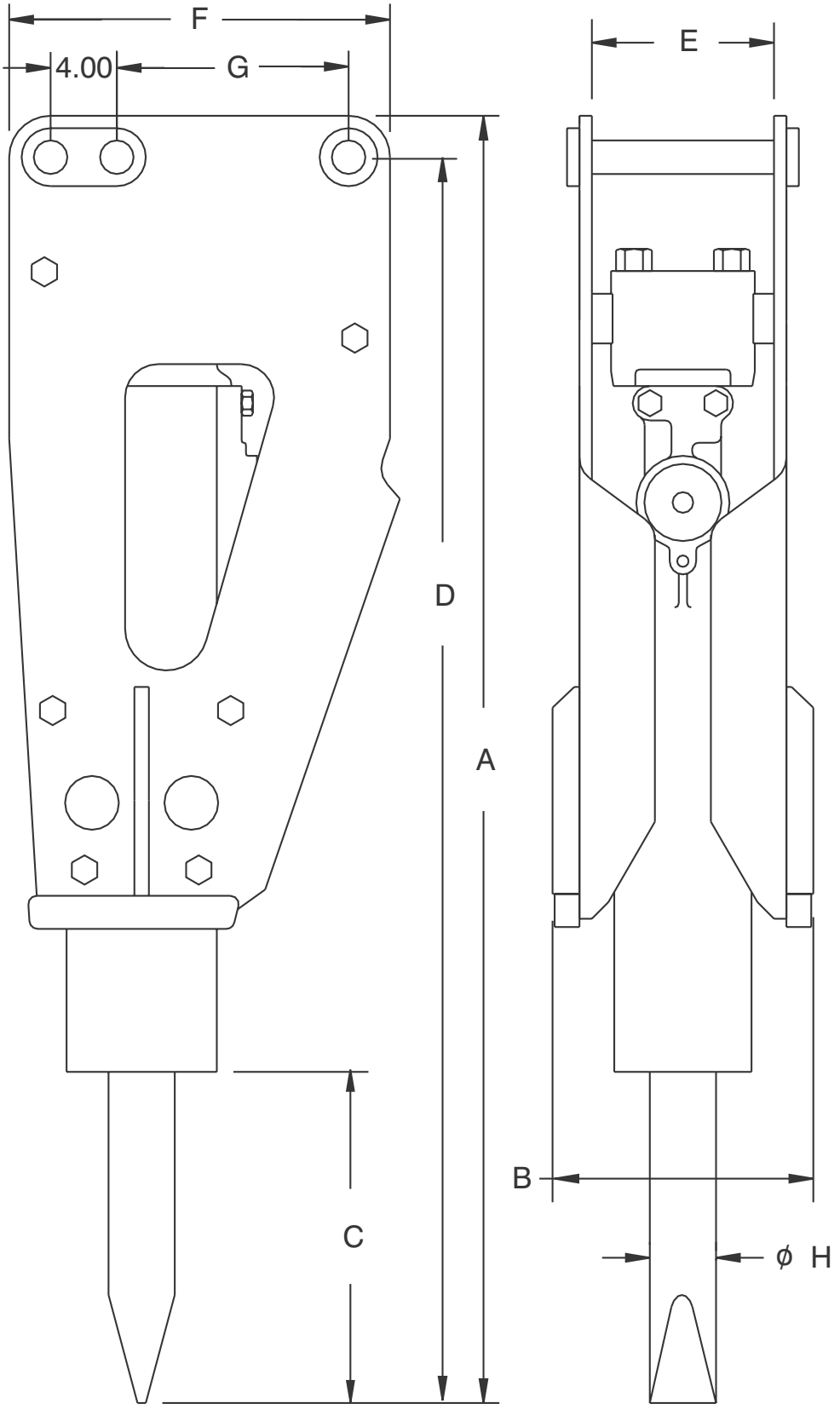

Figure 4-3. Dimension Drawing - Model 745

SECTION 5.0
GENERAL CONSTRUCTION SAFETY

5.1 Owner's Responsibilities

The equipment owner shall:

- Provide this technical manual to the Hy-Ram operators.
- Train all operating personnel and enforce the procedures explained in this manual, especially regarding safety to personnel and equipment.
- Adapt these general instructions to specific applications.

5.2 General Construction Safety

Follow standard safety precautions expected and required of those working in construction, including but not limited to: locating existing underground service and utility lines, establishing pedestrian barriers and using personnel protection equipment, etc.

5.3 Federal, State, Local and OSHA Construction Guidelines and Regulations

Use the Hy-Ram in accordance with all federal, state and local regulations regarding construction practices and public safety. Identification of, and compliance to, governing regulations are the responsibility of the owner and operator.

In the United States, comply with the recommendations of the Occupational Safety and Health Administration standards of the U.S. Department of Labor. For OSHA construction guidelines contact your local federal government office or write:

U.S. Government Printing Office
Superintendent of Documents
P.O. Bo 371954
Pittsburgh, PA 15250

Ask for Construction Industry OSHA Standards 29 CFR 1926/1910.

5.4 General Safety Summary

The safe and effective use of any heavy construction equipment depends upon proper installation, operation, maintenance and repair. Operational safety must encompass all of these factors. This section includes minimum safety policies the Hy-Ram owner shall establish for all Hy-Ram installations. The operational safety program must be tailored by the Hy-Ram owner to the specific site and application. Such a program will result in increased equipment life and performance and reduced downtime. Most importantly, it will reduce the risk of equipment damage and personnel injuries.

5.4.1 CAUTIONS and WARNINGS

Throughout this manual detailed CAUTIONS and WARNINGS are included with instructions and procedures. Even experienced service technicians are to review these CAUTIONS and WARNINGS prior to performing a procedure. CAUTIONS and WARNINGS are highlighted by the symbol shown here and explained as follows:

⚠WARNING⚠

Instructions preceeded by this symbol identify hazards to personnel. WARNING instructions must be followed to ensure safe handling and operation. These instructions shall be followed at all times. Improper operation or servicing can result in personal injury. Read this manual thoroughly before operating or maintaining the Ho-Pac.

⚠CAUTION⚠

Instructions identified with this symbol are important to prevent damage to equipoment and to maintain full service life of the Ho-Pac. Follow them carefully. Operation or service not in accordance with these instructions may subject the Ho-Pac to conditions beyond its design capability. Read this manual thoroughly before operating or maintaining the Ho-Pac.

5.4.2 Initial Operating Precautions

Some pre-operational checks and scheduled maintenance must be performed more frequently on a new Hy-Ram installation. Refer to the Operator Checklist and the Care and Maintenance Schedule in Section 11.0 of this manual.

5.4.3 Carrier Precautions

- To assure stable carrier operation, the carrier load capacity must meet or exceed the Hy-Ram requirements listed in the Technical Specifications Table, Section 4.1.
- To protect the operator from hot, high pressure hydraulic fluid, do not run any hydraulic lines through the operator's cab.
- Follow the carrier manufacturer's guidelines regarding filtration of return fluid from the Hy-Ram. The carrier oil filter must be cleaned according to the Care and Maintenance Schedule.
- To protect the operator from injury from flying rock splinters, the operator's cab must have a protective shield. The shield must be closed during hammer operation.
- Refer to the carrier manufacturer's manuals for proper carrier operation, service and maintenance procedures.
- Never lift or move loads with the Hy-Ram.
- Operate the Hy-Ram only from the carrier operator's seat; and only after the carrier and Hy-Ram are correctly positioned.

5.4.4 Personnel Precautions

- The carrier operator shall perform some Hy-Ram procedures with an assistant. Both the operator and assistant must be experienced and thoroughly trained in these procedures.
- Always wear safety glasses and protective clothing when operating or handling the Hy-Ram.
- All personnel in the immediate area, including the carrier operator and the assistant, must wear ear protection.
- Avoid pinch points.
- Never put fingers in mounting bores or locking bars.
- Keep personnel away from the demolition tool while:
  - The demolition tool is jammed in the tool holder; it may release suddenly.

- Technicians service the hydraulic system.
- Technicians service the nitrogen precharge chamber.
- Technicians service the accumulator nitrogen chamber.

