Hy-Ram

Hydraulic Impact Breaker

Model
HR175
HR230

ALLIED

Safety, Operation and Maintenance

Thoroughly read and understand the content of this manual before using the Allied Breaker. The safe and efficient use of the Allied equipment depends upon proper installation, operation, maintenance and training.

Keep this manual in a convenient location so that it is easily accessible for future reference. Contact your Allied Dealer or the Allied Customer Service Department for replacement manuals. Inquiries regarding the content of this manual must include effective date shown on inside cover.

SOM577201

Contact Information

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Cleveland, Ohio 44114

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Tel: 216-431-2600 Fax: 216-431-2601

Revision History of Document 577201

Continuous improvement of our products is an Allied policy. The material in this publication, including figures, captions, descriptions, remarks and specifications, describe the product at the time of its printing, and may not reflect the product in the future. When changes become necessary, these will be noted in the table below. Specifications are based on published information at the time of publication. Allied Construction Products, LLC, reserves the right to change, edit, delete or modify the content of this document, including descriptions, illustrations and specifications without prior notification. For product or document updates go to www.alliedcp.com .

Table of Revisions

Effective Date	Page	Summary of Change
2014, May	45	Table 14.1 Revise N2 gas charge for back head. Add note "Not Equipped" for accumulator.
2014, Mar		Original Issue of SOM577201. Information for HR175, HR230 previously found in SOM575469.

Safety Information

Safety Statements and Hazard Alerts

Safety messages appear throughout this manual and on labels affixed to the Allied equipment. Read and understand the information communicated in safety messages before any attempt to install, operate, service or transport the Allied equipment.

Keep all safety labels clean. Words and illustrations must be legible. Before operating this equipment, replace damaged or missing labels.

Purpose of Safety Messages

Safety messages provide information that is important for your safety. These messages communicate the extent, magnitude and likelihood of injury associated with unsafe practices such as misuse or improper handling of the Allied equipment. Safety messages also explain how injury from potential hazards can be avoided.

Safety messages presented throughout this manual communicate the following information:

1. **Alert** personnel to potential hazards
2. **Identify** the nature of the hazard
3. **Describe** the severity of the hazard, if encountered
4. **Instruct** how to avoid the hazard

Safety Alert Symbol

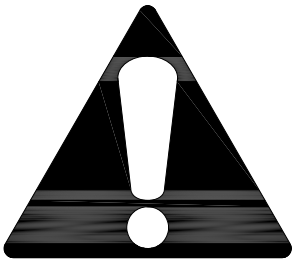


Fig. S1
ATTENTION, BECOME ALERT, YOUR SAFETY IS INVOLVED – CAUTION REQUIRED.

Fig. S1. The exclamation point within an equilateral triangle is the safety alert symbol. This symbol, either used alone or with a signal word, is used to draw attention to the presence of potential hazards.

Signal Words

"DANGER", "WARNING" and "CAUTION" are signal words used to express severity of consequences should a hazard be encountered.

DANGER - Indicates an imminent hazard, which, if not avoided, **will** result in death or serious injury.

WARNING - Indicates an imminent hazard, which, if not avoided, **can** result in death or serious injury.

CAUTION - Indicates hazards which, if not avoided, **could** result in serious injury or damage to the equipment.

Safety messages are displayed in a uniform arrangement as shown in Fig S2.

CAUTION

Burn injury from contact with hot surface. Some components become hot during operation. Allow parts and fluids to cool before handling.

Fig. S2 Safety Message – Typical Presentation

Signal Words Used for Non-Hazard Messages

Other message types that appear in this manual utilize signal words "IMPORTANT" and "NOTE". These are used only for the purpose of notifying personnel to instructions and suggestions but do not pose a safety hazard to workers.

IMPORTANT – Identify instructions that if not followed, may diminish performance; interrupt reliability and production or cause equipment damage.

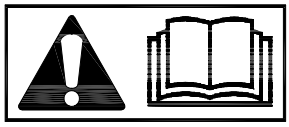
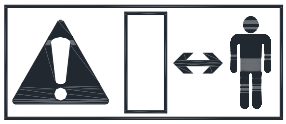
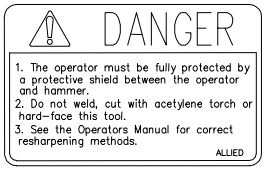
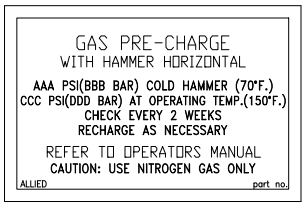
NOTE – Highlight suggestions, which will enhance installation, reliability, or operation.

Safety Information – [cont'd]

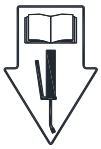
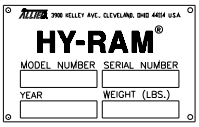
Safety, Information and Identification Labels

Information labels affixed to the Allied equipment include safety warnings, identification and instructions important to operation and service. Refer to Figure "L14" for their location on the equipment.

Keep all safety labels clean. Words and illustrations must be readable. Before operating this equipment, replace damaged or missing labels. For replacement, refer to the appropriate Parts Manual for identification.

Figure	Label	Description
L1		**READ INSTRUCTIONS** - Decal directs personnel to the manual for further information / instructions.
L2		**STAY CLEAR** – Decal alerts personnel and by-standers to maintain a safe distance from the Breaker while in operation.
L3		**FLYING DEBRIS** – Alerts personnel to the hazard of debris becoming projectiles and the need for a protective guard to shield the operator from injury. It directs personnel to the Operator's Manual for safety instructions. **NOTE: Place the smaller size decal in a conspicuous location inside the operator's cab.**
L4		**TOOL SHARPENING** – Decal warns against welding, cutting, or hard-facing the tool. It directs personnel to the Operator's Manual for approved sharpening methods.
L5*		**PRESSURIZED NITROGEN ACCUMULATOR** – Decal warns of pressurized gas and directs personnel to the Repair Manual for service instructions. *HR175 and HR230 are not equipped with accumulator.
L6		**GAS PRE-CHARGE** – Decal outlines measuring / charging the back head. Alerts personnel to the following – • Maintenance interval – every 2 weeks • Proper position when measured / charged • Charge pressure when COLD vs. HOT • Refers personnel to the Operation and Maintenance Manual • Cautions personnel to use nitrogen gas only
L7		**LIFT POINT** – Decal identifies approved lift points.

Safety Information – [cont'd]

Fig.	Label	Description
L8		**LUBRICATION** – Decal emphasizes key re-lubrication instructions, including; frequency and precautions that must be observed to ensure breaker is not damaged through unapproved methods.
L9		**LUBRICATION POINT** – Decal identifies lubrication points. Refer to the manual(s) for grease type, re-lubrication schedules and procedures. Risk of equipment damage if instructions are not followed.
L10		**PRESSURE I.D. TAG** - The oil supply hose is tagged for ease of identification.
L11		**ALLIED LOGO** – This decal is the Allied brand identifier and is a registered trademark of Allied Construction Products, LLC.
L12	**HR230**	**MODEL** – Decal identifies the specific model.
L13		**EQUIPMENT ID TAG** - Contains identifying information about the equipment, including: Manufacturer's name, address, product name, model number, serial number, year of manufacture, and weight.

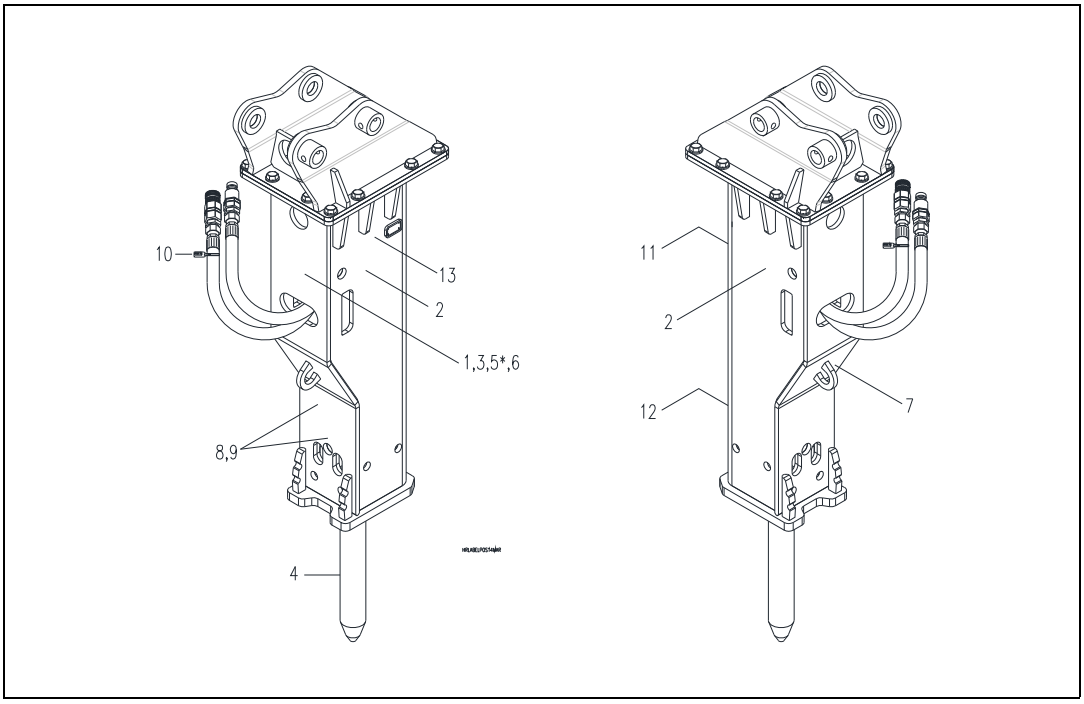


Fig. L14 Label Positions

Safety Information – [cont'd]

Meaning of Pictograms

Pictograms are used to rapidly communicate information. For the purposes of this manual and labels affixed to the Allied equipment, pictograms are defined as follows:

- Read the manual
- Refer to the manual for further details
- Procedures are explained in the manual

Read the Service Manual For Additional Information

- Crush point

Moving part (in direction indicated by arrow)

- Falling object
- Unsupported loads

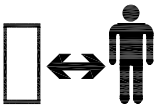
Personal Protection Equipment

- Hearing protection

- Safety eyewear

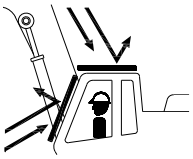
- Gloves

- Safety shoes
- Falling part



Personnel maintain a safe distance from breaker

Fragments / debris becoming airborne projectiles

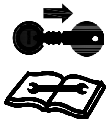


Protective guards required on cab when operating this work tool

Leaking fluid under pressure

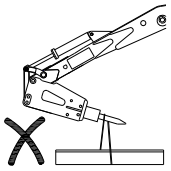
Hot surfaces

Gas / Oil under pressure

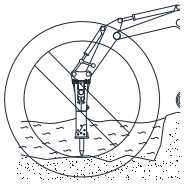


Shut off carrier & remove key before servicing

Identifies lift point



Figures marked with an X-out or a circle with a diagonal slash describes a prohibited action.



Prohibited actions must be avoided to prevent injury and/or equipment damage

The check mark symbol is used to indicate actions and methods that are recommended, correct and approved

Safety Information – [cont'd]

Attention Read the Manual

Improper installation, operation or maintenance of the Allied equipment could result in serious injury or death. Only qualified operators may operate the Allied equipment. Personnel responsible for the maintenance of the Allied equipment or its systems, including inspection, installation or adjustments must also be qualified. Operators and personnel responsible for maintenance of this equipment should read this manual. Other manuals, such as those published by the machinery used in support of the Allied equipment, should also be read.

Qualified Person

For the purposes of this manual, a qualified person is an individual that has successfully demonstrated or completed the following:

- Has read, fully understands and adheres to all safety statements in this manual.
- Is competent to recognize predictable hazardous conditions and possess the authorization, skills and knowledge necessary to take prompt corrective measures to safeguard against personal injury and/or property damage.
- Has completed adequate training in safe and proper installation, maintenance and operation of this Allied equipment.
- Is authorized to operate, service and transport the Allied equipment identified in Table 1.1.

Safety Information Overview

It's important for all personnel working with the Allied equipment to read this manual in its entirety. It includes important safety information intended to help personnel avoid unsafe practices that may lead to mishaps. Safety information described at the beginning of this manual is generic in nature. As you continue reading through later sections of this manual, instructions and safety information become tool-specific and operation-specific.

Allied has made every effort to provide information as complete and accurate as possible for this document. Allied cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and labels affixed to the Allied attachment are therefore not all inclusive.

General Construction Safety

Always follow procedures that promote safe conditions for workers and bystanders. The standard safety precautions expected and required of those working in construction shall include, but not limited to:

- Locating existing underground service and utility lines
- Establishing pedestrian barriers
- Using personnel protection equipment appropriate to working conditions, etc.

Federal, State, Local and OSHA Construction Guidelines and Regulations

Use the Allied equipment 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. 15250-7954
Website: www.osha.gov

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

Owner's Responsibilities

Ensure that only qualified personnel operate and service the Allied equipment.

Ensure personnel protection equipment is available to personnel and enforce the use of PPE

Ensure equipment is kept in safe operating condition

Ensure safety-related materials such as instructions and including this manual are kept in a convenient location so that they are easily accessible to operators and maintenance personnel.

Safety Information – [cont'd]

Operational Safety Program

The safe and efficient use of the Allied equipment depends upon proper installation, operation, maintenance and repair. Operational safety programs must encompass all of these elements.

Accident prevention through operational safety programs are most effective when the equipment owner further develops the program by taking into account his own experience in using and maintaining equipment.

Developing such programs will help minimize equipment downtime, while maximizing service life and performance. Most importantly, it will minimize the risk of personal injuries.

Personal Protective Equipment (PPE)

Personnel operating or nearby the equipment that may be exposed to the hazard of falling, flying and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall use the particular personal protection equipment (PPE) necessary to protect them from the hazard. Such PPE may include safety eyewear, face shield, hearing protection, safety footwear, gloves, and dust mask. Supervisors shall review proper PPE selection and ensure PPE is made available to personnel. Personnel are responsible for wearing PPE as directed by the supervisor.

Protective Equipment - Guarding

Allied equipment designed with guards shall have guards in place when equipment is in use. Guards are fitted to the equipment to protect against unsafe situations that could not be eliminated through design measures. Where it was not possible to prevent an unsafe situation by means of a guard, safety messages appear on the equipment, warning personnel of a hazardous condition.

Guards shall not be removed unless for the purpose of inspection and service of components. All guards must be reinstalled after service or adjustments are completed. Do not operate the Allied equipment without guards installed.

Additional guarding, not included with the Allied equipment, is necessary at the operator's station to protect the operator and other nearby personnel against flying debris from material being cut or demolished. Do not handle, demolish or cut material overhead without proper guards installed.

To prevent accidental start up, the control switch shall be located in a protected area that is guarded and makes it difficult to accidently operate the equipment.

Unapproved Use or Modifications

In order to provide and maintain efficient operation with reliable service, while ensuring operator safety, the Allied equipment may not be used for any other purpose other than, for which it was intended. Use of the Allied equipment, other than those cited in this manual, may place personnel at risk of injury and/or may subject the equipment to damage.

When making repairs, use only the manufacturer's genuine parts. Substitute parts may not meet the required standards for fit and quality, or may impair function, safety and performance. The Allied equipment shall not be modified or used in unapproved applications unless written consent is received from the Allied Engineering Department.

Table of Contents

Table of Contents - [cont'd]

Table of Contents - [cont'd]

List of Figures

1.0 Introduction and Scope

1.1 Purpose of this Manual

This manual has been prepared in support of the Allied equipment named in Table 1.1 and is intended to assist the operator and maintenance personnel with the information necessary for the safe and proper use of the Allied equipment.

1.2 About This Manual

Table 1.1 About This Manual

Document ID No.	SOM577201
Type	Safety, Operation and Maintenance
Current Status	See Inside Cover
Product Name:	Hydraulic Impact Breaker
Series	Hy-Ram
Applicable Model[s]:	HR175, HR270
Years of Manufacture:	2011 & above

Material presented in this manual, including figures, captions, tables, descriptions, remarks and specifications may not be suitable for use with models other than those identified in Table 1.1. Prior to using this manual, confirm that all information recorded on the equipment's identification label corresponds with Table 1.1. Figures and descriptions may show equipment that is optional.

This document is published solely for information purposes and should not be considered all-inclusive. If further information is required, contact your local Allied dealer or the Allied Customer Service Department.

Material in this publication has been reviewed for accuracy. Allied Construction Products, LLC has endeavored to deliver the highest degree of accuracy and every effort has been made to provide information as complete as possible. However, continuous improvement of our products is an Allied policy.

Material in this publication, including figures, captions, tables, descriptions, remarks and specifications, describe the product at the time of its printing, and may not reflect the product in the future. When changes become necessary, these will be noted on the inside cover.

1.3 How to Order Replacement Publications

This manual is an integral part of this product. Keep it in a convenient location so that it is easily accessible for future reference.

