ALLIED®
Construction Products, Inc.

OPERATOR'S MANUAL

Manual Part Number 100276
June 1, 2003

AR SERIES HAMMERS

MODELS AR 48 AR 62

Allied Series Hammers
AR 48 and AR 62
Document Change Notice

Date	Page	Change
03/26/02	4-1	Update Specs
11/20/02	11-2/11-3	Corrected wear specs.
06/01/03	4-1,11-4	Updated Specs & Torque Table

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SECTION 1.0
INTRODUCTION & SCOPE

This manual contains important information for the safe use and maintenance of the Allied Hammer Models AR 48 and AR 62. Read this manual thoroughly before installing, operating or servicing the hammer. This manual must be easily accessible to operators, service and transport personnel. Store this manual in a convenient location. In most cases, illustrations are of a typical hammer. Where necessary, there is a view of each individual model covered in this manual.

⚠ Instructions identified with this symbol are important for personnel safety and full service life of the hammer. Follow these instructions carefully.

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

SECTION 2.0
OVERVIEW

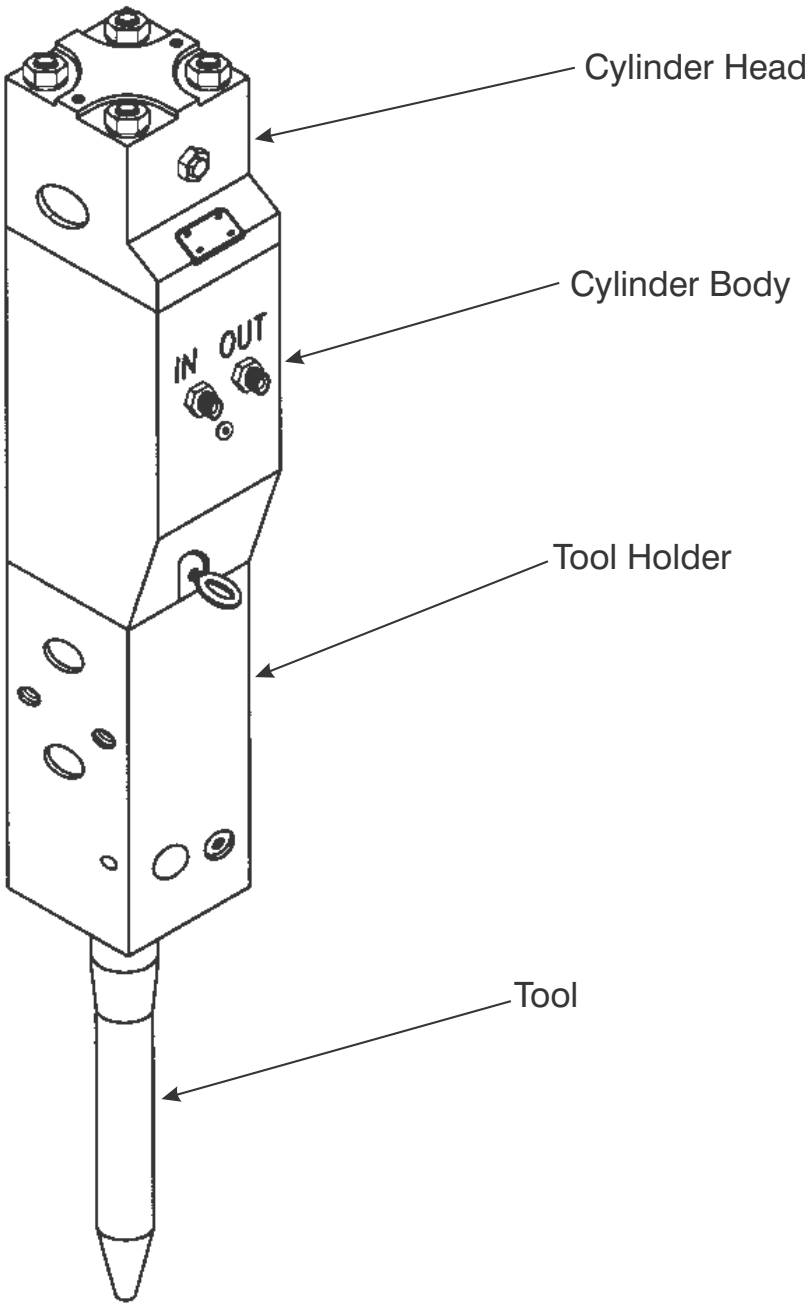


Figure 2-1. Typical Hammer Main Components

2.1 Introduction

The Allied AR Series hammers are classified by carrier application:

(1) skid steer loaders
(2) mini-excavators.

Depending on the hammer model, the AR hammers are compatible with skid steer loaders and mini-excavators from 3,000 lbs. (1,300kg). The hammers can be installed on almost any hydraulic system and can be operated with pump capacities as low as 4 gpm (15 lpm).

The maximum operating pressure is: AR 48: 1750 (120bar); AR 62: 1900 psi (130 bar).

The hammer is designed to operate with the carrier's auxiliary attachment circuit. If the carrier does not have an auxiliary circuit, an Allied installation kit is required. In either case, proper hydraulic flow and pressure must be delivered by the auxiliary circuit.

The hammer side plates are pinned to the hammer with easy-to-remove pins and vibration dampening bushings.

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

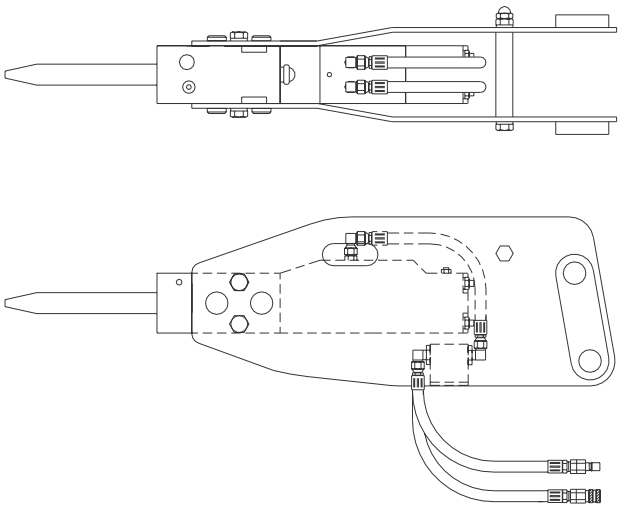


Figure 2-2. Typical Mini-Excavator Configuration

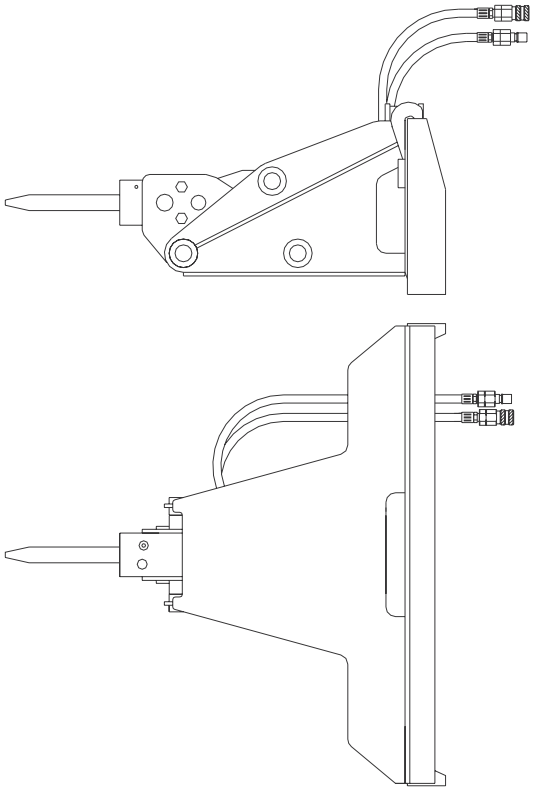


Figure 2-3. Typical Skid Steer Configuration

2.2 Description of Assembly Groups

- **Cylinder Head**

  The cylinder head is the upper hammer section.

  The nitrogen filling and measuring fitting for the precharge chamber is located on the cylinder head. Refer to Figure 2-4.

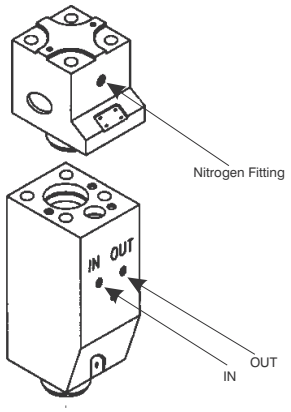


Figure 2-4-AR 48 Ports Cylinder Head & Cylinder Body

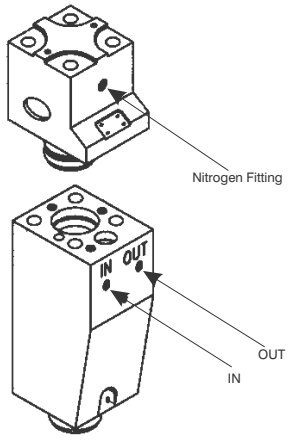


Figure 2-4-AR 62. Ports on Cylinder Head & Cylinder Body

- **Cylinder**

  The cylinder is the center section of the hammer between the cylinder head and the tool holder. These three assemblies are connected with tension rods.

  The pressure connection (from the pump), labeled **IN** above the port, and the return connection (to the tank), labeled **OUT** above the port, are located on the front of the cylinder body. Refer to Figure 2-4.