5.4.5 Hydraulic Pressure Precautions

- Before disconnecting any hydraulic lines, properly bleed all hydraulic system pressure.
- Make sure the Hy-Ram and carrier hydraulic systems are compatible, especially regarding:
  - Flow rate and pressure
  - Pressure relief valve setting
  - Hydraulic fluid compatibility
  - Heat exchanger if required

5.4.6 Nitrogen Gas Precautions

- To avoid an explosion and equipment damage, use only 99.8% pure nitrogen gas in the precharge chamber and the accumulator pressure chamber.
- Do not allow anyone into the service area while the service technicians are testing, measuring, filling or bleeding the nitrogen chambers.

5.4.7 Hoisting and Lifting Precautions

- The Hy-Ram and component weights are listed in the Technical Specifications table, Section 4.1. Before starting a procedure that requires hoisting, prepare the required lifting equipment.
- When hoisting the assembled Hy-Ram, use the designated lifting eyes.
- Keep hands clear of any bores or fittings when moving, removing, attaching, or hoisting the Hy-Ram.

5.4.8 Maintenance Precautions

- Do not start maintenance on the Hy-Ram until it has cooled. The Hy-Ram is heated during operation and some components become very hot.

WARNING
Bodily injury and equipment damage could result if the Hy-Ram falls. After detaching it from the carrier, block the Hy-Ram securely.

WARNING
Clearing a jammed demolition tool is hazardous. Properly protect personnel against sudden release.

- Jamming the demolition tool in the holder can damage internal hammer components and shorten Hy-Ram service life. To reduce the risk of jamming, carefully follow the operator checklist and the care and maintenance schedule, especially:
  - Lubricating the demolition tool. (See Section 8-5.)
  - Checking tool bushing wear. (See Section 11.2.3.)
  - Checking piston impact surface wear (See Section 11.2.4.)
  - Checking demolition tool wear. (See Section 11.2.6.)

5.4.9 Site Precautions

- The danger area around the carrier is greater for hammer operation than for carrier operation due to the risk of flying rock splinters and debris. Immediately cease operation of the Hy-Ram if personnel without protective glasses or protective clothing enter the danger area.
- Never use the Hy-Ram Models 730, 740 or 745 in or under water. These models are not designed and built for underwater use.
- When work site temperatures are below minus 4°F [-20°C], follow the carrier manufacturer's low temperature operating instructions. Refer to Section 9.13 Working in Low Outside Temperatures.

SECTION 6.0
HY-RAM APPLICATIONS

The Hy-Ram Models 730, 740 and 745 are suited for many types of construction applications. The following examples are typical and suggest the variety of standard applications such as post-driving, sheet-driving, frost-cutting, etc. The small models covered in this manual are used for lighter duty applications than larger hammers. Please note that the Models 730, 740 and 745 cannot be used in or under water without modification. Typical surface applications are:

Clearance Work: Concrete structures, building foundations, bridge decks, pavement.

Trenching: Trench rock and quarry oversize.

Safety regulations for the Hy-Ram and the carrier must be observed at all times.

SECTION 7.0
HY-RAM ATTACHMENT & REMOVAL

7.1 Carrier Requirements

Refer to Section 4.1 Technical Specifications to determine the carrier weight required to adequately maneuver and handle the Hy-Ram.

> **WARNING**
> Do not attempt to set the Hy-Ram operating pressure or flow without first consulting the installation instructions for your machine. Maximum operating pressures are listed in Section 4-1 Technical Specifications. Do not exceed this value.

The hydraulic pressure and flow must be adequate for operation of both the carrier and the hammer simultaneously. Hydraulic pressure and flow requirements for the Hy-Ram model being used are given in Section 4.1 Technical Specifications.

The carrier must have an oil temperature gauge. Operating temperature range of the hydraulic oil is 140° F.(60°C.) to 176° F. [80°C.]. If the ambient temperature is low, warm the oil to a minimum of 32° F. (0° C.) by running the carrier (see paragraph 9.13 for operating at low temperature).

7.2 Installation Kits

Proper mounting hardware must be used to mount the Hy-Ram to the carrier. Allied installation kits are recommended; if others are used, they must satisfy the minimum requirements listed under Section 7.6 Attaching the Hy-Ram.

Allied Installation Kits are designed for most carrier makes and models and contain the parts required for the mechanical and hydraulic hookup.

7.3 Top Mounting Brackets

Top mounting brackets are not used with the models covered in this manual.

7.4 Heat Exchanger

In some working environments with a high ambient temperature, a heat exchanger may be necessary to maintain a safe operating oil temperature. The oil temperature shall never exceed 176° F. [80°C.]. There are several operating problems that could cause oil to overheat. DO NOT install a heat exchanger before inspecting and correcting Hy-Ram or carrier malfunctions. Refer to Section 10.0 Troubleshooting and also carrier troubleshooting.

7.5 Tools Required to Attach Hy-Ram

No special tools are required, but the following tools are recommended:

- safety glasses & gloves
- sledge hammer
- drift pin
- 3/4-inch drive socket wrench
- 3/4-inch sockets
- grease gun
- open end wrenches
- caliper for checking tool wear
- pry bar

7.6 Attaching the Models 730, 740 or 745 Hy-Ram to the Carrier

(Refer to Figure 7-1.)

WARNING

The Hy-Ram shall only be attached to a carrier with sufficient load carrying capacity. If the carrier is too light, it may become unstable.

WARNING

When an assistant is required to attach and remove the carrier attachments, all directions and signals must be agreed upon before beginning attachment or removal.

WARNING

Keep hands away from bores and pin areas when attaching the Hy-Ram. Do not touch any parts when the boom is moving. Never put fingers in bores to check alignment; use drift pin.

WARNING

Always wear safety glasses during attachment, operation, and removal of the Hy-Ram.

NOTE

The installation desribed below is typical; installation procedures may vary. Consult carrier attachment installation instructions for specific details.

1. Before attaching the Hy-Ram, remove the bucket or other tool attached to the stick of the carrier.

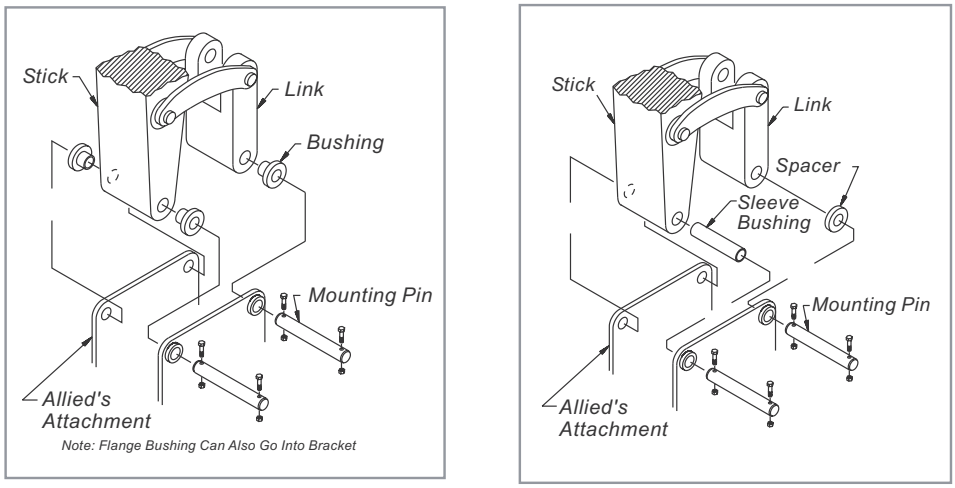

Figure 7-1. Attaching Hy-Ram

2. Slide the stick into the hammer at the front (hose side) and align mounting holes. The front (hose side) of the hammer should face the operator in the carrier cab.

3. Push the stick pin into holes through the hammer, spacer, if required, and the stick. Tap stick pin through holes with a hammer if necessary. Note that a spacer may go between the stick and hammer on both sides.

4. Install stick pin bolts and nuts.

5. Start the backhoe and maneuver the stick until the link lines up with the holes on the back (non-hose side) of the hammer.

6. Install the spacers and link pin through the link and hammer.

7. Install nuts and bolts in link pin.

8. Connect the hoses to the quick disconnects on the stick.

CAUTION

Contaminated hydraulic oil is harmful to attachments and carriers. Clean connection areas and hose ends before and after removing protective caps so hose fittings are clean when attached to hammer and carrier.

7.7 Connecting the Hy-Ram Hydraulic Lines

(Refer to Figure 7-2.)