Replacement manuals can be ordered by contacting your Allied dealer service center.

1.4 Related Publications

Allied Construction Products, LLC offers the following publications for the product identified in Table 1.1.

1.4.1 Parts Manual

Parts Manuals identify each component of the Allied work tool, including safety and information labels.

1.4.2 Repair Manual

The Repair Manual has been prepared to assist the Service Technician with the information necessary for the disassembly & reassembly of the Breaker. Content includes:

- Safety Information
- Disassembly & Reassembly
- Bolt Torque Specifications
- Wear Limits of Parts
- N2 Gas Charging Instructions

1.4.3 AEM Safety Manual for Hydraulic Mounted Breakers

The Association of Equipment Manufacturers offers a safety manual designed for operators and maintenance personnel of hydraulic mounted breakers.

The manual is available in Spanish, French and English. It is published in an illustrated format of sensible do's and don'ts, featuring typical daily situations on the job site.

Content includes safety tips concerning the workplace and equipment, start up and shut down guidelines and special operating and maintenance precautions.This publication is available by contacting:

Association of Equipment Manufacturers
Toll free 1-866-AEM-0442
E-mail: aem@aem.org
Website: www.aem.org

1.0 Introduction and Scope – [cont'd]

Ask for FORM CMHB-1004, Hydraulic Mounted Breakers.

This publication is also available through Allied under part number 953076 (English). To order a copy, contact the Allied Customer Service Department.

2.0 Equipment Identification

2.1 Serial Number Location

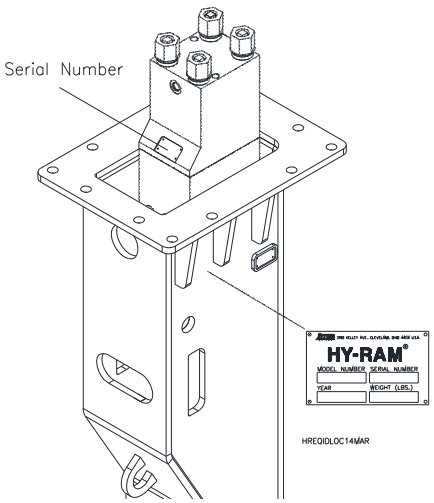


Fig 2-1 Equipment Identification

Refer to Figure 2-1. The Serial Number assigned to this equipment can be found in the following locations:

1. Stamped on the Equipment Identification Tag
2. Stamped on the back head near the charge plug.

2.2 Equipment Identification Tag

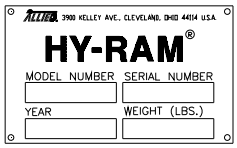


Fig 2-2 Equipment Identification Tag

The Equipment Identification Tag is affixed to the housing. It provides the following information:

- Manufacturer's name
- Address
- Product name
- Model number
- Serial number
- Year of manufacture
- Weight

Confirm that the information contained on the Tag corresponds with the information provided in Section 1, Table 1.1.

2.3 Record Equipment ID Information for Future Reference

Your local Allied dealer requires complete information about the equipment to better assist you with questions regarding parts, warranty, operation, maintenance, or repair.

- Copy the Model and Serial Number from the Equipment Identification Tag to the space provided below.
- Indicate the date in which the Allied equipment was placed into service.
- Fill out the Warranty Registration form and return to Allied Construction Products, LLC.

Product **Hydraulic Breaker**

Series **Hy-Ram**

Model _____

Part Number: _____

Serial Number: _____

In Service Date: _____

Registration Date _____

3.0 Warranty Protection Summary

3.1 Overview

The Allied attachment is delivered assembled, lubricated, and factory tested. Upon receipt of the equipment, inspect for possible shipping damage.

For every new Breaker, Allied requires that a Warranty Registration form be completed and returned to Allied. The form includes a section to record information about the carrier on which the breaker is being installed.

To keep the Allied equipment operating within its performance limits, familiarize yourself with the technical specifications section of this manual. Adhere to these specifications when calibrating the carrier. Improper installation, including failure to calibrate the carrier correctly may result in loss of performance or subject the equipment to conditions beyond their design.

Use of non-Allied parts, unapproved service methods, modifications to the attachment, or installation, operation and maintenance, not in accordance with the instructions outlined in this manual may cause equipment failure or personal injury.

For details regarding warranty terms and conditions, refer to document 574490.

3.2 Owner's Responsibilities

When properly installed, operated and maintained by qualified personnel, the Allied attachment will remain productive with a minimum of service.

The following outlines general maintenance policies required for all breaker models. The equipment owner is strongly encouraged to adopt these general guidelines and further develop them in order to manage particular applications and operating environments.

Ensure that personnel entrusted with installation, operation, maintenance and transporting of the Allied equipment adhere to the following:

- Read and thoroughly understand the information and procedures detailed in this manual.
- Understand proper operating techniques for all recommended applications.
- Use the Allied attachment only if it is in sound operating condition. Take prompt action to rectify any faults that, if left uncorrected, could lead to personal injury or further damage.
- Use the Allied attachment only for the purpose for which it is intended.
- Understand that particular applications, such as working underwater, will require modifications to the standard breaker and additional training for operation and service.
- Appoint Who Does What. Ensure that all personnel understand what their specific responsibilities include.
    1. Establish maintenance responsibilities to be performed by the OPERATOR.
    2. Establish maintenance responsibilities to be performed by the SERVICE TECHNICIAN.
- Recognize problems and know how to take corrective action as detailed in Troubleshooting Section 13.
- Conduct regular checks and inspections as scheduled in the Care and Maintenance Section 7.
- Allow only qualified operators and Allied trained service technicians to perform maintenance and repair as specified in the care and maintenance schedule.
- Use only genuine Allied replacement parts and recommended lubricants to protect total warranty coverage.
- Maintain written records of equipment maintenance, service and repair. These records are helpful if warranty coverage is ever in question.

Each record shall include at least:

- Date of service, maintenance or repair.
- 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.

3.0 Warranty Protection Summary – [cont'd]

3.3 Allied Product Policies

In this manual, Allied recommends breaker applications, maintenance and service consistent with industry practices.

Allied assumes no responsibility for the results of actions not recommended in this manual and specifically the results of:

- Improper Training
- Improper Installation
- Operation in unapproved applications
- Incorrect operation
- Improper maintenance
- Use of non-genuine Allied replacement parts
- Unapproved modifications

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

4.0 Product Information

4.1 Description and Use

The Allied Breaker is a hydraulic powered impact breaker designed for mounting on mobile equipment with hydraulic booms, such as rubber tired or track-type construction vehicles.

The breaker is suited for many types of construction and mining applications including -

- Clearance Work: Demolition of buildings, bridges, reinforced foundations etc.
- Trenching: Breaking trenches out of rocky and frozen ground.
- Mining and Quarrying Applications: Demolishing and leveling quarry rock, breaking oversized minerals and other rock-like raw materials. Excavation of rock from trenches, foundations and tunneling.
- Underwater: Demolition and deepening of shipping channels. (Requires special modification for underwater use!)
- Recycling: Breakup of "skulls" from the steel industry.

4.2 Familiarization of Main Components

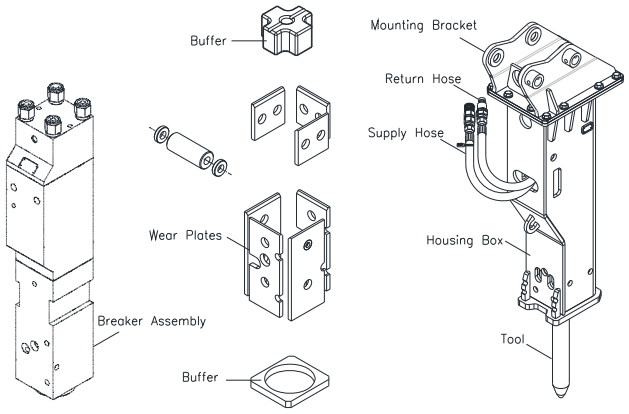


Fig 4-1 Main Components of Hydraulic Breaker

4.3 Principle of Operation

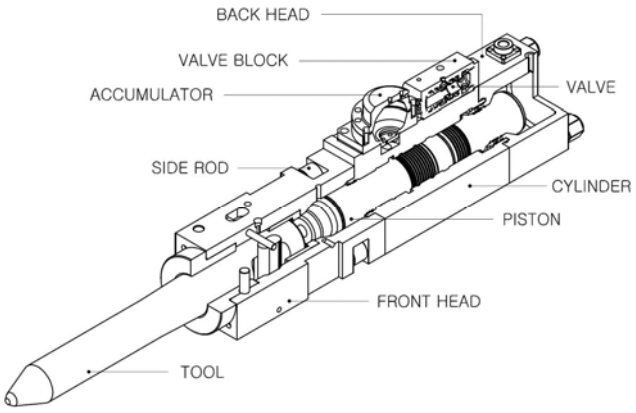


Fig 4-2 Cutaway View of Breaker Assembly

- The Breaker is not self-powered. Performance relies on a capable host machine that's equipped with a hydraulic circuit. Within the hydraulic circuit, an ON/OFF valve is used to control flow in one direction to the Breaker. The valve will be managed with a momentary switch located inside the operator's cab within easy reach of the operator.
- With the valve ON, supply oil from the host machine flows to the [IN] port on the breaker. Oil is blocked from entering the breaker unless sufficient contact pressure is applied on the tool to push the piston up and out of the brake position.
- Located on the breaker is the operating valve. Oil is directed by this valve to the lower end of the cylinder. The first half of the cycle begins when oil, under pressure, raises the piston. As the piston strokes upwards, oil in the upper cylinder is expelled through the [OUT] port and returned back to the machine.
- A gas-charged accumulator is equipped on larger breakers. Inside this self-contained pressure vessel is a pair of expansible chambers divided by an elastic membrane. The top chamber is pre-charged with nitrogen gas (N2). The bottom chamber will receive, store and discharge pressurized oil.
- The chamber inside the Back Head is also filled with nitrogen gas (N2). The pre-charged gas is compressed to a higher pressure as the piston is pushed into the back head.

4.0 Product Information – [cont'd]

- As the piston nears the top of its stroke, signal ports inside the cylinder become pressurized and shift the operating valve closed. Blocked from exiting the [OUT] port, the oil in the upper end of the cylinder becomes pressurized.

- With the piston at the top of its stroke, the final half of the cycle will begin. The force of the pressurized oil combines with the charge pressure inside the back head and drives the piston down. The cycle is completed when the piston impacts the tool.

- The cycle is continuous without interruption until the machine operator releases the momentary switch controlling the ON/OFF valve.

5.0 Sizing The Breaker

5.1 Breaker Selection - General

When selecting a breaker, key points to consider include –

- Production rate (Material strength)
- Lifting capacity of machine
- Hydraulic power of machine

The size of the breaker is typically dictated by the job requirements, but the size must also be compatible with the carrier on which it will be mounted.

For optimum productivity, match the size of the breaker to the job. Materials are fractured by two methods – Penetrative and Impact. With penetrative breaking, blows from the piston drive the tool into the material and wedge it apart. With impact breaking, blows from the piston generate a compressive force that squeezes the material. When the material's strength is exceeded, it fractures.

Be careful not to undersize the breaker in hard material. It's important that the material absorb all of the energy (mechanical stress wave). Problems arise when these undesirable waves of energy are reflected back into the breaker.

Ideally, it should take 3- 5 seconds to fracture the material. When working in extremely hard materials, undersized breakers will be subjected to longer running cycles. This negatively impacts production, component longevity and reliability. Continuous running beyond 15 seconds will generate unwanted heat at the tip of the tool. Attention to wear parts, such as bushings and tools, will need to be more frequent. The machine's service intervals will also require extra attention.

Reaching optimal production rates requires efficient interaction between the operator and machine. A machine that is undersized will force the operator to work at a slower pace to keep the machine stable. An undersized machine also reduces the size of the material it can shuffle when repositioning materials.

Allied breakers are assigned a recommended carrier weight range. On a general level, if the breaker falls within this range, it's regarded as a good match.

To ensure the carrier can safely handle the weight of the breaker, always consult the specifications in the manual provided by the carrier manufacturer. Factors such as boom and stick length, undercarriage and tracks, counterweights, etc., all affect the lifting capacity of the carrier. Check the machine for any modifications and also take into account any add-ons such as a quick attach coupler.

Next, review the hydraulic specifications of the carrier and breaker. All hydraulic breakers are designed to provide optimum performance with reliable service life at a specific oil pressure and flow range. For a combination to be successful, the circuit must be in good working condition and able to deliver adequate flow and pressure with minimal heat generation and power loss.

Before the breaker is used, complete a performance evaluation of the hydraulic circuit. These test results will confirm if the hydraulic circuit is calibrated and set in accordance to the specifications of the breaker.

Tools required for testing the oil flow, operating pressure and back pressure include a flow meter and pressure gages. An overview of the testing procedure, along with a form to record the results of the flow test, can be found in the Technical Data section in this manual. Compare test results with the specifications of the breaker. Make all necessary adjustments.

5.2 Auxiliary Circuit and Conversion Kits

CAUTION

Equipment damage from improper oil flow or pressure. Accurate calibration of the hydraulic circuit is important for reliable operation.

Hydraulic circuits differ between machines. Only qualified personnel, having knowledge of the machine's systems, proper test equipment and tools should perform conversion set-up and adjustments.

Work tools, such as Breakers, are not self-powered. Their performance is reliant upon the hydraulic power of the host machine. The hydraulic power it provides to the breaker must meet all of the requirements specified in the technical data section of this manual.

Most machines will require some degree of conversion to make use of their hydraulic power. A hydraulic circuit, capable of producing flow and pressure in one direction is needed to operate a breaker.

5.0 Breaker Selection – [cont'd]

Conversions to machines equipped with a factory or dealer installed auxiliary circuit may require little more than minor adjustments to flow and pressure settings. Follow the machine manufacturer's instructions when making any adjustments.

If the machine is not equipped with a hydraulic circuit, a conversion kit, from Allied, can be installed. When necessary, Allied conversion kits include the Allied "AC" series valves. These are solenoid-operated valves that control flow and pressure.

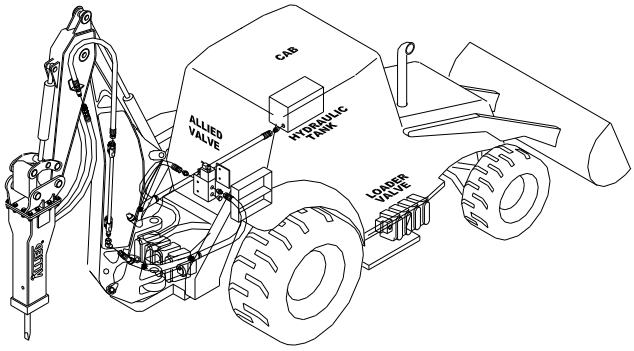


Fig 5-1 Allied Conversion Kit With AC-Series Valve

The process of selecting the right breaker must consider the type of work to be done. This includes any special needs such as required modifications when working in underwater applications

Requests for further information or assistance with breaker selection should be directed to your Allied dealer or by contacting the Allied Sales or Product / Technical Support Departments.

6.0 Operation

6.1 Before the Breaker is Used

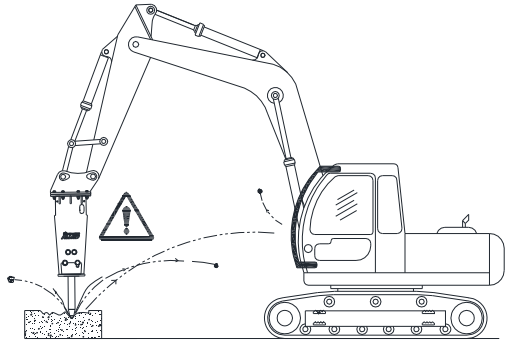
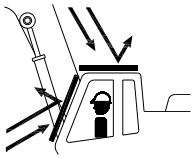


Fig. 6-1 Install Protective Guards



CAUTION

Injury from flying debris. Protective guarding must be fitted to the operator's cab when the breaker is used.

6.1.1 Pre-Operation Inspection

Prior to using the Breaker, check that it has been properly serviced with all scheduled maintenance and repairs completed. A qualified individual should conduct a visual inspection of the following:

- ❑ Ensure Breaker is securely attached to the carrier.
- ❑ Ensure Breaker tool is locked securely in the front head
- ❑ Ensure Breaker tool is well lubricated
- ❑ Check grease level and test operation of automatic lube system, if equipped
- ❑ Ensure hoses are not rubbing and tubes are secured tightly in clamps
- ❑ Ensure fasteners are not loose, missing or damaged

Do not operate breaker until all faults are corrected.

An inspection record, which can be copied, is located in Section 7 of this manual.

6.2 Proper Operation and Use

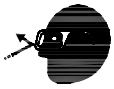
CAUTION

Before work can start, identify all site hazards, including electrical and gas utilities. Set up barriers.

CAUTION

Only qualified personnel shall operate the breaker. Never activate the breaker unless the operator is seated in the operator's seat and is in full control of the machine.