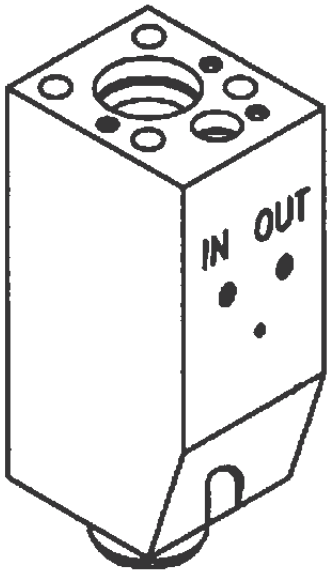


Figure 2-5. Typical Cylinder

- **Piston**

  The piston reciprocates in the cylinder transferring its energy to the demolition tool upon impact.

- **Tool Holder**

  The tool holder holds the demolition tool in place with a retainer pin. A tool bushing and impact ring are located in the tool holder.

Figure 2-6. Typical Piston

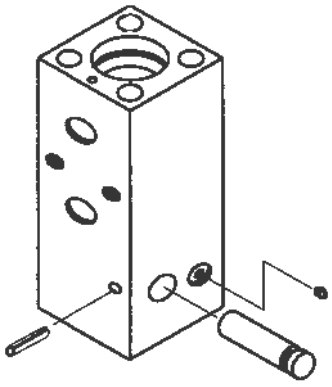


Figure 2-7. Typical Tool Holder

SECTION 4.0
TECHNICAL INFORMATION

4.1 Technical Specifications

Technical Specifications			
Hammer Model		**AR 48**	**AR 62**
Frequency Range	blows per minute	700 - 1500	450 - 1150
Hydraulic Flow	gpm (lpm)	4 - 9 (15 - 35)	6 - 12 (23 - 45)
Hydraulic Operating Pressure	psi (bar)	1300 - 1750 (90 - 120)	1300 - 1900 (90 - 130)
Hydraulic Relief Pressure	psi (bar)	2050 (141)	2200 (152)
Precharge Chamber N2 Pressure	psi (bar)	185 (12.8) at 70 F (21 C) 215 (15.0) at 150 F (65 C)	150 (10.3) at 70 F (21 C) 175 (12.0) at 150 F (65 C)
Weight - Mini-Excavator	lbs. (kg)	320 (145)	440 (200)
Working Length Mini-Excavator	in. (mm)	46.2 (1174)	55.9 (1420)
Weight - Skid Steer	lbs. (kg)	600 (272)	670 (304)
Working Length Skid Steer	in. (mm)	42.0 (1066)	47.1 (1197)
Demolition Tool Diameter Working Length	Type in. (mm) in. (mm)	Conical 1.89 (48) 12 (305)	Conical 2.44 (62) 15 (380)
Carrier Weight Class Excavator	1000 lbs (1000 kg)	4 - 8 (1.8 - 3.6)	6 - 10 (2.7 - 4.5)
Carrier Weight Class Skid Steer	1000 lbs (1000 kg)	3 - 6 (1.3 - 2.7)	4 - 6 (1.8 - 2.7)
Hydraulic Hose Size	In. (mm)	½ in. (13mm)	½ in. (13mm)

NOTE

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

4.0 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 AR 48 Hammer - Mini-Excavator Configuration (XSF)

Letter	Dimension in. (mm)	Decscription
A	48.7 (1225)	Hammer length
B	9.44 (240)	Hammer width
C	12.0 (305)	Tool length
D	46.2 (1174)	Hammer working length - stick pin to tool tip.
E	6.69 (170)	Mounting width
F	13.4 (340)	Hammer depth
G	7.00 (178)	Stick pin to link pin length
H	1.89 (48)	Tool diameter

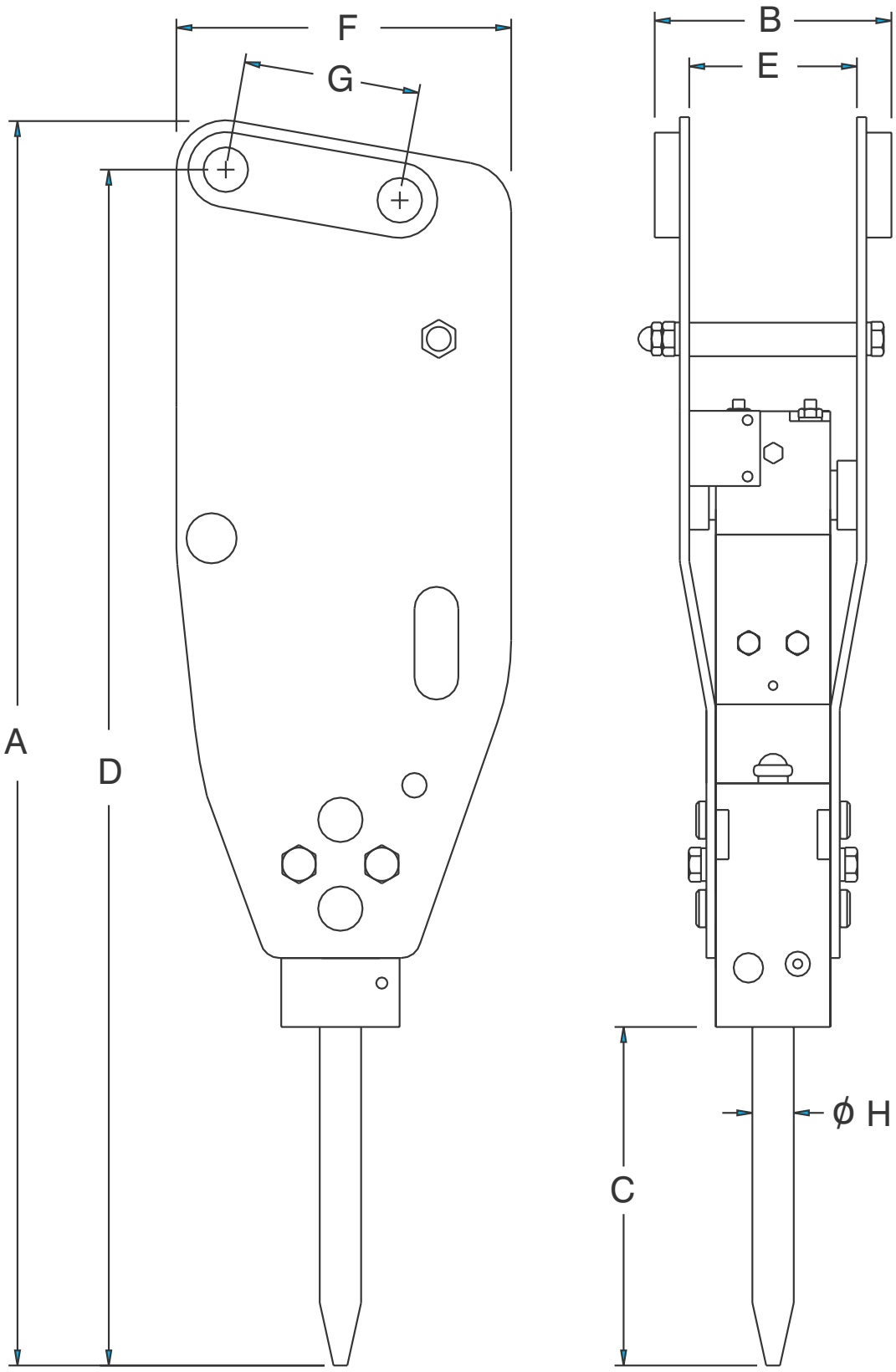


Figure 4-1. Dimension Drawing - Model AR 48 Mini-Excavator Configuration (XSF)

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 AR 48 Hammer - 2-Position Universal Skid Steer Configuration (SSU-2)

Letter	Dimension in. (mm)	Decscription
A	46.2 (1184)	Hammer length
B	48.5 (1232)	Hammer width
C	12.0 (305)	Tool length
D	42.0 (1066)	Hammer working length
E	39^{o}	Hammer rotation angle
F	20.0 (508)	Hammer depth
G	1.89 (48)	Tool diameter