If not attached, connect the hydraulic lines to the Hy-Ram as follows:

1. Unscrew the cap nuts from Hy-Ram connections **P** and **T** (see Figure 7-2).

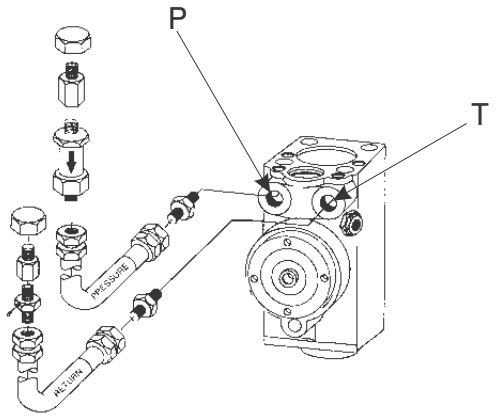

Figure 7-2. Connecting Hydraulic Lines

2. Clean dirt from connection areas.

3. Put the cap nuts in the tool box for safekeeping. The pressure connection is marked **P**.

4. Remove the plugs from the ends of the hydraulic lines that connect to the Hy-Ram.

WARNING

Do not run any hydraulic lines through the operator's cab, since they may leak or burst. The hydraulic oil becomes very hot during operation.

5. Check the connections on the Hy-Ram hoses. The connecting threads must be undamaged and free of sand or similar foreign bodies.

6. Connect the hydraulic lines to the Hy-Ram ports.

7. On the 730, remove the caps from the ends of the Hy-Ram hoses and connect

the pressure and return lines to the carrier quick disconnect coupling. On the 740 and 745, connect the pressure hose to its ball valve on the dipperstick and the return line to its ball valve.

8. Open the ball valves. Refer to Figure 7-3.

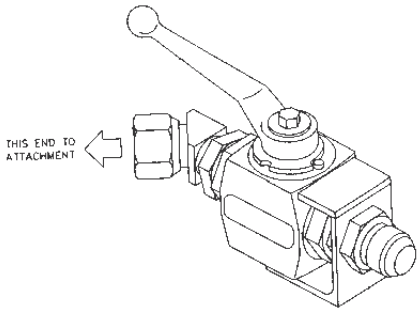

Figure 7-3. Ball Valve

7.8 Connecting the Hydraulic Line to the Two-Speed Valve

This hydraulic line is not required. The Models 730, 740 and 745 covered in this manual do not have two-speed function.

7.9 Removing the Hy-Ram from the Carrier

WARNING

All directions and signals must be agreed upon beforehand with the assistant. Keep hands well clear of bores and boom pin areas when removing the hydraulic hammer. Do not touch any parts when the boom is moving.

CAUTION

Collect any oil which leaks out and dispose of it correctly.

Removal of the Hy-Ram is done in reverse order of installation unless otherwise stated. Refer to section 5.4.5 for hydraulic pressure precautions.

Model 730:

1. Lay the Hy-Ram on the ground horizontally.
2. Disconnect the high pressure from the carrier quick discounnect coupling and seal the connections with the appropriate caps.
3. Remove the mounting pins using a steel rod and a sledge hammer.
4. Store the Hy-Ram as instructed in Section 13.0.

Models 740 and 745:

1. Close the ball valves on the dipper stick.
2. Lay the Hy-Ram on the ground horizontally.
3. Unscrew the high pressure hoses from the carrier dipperstick and seal the connections with the appropriate caps.
4. Remove the mounting pins using a steel rod and a sledge hammer.
5. Store the Hy-Ram as instructed in Section 13.0.

SECTION 8.0
DEMOLITION TOOL

8.1 Demolition Tool

Only use genuine Allied demolition tools. Use of other demolition tools may render the warranty invalid.

It is important that the demolition tools be used correctly, especially longer demolition tools which are more susceptible to damage from prying. Pay particular attention to Section 9.0 Operation.

8.2 Sharpening

Demolition tools shall only be remachined on suitable equipment. Conical and blunt demolition tools can be remachined on a lathe with carbide tooling. Chisels can be sharpened on a shaping or milling machine. During remachining, the demolition tool must be cooled thoroughly with liquid coolant.

Never attempt to burn or weld the demolition tools. The high temperatures involved can damage demolition tools.

8.3 Installing the Demolition Tool

WARNING

The demolition tool shall only be installed in the way described. Failure to do so could allow the demolition tool to be driven out of the tool holder with force possibly causing bodily injury or physical damage.

WARNING

Always wear safety glasses and gloves when installing the demolition tool and clear the area of bystanders.

8.3.1 Locking Pin Style - Installation

None of the hammer models covered in this manual have the locking pin style demolition tool holder.

8.3.2 Spring Pin Style - Installation

None of the hammer models covered in this manual have the spring pin style demolition tool holder.

8.3.3 Retainer Pin/Plunger Spring Style - Installation

(Refer to Figure 8-1.)

1. Clean tool holder bore and upper half of tool.
2. Liberally apply Allied Chisel Paste to the tool shank.
3. Position hammer horizontally to allow access from below.
4. Using a hoist, lift the demolition tool and insert it into bore, turning it until the slot in the tool is in line with the retainer pin hole.
5. Insert retainer pin. Make sure plunger spring locks the retainer pin in place.

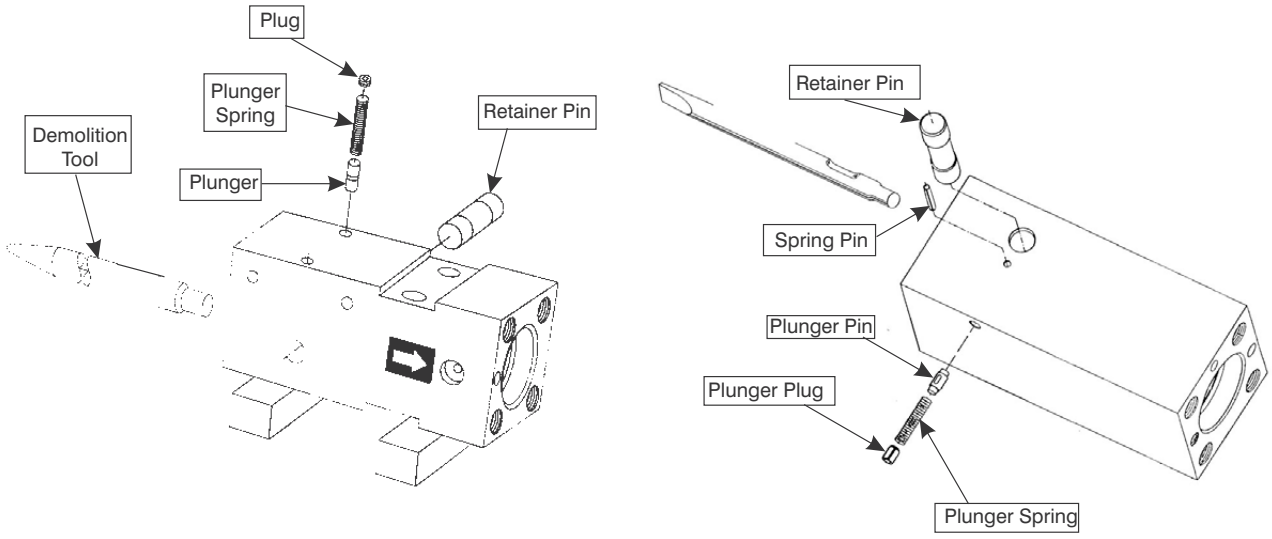

Figure 8-1. Installing the Demolition Tool

8.3.4 Retainer Pin/Spring Pin Style - Installation

None of the hammer models covered in this manual have the retainer pin/spring pin style demolition tool holder.

8.4 Removing the Demolition Tool

8.4.1 Tools that may be required:

- Hand sledge
- Drift pin
- Large size screwdriver
- 3/8-in. diameter x 8-in. long steel rod

8.4.2 Locking Pin Style - Removal

None of the hammer models covered in this manual have the locking pin style demolition tool holder.

8.4.3 Spring Pin Style - Removal

None of the hammer models covered in this manual have the spring pin style demolition tool holder.

8.4.4 Retainer Pin/Plunger Spring Style - Removal

(Refer to Figure 8-1.)

1. Position the Hy-Ram horizontally to allow access from below.
2. Depress the plunger spring in the tool holder with a screwdriver to clear the retainer pin.
3. While keeping the plunger spring depressed, push or drive the retainer pin out using a rod and hand sledge if necessary, to clear the plunger spring. Remove the screwdriver and finish driving the retainer pin until tool slot is clear.
4. Using a hoist, remove the demolition tool from the Hy-Ram. Refer to Figure 8-2.
5. Refer to Section 13.0 for storage instructions.