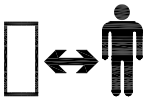
CAUTION



Injury from flying debris. Personal protection equipment is required when operating this equipment. PPE must include safety eyewear and hearing protection.

Prolonged exposure to high noise levels may cause hearing impairment or loss. Hearing protection must be worn when breaker is in operation.

CAUTION



Clear out all personnel before maneuvering the carrier into the work area.

Injury form flying debris. Do not operate breaker with personnel in vicinity of work zone.

IMPORTANT

Serious equipment damage may result if proper procedures are not followed. Select proper engine speed and set function mode to "BREAKER".

IMPORTANT

Service life of parts is diminished if attention to correct working methods is not applied. Prevent the tool from binding against the bushings by always aligning the breaker tool 90° to the work surface.

- Use the boom and arm controls to extend the breaker away from the carrier.
- Position the breaker tool against the material to be broken. Do not drop breaker on to material.

6.0 Operation – [cont'd]

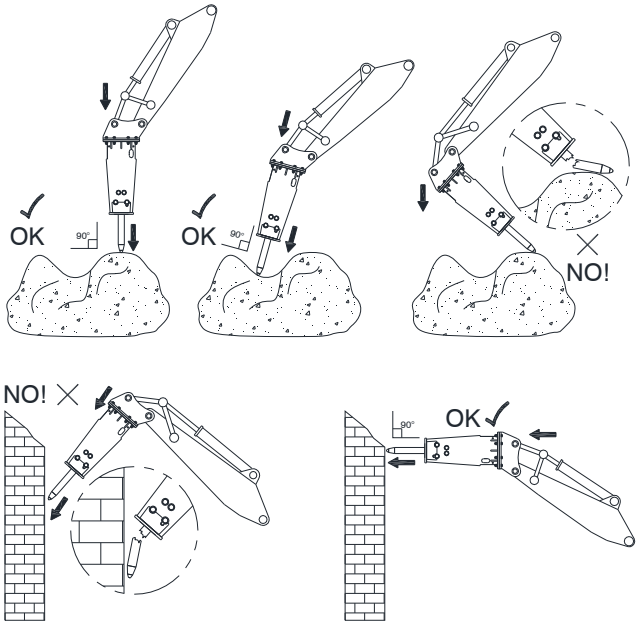


Fig. 6-2 Align the Breaker 90° to the Work Surface

- With a "firm preload" applied on the breaker tool, the breaker is ready to operate.
- Actuate the control that fires the breaker.
- Keep a constant feed force on the tool as it penetrates the material. Strong vibrations will generate back to the carrier if sufficient force is not maintained.
- Stop the breaker immediately when the tool breaks through.

6.2.1 Cycle Time

Breaking in extremely hard materials requires care to prevent overheating the tool. Prolong hammering in one spot must be avoided.

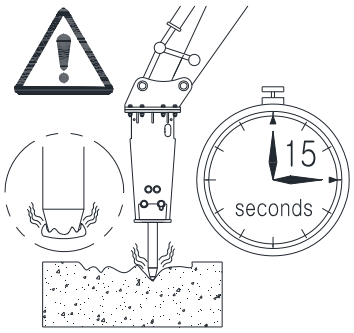


Fig. 6-3 Do Not Overheat Tool

If the material does not break within 15 seconds of hammering, stop and reposition the tool nearer the edge.

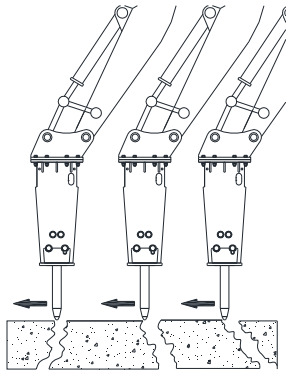


Fig 6-4 Begin at Outer Edge and Work Inward

6.3 Operating Mistakes to Avoid

IMPORTANT
Equipment damage may result if proper procedures are not followed. Carefully read through this section as it describes actions to be avoided when using the breaker.

6.3.1 Recognize Change in Pitch or Frequency

Never operate the breaker when the tool suspended in the air (Blank Fire), or is not pressed firmly against the material (Idle Strokes). Both conditions are damaging to the breaker.

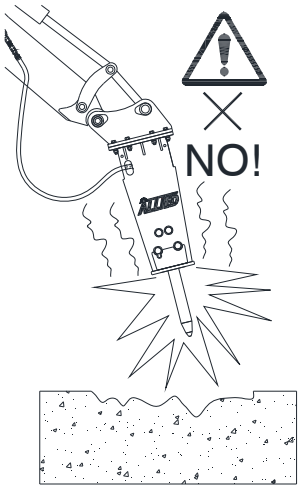


Fig 6-5 Do Not Blank Fire

6.0 Operation – [cont'd]

The operator must remain attentive to the sound emitted by the breaker. A metallic pinging sound is emitted when the tool strikes against the retainer pins. The tool must always remain firmly in contact with the material.

Always keep the tool in firm contact with the material as it penetrates the material. Material that is weak and easily fractured, requires quick reaction by the operator to stop the breaker so idle strokes are prevented.

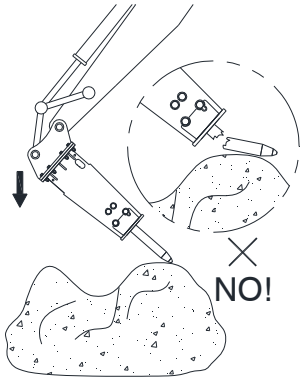


Fig 6-6 Misalignment – Side Load against Bushing

A hollow (thin) sound is emitted when the tool binds in the bushing. This is usually accompanied by a drop in blow frequency and reduced impact energy.

Binding results when the tool is misaligned or lacks sufficient lubrication. Review operator technique. Avoid binding by aligning the tool 90° to the material. Keep the tool and bushings well lubricated. Re-lubricate the tool every two hours or if it appears dry.

6.3.2 Do Not Pry With the Breaker

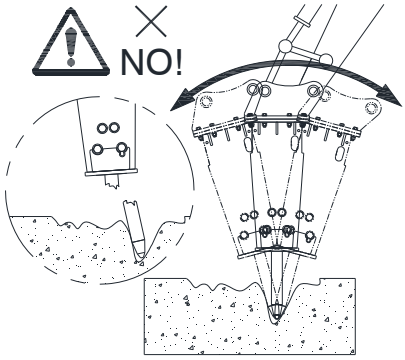


Fig 6-7 Do Not Pry With the Breaker

The leading cause of tool breakage is from bending. In the occurrence of tool failures from bending, the length of the tool, skill level of the operator and lubrication management, all play a decisive role. Prying will damage other parts as well, including the bushings, front head and housing.

NOTE: The force of the impact is dampened by soft ground underneath the material and by rock dust accumulated at the tool. Tilt the breaker to expel dust away from the tool. Tilt no more than 5º to avoid placing a strain on the front head and bending the tool.

6.3.3 Do Not Drop or Hack at Material

Avoid reckless movements that may cause the carrier to become unstable. Do not drop the breaker against the material. Do not use the breaker to hack at the material.

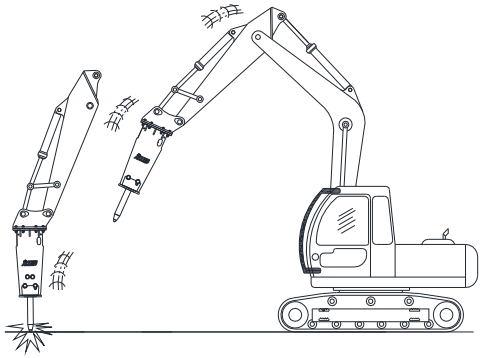


Fig 6-8 Do Not Drop, Pound or Hack the Material.

6.3.4 Do Not Operate with Cylinders at Stroke End

Operating the breaker with the cylinders fully extended or retracted can damage cylinders.

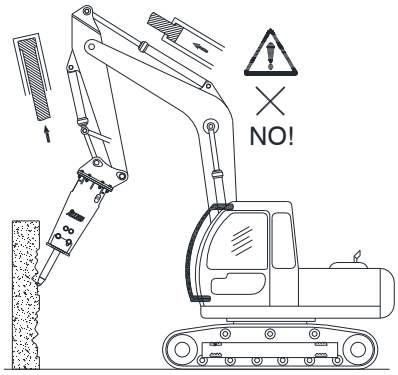


Fig 6-9 Do not Operate with Cylinders at Stroke End

6.0 Operation – [cont'd]

6.3.5 Other Prohibited Actions to Avoid with Breaker

CAUTION
The Breaker is not designed to lift or transport loads. This practice is unsafe and can damage the Breaker.

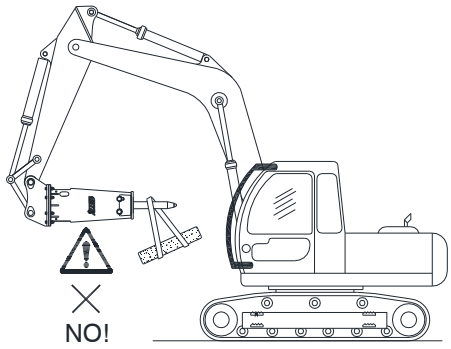


Fig 6-10 Do Not Use the Breaker to Lift or Transport Loads

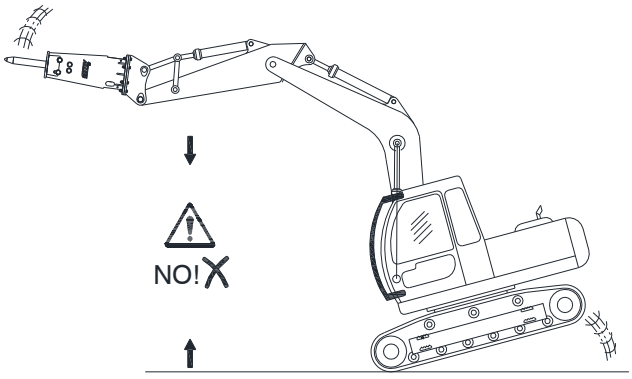


Fig 6-11 Travel With Breaker Low to Ground

CAUTION
The carrier may become unstable with risk of tipping if work tool is too heavy or transported with loads too high. Keep loads low to the ground when travelling.

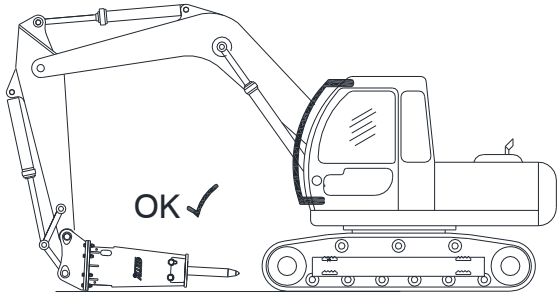
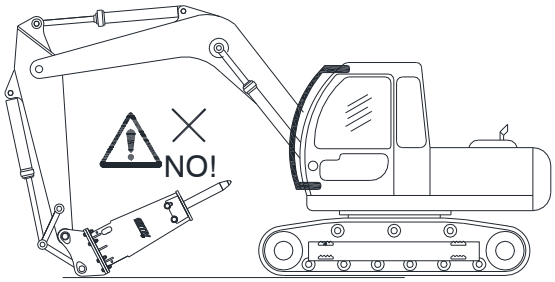


Fig 6-12 Park With Breaker Horizontally On Ground



6.4 Special Applications & Operating Conditions

6.4.1 Working Underwater

CAUTION
Serious equipment damage will result if Breaker is submerged in water without proper modifications, equipment and training.

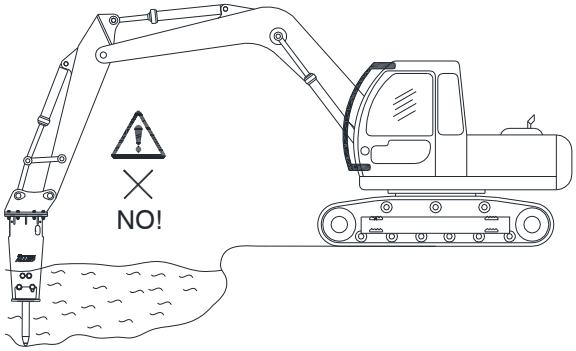


Fig 6-13 Breaker Is NOT Underwater Ready - Modifications Are Required

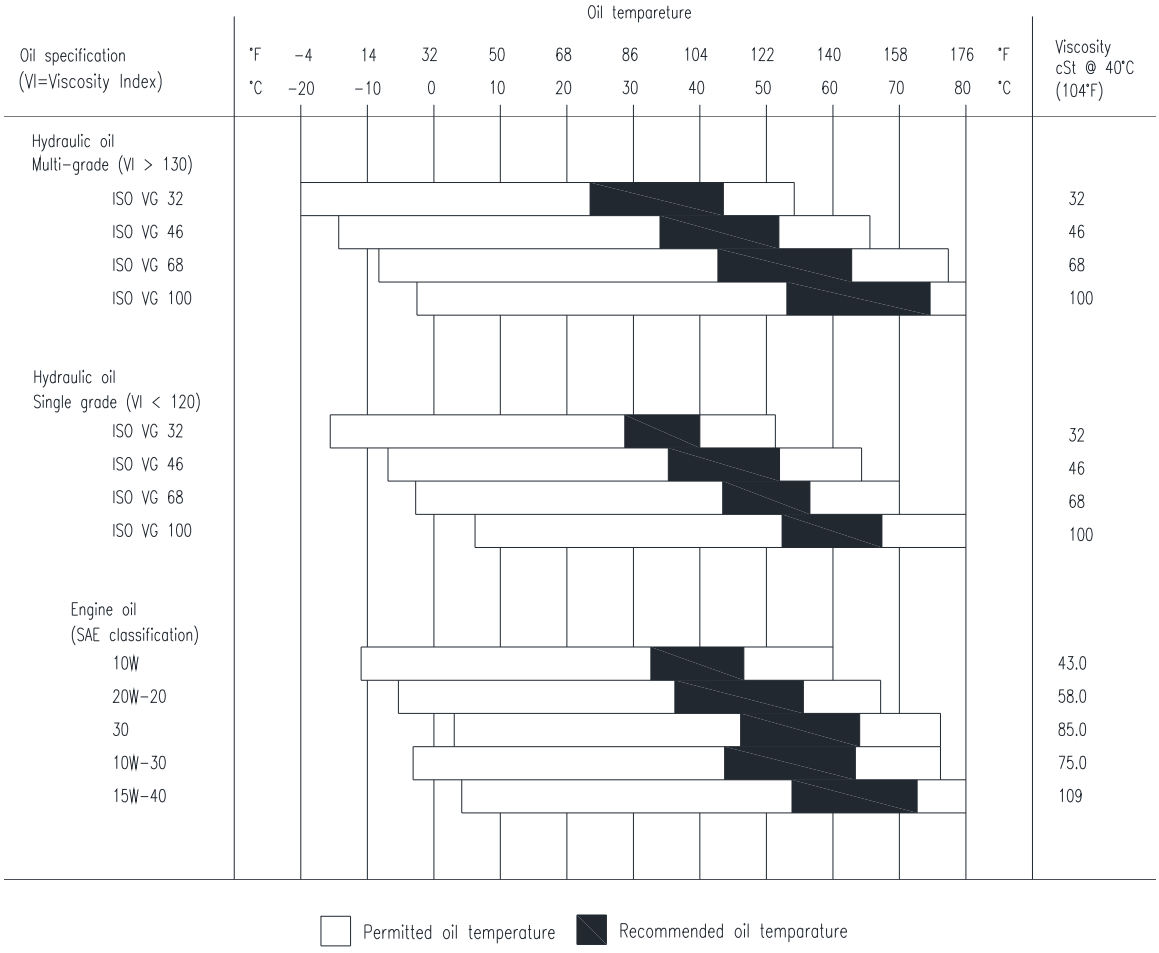
Working underwater requires special preparation, additional equipment and training. Further instructions should be directed to the Allied Technical Service Department.

6.0 Operation – [cont'd]

6.4.2 Working Underground

When using the Breaker underground [tunneling or mining applications] special safety regulations may apply. Additional considerations include:

- Use of water sprays to suppress dust.
- Use of fire-resistant hydraulic fluids. Hydraulic systems using fire-resistant fluids require special engineering consideration when using the Breaker. With some fluids, decreased flow and/or pressure to the Breaker may be necessary.



6.4.3 Working in Hot Temperatures

IMPORTANT
Serious equipment damage may result if proper procedures are not followed. Check the oil temperature often to ensure it does not exceed 176ºF [80ºC]. If higher temperatures are measured in the tank, refer to the Troubleshooting Section in this manual.

- Specify hydraulic oils with viscosity suitable for the climate conditions. In general, the hydraulic oil that was originally specified for the machine by the carrier manufacturer can be used with this equipment.
- Check the oil level in reservoir

Inspect the cooling system. Good air circulation is essential in dissipating heat from the hydraulic oil. Make sure the cooler is clean.