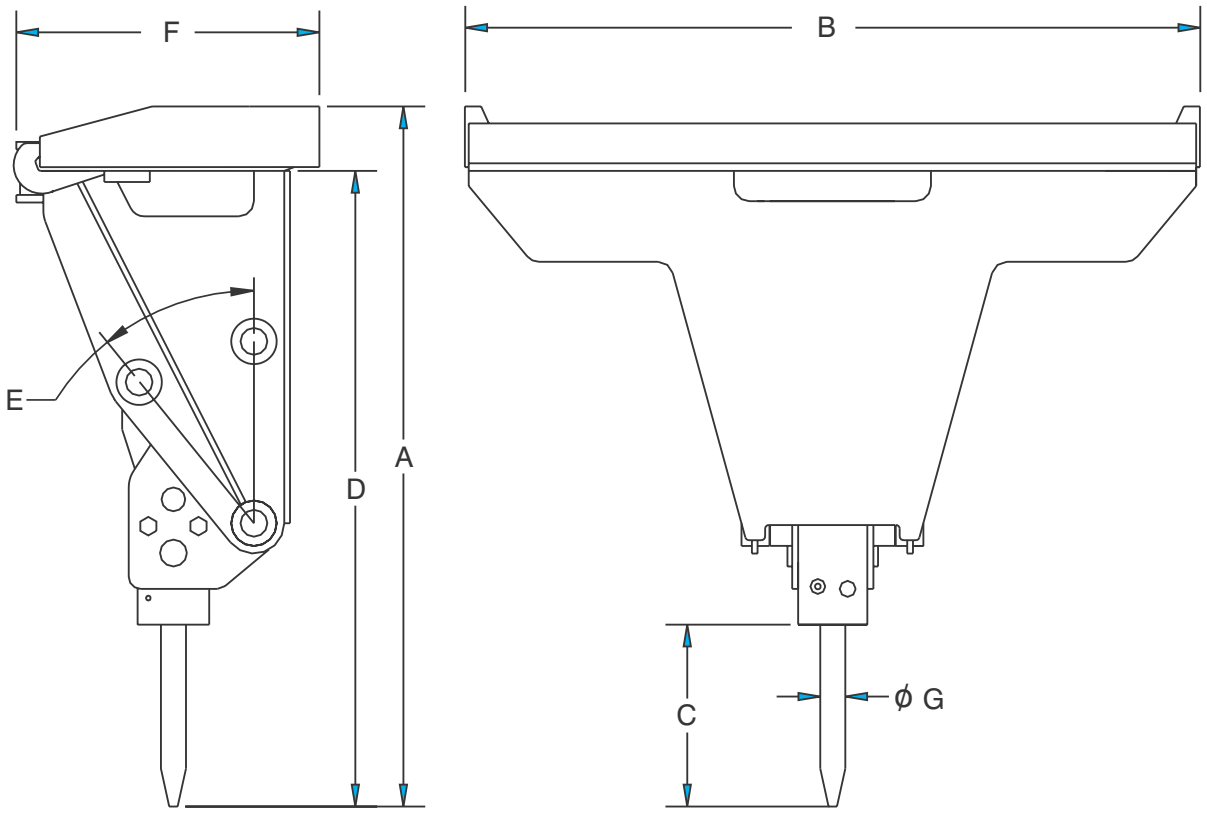


Figure 4-2. Dimension Drawing - Model AR 48 2-Position Skid Steer Configuration (SSU-2)

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 AR 62 Hammer - Mini-Excavator Configuration (XSF)

Letter	Dimension in. (mm)	Decscription
A	56.9 (1445)	Hammer length
B	9.44 (240)	Hammer width
C	15.0 (371)	Tool length
D	55.9 (1420)	Hammer working length - stick pin to tool tip.
E	6.69 (170)	Mounting width
F	15.3 (387)	Hammer depth
G	7.00 (178)	Stick pin to link pin length
H	2.44 (62)	Tool diameter

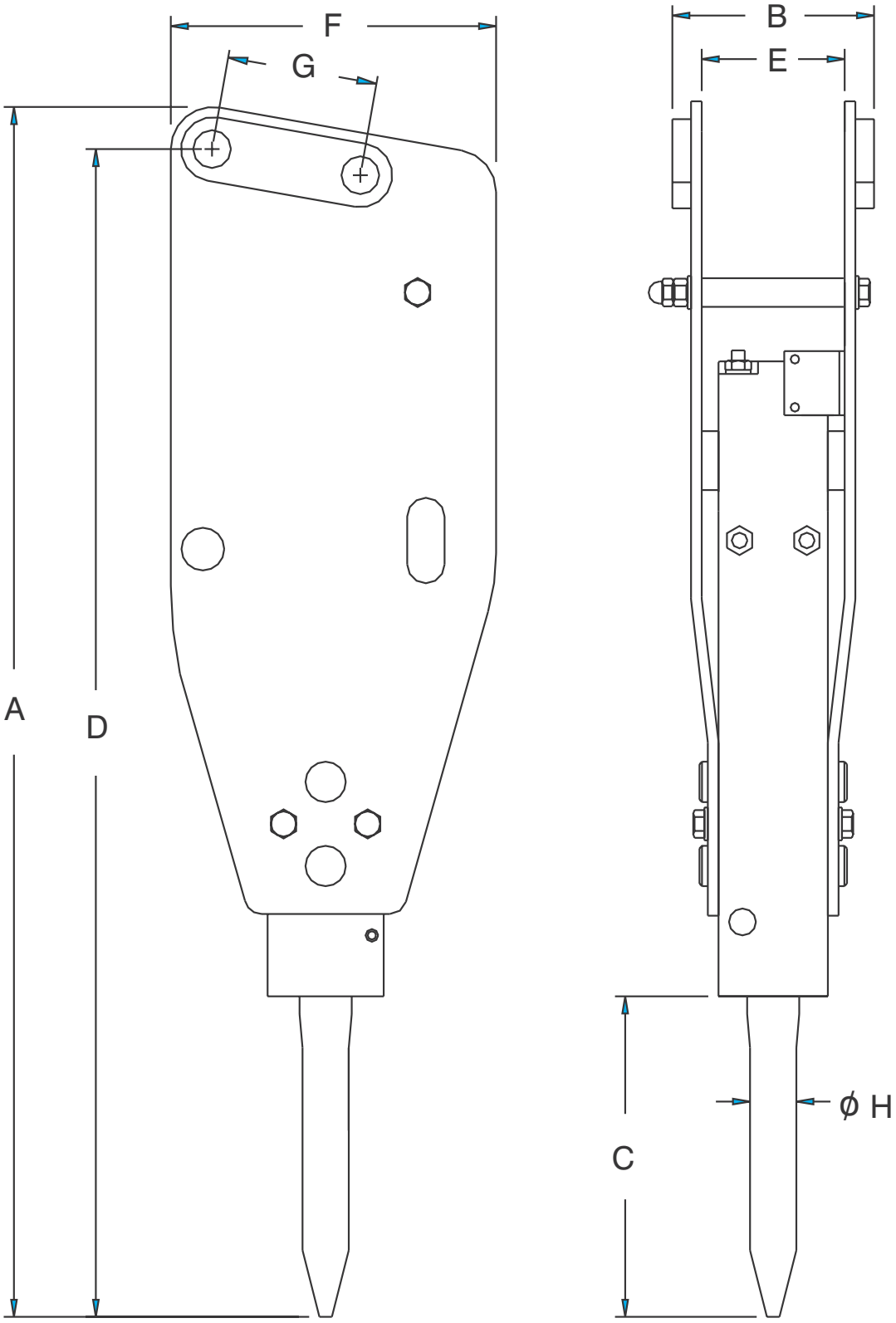


Figure 4-3. Dimension Drawing - Model AR 62 Mini-Excavator Configuration (XSF)

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

Table 4-4. Dimensions of AR 62 Hammer - 2-Position Universal Skid Steer Configuration (SSU-2)

Letter	Dimension in. (mm)	Decscription
A	51.4 (1305)	Hammer length
B	48.5 (1232)	Hammer width
C	15.0 (371)	Tool length
D	47.1 (1197)	Hammer working length
E	39°	Hammer rotation angle
F	20.0 (508)	Hammer depth
G	2.44 (62)	Tool diameter

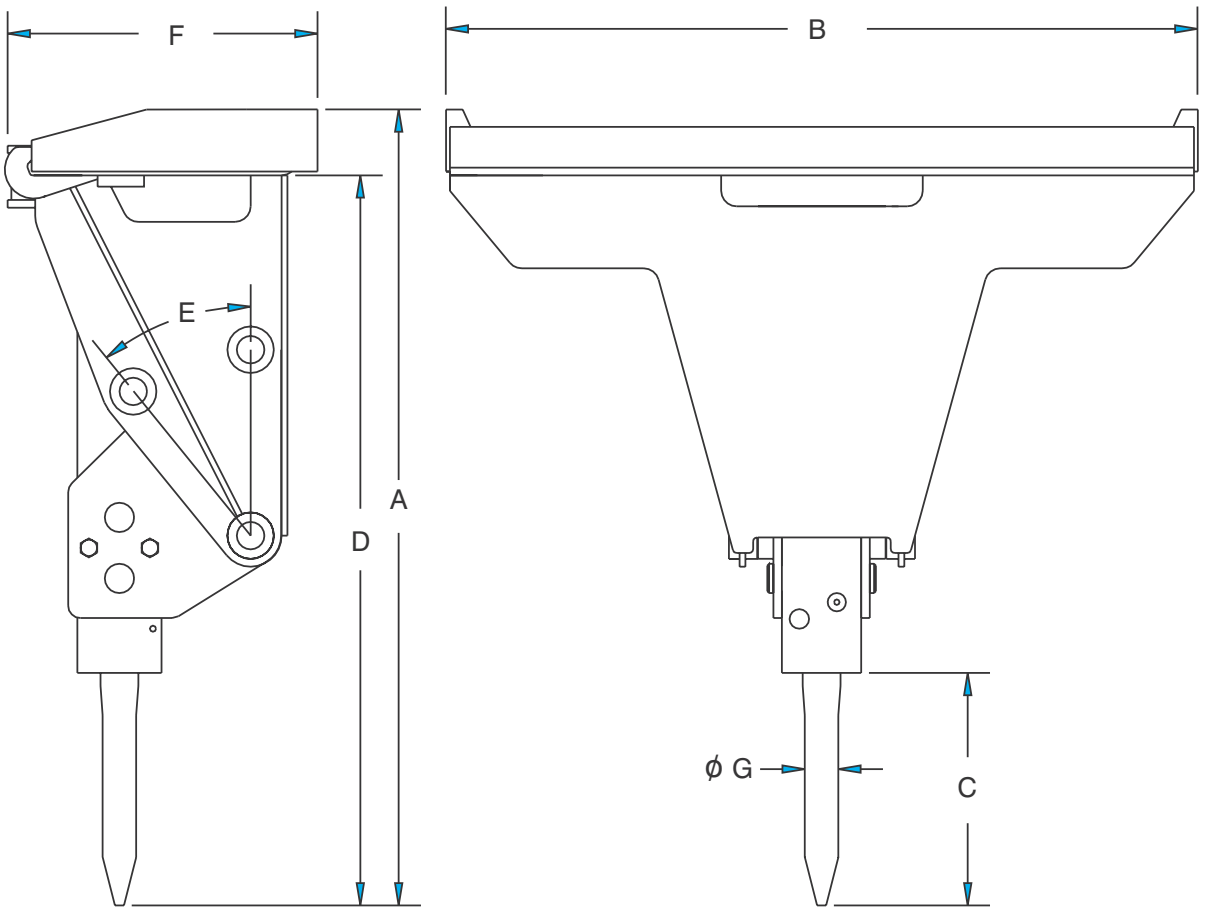


Figure 4-4. Dimension Drawing - Model AR 62 2-Position Skid Steer Configuration (SSU-2)