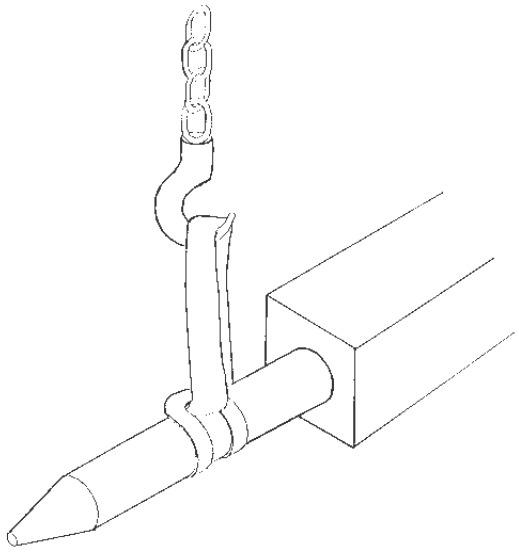

Figure 8-2. Lifting Demolition Tool

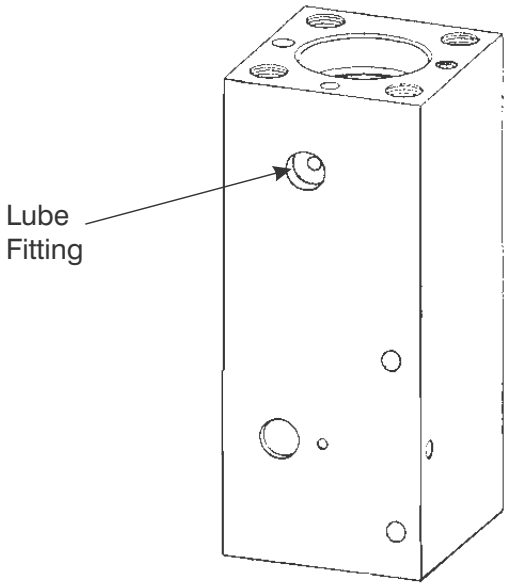

Figure 8-3. Lubricating the Demolition Tool

8.4.5 Retainer Pin/Spring Pin Style - Removal

None of the hammer models covered in this manual have the retainer pin/spring pin style demolition tool holder.

8.5 Manually Lubricating the Demolition Tool

(Refer to Figure 8-3.)

Allied Chisel Paste is recommended for lubrication. If Allied Chisel Paste is unavailable, a high quality, petroleum based, lubricating grease with molybdenum disulfide can be used.

The demolition tool must be lubricated every two hours during operation as follows:

1. Stand the hydraulic hammer vertically on the demolition tool and apply contact pressure. This ensures that the tool is positioned in the maximum upward location within the Hy-Ram tool holder.
2. Attach grease gun to lubrication fitting. See Figure 8-3.
3. Lubricate until grease emerges from the gap between the lower tool bushing and the demolition tool.

8.5.1. Allied AutoLube Automatic Lubrication System

The Allied AutoLube Automatic Lubrication System is not used on the hammers covered in this manual.

8.5.1.1 Using the AutoLube During Underwater Operation

WARNING

Never use a Model 730, 740 or 745 Hy-Ram Hammer underwater. These models are not built for underwater use.

SECTION 9.0
OPERATION

9.1 Operator Check List

Before operating the Hy-Ram, inspect the following:

- Check that hose and tube connections are secure.
- Check all fasteners for wear and tightness.
- Check all fasteners according to the maintenance schedule (see Section 11.0).
- Check that demolition tool is inserted properly.
- Be sure scheduled maintenance is performed before operating the Hy-Ram.
- Frequently check the oil temperature. The temperature of the hydraulic oil must never exceed 176ºF. [80ºC.].
- Be sure all tools that will be required for functions to be performed are available.
- Remember to lubricate the demolition tool every two hours during operation.

9.2 Tools Required By Operator

No special tools are required, but the following tools and safety items are recommended:

- safety glasses & gloves
- hearing protection
- sledge hammer
- drift pin
- 3/4-inch socket wrench
- 3/4-inch sockets
- grease gun
- open end wrenches
- caliper for checking tool wear

9.3 Operating the Hy-Ram

WARNING

The precharge chamber and high pressure accumulator shall only be filled with 99.8% pure nitrogen gas. Make sure no other gas, i.e., air or oxygen, is allowed into the precharge chamber; this could result in an explosion.

CAUTION

Check the oil temperature often to ensure it does not exceed 176ºF [80ºC]. If higher temperatures are measured in the tank, refer to Section 10.0 Troubleshooting.

9.4 Startup

WARNING

Close the protective shield on the operator's cab to prevent possible injury from flying rock splinters during hammer operation.

All persons in the immediate area, including the carrier operator, must wear ear protection.

The Hy-Ram shall only be operated from the operator's seat and shall not be put into operation until both carrier and hammer are in the correct position.

WARNING

Immediately cease operating the Hy-Ram if anyone moves into the danger area, which is greater for hammer operation than for carrier operation due to the risk of flying debris.

When working with a hydraulic hammer, operation of the carrier is governed by the carrier manufacturer's safety regulations.

In cold weather conditions, warm the hydraulic fluid by operating the Hy-Ram in pressure-reduced mode. This is done by turning on the operating switch with **NO** contact pressure on the demolition tool. After oil has been warmed to operating temperature, turn off the hammer, position the tool for operation, then restart the hammer. With contact pressure on the demolition tool, the piston in the Hy-Ram is driven up to its starting position and the hammer will begin cycling the piston and tool up and down. The front part of the vehicle may be raised a few inches (approximately 12 centimeters) from the ground so that the weight of the carrier is exerted on the demolition tool.

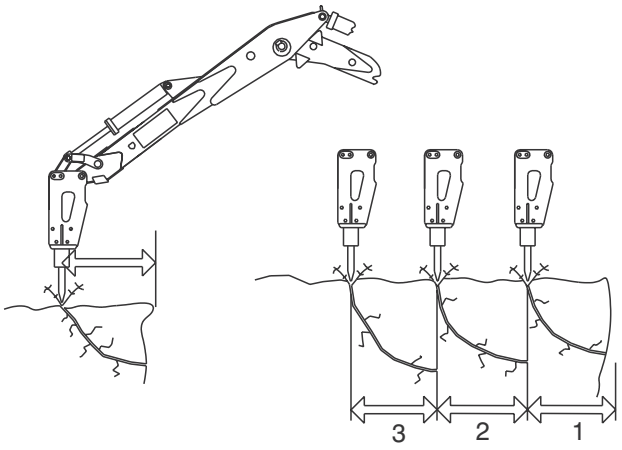

Figure 9-1. Advancing From Outer Edge

9.5 Advance From Outer Edge

(Refer to Figure 9-1.)

Start breaking large and hard rocks near the outer edge.

Place the tool a short distance from the edge of the material. If the rock does not break away after thirty (30) seconds (maximum), the advance must either be reduced or breaking restarted at a different point.

9.6 Angle Of Operation

(Refer to Figure 9-2.)

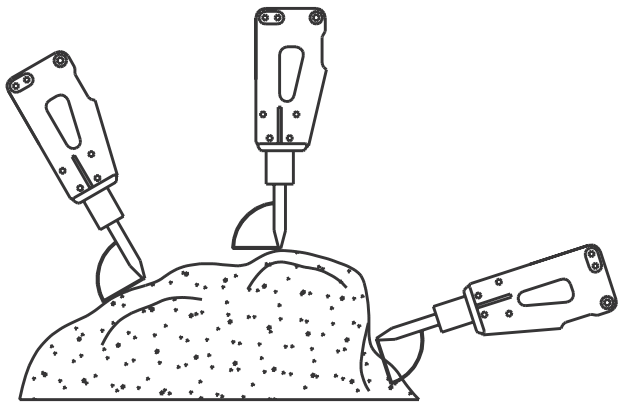

Figure 9-2. Angle Of Operation

Always place the demolition tool at right angles to the surface of the material. If not placed at right angles, the hammer will wear more quickly which could cause accelerated wear and premature parts damage.

9.7 Hammer Rocking

(Refer to Figure 9-3.)