6.4.4 Working in Cold Temperatures

IMPORTANT
Serious equipment damage may result if proper procedures are not followed. When working in temperature conditions below minus 4ºF [-20ºC], operating the Breaker with cold hydraulic oil may damage the seals.

6.0 Operation – [cont'd]

- At temperatures below minus 4º F [-20º C], the hydraulic oil must be warmed up before starting the Breaker. Follow instructions provided by the carrier manufacturer for on warming up the carrier.

- Keep oil circulating in the carrier during pauses in work to prevent it from falling below a temperature that is too cold for normal operation.

- Specify hydraulic oils with viscosity suitable for the climate conditions. In general, the hydraulic oil that was originally specified for the machine by the carrier manufacturer can be used with the Allied equipment.

- Use oil viscosity based on the expected air temperature range during the period between oil changes.

- Optimum oil viscosity for the breaker @ operating temperature is 60 – 30cSt. Allowable oil viscosity range 1000 – 20cSt.

6.4.5 Flow Adjustment

Available on Hy-Ram models HR390 thru HR710.

7.0 Care and Maintenance

7.1 Preventative Maintenance Checks & Services

All hydraulic breakers require regular inspection and maintenance. The aim of inspection and maintenance programs is to preserve equipment reliability by replacing worn components before they reach the point of failure.

The following includes the minimum requirement for maintaining the equipment in safe operating condition. Service intervals apply only to normal applications. In extreme operating conditions or applications such as underwater, tunneling, scaling, foundry cleaning, etc., the breaker will require inspections on more frequent intervals.

Daily Pre-operation Walk-around Inspection

- ❑ Lubricate breaker tool
- ❑ Check breaker tool is properly engaged in front head
- ❑ Check level and operation of automatic lube system - If equipped
- ❑ Check for loose or missing fasteners
- ❑ Check for fluid leaks at tubes, hoses, connections and seals
- ❑ Ensure hoses are not rubbing and tubes are secured tightly in clamps
- ❑ Ensure breaker is properly engaged with carrier. Check mounting pins and ensure pin keepers are secure
- ❑ Check housing and mounting bracket for wear and cracks
- ❑ Look for signs of contact between breaker and housing caused by excessive movement

Every 2 Hours (While in use – Service Hours)

- ❑ Lubricate breaker tool or sooner if the tool appears dry
- ❑ Check breaker tool is properly engaged in front head

During Shift (While breaker is in use)

- ❑ Actively monitor efficiency and evenness of operation. Look and listen for any interruptions from normal operation
- ❑ Monitor hydraulic oil temperature. Keep within the required operating range
- ❑ Be alert to fluid leaks

Every 50 Hours or Weekly

- ❑ Measure gap between breaker tool and bushing

Every 100 Hours or 2 Weeks

Remove breaker tool from front head

- ❑ Check retainer slot area for burring
- ❑ Inspect impact surface for uneven wear, cracks or chips
- ❑ Inspect retainers for wear, cracks or chips
- ❑ Inspect impact surface of piston for uneven wear, cracks or chips
- ❑ Inspect thrust ring for evenness of wear, cracks or chips

Every 250 Hours or 3 Months (Or As Required)

- ❑ Measure hydraulic oil pressures and confirm all are within required range
- ❑ Should repairs or changes be made to the hydraulic system, the oil flow and pressure must be re-tested.

At Rebuild

- ❑ Replace all seals. Replace all worn components
- ❑ Replace accumulator membrane and charge accumulator

After Rebuild – Before Use

- ❑ Test quality of hydraulic oil
- ❑ Service hydraulic oil filters
- ❑ Test hydraulic circuit with flow meter and pressure gages.

Service Notes	Date

7.0 Care And Maintenance – [cont'd]

7.2 Equipment Maintenance Log

The importance of frequent inspections along with regular maintenance and accurate record keeping cannot be overemphasized. Keep records of equipment maintenance and services performed. This is helpful if warranty coverage is ever in question. Records should include:

- Date of service and hour meter reading
- Details of the service, maintenance or repair performed.
- Names of persons performing the service, maintenance or repair
- Copy of the purchase order or invoice, including part numbers used in the repair

7.3.1 Housing Box Inspection – Daily Start of Shift

Inspect the housing box for cracks and wear. Frequent raking of material will lead to a higher rate of wear. Build-up worn areas and promptly repair cracks to prevent further spreading. Neglecting or delaying repairs will lead to further damage and increased repair costs.

7.3.2 Vibration Dampening Inspection

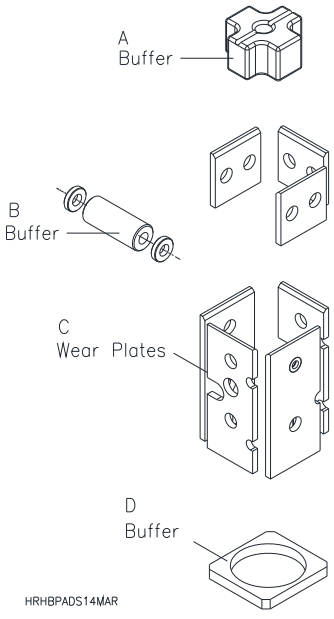


Fig. 7-1 Buffers, Wear Plates

A system of buffers, dampers and guide plates help minimize vibrations to the carrier and unwanted noise by isolating the breaker from the housing box.

With guide plates in good condition, the breaker has minimal movement inside the housing box. The operator must actively monitor for excessive movement. Never allow the breaker to contact the housing. Worn isolators must be replaced immediately. Minimize wear of these abrasion resistant plates by using proper operating techniques and keeping dust plugs and covers in place.

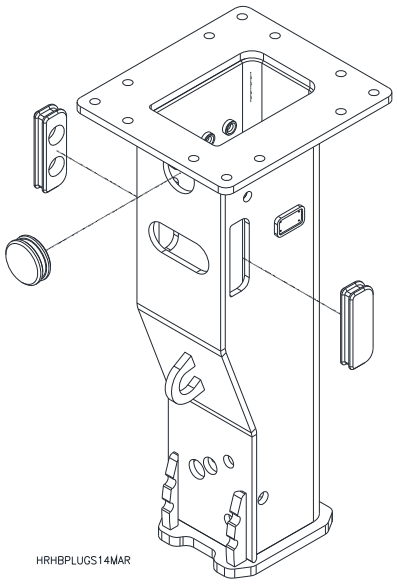


Fig. 7-2 Keep Dust Plugs and Covers In Place

Table 7.1 Buffer Wear Limits. Inch [mm]

	HR175	HR230
A-Min		
B-Min		
C-Min		
D-Min		

7.4 Front Head Inspection – Description of Parts

The aim of regularly inspecting these parts is to spot problems and correct them in their early stages. Ignoring inspections or failure to complete maintenance when repairs are minor can quickly escalate into extensive damage and higher repair costs.

7.0 Care and Maintenance – [cont'd]

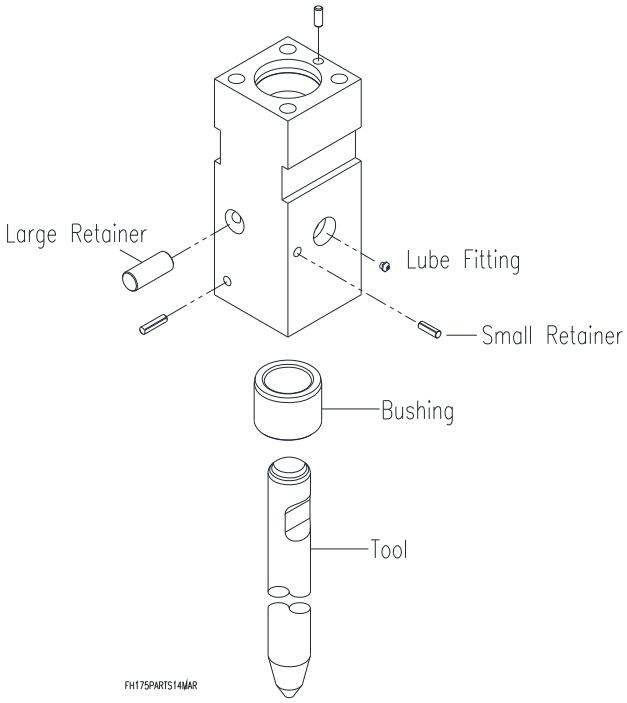


Fig 7-3 Front Head Assembly - Description of Parts

7.4.1 Front Head Inspection – Every 2 Hours

Each part of the front head plays a critical role. The condition of these parts must be actively monitored for wear and replaced when needed.

Visually inspect the front head area each time the tool is re-lubricated.

- Check that the retainer system used to secure the tool in the front head is fully engaged.
- Check that both the tool and bushings are receiving sufficient lubrication.
- Be alert to any oil seepage on the ground, tool or the front head, as this may indicate a serious condition that will require further investigation
- Visually inspect the gap between the lower bushing and tool. Further details in Section 7.4.2.

IMPORTANT
Many factors contribute to the wear of front head components, but the most apparent of these include the operator's technique and lubrication management.

Table 7.2 Inspection of Parts

Part - Condition	Cause	Remedy
Tool - Burs form in retainer slot	Wedge shape tool prone to twisting from material	Use conical tool - less prone to twisting
Tool retainer - Chipped, burs, uneven wear.	Blank fire / tool twist	Maintain sufficient feed force. Stop hammering at instant material breaks. Use conical tool - less prone to twisting
Tool, bushing or retainer - Rapid wear or galling	Ineffective lubricant, Insufficient re-lubrication	Lubricant must meet application requirements. Re-lubricate every 2 hours – sooner if tool shank is dry. Increase quantity dispensed.
Thrust Ring - Chipped, cracked or uneven wear	Idle blows	Maintain sufficient feed force. Stop breaker as soon as material breaks. Align tool at 90° angle to work surface. Do not pound or hack material with tool.
Piston - Impact face is cracked, chipped, dished or sharp edges	Tool misalignment	Excessive gap between tool & bushing. Maintain 90° angle to work surface.
Bushing - Cracked	Side loading	Do not pry with tool.

7.0 Care and Maintenance – [cont'd]

7.4.2 Check Tool & Bushing Gap – Every 50 Hours

Inspect the condition of the tool and bushing. Check the gap and replace worn parts when their wear limit is reached.

Measure the gap between the lower bushing and tool. If maximum gap, shown in Table 7.3, is reached, follow the instructions in Section 7.4.3.

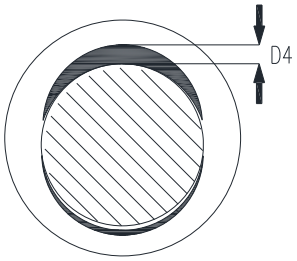


Fig 7-4 Gap (D4) Between Tool and Bushing

7.4.3 Front Head – Inspection of Internal Parts

Internal components of the front head are viewable only when the breaker tool is removed.

Wipe grease from parts to be inspected. Check parts for wear and damage. Review Table 7.2 for cause and remedy.

7.4.4 Measure Tool and Bushing Wear

The tool is guided by the bushings and is kept square to the piston. It's critical for the protection of the piston and seal system to keep bushings in good condition. Replace parts that have reached their wear limit.

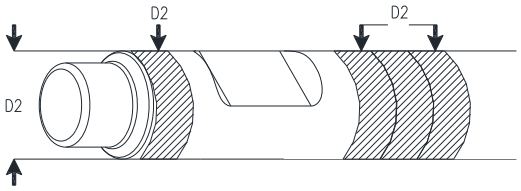


Fig 7-5 Measure Tool Diameter for Wear

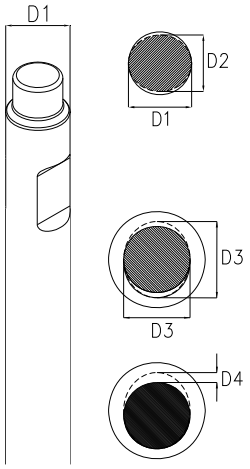


Fig 7-6 Measure Bushing & Tool for Wear

Table 7.3 Wear Limits – Inch [mm]

Model	HR175	HR230
D1 Tool O.D. New	1.75" [44.5]	2.34" [59.5]
D2 Tool O.D. Limit	1.67" [42.5]	2.26" [57.5]
D3 Bushing I.D. Limit	1.83" [46.5]	2.42" [61.5]
D4 Gap	3/16" [4.5]	3/16" [4.5]

IMPORTANT

Wear cannot be prevented, but it can be minimized through proper operating techniques and timely re-lubrication. Re-lubricate every two hours or sooner if grease is not visible. Allied Chisel paste is recommended.

7.4.5 Tool Retainer Inspection

Inspect tool retainers each time the breaker tool is removed. The retainer should be rotated when the surface becomes uneven or damaged from galling. Replace when both sides are worn.

7.5 Piston Inspection

The piston can be viewed after the tool is removed. The impact surface should be flat and smooth.

7.0 Care And Maintenance – [cont'd]

Replace the piston if the impact face is cupped, chipped, cracked or has sharp edges. This damage is often the result of tool misalignment caused by improper operating technique or from worn bushings. Damage can also be the result of metal fatigue.

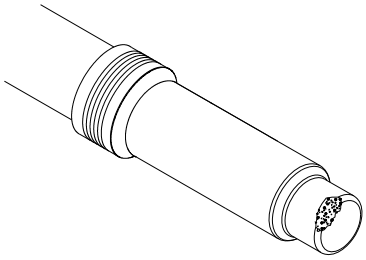


Fig 7-7 Piston Shown With Damage to Impact Face

Complete disassembly of the breaker is required to replace the piston. Contact your Allied service center.

7.6 Inspection of the High-Pressure Accumulator

WARNING

Prevent unexpected release of high pressure gaseous energy. The accumulator is pressurized with nitrogen gas and remains pressurized even at times when there is no hydraulic pressure to the breaker.

Never attempt to dismantle the accumulator unless completely discharged of all pressure. If the breaker is attached to a carrier do not service the accumulator until oil pressure inside breaker and hydraulic circuit is relieved.

Only qualified technicians with special tools and training should service the accumulator.

CAUTION

In the event of an accumulator failure, immediately discontinue operation. Ignoring this notice can damage the breaker and the carrier.

The accumulator is a self-contained pressure vessel with a flexible membrane dividing the inner chamber. The lower chamber is used to receive, store and discharge pressurized oil. The upper chamber is filled with nitrogen gas.

During normal operation, no service is required to the accumulator between rebuilds. Visually inspect the accumulator daily for oil leaks and broken or loose bolts.

Generally, membrane failure is often sudden and results in immediate and complete discharge of gas. The breaker will continue to operate, but without assistance from the accumulator, a noticeable change in performance will be observed. Symptoms include one or more of the following:

- Loss of blow energy
- Decrease in blow frequency
- Strong pulsations in hoses
- Oil leaking from around the accumulator

After membrane replacement, the breaker cannot be used until the upper chamber is charged. Several factors, including the pre-charge pressure, will affect the function and reliability of the accumulator. Accurate charging to the proper pressure is important if it is to deliver a long and reliable service life.

7.7 Inspect the Mounting Pins

Inspect the mounting pins for wear and damage when the breaker is removed from the carrier. Replace worn or damaged pins.

7.8 Threaded Fasteners

IMPORTANT

Keep threaded fasteners tight. Replace damaged or missing fasteners prior to operating equipment. Replacement must be the same type and grade.

Threaded fasteners are subjected to high stresses. All threaded fasteners must be checked daily for the first 50 operating hours and once a week thereafter. Tighten fasteners to the specified torque.

7.9 Inspect Hoses

Replace hoses if any of the following conditions are present:

- End fittings are damaged or leaking
- Outer coverings are chafed or cut.
- Wires are exposed
- Outer coverings are ballooning
- Flexible part of the hoses are kinked
- Outer covers have embedded armoring
- End fittings are displaced

7.0 Care and Maintenance – [cont'd]

7.10 Check Oil and Filter on Carrier

CAUTION

Refer to the manuals provided by the carrier manufacturer for required service and maintenance intervals.

Check oil level in reservoir. Check service record for last oil and filter change. Test oil quality. Review the maintenance schedule from the manufacturer of the carrier. It may specify special maintenance conditions when operating breakers.

7.11 Measuring Oil Pressure

All hydraulic breakers are designed for optimum performance with reliable service life when operated within specified parameters. Monitor the efficiency of the breaker through regular checks of the oil pressure.

It is required to measure the oil pressure –

- When the breaker is first installed to a new carrier.
- Anytime the carrier's hydraulic circuit is repaired or modified.
- Anytime other work tools are used on the same carrier and these operate at different flow and pressure settings.
- Anytime the breaker is moved off one carrier and installed to a different carrier.

It is recommended to measure the oil pressure –

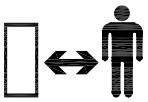
- At every 250 hours of use.

7.11.1 Safety Precautions – Read First

CAUTION

Equipment damage from improper oil flow or pressure. Accurate calibration of the hydraulic circuit is important for reliable operation.