SECTION 5.0
GENERAL CONSTRUCTION SAFETY

5.1 Owner's Responsibilities

The equipment owner is responsible to assure that all operating personnel are fully trained and adhere to the procedures explained in this manual, especially regarding safety to personnel and equipment. If necessary, the owner or safety/training personnel must expand upon these general instructions to adapt them to particular applications.

5.2 General Construction Safety

The standard safety precautions expected and required of those working in construction shall be followed, 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 hammer 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. Box 371954
Pittsburgh, Pa. 15250

Ask for Construction Industry OSHA Standards Stock #869-034-00107-6.

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. The following safety summary outlines the minimum safety policies the hammer owner shall establish for any hammer installation. The summary is arranged by topic. Each summary Section addresses a safety topic and states the Allied recommended policy. Any operational safety program must be tailored by the hammer owner to the specific site and application. Such a program will result in equipment life, performance and reduced down-time. 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 the instructions and procedures. Even experienced service technicians are to review these CAUTIONS and WARNINGS prior to performing a procedure. These are highlighted by the symbol shown here.

5.4.2 Initial Operating Precautions

Some pre-operational checks and scheduled maintenance must be performed more frequently on a new hammer 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 hammer 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 hammer. The carrier oil filter must be cleaned according to Section 11.1 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 hammer.
- Operate the hammer only from the carrier operator's seat; and only after the carrier and hammer are correctly positioned.

5.4.4 Personnel Precautions

- The carrier operator shall perform some hammer 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 hammer.
- 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.

5.4.5 Hydraulic Pressure Precautions

- Before disconnecting any hydraulic lines, properly bleed all hydraulic system pressure.
- Make sure the hammer 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 Hoisting and Lifting Precautions

- The hammer 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 hammer, use the designated lift points on the side plates.
- Keep hands clear of any bores or fittings when moving, removing, attaching, or hoisting the hammer.

5.4.7 Maintenance Precautions

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

WARNING
Bodily injury and equipment damage could result if the hammer falls. After detaching it from the carrier, block the hammer 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 hammer 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 8-4.)
  - Checking tool inner bushing wear. (See Section 11.2.3.)
  - Checking piston impact surface wear (See Section 11.2.4.)
  - Checking demolition tool wear. (See Section 11.2.5.)

5.4.8 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 hammer if personnel without protective glasses or protective clothing enter the danger area.
- Never use the hammer in or under water. These models are not designed and built for underwater use.
- When work site temperatures are below minus 4ºF [-20ºC], follow the carrier manufacturer's low temperature operating instructions. Refer to Section 9.7 Working in Low Outside Temperatures.

5.5 Warranty Protection Summary

The Allied hammer requires a minimum of service if properly operated and maintained by trained personnel. The following steps will help keep the hammer in a safe, efficient operating condition. This summary outlines the minimum maintenance policies the hammer owner shall establish for any hammer installation to ensure effective operation and warranty coverage. This operational maintenance program must be tailored, by the hammer owner, to the specific site and application. Under such a program, the hammer will afford many years of reliable, effective operation; and warranty coverage will be effective.

- Train all carrier operators in the following functions.
  - Read and thoroughly understand the information and procedures detailed in this manual.
  - Understand proper operating techniques for all recommended applications.
  - Understand the maintenance schedule and requirements for:
    - procedures performed by the carrier operator.
    - procedures performed by the Allied trained service technicians.
  - Recognize problems and know how to take corrective action as detailed in operator troubleshooting.

  - Conduct regular pre-operational checks as described in operator checklist.
  - Conduct regular checks and inspections as scheduled in the care and maintenance schedule.
- Establish for each hammer application a pre-operational check and maintenance program as described in Sections 9.1 and 11.1 of this manual.
- Establish a scheduled maintenance program for each hammer application in accordance with the carrier operator maintenance section (Section 11.0) in this manual.
- Allow only trained carrier operators and Allied trained service technicians to perform maintenance and repair as specified in the care and maintenance schedule.
- Use only Allied trained service technicians and Allied repair parts, and lubricants to protect total warranty coverage.
- Maintain written records of hammer maintenance, service and repair. These records will be helpful if warranty coverage is ever in question. Each record shall include at least:
  - The date of the 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.

5.6 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 hammer applications, maintenance and service consistent with industry expectations for high performance, heavy impact hammers. 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 and/or demolition tools not approved or supplied by Allied.

These exclusions apply to damage to the hammer, the carrier, associated equipment and injury to personnel.

SECTION 6.0
HAMMER APPLICATIONS

The AR Series Hammers are suited for many types of light duty construction and mining applications. The following examples are typical and suggest the variety and limitations of standard applications. The hammers are not designed for use in or under water. Typical surface applications are:

Clearance Work: Light concrete and brick breaking; curb and gutter, sidewalk and driveway work. Cutting asphalt*.

Trenching: Trench compaction*; sheet, pipe and pile driving*. Trench rock excavation.

*in certain applications

Mining: Descaling in mines; horizontal breaking in tunnels.

Demolition: Concrete road and structural demolition.

Safety regulations for the hammer and the carrier must be observed at all times.

SECTION 7.0
AR HAMMER 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 hammer.

CAUTION

Do not attempt to set the hammer operating pressure or flow without first consulting the installation instructions for your machine. Maximum operating pressure is AR 48: 1750 psi (120 bar); AR 62: 1900 psi (130 bar). Do not exceed the maximum operating pressure.

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 hammer 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 Section 9.7 for operating at low temperature).

7.2 Installation Kits

Proper mounting hardware must be used to mount the hammer to a mini-excavator or skid steer. Allied installation kits are recommended; if others are used, they must satisfy the minimum requirements listed under Section 7.5 Attaching the AR Hammer.

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

7.3 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 hammer or carrier malfunctions. Refer to Section 10.0 Troubleshooting and also carrier troubleshooting.

7.4 Tools Required to Attach AR Hammer

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

- safety glasses & gloves
- sledge hammer
- drift pin
- socket wrench set
- grease gun
- open end wrenches
- caliper for checking tool wear
- pry bar

7.5 Attaching the AR Hammer to the Carrier

7.5.1 Attaching the AR Hammer to a Mini-Excavator

(Refer to Figure 7-1.)

WARNING

The hammer 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 and removal.

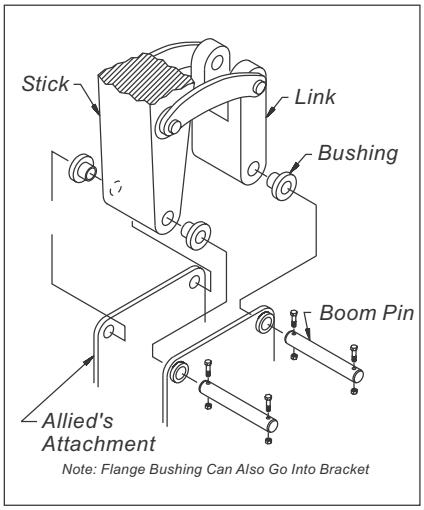
WARNING

Keep hands away from bores and pin areas when attaching the hammer. 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 hammer.

1. Before attaching the AR Hammer, remove the bucket or other tool attached to the stick of the carrier.
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.



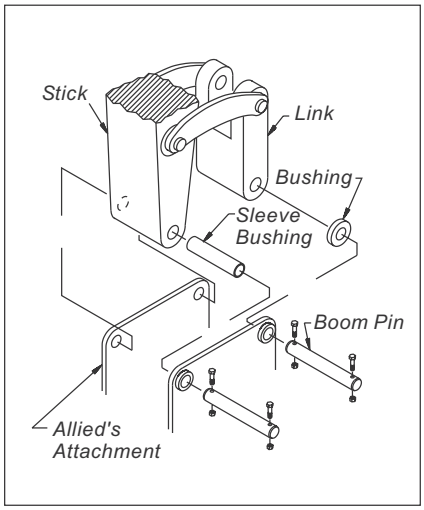


Figure 7-1.

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 mini-excavator 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.

7.5.2 Attaching the AR Hammer to a Skid Steer

WARNING
The operator must be properly protected. Refer to carrier's operating manual for proper equipment components.