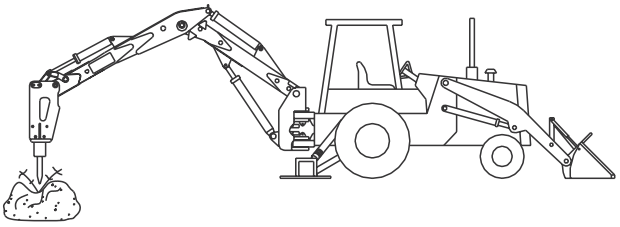

Figure 9-3. Rocking The Hammer

The hammer may be gently rocked backward and forward at a maximum of 5º to allow dust to escape which would otherwise dampen the impact power of the demolition tool. Do not rock the hammer at angles greater than 5º or bending strain will occur damaging the demolition tool and the Hy-Ram.

9.8 Incorrect Use of the Hydraulic Hammer

Carefully read through this section. The following paragraphs describe functions that damage the Hy-Ram or cause personal injury.

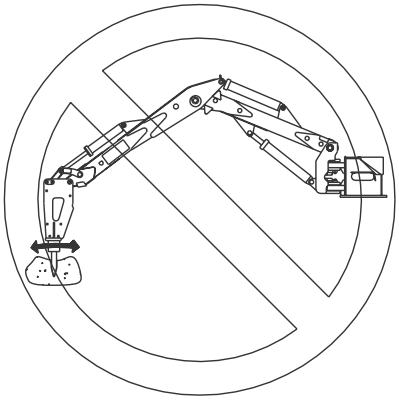

Figure 9-4. Never Use Hy-Ram As A Crowbar

9.8.1 Never Use as a Crowbar

(Refer to Figure 9-4.)

Using the Hy-Ram as a crowbar may cause the demolition tool to break.

9.8.2 Never Drive Demolition Tool into the Material

(Refer to Figure 9-5.)

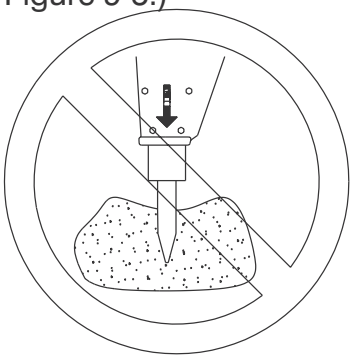

Figure 9-5. Never Drive Tool into Material

If the advance is too large and the hammer is not rocked to release the dust, the demolition tool will be driven into the material, causing the tip to glow red hot and become soft. It then could become wedged in the hole.

9.8.3 Never Pound with the Hammer and Demolition Tool

(Refer to Figure 9-6.)

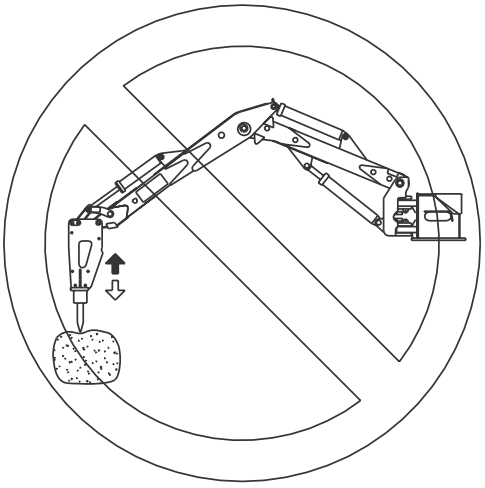

Figure 9-6. Do Not Pound With Hammer

Pounding at material with the hammer could cause damage to the Hy-Ram and the carrier.

CAUTION

The Hy-Ram is not designed to lift or transport loads. This practice will damage the Hy-Ram.

9.8.4 Never Lift Or Transport Loads With The Hammer

(Refer to Figure 9-7.)

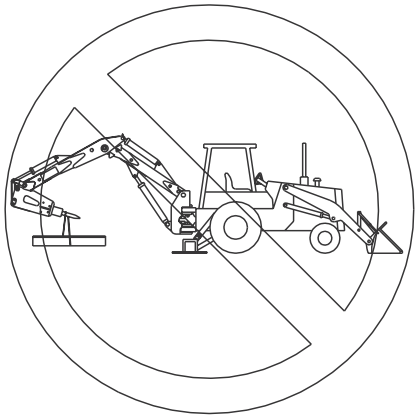

Figure 9-7. Do Not Use Hammmer As Lift Or Transport

9.9 Never Use In or Under Water

WARNING

Never use a Model 730, 740 or 745 Hy-Ram Hammer underwater. These models are not built for underwater use.

9.10 Special Operating Features

9.10.1 Energy Recovery

The Energy Recovery system increases the performance of the hammer in hard material by utilizing piston recoil energy. Prior to fracture, hard material reflects a significant amount of breaking energy back to the piston. Without the energy recovery system, this reflected energy is lost into the hydraulic oil within the hammer.

The energy recovery valve quickly senses the piston recoil and reduces the hydraulic oil pressure above the piston. The lower oil pressure allows the piston to move upward more quickly and with less resistance. Once the recoil energy has partially lifted the piston, the hydraulic oil pressure completes the process.

The energy recovery system shortens the piston cycle time, thus increasing speed and overall performance. No additional oil flow is required for this increased operating speed. Since unused breaking energy is recovered, the efficiency of the hammer is increased.

9.10.2 Two-Speed Operation

The Models 730, 740 and 745 Hy-Ram do not have the Two-Speed Operation feature.

9.10.3 AutoControl

The Models 730, 740 and 745 Hy-Ram do not have the AutoControl feature.

9.10.4 Auto Shut-Off

Automatic shut-off refers to an automatic system of hydraulic pathways and controls which protects the hammer components from damage when the demolition tool is not in impact position. This feature eliminates blank-firing: the hammer automatically shuts down when there is no contact pressure on the tool.

9.10.5 Pressure-Reduced Mode

Pressure-reduced mode can be used to warm oil by cycling it through the hammer without operating the demolition tool. This is done by turning on the operating switch with NO contact pressure on the tool. After oil has been warmed to operating temperature, the hammer is turned off, the tool is set for operation, then the hammer is restarted. Refer to section 9.4 Startup.

9.10.6 Precharge Chamber

The precharge chamber is located in the cylinder head above the piston and is filled with nitrogen. As the piston moves to its upper most position, the nitrogen is compressed. The force arising from this compression is transferred to the top of the piston and helps drive the piston down.

Both the precharge chamber and the hydraulic system of the carrier provide the force for the working stroke. This design feature makes the impact energy of the hammer largely independent of fluctuations in the hydraulic system of the carrier during operation.

9.11 Special Operation Environments

9.11.1 Working Underground

When using the Hy-Ram underground (tunnelling or mining applications) special regulations may apply. Additional considerations include:

- use water sprays to suppress dust
- use fire-resistant hydraulic fluids when required.

Hydraulic systems using fire resistant fluids require special engineering consideration when using the Hy-Ram. With some fluids, decreased flow and/or pressure to the hammer may be necessary. Contact Allied well before installation for specific parameters for your particular fluid.

9.11.2 Working Underwater

WARNING

Never use a Model 730, 740 or 745 Hy-Ram Hammer underwater. These models are not built for underwater use.

9.12 Working In High Outside Temperatures

Check the oil temperature frequently to ensure it does not exceed 176ºF [80ºC]. If higher temperatures are measured in the tank, an oil cooler must be installed. Use only hydraulic oils with adequate viscosity.

CAUTION

When working in temperature conditions below minus 4ºF [-20ºC], the hydraulic hammer shall not be put into operation while the hydraulic oil is still cold. Operating the hammer with cold hydraulic oil may cause the seals in the hammer to break and the diaphragm in the high-pressure accumulator to tear. Observe the carrier manufacturer's regulations.

9.13 Working in Low Outside Temperatures

When the temperature is below minus 4° F. (-20° C.), warm up the oil by running the carrier before starting the Hy-Ram. Once the oil has reached 32° F. (0° C.), the hammer can be run in pressure-reduced mode as described in Section 9.4 Startup, to flush out the cold oil and warm circulating oil to operating temperature of 140° F. (60° C.).

Keep oil circulating in the carrier and in Hy-Ram pressure-reduced mode during breaks in work so that the oil does not get too cold for normal operation.

SECTION 10.0
OPERATOR TROUBLESHOOTING CHART

WARNING

Before removing the hydraulic lines, bleed off all hydraulic pressure.When rectifying faults, observe all safety regulations.

CAUTION

Before disassembling the Hy-Ram, bleed off all nitrogen pressure in the precharge chamber.