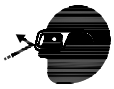
Hydraulic circuits differ between machines. Only qualified personnel, having knowledge of the machine's systems, proper test equipment and tools should perform conversion set-up and adjustments.



CAUTION

Some procedures, such as measuring the oil pressure, must be done while the breaker is operating. This will require an assistant.

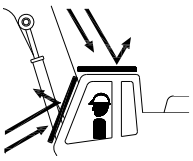
Both must be qualified in these procedures. Take all necessary precautions. All directions and signals must be agreed upon in advance. Never activate the breaker unless the operator is seated in the operator's seat and is in full control of the machine.



CAUTION

Injury from flying debris. Personal protection equipment is required when operating this equipment. PPE must include safety eyewear and hearing protection.

Prolonged exposure to high noise levels may cause hearing impairment or loss. Hearing protection must be worn when breaker is in operation.

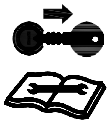


CAUTION

Injury from flying debris. Proper guarding must be fitted to the operator's cab when the breaker is used.

CAUTION

Crush injury from falling or shifting loads. All loads must be stable before service begins.



Engage interlock, shut off carrier and remove key. Follow safety instructions in the manual provided by the carrier manufacturer.

WARNING

Prevent injury from unexpected release of high pressure hydraulic energy. Relieve all oil pressure inside breaker and attachment circuit before service.

Wear personal protection equipment, including safety eyewear when working with pressurized systems.

7.0 Care And Maintenance – [cont'd]

WARNING

Escaping fluid under pressure can cause injury from injection. Always relieve pressure before disconnecting hydraulic lines or other pressurized lines.

If any fluid appears to penetrate the skin, seek immediate medical attention. Qualified technicians with special tools and training should test the hydraulic system.

IMPORTANT

Contamination can shorten service life. Prevent dirt and debris from contaminating the oil. Always clean the area around the connections prior to removal of plugs or caps. Have a suitable container and rags on hand before disconnecting hose. Collect fluid and dispose of it properly.

7.11.2 How to Measure Oil Pressure

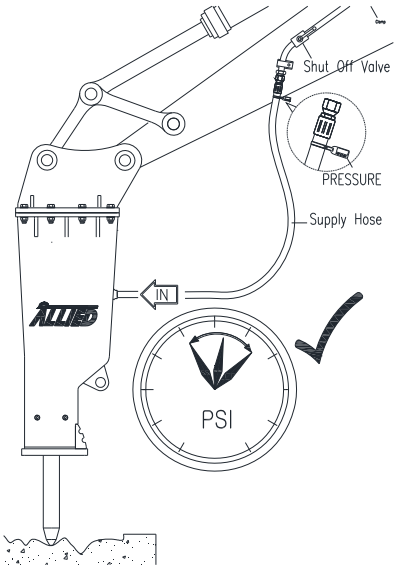


Fig. 7-8 Measuring Oil Pressure

- Connect a pressure gauge [0-5000 PSI] into the supply line near the breaker.
- Start the carrier and allow the oil temperature to reach its normal operating temperature before starting.
- Move the breaker into a suitable working position.
- Set the engine rpm at the normal operating speed
- Set work mode to breaker.
- Start the breaker and record the oil pressure. It's normal for the needle of the gauge to pulsate. Compare the average reading with the values listed in the Technical Data Section of this manual.
- Make all necessary adjustments. Remove the gauge when finished.

8.0 Safe Handling & Storage

WARNING

Falling or shifting loads may cause injury or equipment damage. Do not lift the Breaker by the mounting pins or hose. Approved lift points are identified by the LIFT HOOK. The lifting eye located on the housing is for handling the breaker. Do not use it to lift other loads.

Crush hazard. Falling or shifting loads may cause injury. Lifting devices must safely carry the loads to which they will be subjected. Lift away from people. Do not enter the danger zone while the Breaker is being lifted.

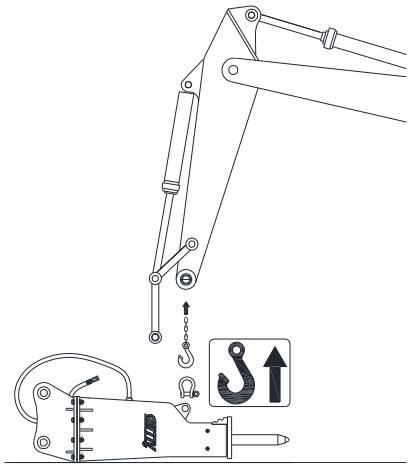


Fig 8-1 Use Approved Lift Points

8.1 Transport Breaker Independently of Carrier:

1. Remove all loose debris from Breaker.
2. Follow removal instructions in Section 9.6.
3. Secure hoses to unit to avoid accidental damage.
4. Lift the Breaker at approved lift points only with appropriate lifting equipment.
5. Adequately stabilize and secure the Breaker for transport.

8.2 Transport Breaker Installed on Carrier:

1. Remove all loose debris from Breaker.
2. Secure hoses to unit to avoid accidental damage.
3. Inspect the mounting pins and hardware for damage and integrity.
4. Transport carrier in accordance with the carrier manufacturer's recommendations

8.3 Breaker Storage – Short Term [< 14 Days]

1. The Breaker may be stored vertically (tool down) or horizontally.

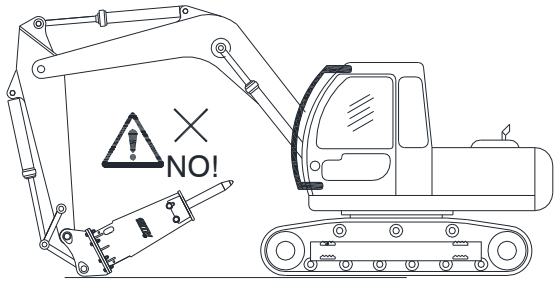


Fig 8-2 Improper Park Position

IMPORTANT
Exposure to moisture can cause destructive rust and pitting on the piston. Elevate the top of the breaker slightly higher to prevent water ingress through front head.

If the Breaker is stored off the carrier -

2. Seal all hydraulic connections.
3. If stored outside, cover the Breaker with a waterproof tarp.

8.4 Breaker Storage – Long Term [> 14 Days]

1. Remove the breaker tool from the Breaker. [Refer to Section 10.]
2. Seal all hydraulic connections.
3. Release back head charge. Push piston to its highest position. (Crack open [OUT] cap).

IMPORTANT
Contamination can shorten service life. Prevent dirt and debris from contaminating the oil. Always clean the area around the connections prior to removal of plugs or caps. Have a suitable container and rags on hand before disconnecting hose. Collect fluid and dispose of it properly.

8.0 Safe Handling & Storage – [Cont'd]

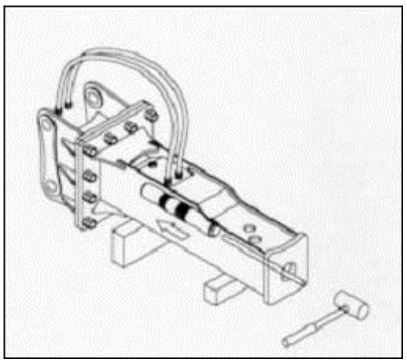


Fig 8-3 Push Piston To Its Highest Position

4. Protect the lower end of the piston with grease

IMPORTANT
Exposure to moisture can cause destructive rust and pitting on piston. Protect from damage by coating the exposed surface (below the wiper) with grease.

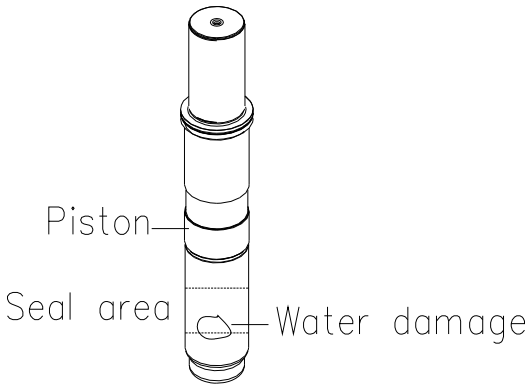


Fig 8-4 Protect Piston From Water Damage

5. The Breaker must be stored in the vertical position.

WARNING

Crush Hazard. Unsupported loads may cause injury or equipment damage. Use sufficient blocking and restraints to stabilize loads.

6. If stored outside, cover the Breaker with a waterproof tarp.

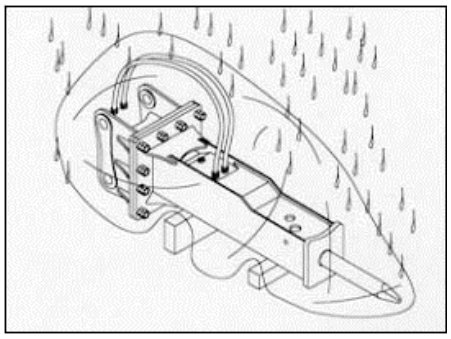


Fig 8-5 Protect Breaker with Waterproof Tarp

9.0 Attach / Remove Breaker From Carrier

9.1 Carrier Requirements

CAUTION

Carrier may become unstable with risk of tipping if work tool is too heavy or transported incorrectly.

- The Breaker shall only be attached to carriers that are capable of providing sufficient load carrying capacity.
- Know the capacities and limitations of your machine and do not exceed them.
- Consult the manual provided by the carrier manufacturer for the lift capacity of the machine.
- Lift capacities decrease as the load moves away from the machine.
- Factors such as stick length, undercarriage, counterweights, etc., all affect the lifting capacity of the carrier.
- Any modifications made to the Breaker or the carrier must be taken into consideration to prevent machine instability

IMPORTANT

Incorrect combination of Breaker and carrier will result in poor performance or equipment damage. Review hydraulic specifications of each.

9.2 Mounting Kits

A mounting bracket is required to attach the Allied Breaker to a carrier. Allied offers an array of mounting brackets to fit virtually any carrier, including those equipped with quick mounting couplers.

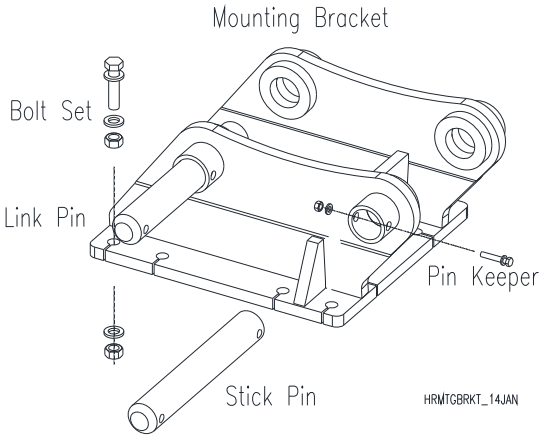


Fig 9-1 Mounting Bracket – Pin-On Typical

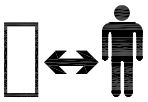
9.3 Tools Required to Attach the Breaker

No special tools are required, but the following tools should be available:

- PPE including Safety eyewear & gloves
- Sledge Hammer
- Drift pin
- 3/4 drive socket wrench
- 3/4 drive metric sockets
- Grease gun
- Standard and Metric open end wrenches
- Pry bar
- Rags

9.4 Attach the Breaker to the Carrier

CAUTION



Some procedures, such as attaching the Breaker to and from the carrier, will require an assistant. Both the operator and assistant must be qualified in these procedures.

Take all necessary precautions. Throughout the procedure the machine operator shall be seated in the operator's seat and maintain full control of the machine. All directions and signals must be agreed upon in advance. Take signals from only ONE person.

Crush hazard. Use sufficient blocking to avoid accidental or sudden movement of the Breaker. Keep hands and feet clear of crush points. Do not touch any moving parts.

Use personal protective equipment when handling the breaker. PPE should include appropriate clothing, gloves, safety eyewear and shoes.

The breaker is attached to the carrier in the same manner as mounting a bucket. Use standard mechanic's techniques and tools to attach the breaker to the carrier.

The installation described is for a typical pin on type. Procedures may vary and you should follow the instructions in the manual provided by the carrier manufacturer.

For carriers equipped with a quick coupler, refer to the owner's manual provided by the coupler manufacturer for instructions.

9.0 Attach / Remove Breaker From Carrier – [cont'd]

The machine operator and an assistant shall perform the following procedure:

1. Operator: Move carrier and Breaker to a firm level surface. Position the Breaker horizontally with the hose side up and the breaker tool pointing toward the carrier.

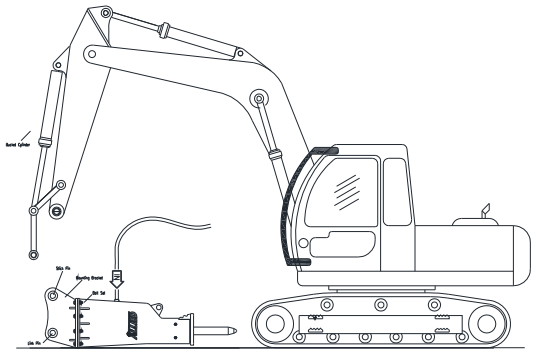


Fig. 9-2 Attach Breaker to Carrier

2. Assistant: Check that the Breaker is stable and all loads are supported.

3. Operator: Maneuver the stick in between lugging of the mounting bracket. Align the stick pin holes and mounting bracket holes with each other.

4. Assistant: Pins must be free of rust and debris before they are installed. Clean pin and lightly coat with lubricant. Insert the stick pin through the holes.

5. Assistant: Secure stick pin with keepers.

6. Repeat procedure with link pin.

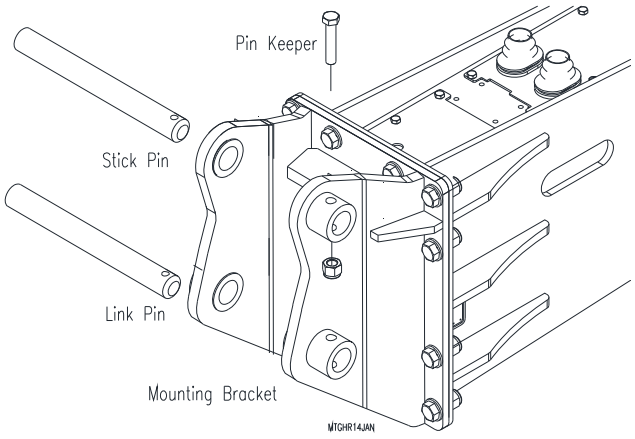


Fig. 9-3 Install Pins and Keepers

9.5 Supply Hose [IN] and Return Hose [OUT]

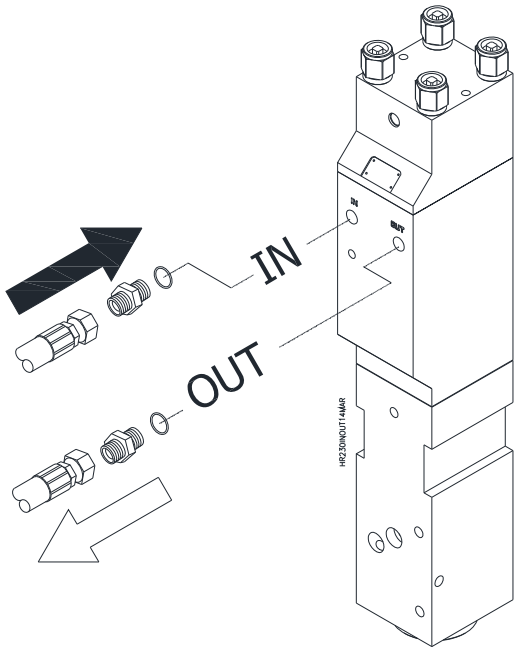


Fig. 9-4 – Supply Hose [**IN**] and Return [OUT]. Port Connections On Cylinder Body

IMPORTANT
The Breaker will not operate if the supply and return hoses are reversed. Connect the hose tagged with "PRESSURE" to the pressure line of the carrier. The location of the Supply Line can vary from one carrier to another. Determine carefully if the supply line on the carrier is located on the right-hand or left-hand side. Do not guess.

IMPORTANT
Contamination can shorten service life. Prevent dirt and debris from contaminating the oil. Always clean the area around the connections prior to removal of plugs or caps. Have a suitable container and rags on hand before disconnecting hose. Collect fluid and obey all local regulations for the disposal of these fluids.

1. Remove the plugs from the ends of the hydraulic hoses. Set plugs aside and store them for later use when the Breaker is removed.