1. If the skid steer hammer is attached to its mounting bracket, proceed to step 3; otherwise, see step 2.
2. Attach the backhoe hammer on the skid steer mounting bracket with the hoses facing the top. Refer to Figure 7-2. Use standard hammer pins to mount the hammer to the mounting bracket.
3. Make sure attaching clamps are open on the skid steer. The locking pins should be retracted. Refer to carrier operator's manual for quick attach operation.

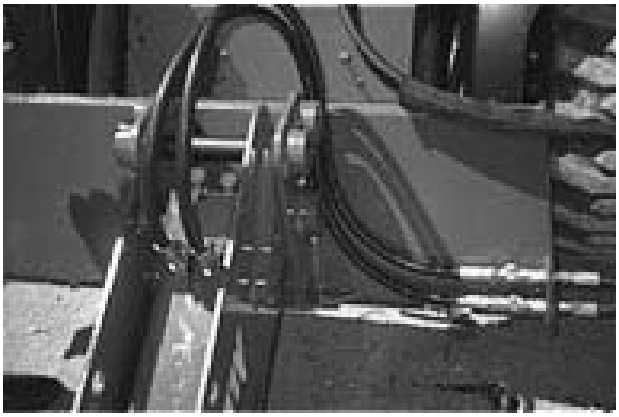


Figure 7-2.

4. Maneuver the skid steer up to the mounting plate and, using the hydraulic cylinders, slide the mounting arms into their brackets on the top of the mounting bracket.
5. Slowly lift the mounting bracket with the skid steer hydraulic cylinders until the bottom of the mounting bracket is flush with bottom of the skid steer arms.

CAUTION
In Step 6, make sure the mounting pins are through the holes in the bottom of the mounting bracket. Refer to Figure 7-2.

6. Engage the skid steer lower mounting assembly so the locking pins protrude through the holes in the bottom of the mounting plate. Refer to Figure 7-3.
7. Lock the attaching clamps in place. Refer to carrier operator's manual.
8. Connect the hammer hoses to the skid steer hoses. Refer to Figure 7-4.

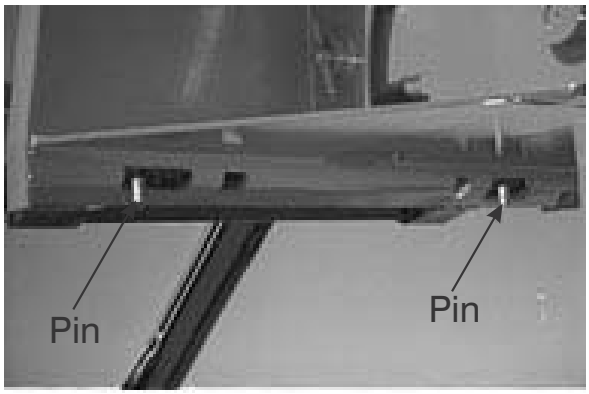


Figure 7-3.

Figure 7-4.

NOTE

When operating the hammer on the skid steer, make sure the hammer is perpendicular to the work. Refer to Figures 7-5 and 7-6.

9. If necessary, change the angle of the hammer.

   a. On the direct mount skid steer 2-position bracket, remove the retainer pin and move the hammer up or down in the mounting bracket; then insert the pin in the upper or bottom hole. Refer to Figure 7-7. Be sure to secure the hammer so that it does not swing.

Figure 7-5.

Figure 7-6.

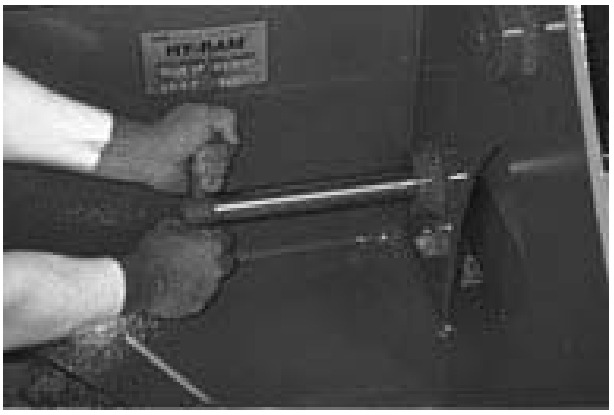


Figure 7-7.

   b. On the tractor loader backhoe hammer to skid steer bracket, remove the upper mounting pin and reposition the hammer in either the lower or upper mounting hole. Then install the upper pin. Refer to Figure 7-8.

Figure 7-8.

7.6 Connecting the Hammer and Hydraulic Lines

(Refer to Figure 7-9.)

CAUTION

Auxiliary hyrdraulic pressure and return connection orientation varies among carriers. Ensure that the **pressure** hose is connected to the auxiliary hydraulic **pressure** connection on the carrier. Damage to equipment will result if hoses are connected incorrectly.

If not attached, connect the hydraulic lines to the hammer as follows:

1. Unscrew the cap nuts from hammer connections **P** and **T** (see Figure 7-9).
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 hammer.

WARNING

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

5. Check the connections on the hammer hoses. The connecting threads must be undamaged and free of sand or similar foreign bodies.
6. Connect the hydraulic lines to the hammer ports.
7. Remove the caps from the ends of the hammer hoses and connect the hoses to the carrier ensuring that pressure hose is connected to auxiliary hydraulic pressure connection on carrier.

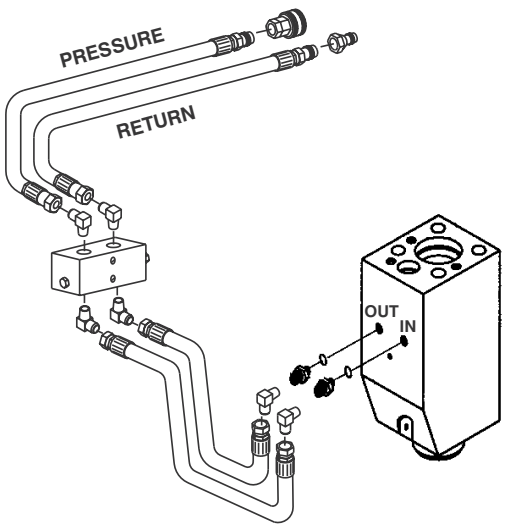


Figure 7-9-AR-Typical Mini-Ex Connecting Hydraulic Lines

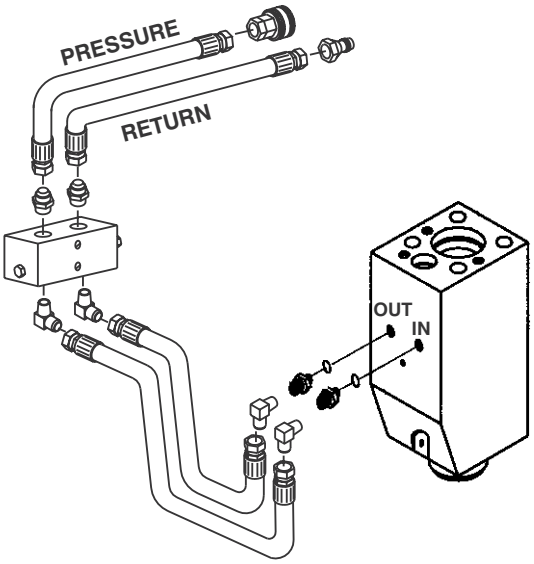


Figure 7-9-AR 48 Skid Steer.
Connecting Hydraulic Lines

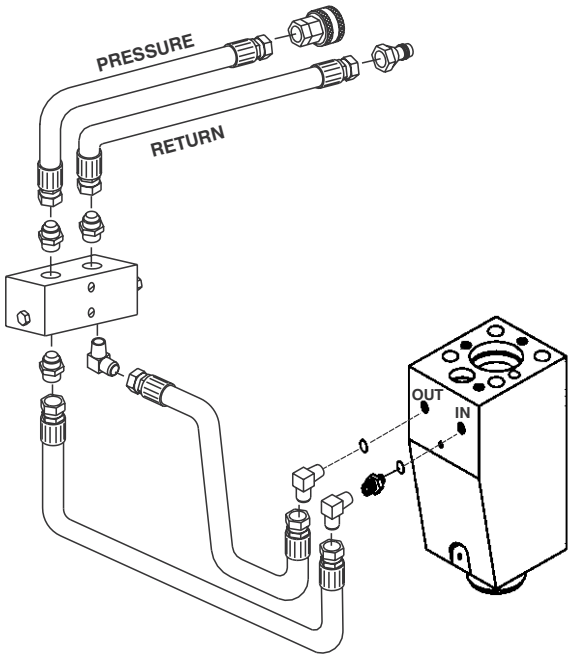


Figure 7-9-AR 62 Skid Steer.
Connecting Hydraulic Lines

7.7 Removing the AR Hammer 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 hammer is done in reverse order of attachment unless otherwise stated.

SECTION 8.0
DEMOLITION TOOL

8.1 Demolition Tool

Use only 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.

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.

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 the demolition tools.

WARNING

Always wear safety glasses and gloves when installing the demolition tool and clear the area of bystanders. Metal chips and debris may fly off when hammering the pins in or out, injuring workers or bystanders.

8.3 Installing and Removing the Demolition Tool

Refer to Figures 8-1 and 8-2. The Retainer Pin is held in place by the Spring Pin. The Retainer Pin, which is positioned at right angles to the Spring Pin, is installed and removed by removing the Spring Pin as detailed in the following paragraphs.