Problem	Cause	Remedy
Operating pressure is too low.	Relief valve set too low.	Reset pressure, check dynamically.
	Damaged relief cartridge or seals.	Inspect-repair or replace.
	Insufficient pump delivery (low flow means low pressure at the hammer).	Check pump with flow meter (check dynamic pressure).
	Flow control not set properly.	Set flow control.
Return line pressure too high.	Failed hoses or blockage at crimp on fitting.	Replace hoses that are frayed or damaged.
	Heat exchanger and return filters may be blocked.	Change filter and repair or replace plugged cooler.
	Return line connected to valve bank.	Hammer return must bypass valve bank.
	Hoses or fittings too small for installation.	Always use proper hose and fitting sizes.
Repeated HP accumulator failure.	No check valve in pressure line, accumulator discharges suddenly.	Install check valve Inspect check valve for damage.
	Operating temperature too high. Heat deteriorates rubber diaphragm.	Correct overheating problem. See Problem: Operating temperature too high on page 10-3.
	Nitrogen charge too high or too low.	Charge to factory specs. after rebuilding.
	Operating pressure is too high.	Check and adjust hydraulic operating pressure.
	Return line pressure is too high.	Locate and correct problem.
Blow frequency of hammer too low	Return pressure too high	Check return pressure and eliminate cause
Operating temperature too high.	Operating pressure too high.	Adjust as needed.
	Excessive leakage through hammer.	Repair or replace worn parts.
	Ambient temperature is high.	A cooler may be necessary — check with carrier manufacturer.
	Tool binding in bushing(s).	Repair or replace as needed. Check for proper lubrication.
	Return line pressure is too high.	Locate and correct problem.

10.0 OPERATOR TROUBLESHOOTING CHART (cont')

Problem	Cause	Remedy
Hammer does not start.	Pressure and return lines crossed.	Reverse hoses.
	Insufficient impact pressure.	Force tool fully into tool holder by pushing down with the carrier.
	Nitrogen precharge is too high.	Check and reset pressure if needed.
	Quick disconnects not opering.	Repair or replace.
	Ball valves closed.	Open ball valves.
	Operating pressure is too low.	Check and reset pressure if needed.
	Fault in electrical circuit.	Check for power at solenoid.
Hammer runs slow.	Insufficient flow of oil.	Increase flow if possible.
	Return oil pressure too high.	Find and repair restriction to return flow.
	Nitrogen precharge is too high.	Check and reset pressure as needed.
Reduced breaking power.	Operating pressure is too low.	Check and reset pressure as needed.
	Nitrogen precharge pressure is too low.	Check and reset as needed.
	HP accumulator failure.	Repair as needed.
	Operating temperature is too high.	Correct overheating problem. See Problem: Operating temperature too high on page 10-3.
	Tool binding in bushing(s).	Repair or replace as needed—check for proper lubrication.
	Return line pressure is too high.	Locate and correct problem.

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SECTION 11.0
CARE AND MAINTENANCE

11.1 Care and Mainenance Shedule

During Shift

- Lubricate demolition tool every two hours or anytime the tool appears dry. (See 8-5.)
- Check lube fitting for damage.

Daily

- Tighten threaded connections (during first 50 hours)
- Check for leaks in hydraulic lines.
- Check that pipe clamps fit correctly.
- Check mounting brackets for wear.

Weekly

- Check threaded connections.
- Check retainer pin for burrs.
- Check retainer pin and plunger spring in tool holder for tight fit.
- Check demolition tool for burrs. Pay special attention to slot area.

Every Two Weeks

- Check precharge chamber pressure.
- Check demolition tool for wear.
- Check lower tool bushing for wear.
- Check side plates for wear.

Monthly

- Check piston impact surface for dents.
- Check impact surface (top) of demolition tool for chips.
- Check surface of upper tool bushing for cracks, chips, wear or looseness.

At Hammer Rebuild

- Check high pressure accumulator for proper nitrogen pressure.

As Required

- Replace bent and damaged tubes.
- Replace any damaged hose(s).
- Clean hydraulic oil filter.

11.1.1 Warranty Protection

Maintain written records of Hy-Ram maintenance, service and repair. These records will be helpful if warranty coverage is ever in question. Each record shall include :

- The date of service, maintenance or repair.
- A description of the service, maintenance or repair performed. Include part numbers if applicable.
- Copies of purchase order(s) and invoice(s) for repair parts and service.
- The name and signature of the person performing the service, maintenance or repair.

11.2 Care and Maintenance Instructions

Refer to Sections 11.2.1 thru 11.2.15.

11.2.1 Checking Hydraulic Lines for Leaks Before Starting Work

1. Visually check all hydraulic lines (tubes and hoses) from the pump to the hydraulic hammer and back into the tank.
2. Tighten any loose fasteners and hose clamps.
3. Replace any damaged tubes or hoses.

11.2.2 Daily Checking for Cracks

Check the side plates for cracks everyday.

11.2.3 Checking Wear to the Tool Bushings

(Refer to Figure 11-1.)

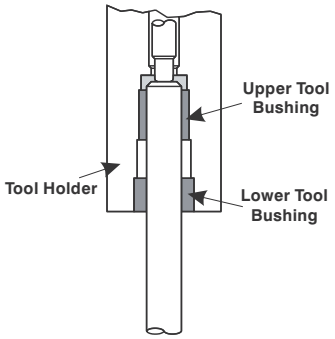


Figure 11-1. Checking Wear Of Tool Bushings

Check the inside diameter of the lower tool bushing every time the demolition tool is changed and at the least, every 100 operating hours. Determine the allowable diameter from the following table. If the diameter has increased to more than the specified dimension, both tool bushings must be replaced.

Tool Bushing Diameter		
730	740	745
3.3 in. (83mm)	4 in. (102mm)	4 in. (102mm)

NOTE

It is recommended that the Hy-Ram be taken to an Allied distributor ser vice department to make this repair.

The tool bushings must be replaced by a service technician in a suitably equipped workshop.

11.2.4 Checking Impact Face of Piston for Wear

The impact face of the piston must be checked each time the demolition tool is

changed or at least once a month. After the demolition tool has been removed, proceed as follows:

1. Shine a light on the piston's impact surface and check for dents or chipping.
2. Do not operate the Hy-Ram if dents or chips are evident.
3. Contact your authorized Allied service center.

11.2.5 Checking Wear to the Retainer Pin

1. Check the retainer pin every time the demolition tool is changed or removed.
2. If excessive wear such as sharp edges, notches or dents are found, replace the retainer pin.
3. Carefully smooth off any burrs found on the retainer pin.

11.2.6 Checking Wear to the Demolition Tool

(Refer to Figure 11-2.)

Check the demolition tool diameter each time it is changed or at the least, every 100 operating hours. If the shank diameter of the demolition tool has worn to less than the dimension listed in the following table, the demolition tool must be replaced.

Burrs on the shank of the demolition tool and on the retainer pin must be smoothed off carefully. A grinder may be used observing the following CAUTION .

Demolition Tool Outside Diameter		
730	740	745
3.03 in. (77mm)	3.82 in. (97mm)	3.82 in. (97mm)

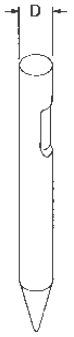


Figure 11-2. Check Wear To Demolition Tool

CAUTION

Do not allow the shank of the tool to get too hot if using a grinder to remove burrs.

11.2.7 Inspect Dust Ring

The Models 730, 740 and 745 do not have a dust ring.

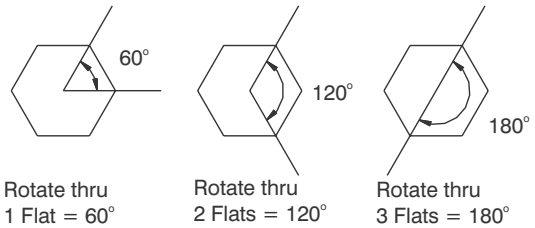
11.2.8 Check Tightness of Threaded Connections

The hydraulic hammer threaded connections are subjected to high stresses. All hydraulic hammer threaded connections must be checked daily for the first 50 operating hours and thereafter once a week. Loose connections shall be tightened to the specified torque. Refer to the Torque Table below for applicable connections. Figure 11-3 on the following page shows the item numbers referenced in the table. This table and the following figure show the Models 730 and 740.