9.0 Attach / Remove Breaker From Carrier – [cont'd]

2. Connect hoses to the shut-off valves located on the carrier. (Supply hose tagged "PRESSURE")

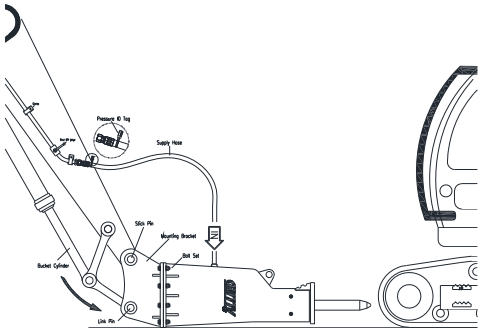


Fig. 9-5 Connect Supply & Return Hoses to Carrier

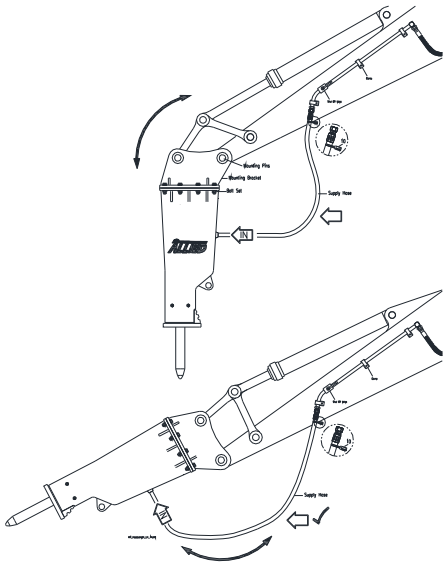


Fig. 9-6 Check hose routing and length

3. Raise the Breaker off the ground. Operate the bucket cylinder thru its full range of motion to assure hoses will not be pinched or restricted.

9.6 Removal from Carrier

CAUTION

Burn injury from contact with hot surface. Some components become hot during operation. Allow parts and fluids to cool before handling.

The procedure described is for a typical pin on type. Procedures can vary between different machines. Be sure to follow the instructions found in the manual provided by the carrier manufacturer.

CAUTION

Some procedures, such as attaching the Breaker to and from the carrier, will require an assistant. Both the operator and assistant must be qualified in these procedures.

Take all necessary precautions. Throughout the procedure the machine operator shall be seated in the operator's seat and maintain full control of the machine. All directions and signals must be agreed upon in advance. Take signals from only ONE person.

Crush hazard. Use sufficient blocking to avoid accidental or sudden movement of the Breaker. Keep hands and feet clear of crush points. Do not touch any moving parts.

Use personal protective equipment when handling the breaker. PPE should include appropriate clothing, gloves, safety eyewear and shoes.

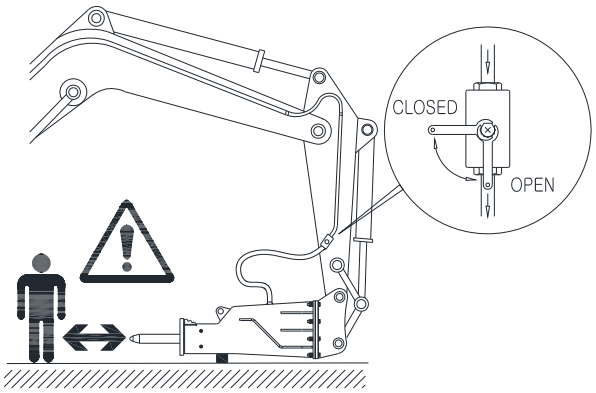


Fig. 9-7 Close Shut Off Valve to Breaker

IMPORTANT

Contamination can shorten service life. Prevent dirt and debris from contaminating the oil. Always clean the area around the connections prior to removal of plugs or caps. Have a suitable container and rags on hand before disconnecting hose. Collect fluid and obey all local regulations for the disposal of these fluids.

9.6.1 Tools Required For Removal

No special tools are required, but the following tools should be available:

9.0 Attach / Remove Breaker From Carrier – [cont'd]

- PPE including Safety eyewear & gloves
- Sledge Hammer
- Drift pin
- 3/4 drive socket wrench
- 3/4 drive metric sockets
- Grease gun
- Standard and Metric open end wrenches
- Pry bar
- Rags

1. Operator: Move carrier and Breaker to a firm level surface. Position the Breaker horizontally with the hose side up and the breaker tool pointing toward the carrier.

2. Shut the carrier off and relieve the pressure in the hydraulic tank and hydraulic lines.

3. Assistant: Check that the Breaker is stable and all loads are supported. Close the shut off valves on the carrier that's connected to the Breaker.

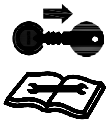
4. Clean dirt from connection areas. Disconnect the hoses from the shut off valves. Seal all open connections with the appropriate plugs and caps.

5. Remove the pin retainers from the stick and link pins. Collect any spacers that may have been used.

6. Refer to Section 8.0 for proper storage instructions.

10.0 Changing the Tool

10.1.1 Safety Precautions – Read First



CAUTION

Follow all safety and operating instructions provided by the carrier manufacturer. Engage interlock, shut off engine and apply parking brake.

CAUTION

Crush injury. Unsupported loads may cause injury or equipment damage. If attached to a carrier, lower the breaker to a flat stable surface. Ensure all loads are stabilized. Use sufficient blocking and restraints to stabilize loads.

CAUTION

Crush injury. If breaker is attached to carrier, relieve all hydraulic pressure inside breaker and attachment circuit before tool is removed.

CAUTION

Crush injury. Keep fingers, hands and other body parts clear of falling or moving parts. Do not insert fingers into bores. Use a screwdriver or rod to push pins out of bore.

Keep hands, feet and other body parts out of path and clear of falling parts.

CAUTION

Burn injury from contact with hot surface. Some components become hot during operation. Allow parts and fluids to cool before handling.

CAUTION

Injury from flying debris. PPE must be worn when striking pins with hammer. PPE includes appropriate clothing, gloves, safety eyewear and shoes.

CAUTION

Tools and other components of the breaker are heavy. Use suitable lifting equipment.

10.1.2 Tools Required to Remove

- PPE including safety eyewear and gloves
- Screw Driver or round push bar
- Hammer - Hand sledge
- Drift pin
- Sling and lifting device

10.1.3 Overview of Tool Retainer System

The procedure for removing and installing the tool is essentially the same for all models. The tool can be changed with the breaker on or off the carrier.

Housing box (E). The tool (D) is secured in the front head (A) by a combination of retainers. The large pin (B) passes through the slot located on the shank end of the tool (D). The smaller retainer (C) holds the larger pin captive.

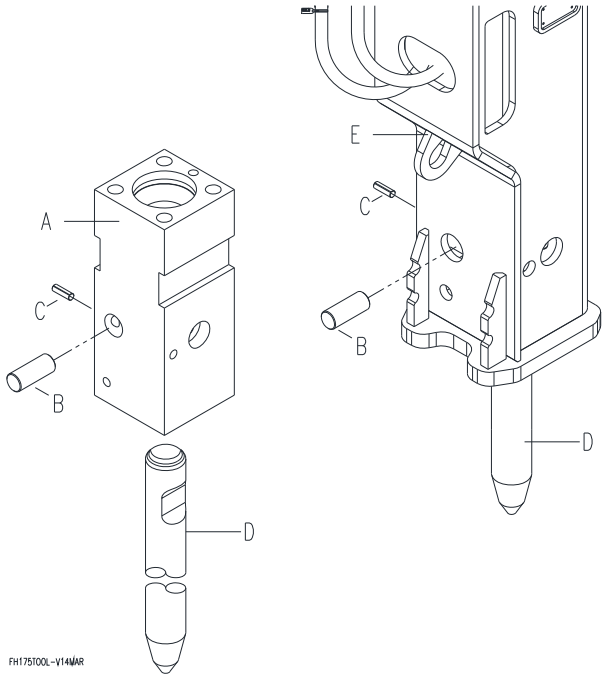


Fig. 10-1 Tool Retainer System

10.0 Changing the Breaker Tool

10.1.4 How to Remove Tool

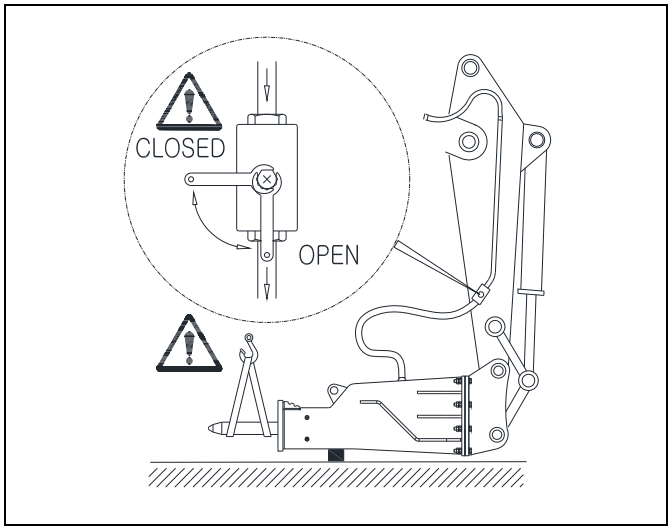


Fig. 10-2 Close Valves, Elevate, Support Tool

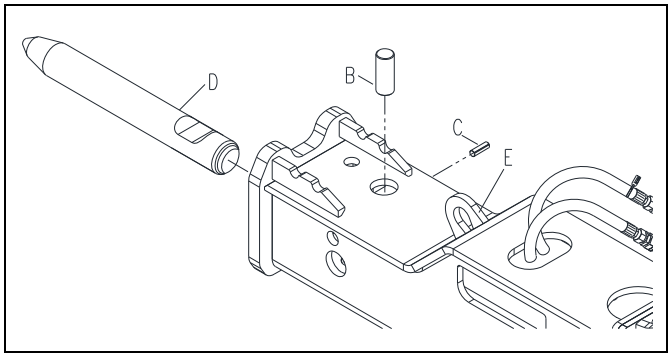


Fig. 10-3 Remove smaller pin (C). Next, remove large pin. (B)

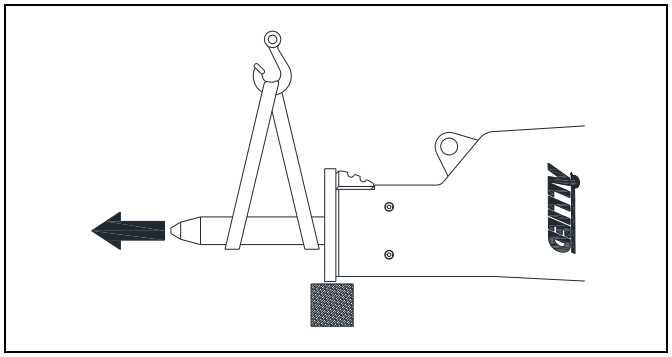


Fig. 10-4 Support Weight of Tool & Remove

1. If attached to the carrier, lower the breaker and position horizontally on a stable and level surface. Allow access to the large retainer (B) from below. Use adequate load bearing device to support weight of breaker.
2. Stop the engine and apply the parking brake. Enable the hydraulic interlock. Close shut off valves [Fig. 10-2].
3. Drive small retainer (C) out of front head until it clears large retainer (B). [Fig. 10-3].
4. Remove large retainer and set aside. [Fig. 10-3]
5. Tool is released from Front Head. **Large Tools are Heavy!** Handle tools with a suitable hoist and sling. [Fig. 10-4].

10.2 Tool Inspection / Prepare for Installation

1. Clean and inspect front head bushings, tool and retainers. Check for uneven or excessive wear, cracks or other damage.
2. Measure bushing and tool. Parts must be replaced if worn beyond wear limit.
3. Inspect impact face of piston and thrust ring for uneven or excessive wear, cracks or other damage.
4. Grind any burrs and sharp edges smooth if found on tool shank.

IMPORTANT
Gradually remove burrs to prevent over-heating the steel.

10.3.1 How to Install Tool - General

WARNING
Read, understand and follow all safety precautions described in section 10.1 of this manual before installing the breaker tool. Incorrect installation may allow the breaker tool to be driven out of the front head, possibly causing bodily injury or property damage.

The procedure for removing and installing the tool is essentially the same for all models. The tool can be changed with the breaker on or off the carrier.

The tool is inserted into the open end of the front head and secured by an arrangement of pins which pass through slots located on the tool shank.

10.0 Changing the Tool – [cont'd]

10.3.2 Tools Required to Install

- PPE including safety eyewear and gloves
- Screw driver or round push bar
- Hammer - Hand sledge
- Drift pin
- Sling and lifting device
- Grease gun

10.3.3 Tool Install

IMPORTANT

Rapid wear of bushings and tool will result if the following are not observed.

- Pre-lubricate the breaker tool before inserting into front head. This applies to new tools and tools that have been wiped clean for inspection.
- Prevent dirt and rocks from contaminating the grease.

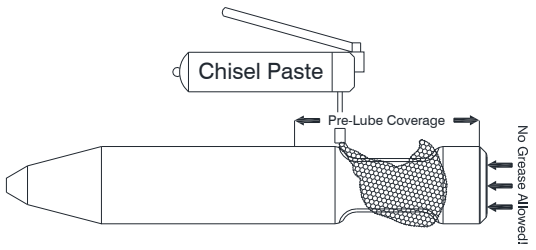


Fig. 10-5 Pre-Lube the Tool Shank

1. Position breaker horizontally on a stable and level surface. Use adequate load bearing device to support weight of breaker.
2. If attached to the carrier, close shut off valves [Fig. 10-2].
3. **Large Tools are Heavy!** [Fig. 10-4]. Handle tools with a suitable hoist and sling. Insert tool in front head.
4. Insert the large retainer (B). [Fig. 10-3].
5. Insert small pin (C) through slot in large retainer (B) until fully engaged. [Fig. 10-3].

CAUTION

If tool lubrication is provided by an automatic dispenser, please read carefully. When delivery is continuous and the output is properly adjusted, the amount dispensed from the pump will be sufficient in volume to replenish the amount consumed during normal breaker operations. Any interruptions from normal grease delivery will require special attention before the breaker is returned to service. Interruptions from normal delivery include:

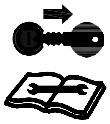
- New replacement tool installed
- New replacement bushings installed or wiped clean of grease for purpose of inspection
- Any grease line is replaced or added
- Operating the grease dispenser beyond the minimum mark has depleted the reservoir

Prior to insertion, pre-lubricate all new tools or if used tool was cleaned for inspection. Spread a layer of clean grease over surface of tool shank including the retainer slots. Further greasing is required after it is installed. Read and follow instructions for re-lubrication in Section 10.4. New grease lines must be Pre-filled. Purge all pockets of air until delivery is continuous.

10.4 Tool Re-Lubrication – Conventional Method

CAUTION

Crush injury from falling or shifting loads. All loads must be stable before tool re-lubrication.



Engage interlock, shut off carrier and remove key. Follow safety instructions in the manual provided by the carrier manufacturer.

Figure 10-6. The breaker must be stood upright with the tool contacting the ground. Use the carrier to push down until the tool is seated firmly against the thrust ring.

10.0 Changing the Tool – [cont'd]

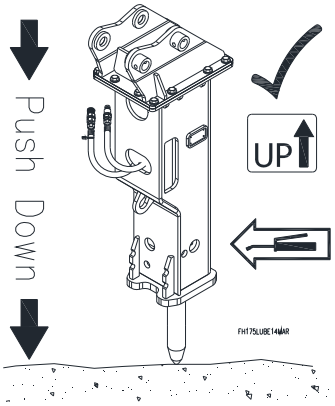


Fig 10-6 Stand Upright. Push Tool Against Firm Surface. OK To Grease

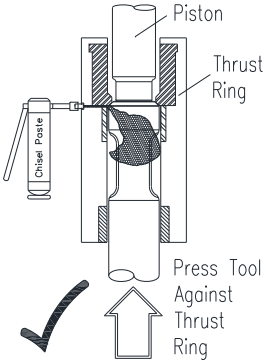


Fig 10-7 Tool Seated Against Thrust Ring Prevents Bypass Into Impact Chamber

Conventional re-lubrication is accomplished with a grease dispenser such as a standard hand-operated or power-assisted grease gun.

Apply lubricant as shown in Fig. 10-6. The top lube fitting lubricates the upper bushing. The lower bushing is lubricated through the bottom fitting.

1. On stable and level ground, stand the breaker vertically and push the tool firmly against the ground. Engage interlock and shut off carrier.

2. Wipe off grease nipple. Press grease gun over top lubrication nipple. Pump lever 20-30* strokes.

3. Repeat step 2 on lower lube nipple.

*The amount a grease gun will deliver per lever stroke will vary widely from one gun to the next. The amount dispensed must equal the amount consumed between last replenishment. If greasing intervals are infrequent, additional strokes will be necessary to refill grease reserves. Pump enough grease until surfaces are sufficiently covered.

Generally, tool re-lubrication is recommended every two hours. However, the operator must actively monitor the tool and grease must always visible. If not, shorten the time between re-lubrication. Excess lubrication ends up as waste. Either extend period between re-lubrication or decrease the number of lever strokes.

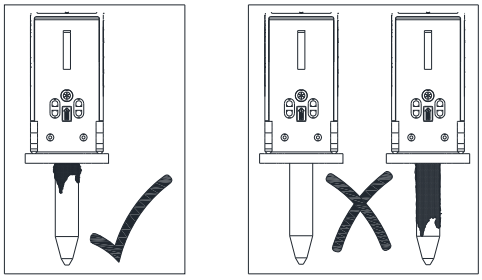


Fig 10-8 Grease Must Be Visible On Tool At All Times

10.4.1 Avoid Costly Lubrication Mistakes

CAUTION

At no time is it permissible to re-lubricate the tool with the breaker lying horizontally as shown in Figure 10-9. Neglecting to press the tool against thrust ring will allow grease to by-pass and fill the space above the tool (impact chamber).