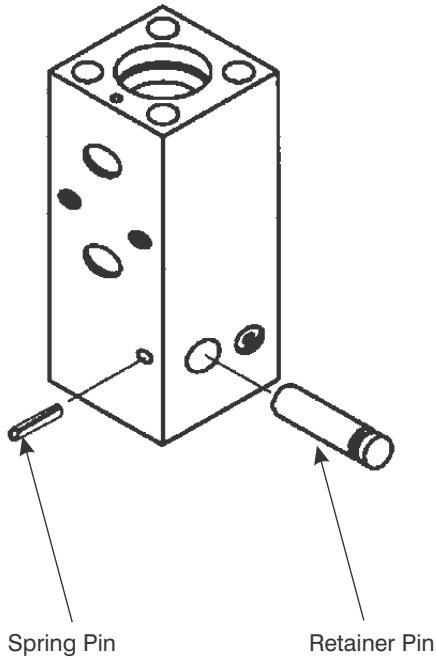
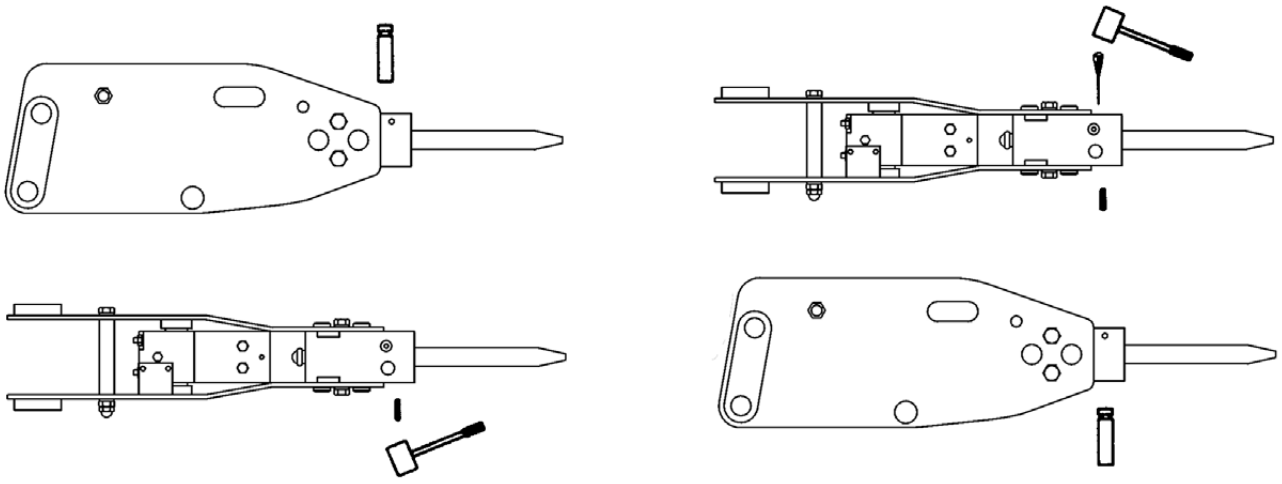


Figure 8-1. Spring and Retainer Pins



Demolition Tool Installation

Demolition Tool Removal

Figure 8-2. Installing the Demolition Tool

8.3.1 Tools that may be required:

- Hand sledge
- Drift pin

8.3.2 Tool Installation

(Refer to Figure 8-2.)

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. Insert demolition tool into bore, turning it until the slot in the tool is in line with the retainer pin hole.
5. Insert Retainer Pin.
6. Install the Spring Pin to secure Retainer Pin. It may be necessary to tap the Spring Pin in place with a hand sledge.

8.3.3 Tool Removal

1. Position the hammer horizontally to allow access from below.
2. Remove Spring Pin using drift pin and hand sledge. Refer to Figure 8-2.
3. Remove the Retainer Pin using a rod and hand sledge if necessary.
4. Remove the demolition tool from the hammer. Refer to Figure 8-2.
5. Refer to Section 13.0 for storage instructions.

8.4 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 hammer tool holder.
2. Attach grease gun to lubrication fitting Refer to Figure 8-3.

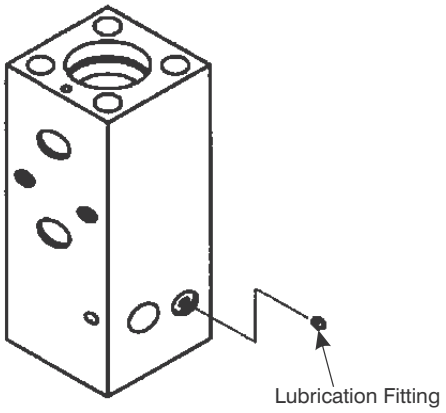


Figure 8-3. Lubricating the Demolition Tool

CAUTION

Do not fill the space between the piston and tool with grease. Refer to Figure 8-4.

3. Lubricate until grease emerges from the gap between the tool bushing and the demolition tool. Refer to Figure 8-4.

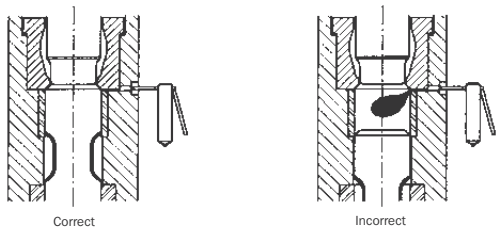


Figure 8-4. No Grease Between Piston & Tool

SECTION 9.0
OPERATION

9.1 Operator Check List

Before operating the hammer, 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 hammer.
- Frequently check the oil temperature. The temperature of the hydraulic oil must never exceed 176°F. [80°C.].
- 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 are recommended:

- safety glasses & gloves
- sledge hammer
- drift pin
- socket wrench set
- grease gun
- open end wrenches
- caliper for checking tool wear

9.3 Operating the Hammer

CAUTION

Check the oil temperature often to ensure it does not exceed 176°F [80°C]. If higher temperatures are measured in the tank, refer to Chapter 10. Troubleshooting.

9.3.1 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 hammer 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 operation of the hammer 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.

When contact pressure is applied to the demolition tool, the piston in the hammer is driven up to its starting position. When the foot switch is activated, the hammer cycles the demolition tool up and down.

9.3.2 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.

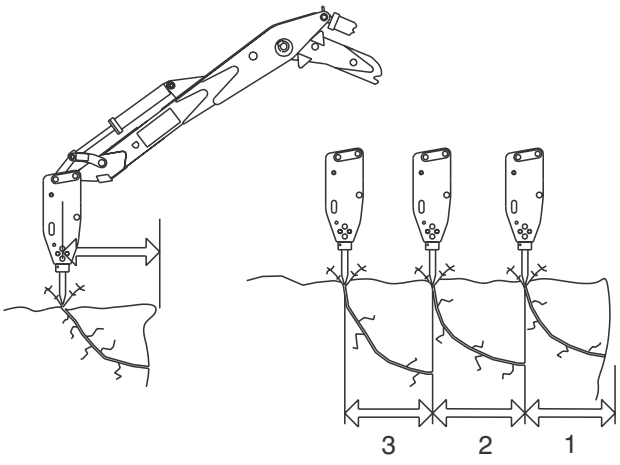


Figure 9-1. Advancing From Outer Edge

9.3.3 Angle of Operation

(Refer to Figure 9-2.)

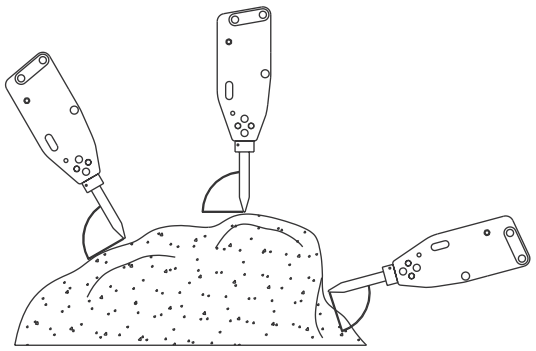


Figure 9-2. Angle Of Operation

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, leading to permanent damage.

9.3.4 Hammer Rocking

(Refer to Figure 9-3.)

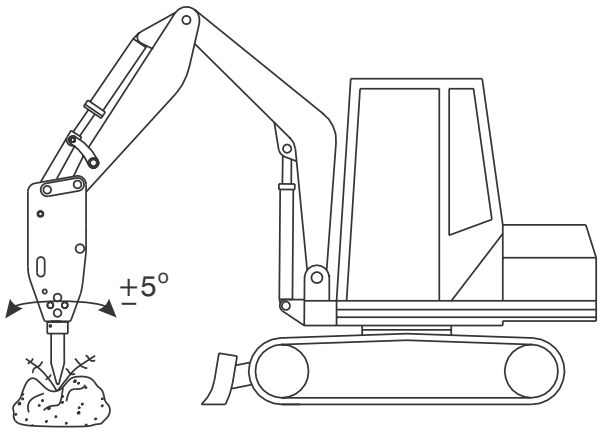


Figure 9-3. Rocking The Hammer

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 hammer.

9.4 Incorrect Use of the Hydraulic Hammer

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

9.4.1 Never Use as a Crowbar

(Refer to Figure 9-4.)

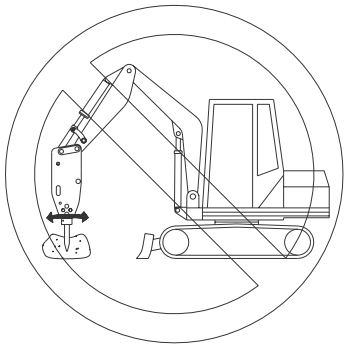


Figure 9-4. Never Use hammer As A Crowbar

Using the hammer as a crowbar may cause the demolition tool to break.