Torque Table for Allied Hy-Ram Models 730, 740 and 745

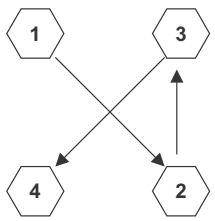
Connection	Item No.	Interval	Hammer Model	Tool Required	Torque Req'd. Ft Lbs. (Nm) Lubricated
Tension bolts Model 730 Models 740 and 745	1	As Required	All	Socket Wrench 1-5/8 in. Socket Wrench 2 in.	 150 (200) +60°+90°* 150 (200) +120°+210°*
Fill Valve G	2	Weekly	All	Socket Wrench 7/8 in.	148 (200)
Connections P & T	3	Weekly	All	Open-end Wrench 1-1/4 in. Open-end Wrench 1-1/2 in.	738 (1000) 738 (1000)
High -pressure Accumulator	4	As Required	All	Accumulator Wrench Assembly Allied Part No. 667341	1475 (2000)
Lube Fittings	5	As Required	All	Socket Wrench 9/16 in.	—
Threaded plug (on side of lower hammer part)	6	As Required	730 only	Socket Head 8mm	—
Hammer bracket	7	Weekly	730 only	Socket Wrench 1-5/8 in.	575 (780)
Hammer bracket	8	Weekly	All	Socket Wrench 2 in.	1180 (1600)
Hose connection on hydraulic hammer	—	As Required	All	Open-end Wrench 1-1/4 in. Open-end Wrench 1-1/2 in.	—

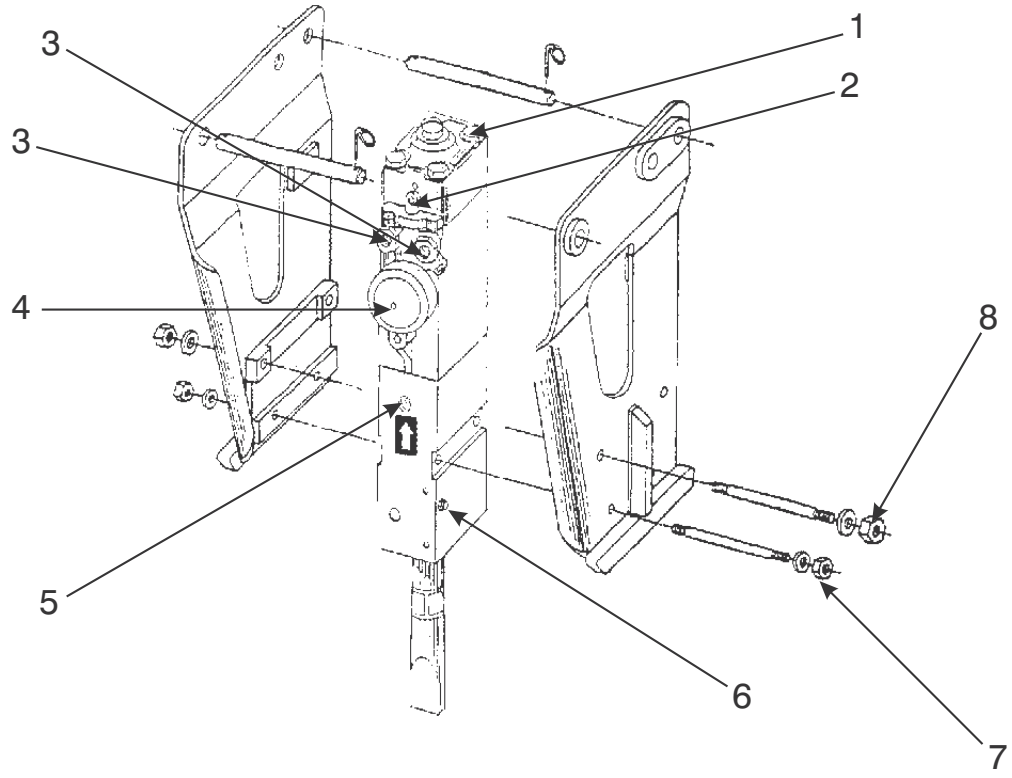
*A flat is one of the six hexagonal edges of the top of the tension bolts. The number in parentheses ( ) indicates the number of flats that correspond to the number of degrees to be tightened.



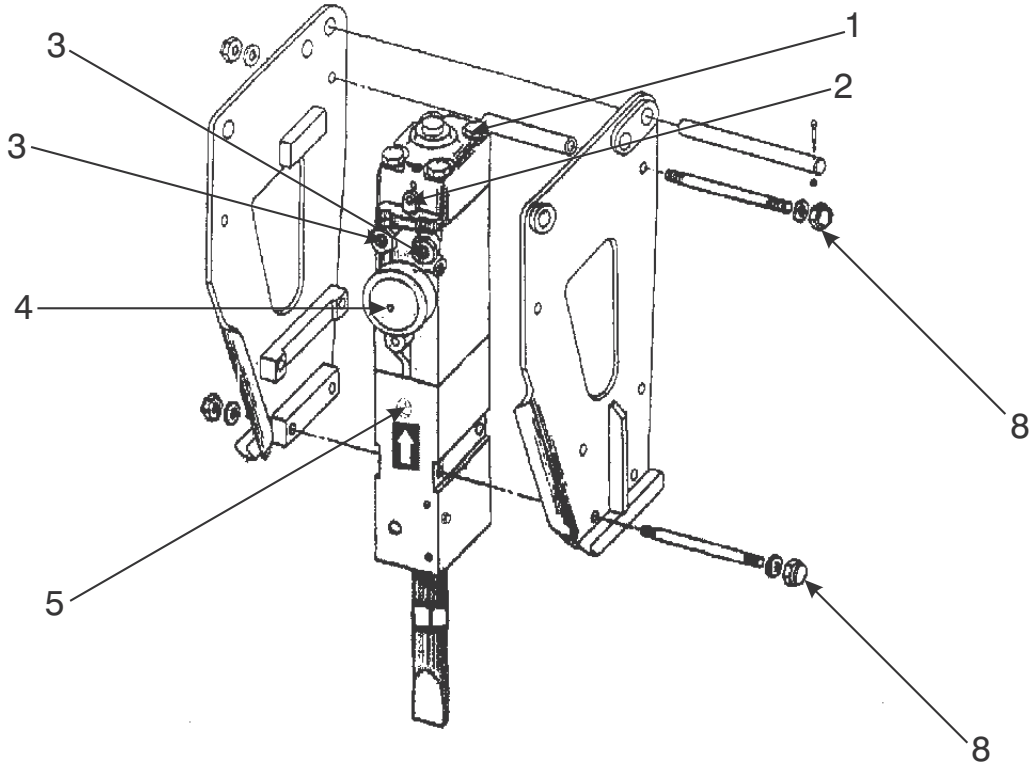
In each of the following steps, tighten the tension bolts in a diagonal sequence as shown to the right.

Step 1: Tighten all bolts to specified torque.
Step 2: Tighten all bolts specified number of degrees.
Step 3: Tighten all bolts specified number of degrees.





Hy-Ram Model 730



Hy-Ram Model 740

Figure 11-3. Models 730, 740 & 745 Torque Items on Hammer

11.2.9 Checking the Nitrogen Precharge Chamber. (Refer to Figure 11-4.)

WARNING

When checking the chamber, make sure no one is in the vicinity of the demolition tool. If the demolition tool is jammed, an increase in pressure in the chamber may release it suddenly.

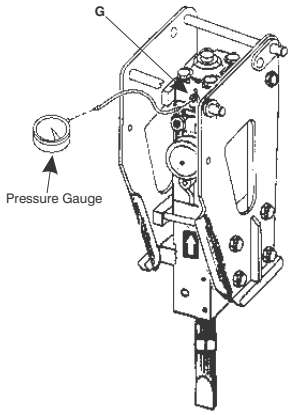


Figure 11-4. Typical Hy-Ram Nitrogen Precharge Chamber

1. Clean the area around the fill valve plug **G** on cylinder head.
2. To check the pressure, lay the Hy-Ram on its side with no contact pressure on the demolition tool.
3. Remove the screw plug from fill valve **G.**
4. Firmly insert test guage hose into fill valve. Refer to Figure 11-4.
5. Read the pressure.
6. Refer to the following table for the correct pressure. A tolerance of plus 0/ minus 5 psi is acceptable. Pressures are given for temperatures at 70°F. (21°C.) and 150°F. (65°C.)