If this occurs, the oil seals may be dislodged and lead to piston and cylinder damage.

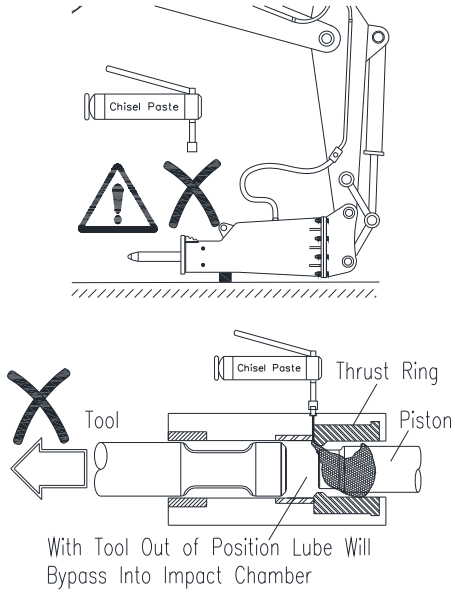


Fig 10-9 Incorrect Re-Lubrication Position

10.0 Changing the Tool – [cont'd]

10.5 Tool Re-Lubrication – AutoLube Options

As an option, Allied offers automatic grease dispensing systems that provide continuous re-lubrication of the tool and bushings during operation.

When installed correctly and properly maintained, automatic lubricators provide the following benefits-

- Higher utilization rate of breaker
- Extend service life of tool and bushings
- Reduced grease waste

A choice of carrier and breaker mounted models is available.

IMPORTANT
The AutoLube can be used with any breaker having the necessary connection port. Available on Hy-Ram models HR290-HR710.

10.5.1 Carrier Mounted Lubricator - CML Series

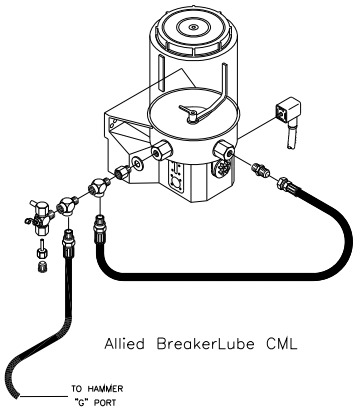


Fig 10-10 Carrier Mounted AutoLube System

The CML series AutoLube is designed for mounting on the carrier. It features a large refillable reservoir with a shut off switch that immobilizes the breaker and signals the operator when the reservoir reaches the low level mark. The electric motor can drive up to three pumping elements.

The CML series is highly configurable to suit virtually any size breaker. Allied offers kits to help facilitate the installation. Components of each kit, such as the number of pumping elements and lube lines, are coordinated with the size of the breaker and carrier combination. Universal kits are also available for non-Allied breakers. When ordering kits, it is necessary to provide the make and model of the carrier and breaker.

10.5.2 Hammer Mounted Lubricator – HML Series

The AutoLube HML-series is a compact size pump that mounts directly to the breaker. There are no electric or hydraulic connections. Grease is dispensed when the pump is pulsated by the breaker. The refillable reservoir is transparent and allows easy monitoring. Delivery is adjustable to match different size breakers and requires no special tools.

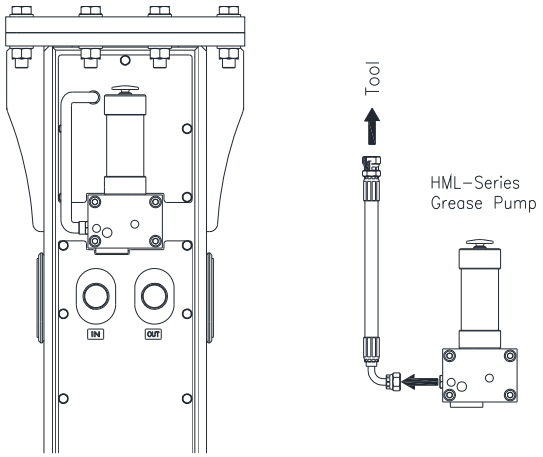


Fig 10-11 Hammer Mounted AutoLube System

Installation kits for both the CML-series and HML-series are available from Allied. These kits do not include Chisel paste. Order separately.

10.6 Benefits of Using Chisel Paste

Allied Chisel Paste is a specialty lubricant made for use with all breakers. Developed exclusively for bushing and tools, chisel paste (when applied regularly) offers supreme protection against friction-related wear from heavy-loading.

Chisel Paste is specially formulated from a unique blend of lubricants that also include solids of molybdenum disulfide [MoS2], graphite and copper. These solids (typically not found in General Purpose" and "Multi-Purpose" grease) are key elements of Chisel Paste that help extend the service life of bushings and tools.

IMPORTANT
Pre-lubricate the tool before inserting into front head. Keep dirt and rocks from contaminating grease. If Allied Chisel Paste is not used, re-lubrication frequency must be increased. Use high-quality EP type grease that contains a high percentage of molybdenum disulfide [MoS2] and formulated for use in high-temperature applications.

11.0 Tool Selection Guide

11.1 Match the Application

Hydraulic breakers are used in a variety of applications including concrete demolition and rock breaking. Efficient operation, production rates and service life of the Breaker is affected by many factors, including:

- Variations in operator technique
- Maintenance
- Selection of breaker tool

11.1.1 Methods Used to Break Material

Materials are fractured by two methods – Penetrative and Impact. With penetrative breaking, blows from the piston drive the tool into the material and wedge it apart. With impact breaking, blows from the piston generate a compressive force that squeezes the material. When the material's strength is exceeded, it fractures.

The three most commonly used tools for concrete demolition, rock cutting and bolder reduction are the Conical, Chisel, and Blunt. Conical [Pointed] and chisel [wedge] type tools work best in penetrative applications. The blunt [Flat] tool is used for impact breaking. Applications include bolder (oversize) reduction, rip rap and any work with hard, brittle and abrasive materials.

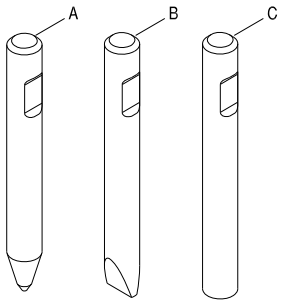


Fig. 11-1 A-Conical, B-Chisel, C-Blunt

A. Conical [Point] – Designed for penetrative breaking, the conical is suitable for most applications, including trenching and benching in sedimentary rock [e.g. sandstone], weak metamorphic rock and general breaking of concrete. The conical preforms well when working in reinforced concrete because its round shape resists twisting that can lead to retainer pin and pin slot deformation.

B. Chisel [Wedge-Cross Cut transverse or In-line parallel] – Same applications as the conical. Useful when cutting action is required.

C. Blunt – Designed for impact breaking, the blunt tool is effective in breaking concrete slabs, boulder reduction and secondary breaking of oversize rock. Blunt tools are best for igneous rock [e.g. granite] and tough metamorphic rock.

11.2 Working Length of Breaker Tool

Allied breaker tools are designed to provide exceptional quality and durability. Tools are made of high-strength alloy steel and given specialized heat treatment. Unless the application requires a longer length tool, it is best to stay with the standard length tool supplied with the breaker. Shorter tools are less prone to breaking when subjected to side loading forces. Review and adopt operating methods described in Section 6.0.

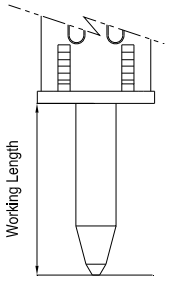


Fig. 11-2 Tool Working Length

11.3 Sharpening the Tool

Breaker tools can be re-machined on suitable equipment. Conical and blunt breaker tools can be re-machined on a lathe with carbide tooling. Chisels can be sharpened on a shaping or milling machine.

CAUTION

High temperatures will alter the original heat treatment of the tool material and change the strength. Do not cut with torch, hard face or weld breaker tools. When sharpening the breaker tool, prevent temperatures from exceeding 390º F.

12.0 Back Head and Accumulator Gas Charge

12.1 Back Head and Accumulator [1] Gas Charge

The Back Head contains nitrogen gas (N2) under pressure. The gas assists with the downward stroke of the piston during the power stroke phase of the operating cycle.

The accumulator is a self-contained pressure vessel with an elastic membrane that divides the inner housing into a pair of expansible chambers. The lower chamber is used to receive, store and discharge pressurized oil. The upper chamber is filled with nitrogen gas.

After membrane replacement, the accumulator must be pre-charged with nitrogen (N2) gas. This is accomplished with the charging tool (Fig. 12-2) and a commercially available nitrogen bottle.

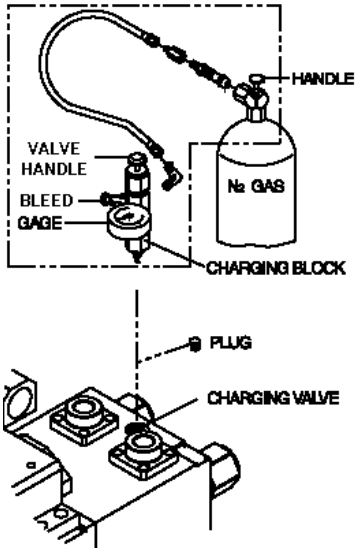


Fig. 12-1 N_2 Gas Charge in Back Head

WARNING

Only qualified personnel, having knowledge of the machine's systems, proper test equipment and tools should attempt accumulator repairs.

Prevent injury from unexpected release of high pressure gaseous energy. The gas must be released before disassembly of accumulator and back head.

Protective eyewear must be worn when servicing the accumulator.

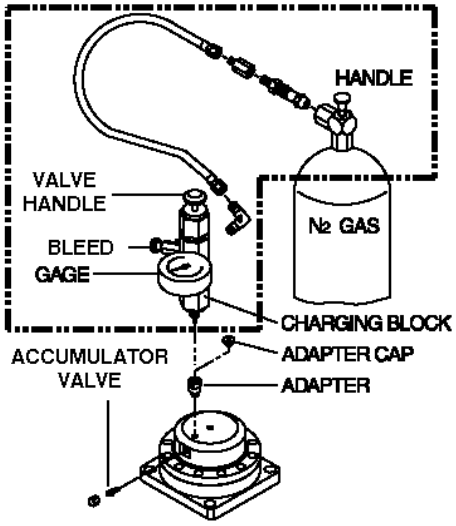


Fig. 12-2 N_2 Gas Charge in Accumulator

Table 12.1 N2 Gas Charge Kit

Item	Part No.	Description	Qty	Remarks / Specifications
1	**575427**	**N2 Gas Charge Kit**	**1 Kit**	**Kit includes 2,3,4,5**
2	---	Charge Tool and Gauge	1	(Fig 12-1 & 2 "Charging Block")
3	---	Extension	1	("Adaptor")
4	---	Hose	1	
5	---	Gas Bottle Adapter	1	
6	N/A	Nitrogen N2 Gas Bottle	1	Not Supplied (Source Locally)

Read, understand and follow all instructions for the safe and proper use of this tool.

[1] Not all models are equipped with accumulator.

12.0 Back Head, Accumulator Charge – [cont'd]

12.2 Back Head N2 Charge – Safety Precautions

Read, understand and follow all instructions for the safe and proper use of this tool. These instructions were prepared to assist the qualified technician with the information necessary for measuring/filling the back head (figure 12-1). The following procedures are accomplished with the use of the N2 charging unit, part number 575427, and a commercially available bottle of nitrogen. Refer to the list of "Tools Required" for other tools needed.

WARNING

Risk of explosion if filled with substitute gas or air. Use only dry nitrogen gas to fill accumulator.

WARNING

Prevent injury from unexpected release of high pressure hydraulic energy. If attached to carrier, relieve all oil pressure inside breaker and attachment circuit before service.

CAUTION

When working with pressurized systems, personal protection equipment, including safety eyewear must be worn.

WARNING

Crush injury from falling or shifting loads. All loads must be stable before service. If breaker is attached to carrier, lower to a flat stable surface.

CAUTION

Stay clear of tool to prevent injury from sudden release. Tool can extend from breaker when charging back head.

12.2.1 Tools Required

- Charge Kit 575427 (Fig. 12-1)

Source additional equipment locally:

- Nitrogen Bottle (equipped with a pressure regulator is recommended)
- Hex wrench
- Torque Wrench
- Light weight oil
- Rags

12.2.2 Connecting the Charge Tool (Fig. 12-1)

1. Clean immediate area around the charge port.
2. Use hex wrench to remove hex plug.
3. Inspect condition of O-ring on charge tool. Close bleed valve.
4. Thread the charge tool into the charge port.
5. Attach hose to the charge valve and the nitrogen bottle.

12.2.3 How to Measure Back Head Pressure

WARNING

For the purpose of these instructions, the nitrogen bottle is equipped with a pressure regulator.

Connect charge tool as described in Section 12.2.2. (Step 5 is not required to measure pressure).

IMPORTANT

Accurate charging to the specified pressure is important for proper performance. Charge the back head with the breaker positioned horizontally and with no contact pressure on the tool. Charge pressure shown in technical data section of this manual is at 70° ambient.

1. Depress valve handle on charge tool.
2. Read pressure gage *.
3. *Over-pressure of > 5% of specification will require adjustment. Use bleed valve to vent excess pressure.
4. *Under-pressure > 10% of specification will require adjustment. Follow the instructions described in Section 12.2.4 for charging the back head.

12.0 Back Head, Accumulator Charge – [cont'd]

12.2.4 How to Pre-charge the Back Head

IMPORTANT

Gas pressure is sensitive to temperature. Note that the charge pressure shown in technical data section of this manual is at 70° ambient. Fluctuations in pressure will be seen as the temperature changes between ambient and working temperatures.

IMPORTANT

Accurate charging to the specified pressure is important for proper performance. Charge the back head with the breaker positioned horizontally and with no contact pressure on the tool.

CAUTION

Risk of injury if tool moves unexpectedly. Stay clear of breaker tool when filling back head with gas.

1. Connect the charge tool following Section 12.2.2.
2. **Slowly** open valve on nitrogen bottle.
3. Adjust the regulator to the value specified in the Technical Data Section + 10 PSI above.
4. Depress and hold valve handle. Allow 1 to 3 minutes.
5. Release valve handle. Wait 5 to 15 minutes for temperature of gas inside back head to stabilize.
6. Depress valve handle to recheck gas pressure. Make final adjustments according to value specified in Technical Data Section.

12.2.5 Charge Tool Removal

1. Close valve at nitrogen bottle.
2. Open bleed valve.
3. Remove charge tool.
4. Tighten hex plug with torque wrench to 15 lb-ft [20 Nm].
5. Check for leaks by filling the area surrounding the charge bolt with oil.
6. Wipe off oil
7. Store nitrogen tank according to regulations
8. Store charge tool in dry location

12.3 Accumulator N2 Gas Charge – Safety Precautions

WARNING

Only qualified technicians , having knowledge of the machine's systems, proper test equipment and tools should attempt repairs to the accumulator.

Prevent injury from unexpected release of high pressure gaseous energy.

Protective eyewear must be worn when servicing the accumulator.

WARNING

Risk of explosion if filled with substitute gas or air. Use only dry nitrogen gas to fill accumulator.

WARNING

Prevent injury from unexpected release of high pressure hydraulic energy. If attached to carrier, relieve all oil pressure inside breaker and attachment circuit before service.

CAUTION

When working with pressurized systems, personal protection equipment, including safety eyewear must be worn.

WARNING

Crush injury from falling or shifting loads. All loads must be stable before service. If breaker is attached to carrier, lower to a flat stable surface.

Read, understand and follow all instructions for the safe and proper use of this tool. These instructions were prepared to assist the qualified technician with the information necessary for measuring/filling the Accumulator (figure 12-2).

12.0 Back Head, Accumulator Charge – [cont'd]

The following procedures are accomplished with the use of the N2 charging unit, part number 575427, and a commercially available bottle of nitrogen. Refer to the list of "Tools Required" for other tools needed.

12.3.1 Tools Required

- Charge Kit 575427 (Fig. 12-2)

Source additional equipment locally:
- Nitrogen Bottle (equipped with a pressure regulator is recommended)
- Wrench
- Hex wrench
- Torque Wrench
- Light weight oil
- Rags

12.3.2 Connecting the Charge Tool (Fig. 12-2)

1. Clean immediate area around the charge port.
2. Use wrench to remove hex cap on accumulator valve.
3. Remove hex plug on top of accumulator.
4. Inspect condition of O-ring on charge tool. Close bleed valve.
5. Thread the charge tool into the charge port.
6. Attach hose to the charge tool and nitrogen bottle.

12.3.3 How to Measure Accumulator Pressure

WARNING

For the purpose of these instructions, the nitrogen bottle is equipped with a pressure regulator.

Connect charge tool as described in Section 12.3.2. (Step 6 is not required to measure pressure).