9.4.2 Never Drive Demolition Tool into The Material

(Refer to Figure 9-5.)

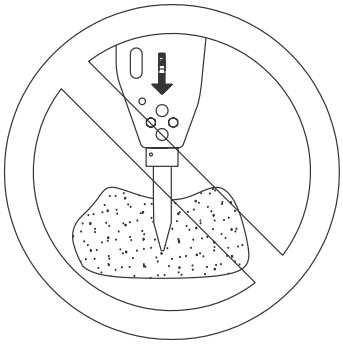


Figure 9-5. Never Drive Tool into Material

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.

9.4.3 Never Pound with the Hammer and Demolition Tool

(Refer to Figure 9-6.)

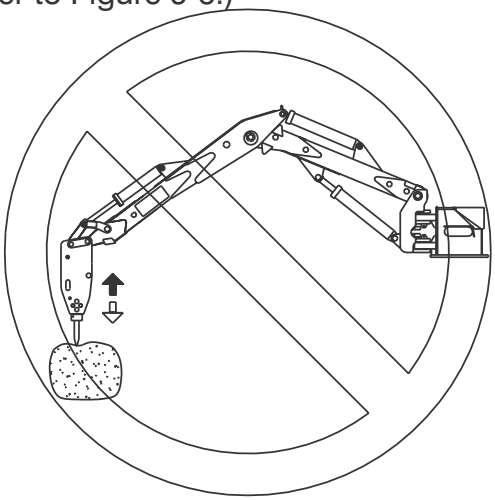


Figure 9-6. Do Not Pound With Hammer

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

CAUTION

The hammer is not designed to lift or transport loads. This practice will damage the hammer.

9.4.4 Never Lift or Transport Loads with the Hammer

(Refer to Figure 9-7.)

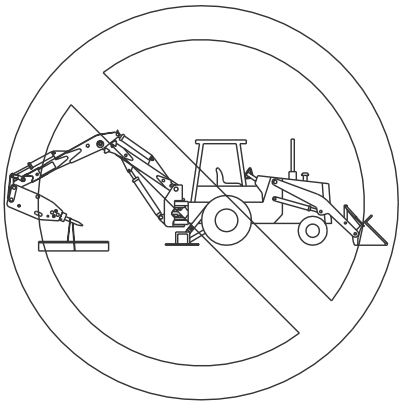


Figure 9-7. Do Not Use Hammmer As Lift Or Transport

9.5 Special Operation Environments

9.5.1 Never Use in or Under Water

WARNING

Never use an AR 48 or AR 62 hammer underwater. These models are not built for underwater use.

9.5.2 Working Underground

When using the hammer 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 hammer. With some fluids, decreased flow and/or pressure to the hammer may be necesasry. Contact Allied well before installation for specific parameters for your particular fluid.

9.6 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, a heat exchanger 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. Observe the carrier manufacturer's regulations.

9.7 Working in Low Outside Temperatures

When the temperature is below minus 4º F. (-20º C.), warm up the oil by running the carrier before starting the hammer.

Keep oil circulating in the carrier 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.

Problem	Cause	Remedy
Hammer does not start.	Pressure and return lines crossed.	Reverse hoses.
	Quick disconnects not opening.	Repair or replace.
	Insufficient impact pressure.	Force tool full into tool holder by pressing down with the carrier.
	Operating pressure is too low.	Check and reset pressure if needed.
	Fault in electrical circuit.	Check for power at solenoid.
	Piston is in lower hydraulic brake.	Keep regulator open and puch tool firmly against material to be broken; tool head lifts piston out of brake.
	Leak in excavator hydraulic circuit.	Check hydraulic components.
	Too much back pressure.	Check hydraulic components and amount of oil and pressure.
	Regulator spool failure.	Call Service Technician.
	Piston failure.	Call Service Technician.
	Hammer regulator does not open.	Call Service Technician.
Hammer runs irregularly.	Insufficient flow of oil.	Increase flow if possible.
	Return oil pressure too high.	Find and repair restriction to return flow.
	Operating pressure is too low.	Check and reset pressure as needed.
	Control valve failure.	Call Service Technician.
Poor operation and reduced breaking power.	Operating pressure is too low.	Check and reset pressure as needed.
	Operating temperature is too high.	Correct overheating problem.
	Tool binding in bushing(s).	Repair or replace as needed—check for proper lubrication.
	Return line pressure is too high.	Locate and correct problem.
	Hammer valves not operating.	Call Service Technician.
	Incorrect operation.	Refer to Section 9.0 OPERATION.

10.0 OPERATOR TROUBLESHOOTING CHART (cont')

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.	Change filter and repair or replace plugged exchanger.
	Return line connected to valve bank.	Hammer return must pass directly to tank or filter.
	Hoses or fittings too small for installation.	Always use proper hose and fitting sizes.
Operating temperature too high.	Operating pressure too high or too low.	Adjust as needed.
	Excessive leakage through hammer.	Repair or replace worn parts.
	Ambient temperature is high.	A heat exchanger 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.
	Excessive cycle time.	Limit hammer operation to 30 second bursts.
	Engine speed too high.	Repair flow control.
	Breaking cycle too long.	Reduce advance.
	Oil viscosity too low.	Check oil.
	Heat exchanger insufficient.	Install new or additional heat exchanger.
Impact rate slows down.	Oil has overheated (over 80°C/176°F).	Check oil cooling system. Replace or install additional heat exchanger. Check carrier hydraulic circuit. Check return line.
	Too much back pressure.	Check hydraulic components and amount of oil and pressure.
	Operating pressure is too low.	Check and reset pressure as needed.
	Leakage in excavator hydrualic circuit.	Check hydraulic components.
	Hammer valve failure.	Call Service Technician.
	Oil viscosity too low.	Check oil.

SECTION 11.0
CARE AND MAINTENANCE

11.1 Care and Maintenance Schedule

During Shift

- Lubricate demolition tool every two hours or anytime the tool appears dry. (See Section 8-4.)
- 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.

Weekly

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

Every Two Weeks

- Check tool bushing for wear.
- Check demolition tool for wear.
- Check side plates for wear.

Monthly

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

As Required

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

11.2 Care and Maintenance Instructions

Refer to sections 11.2.1 thru 11.2.9.

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 Bushing

(Refer to Figures 11-1 and 11-2.)

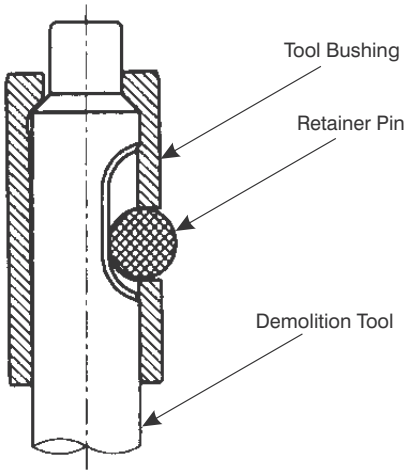


Figure 11-1. Tool Bushing

Check the inside diameter of the tool bushing every time the demolition tool is changed or every 80 operating hours. Determine the allowable diameter from the following table. If the diameter has increased to more than the specified dimension, the tool bushing must be replaced.

Tool Bushing Diameter	
AR 48	AR 62
1.97 in. 50mm	2.52 in. 64mm

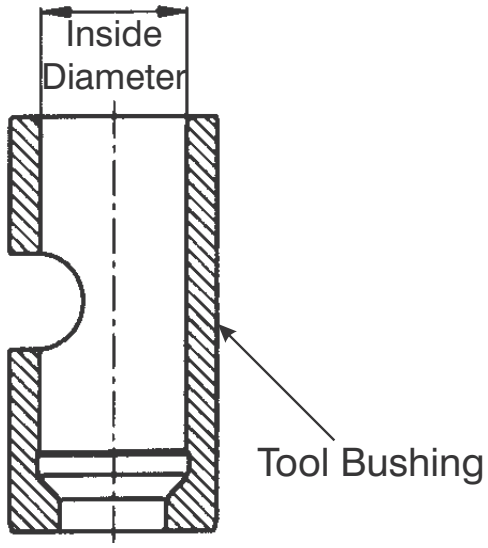


Figure 11-2. Check Wear To Tool Bushing

NOTE

It is recommended that the hammer be taken to an Allied distributor service department to make this repair.

The tool bushing 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 if dents or chips are evident.
3. Contact your authorized Allied service center.

11.2.5 Checking Wear to the Demolition Tool

(Refer to Figure 11-3.)

Check the demolition tool diameter each time it is changed or every 80 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.

CAUTION

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

Demolition Tool Outside Diameter	
AR 48	AR 62
1.81 in 46 mm	2.36 in. 60 mm

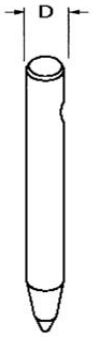


Figure 11-3. Check Wear To Demolition Tool

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11.2.6 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. Connection locations for each hammer model covered in this manual are shown in Figures 11-4 and 11-5; torques are given in the correcsponding Torque Tables.