Nitrogen Precharge Chamber Pressure psi (bar) 70°F. (21°C.)		
730	740	745
154 psi (11 bar)	141 psi (10 bar)	168 psi (12 bar)
150°F. (65°C.)		
180 psi (12 bar)	165 psi (11 bar)	195 psi (13 bar)

7. After pressure reading is obtained, quickly remove test gauge nozzle from fill valve **G**. The fill valve check will automatically close to seal.
8. Replace fill plug in fill valve.

CAUTION

Before removing the complete fill valve **G** for repair, the precharge chamber must be totally depressurized or injury could result.

CAUTION

Use only the hose nozzle to relieve the pressure. Using nails, screwdrivers or similar objects will damage the fill valve.

11.2.10 Refilling the Precharge Chamber

(Refer to Figure 11-5.)

WARNING

The nitrogen precharge chamber shall only be filled with 99,8% pure nitrogen gas. Make sure no other gas, e.g. air or oxygen, is allowed into the precharge chamber: THIS COULD RESULT IN AN EXPLOSION!

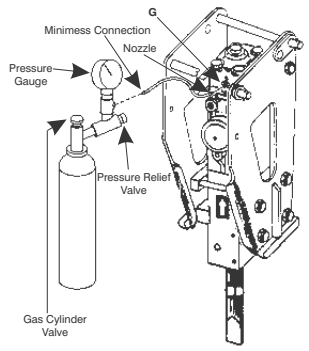


Figure 11-5. Filling the Nitrogen Precharge Chamber

When the pressure in the nitrogen precharge chamber drops more than 15 psi (1 bar) at 70°F. (21°C.) or 20 psi (1.5 bar) at 150°F. (65°C.), the chamber must be refilled as follows:

1. Connect nitrogen regulator valve to nitrogen cylinder.
2. Clean the area around fill valve plug on cylinder head.
3. Connect one nozzle of the filling hose to the nitrogen regulator valve.
4. Back out the nitrogen regulator pressure adjustment.
5. Open valve on nitrogen cylinder.
6. Remove plug from fill valve **G**.
7. Carefully blow out filler assembly to remove any internal foreign matter.
8. Press free nozzle of filling hose into fill valve **G**. Maintain in this position by applying a steady but moderate force.
9. Open the nitrogen regulator valve slowly allowing nitrogen into precharge chamber. Pressure increase can be read on the pressure gauge.
10. Allow approximately 15 seconds for gas chamber in Hy-Ram to fill, or, under quiet conditions, until the gas can no longer be heard entering the cylinder head.
11. Close the nitrogen cylinder valve when the reference value has been reached. Quickly remove fill nozzle from fill valve. The fill valve check will automatically close to seal. Refer to the table on page 11-6 for the correct pressure for the model number Hy-Ram being filled. Pressures are given for temperatures at 70°F. (21°C.) and 150°F. (65°C.)
12. Bleed remaining gas from regulator and disconnect it from nitrogen tank

CAUTION

Use only the hose nozzle to relieve the pressure. Using nails, screwdrivers or similar objects will damage the fill valve.

13 Press free nozzle of test hose into fill valve **G** and read pressure.
14. Make any adjustments necessary so that the correct pressure is set.
15. Close fill valve **G** with screw plug.
16. Remove nitrogen regulator from cylinder and recap.

11.2.11 Checking the High Pressure Accumulator

WARNING

Never attempt to open or repair the high-pressure accumulator. Defective high-pressure accumulators must be rebuilt by a qualified service technician.

If the return line hose from the hammer (which normally pulsates lightly to moderately)) starts to pulsate strongly, the high-pressure accumulator may not be working properly.

Turn off the Hy-Ram immediately. The high-pressure accumulator must be repaired by a qualified service technician.

11.2.12 Checking Mounting Pins

Visually check the mounting pins every time the hammer is removed from the carrier. If the pins show signs of excessive wear, cracks, notches or dents, they must be replaced.

11.2.13 Checking The Side Plates

The side plates shall be checked at least twice a month for cracks or heavy wear. Contact Allied for recommended repair or rebuild procedures.

11.2.14 Checking And Cleaning The Hydraulic Oil Filter If Equipped

1. On new hydraulic hammer installations, clean the oil filter for the first time after eight (8) operating hours, and the second time after fifty (50) operating hours.
2. Thereafter, check the oil filter every 500 hours and clean if necessary.

11.2.15 Checking And Cleaning The Hydraulic Oil Filter On The Carrier

Refer to the carrier manual and change and clean the oil filter in the carrier as instructed.

SECTION 12.0
LIFTING & TRANSPORT

If the hammer is to be transported independently of the carrier:

1. Remove all loose debris from hammer.
2. Follow removal instructions in Section 7.9.
3. Secure hoses to unit to avoid accidental damage.
4. Lift the hammer at approved lift points only with appropriate lifting equipment. See Figure 12-1.
5. Adequately stabilize and secure the hammer for transport.

If the hammer is transported while installed on the carrier:

1. Remove all loose debris from hammer.
2. Secure hoses to unit to avoid accidental damage.
3. Inspect the mounting pins and hardware for damage and integrity.

WARNING

Do not lift the hammer by the mounting pins. The hammer may shift and cause damage or personnel injury.

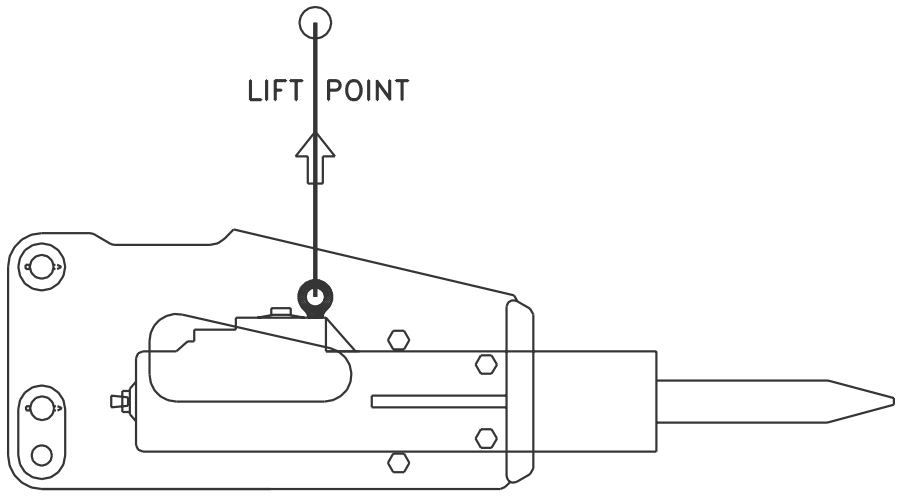


Figure 12-1. Hammer Lift Point

SECTION 13.0
STORAGE OF THE HAMMER

13.1 Storing Hy-Ram on the Carrier

The Hy-Ram shall be stored in the vertical position with the tool pushed all the way in. This lifts the piston into its uppermost position. In this position, the sliding surfaces are covered by oil.

13.2 Short Term Hy-Ram Storage off the Carrier—14 Days or Less

1. The Hy-Ram may be stored on or off the carrier in a vertical or horizontal position with no special storage requirements.
2. If storing the Hy-Ram in a horizontal position, the top of the hammer should be higher than the tool end to prevent water from entering the tool holder.
3. If outside, cover with a waterproof tarp.

13.3 Long Term Hy-Ram Storage off the Carrier—More than 14 Days

1. Refer to Section 8.4 and remove the demolition tool from the Hy-Ram.
2. Drain the nitrogen precharge chamber.
3. Remove the hydraulic hoses.

> **CAUTION**
> Several liters of oil will run out when threaded connections **P** and **T** are opened. This oil must be collected and disposed of correctly.

4. Open threaded connections **P** and **T**.
5. Using a rod or tube, push the piston to its highest position.
6. Block the piston with a rod or tube so it cannot return to the down or out position.
7. Fill the connections on the hammer with hydraulic oil.
8. Close threaded connections **P** and **T**.
9. Close the bore for the demolition tool using either the protective plug or a clean rag.

> **CAUTION**
> The weight of the piston can cause flattening and damage to the seals and O-rings when storing a Hy-Ram in the horizontal position.

> **CAUTION**
> Surface condensation on the normally exposed lower area of the piston can cause destructive rust and pitting of the piston in the lower seal contact area.

10. Store the Hy-Ram blocked in an upright position or on a stand. The piston must be blocked in the upper position.
11. If possible, stand the hammer upside down. The piston will slide to the top of the hammer.

CAUTION

Secure the hammer so that it cannot fall over.

13. If outside, cover hammer with a waterproof tarp.

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