Torque Table for Allied Hammer Models AR 48 and AR 62				
Connection	Item No.	Interval	Tool Required	Torque Req'd. Ft. Lbs. (N·m)
Nitrogen Valve	1	Weekly	19mm Open-end Wrench 22mm Open-end Wrench	18 (25)
Plug & Check Point	2	Weekly	6mm Allen Hex Key	24 (33)
Tension Rod Nut	3	As Required	30mm 6pt. Socket	AR 48: 220 (300) AR 62: 330 (450)
Side Plate Mounting Bolt	4	As Required	30mm 6pt. Socket	258 (350)
Hose conections on hydraulic hammer		As Required	Open-end Wrench 7/8 to 1-1/4 in.	—

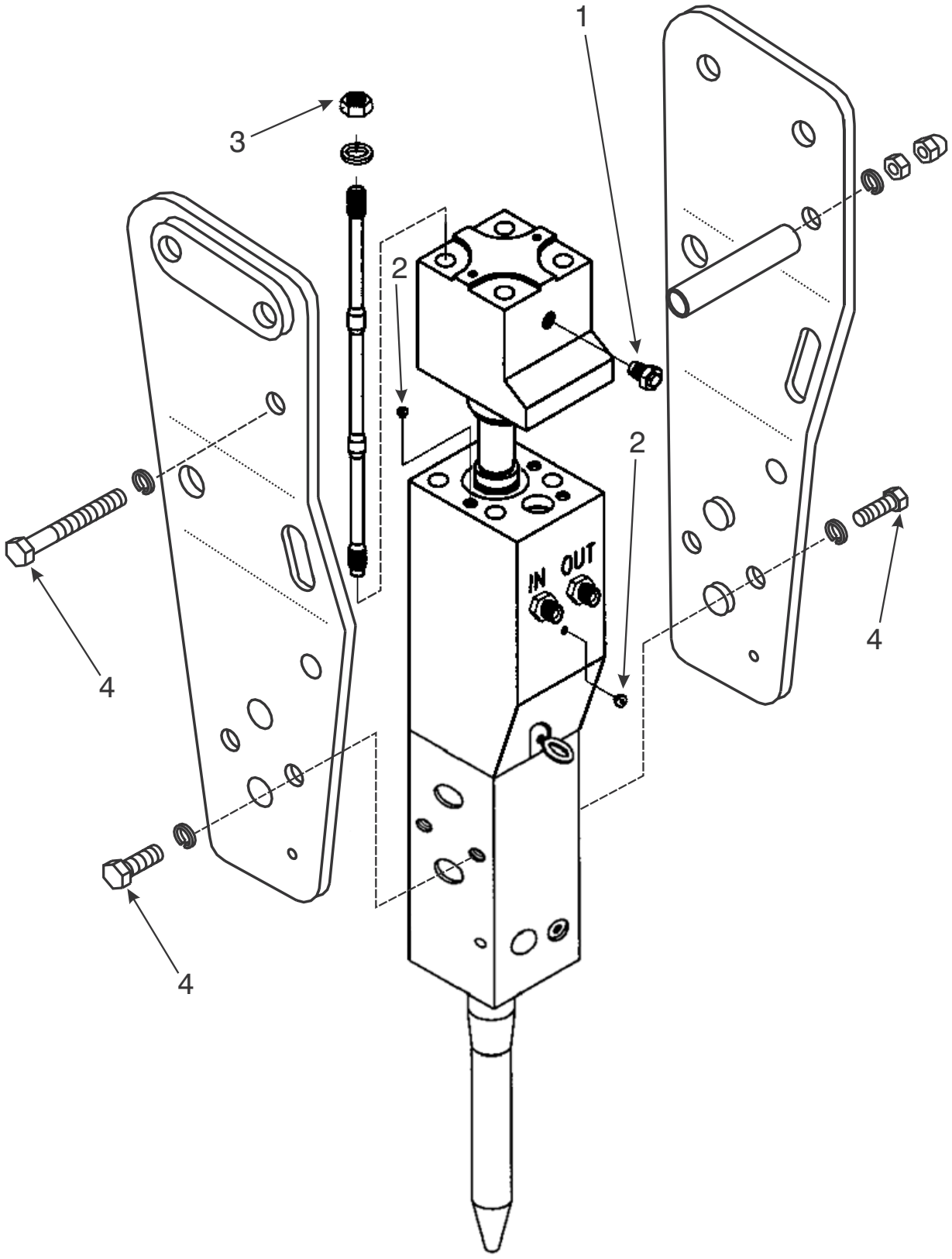

Figure 11-4. Torque Items on AR 48 and AR 62 Hammers

11.2.7 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.

11.2.8 Checking the Nitrogen Precharge Chamber.

(Refer to Figure 11-6)

WARNING

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

1. Clean the area around the fill valve plug on cylinder head. Compressed air can be used with caution to blow dirt away.
2. To check the pressure, lay the Hy-Ram on its side with no contact pressure on the demolition tool.

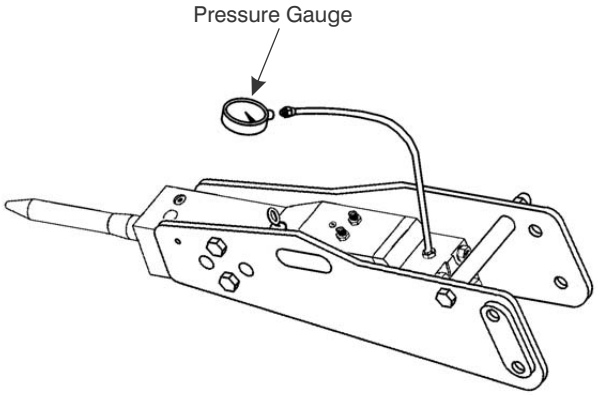

Figure 11-5 Nitrogen Pressure Test

3. Remove the screw plug from filling valve.
4. Firmly insert test gauge 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.)	
AR 48	AR 62
185 psi 13 bar	150 psi 10 bar
150°F. (65°C.)	
215 psi 15 bar	175 psi 12 bar

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

CAUTION

Before removing the complete filling valve 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, screw drivers or similar objects will damage the filling valve.

11.2.9 Refilling the Precharge Chamber

(Refer to Figure 11-7.)

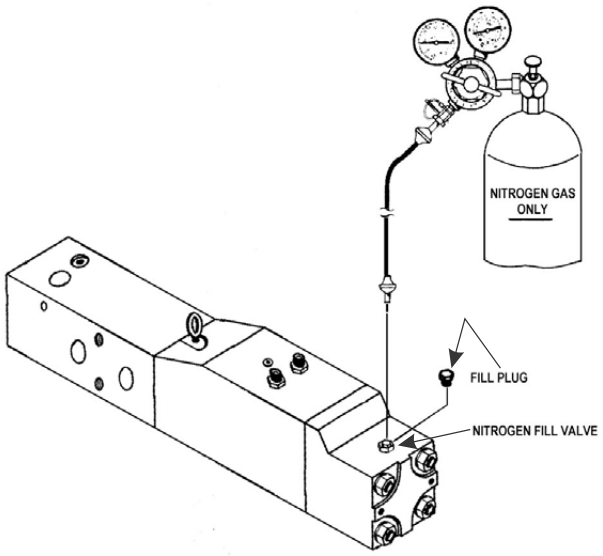

Figure 11-6. Nitrogen Filling

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!

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.
7. Carefully blow out filler assembly to remove any internal foreign matter.
8. Press free nozzle of filling hose into fill valve. 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 11-8 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, screw drivers or similar objects will damage the filling 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.

11.2.10 Checking and Cleaning the Hydraulic Oil Filter

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.

11.2.11 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 7.7.
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.

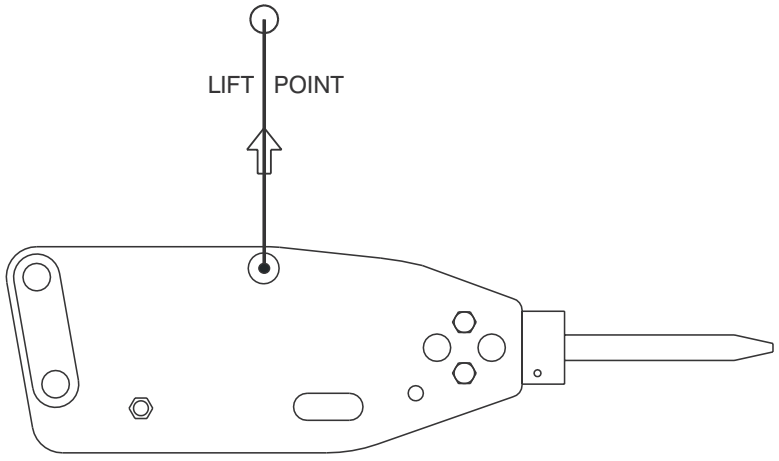

Figure 12-1. Hammer Lift Point

SECTION 13.0
STORAGE OF THE HAMMER

13.1 Storing Hammer on the Carrier

The hammer 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 Hammer Storage off the Carrier—14 Days or Less

1. The hammer may be stored on or off the carrier in a vertical or horizontal position with no special storage requirements.
2. If storing the hammer 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 Hammer Storage off the Carrier—More than 14 Days

1. Refer to Section 8.3.3 and remove the demolition tool from the hammer.
2. Remove the hydraulic hoses.

> **CAUTION**
> Oil will run out when threaded connections **IN** and **OUT** are opened. This oil must be collected and disposed of correctly.

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

> **CAUTION**
> The weight of the piston can cause flattening and damage to the seals and O-rings when storing a hammer 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 hammer 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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