IMPORTANT

Gas pressure is sensitive to temperature. Note that the charge pressure shown in technical data section of this manual is at 70° ambient. Fluctuations in pressure will be seen as the temperature changes between ambient and working temperatures.

1. Depress valve handle on charge tool.
2. Read pressure gage *.
3. *If +/- 5% of specification, no adjustment is necessary. If so, remove charge tool from accumulator following instruction in Section 12.3.5.
4. *If > +/- 5% of specification adjustment is required. Follow the instructions described in Section 12.3.4 of this manual for charging the accumulator.

12.3.4 Charging the Accumulator

1. Follow steps 1-5 for connecting the charge tool.
2. **Slowly** open valve on nitrogen bottle.
3. Adjust the regulator to value specified in the Technical Data Section + 50 PSI above.
4. Depress and hold valve handle. Allow 1 – 3 minutes for gas to transfer.
5. Release valve handle. Wait 5 to 15 minutes for temperature of gas inside accumulator to stabilize.
6. Depress valve handle to recheck gas pressure. Make final adjustments according to value specified in Technical Data Section.

12.3.5 Charge Tool Removal

1. Close valve at accumulator.
2. Close valve at nitrogen bottle.
3. Open bleed valve.
4. Remove charge tool.
5. Check for gas leak. Use light weight oil around charge port. Bubbles indicate leak.
6. Clean oil from charge port
7. Install hex plug and tighten with torque wrench to 15 lb-ft [20 Nm].
8. Install hex cap on accumulator valve.
9. Store nitrogen tank according to regulations.
10. Store charge tool in dry location.

13.0 Troubleshooting Guide

CAUTION

Only qualified personnel, having knowledge of the machine's systems, proper test equipment and tools should attempt adjustments and repairs.

This guide identifies several commonly encountered conditions and the recommended corrective action.

For conditions other than these, or if further assistance is required, contact the Allied Technical Service Department.

Condition	Possible Cause	Corrective Action
Breaker does not operate	Restriction in pressure or return line	Verify shut off valves are open, verify quick disconnects are in working condition. Check if hose has collapsed
	Pressure and return lines are reversed	Verify supply line is connected to port marked "IN" and return line to "OUT"
	Piston in brake	Piston must be pushed out of brake. Apply down pressure on the breaker tool
	Incorrect breaker tool installed	Verify breaker tool is correct
	Insufficient oil pressure	Refer to section "Operating Pressure Too Low"
	Return line pressure too high	Refer to section "Return Line Pressure Too High"
	Carrier hydraulic circuit leaks	Locate source of bypass – Adjust, repair or replace faulty components
	Control valve [Carrier] misadjusted or malfunction	Incorrect working mode. Troubleshoot valve for mechanical, pilot circuit, or electrical fault
	AutoLube reservoir is empty - power interrupted to valve	Fill Auto-lube reservoir
Breaker starts but operation is irregular	Breaker tool is binding	Maintain right angle to work surface. Refer to Section 6.0
		Check breaker tool is receiving sufficient lubrication. Check operation of AutoLube. Use Chisel Paste
		Breaker tool / bushings are worn
	Breaker tool loosing contact with material	Use boom, arm and bucket cylinder to follow breaker as tool penetrates material [Refer to Section 6.0]
	Return line pressure too high	Refer to section "Return Line Pressure Too High"
	Operating flow or pressure is too low	Refer to section "Operating Pressure Too Low"

13.0 Troubleshooting Guide [cont'd]

Condition	Possible Cause	Corrective Action
Breaker operates but at reduced impact	Back head charge is low	Fill back head to proper pressure
	Operating pressure too low	Refer to section "Operating Pressure Too Low"
	Improper Breaker operation Tool binding in bushing	Maintain right angle to work surface. Refer to Section 6.0
		Check breaker tool is receiving sufficient lubrication. Check operation of AutoLube. Use Chisel Paste
		Breaker tool / bushings are worn
	Return line pressure too high	Refer to section "Return Line Pressure Too High"
	Control valve [Carrier] misadjusted or malfunction	Incorrect working mode. Check for mechanical or pilot circuit failure
	Hydraulic oil overheating	Oil temperature should not exceed 176° F [80° C]
Impact rate slows down	Hydraulic oil is overheated	Refer to section "Operating Temperature Too High"
	Return line pressure too high	Refer to section "Return Line Pressure Too High"
	Excessive charge pressure in back head	Readjust to correct pressure
	Flow too low	Measure oil Flow – Set to value listed in the specifications section of this manual
	Leakage in hydraulic circuit [Carrier]	Test hydraulic components for malfunction
	Oil viscosity too low	Consult carrier manufacturer for recommended oil type
	Breaker tool is binding	Maintain right angle to work surface. Refer to Section 6.0
		Check breaker tool is receiving sufficient lubrication. Check operation of AutoLube. Use Chisel Paste
		Breaker tool / bushings are worn
Excessive pulsations in pressure hose	No gas charge in accumulator	Stop breaker operation until accumulator is repaired

13.0 Troubleshooting Guide [cont'd]

Condition	Possible Cause	Corrective Action
Operating pressure too low	Relief valve set too low	Set to value listed in the specifications section of this manual
	Leakage in carrier's hydraulic circuit	Test hydraulic components for malfunction or improper adjustment
	Insufficient pump delivery [low flow results in low pressure]	Check pump flow [Measure with flow meter]
	Flow adjuster misadjusted	Reset flow adjuster
	Flow control set improperly	Set to value listed in the specifications section of this manual
Oil temperature too high	Operating pressure too high or too low	Refer to section "Operating Pressure Too High" or "Operating Pressure Too Low"
	Relief valve set too low	Set to value listed in the specifications section of this manual
	Ambient temperature is high	Auxiliary cooler may be required Check with carrier manufacturer
	Tool binding in bushing	Check breaker tool is receiving sufficient lubrication. Use Chisel Paste
	Return line pressure too high	Refer to "Return Line Pressure Too High" section
	Excessive cycle time	Limit hammering time to 15 seconds maximum [Refer to Section 6.0]
	Oil flow too high	Set to value listed in the specifications section of this manual
	Breaking cycle too long	Review operating technique and application. Reduce advance. Evaluate breaker size to material
	Oil viscosity too low	Consult carrier manufacturer for recommended oil type
	Cooling system fault	Clean cooler, repair
Return line pressure too high	Flow restricted from blocked hoses or fittings	Remove blockage, replace damaged hoses or fittings
	Flow restricted from hoses or fittings too small for installation	Replace with proper size hose and fitting
	Flow restricted from small ports in valve bank	BREAKER return line must by-pass valve bank and be routed directly to the filter.
	Flow restricted from cooler or return filters	Repair or replace cooler Change filter

13.0 Troubleshooting Guide [cont'd]

Condition	Cause	Corrective Action
Oil leakage from body, accumulator or front head	Damaged or worn seals	Stop Breaker operation immediately and replace seals
	Ruptured accumulator membrane	Stop Breaker operation immediately and service accumulator
	Broken Through Bolt	Stop Breaker operation immediately and replace
Tool Excessive / uneven wear	Excessive galling of tool shank or bushings	Check breaker tool is receiving sufficient lubrication Increase lubrication frequency. Use Allied Chisel Paste
		Maintain right angle to work surface. Refer to Section 6.0
	Excessive wear on tip	Reduce advance, Limit cycle time. Refer to Section 6.0
	Uneven wear on tip	Maintain right angle to work surface. Refer to Section 6.0
Tool breakage	Excessive tool length	Use shorter length tool
	Tool driven into material and becomes stuck	Limit tool penetration. Refer to Section 6.0
	Bending force exceeds material strength	Do not pry with tool. Refer to Section 6.0
		Operator technique to adopt correct working angle. Maintain right angle to work surface. Refer to Section 6.0
	Material strength is weakened if surface is damaged from galling, deep gouge or corrosion.	Operator technique to adopt correct working angle. Maintain right angle to work surface. Refer to Section 6.0. Check breaker tool is receiving sufficient lubrication. Increase lubrication frequency. Only use grease that is approved for this application such as a premium high temperature and extreme pressure type grease. Allied Chisel Paste is specifically formulated for this application. Store indoors. Coat with grease to protect from moisture.

The Breaker is not self-powered. Its performance level is affected by a hydraulic system that is not delivering to specification.

All hydraulic breakers are designed for optimum performance with reliable service life when operated within the specified parameters. If Breaker operation is abnormal, first check that the carrier's mode switch is set in the correct position for operating a breaker. Next, check that the shut off valves are fully open.

If no improvement is seen in the breaker's performance, conduct a series of tests to evaluate the output of the carrier's hydraulic circuit. Measure oil pressures at the supply [IN] and return [OUT].

Use a flow meter to test oil delivery of the hydraulic circuit. Be sure to include the breaker's supply and return hoses when conducting a flow test, as they may be faulty, e.g. collapsed hose. The flow meter is also used to verify normal operation of the relief valve and the correct setting of the cracking pressure.

14.0 Technical Information

14.1 Definition of Terms

For the purposes of this manual, Hydraulic Flow, Operating Pressure, Dynamic Relief Pressure and Static Relief Pressure are defined as follows:

- **Range** – A range is represented by two values 'V1 – V2' and generally means the lowest-to-highest limit of a device that will allow it to adequately respond. “Minimum flow” describes the least amount required while permitting continuous operation that is both satisfactory and efficient.

- **Hydraulic Flow** – A measure of the volume of oil (values given in GPM / LPM) necessary for the safe and efficient operation of the Allied attachment. Flow parameters for attachments such as Breakers are represented by a minimum-to-maximum range.

- **Operating Pressure** – A measure of the hydraulic oil pressure (values given in PSI / BAR) taken in the breaker’s supply line during operation. Pressure parameters for attachments such as Breakers, are represented by a minimum-to-maximum range.

- **Relief Valve** – An adjustable, spring-loaded valve that opens when a preset pressure value is reached. A relief valve is safety device, used to protect the circuit against hydraulic overload. Relief valves vary in design. Pilot controlled pressure relief valves are designed so that the relief pressure increases very little as the flow through the valve increases. For Breaker applications, they are recommended over direct acting type relief valves.

- **Dynamic Relief Pressure –** Also referred to as “Cracking Pressure”. The pressure measured at the moment the oil pressure exceeds the preset value of the relief valve and the spool “cracks” open.

- **Static Relief Pressure** – Also referred to as “Full Relief Pressure”. The pressure measured at the moment the relief valve has opened fully and all oil is by-passed.

- **Opening Curve** – The opening curve is the rise of pressure between dynamic (first open) and static (all of the oil flow is bypassed). The dynamic pressure is always less than the static pressure. A relief valve adjusted to a dynamic pressure of 3000 psi (200 Bar) will crack open when the preset point is reached, but fully opens at a higher pressure.

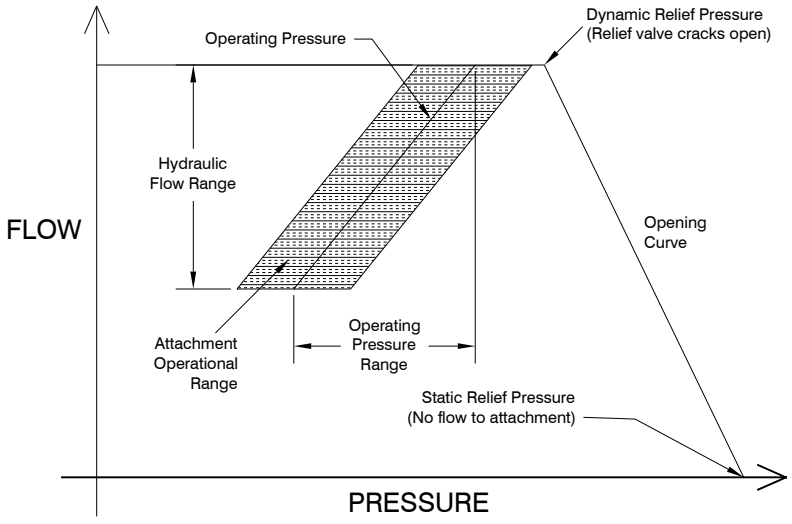


Fig. 14-1: Flow-Pressure Diagram

14.0 Technical Information

14.2 Testing the Hydraulic Circuit

A performance evaluation of the carrier's hydraulic circuit is important before the breaker is first used. Accurate assessment entails thorough testing under varied conditions, including temperature, work mode, engine speed and load.

Tools required to complete these tests include a flow meter and pressure gages. Record the test measurements in the worksheet provided below. Compare the test results with the Technical Data section of this manual.

The hydraulic breaker is designed to perform efficiently and reliably at the prescribed specifications. Performance is negatively impacted if the hydraulic system is operating at a diminished capacity and/or set outside the permissible range.

If the Breaker is not working or underperforming, thoroughly check the hydraulic system of the carrier before disassembly of the Breaker. Be sure to include the hoses attached to the breaker to eliminate any possible faults, e.g. collapsed hose.

Mode	Engine RPM	Flow [GPM]	Load Pressure [PSI]	Oil Temp [ºF]	Relief Pressure [Crack]	Relief Pressure [Static]	Return Pressure [PSI]
			0				
			1000				
			1500				
			1800				
			2000				
			2200				
			2400				
			2600				
			2800				
			3000				
			3200				
			3400				

CAUTION

Before starting, make sure the circuit to be tested has a relief valve. Open restrictor valve on flow meter. Procedures can vary depending on specifics of your equipment. Follow the instructions provided by the manufacturer of the carrier and flow meter when testing.

Mode – Set to Breaker position (if equipped).

Engine RPM – Set to normal operating speed

Flow [GPM] – Record measured flow at each load pressure

Load Pressure [PSI] – Steadily increase load with restrictor valve on the flow meter

Oil Temperature – Testing must be done while the hydraulic oil temperature is at normal operating temperature. Stop test if temperature exceeds 176° F (80° C)

Relief Pressure [Crack] – Slowly close restrictor valve until pressure gage indicates relief valve has cracked open.

Relief Pressure [Static] – After cracking pressure is reached, further adjust restrictor valve until flow gage indicates relief valve is fully open.

Return Pressure [PSI] – Record the pressure measured in the return line. Measuring point for gage must be located near breaker's outlet port.

14.0 Technical Information – [cont'd]

Table 14.1 Technical Data			HR 175	HR 230
Impact Rate [a]		Blows/min	700 - 1200	550 - 1000
Oil Flow Range		GPM [L/min]	4 – 10 [15 - 40]	8 – 15 [30 - 60]
Operating Pressure [b]		PSI [bar]	1160 – 1900 [80 - 130]	1310 – 1900 [90 - 130]
Pressure Relief – Min [c]		PSI [bar]	2030 [140]	2030 [140]
Pressure Relief – Max [d]		PSI [bar]	2320 [160]	2320 [160]
Back Pressure		PSI [bar]	60 –145 [4 - 10]	
Oil Viscosity @ Operating Temperature [h] Optimum [Permissible Range]		cSt	30-60 [15 – 1000]	
Oil Temperature		F° [C°]	-4 - 176° [-20 - 80°]	
N2 Gas Charge – Back head 70 F° [21 C°]		PSI [bar]	116 [8]	
N2 Gas Charge – Accumulator @70 F° [21 C°]		PSI [bar]	Not Equipped	
Port Connection – IN [OUT]		Threaded	BSPP 3/4-14 [same]	
Line Size – Min. ID. IN [OUT]		in. [mm]	3/4 [19] [same]	
Breaker Tool:	Standard Diameter Work Length	Type in. [mm] in. [mm]	Conical 1.75 [44.5] 7.5 [190]	Conical 2.34 [59.5] 12 [305]
Working Weight [e]		lbs [kg]	250 [110]	490 [220]
Carrier Weight	Excavator [f-E]	1000 lbs [kg]	2 – 7 [.8 - 3]	6 – 13 [3 – 6]
	Backhoe [f-LB]		N/A	N/A
	Skid Steer [f-SS]		N/A	N/A
Mounting Family			XR	XR

a] Actual frequency depends on oil flow. Factors that affect oil flow include oil viscosity and temperature.

b] Actual operating pressure depends on oil flow, back pressure, material to be broken. Models HR390 thru HR710 are equipped with Pressure Adjuster.

c] Permissible setting of MINIMUM pressure relief – DYNAMIC. Measured operating pressure + Minimum 435 psi [30 Bar]

d] Permissible setting of MAXIMUM pressure relief – STATIC. Not to exceed carrier's main relief setting.

e] Weight reflects standard configuration for E, LB & equipped with typical mounting bracket & standard tool

f-E], f-B], f-SS], Values shown are guidelines – Always consult carrier manufacturer's lift capacity to assure stable carrier operation. The carrier must have adequate lift and hydraulic capacities to properly and safely operate the Breaker.

h] Many factors can reduce the service life of hydraulic components. Incorrect fluid viscosity is just one of these factors. To prevent low (or high) viscosity from cutting short component life, select an appropriate fluid for the operating temperature and viscosity range and then keep it maintained on a continuous basis.

14.0 Technical Information – [cont'd]

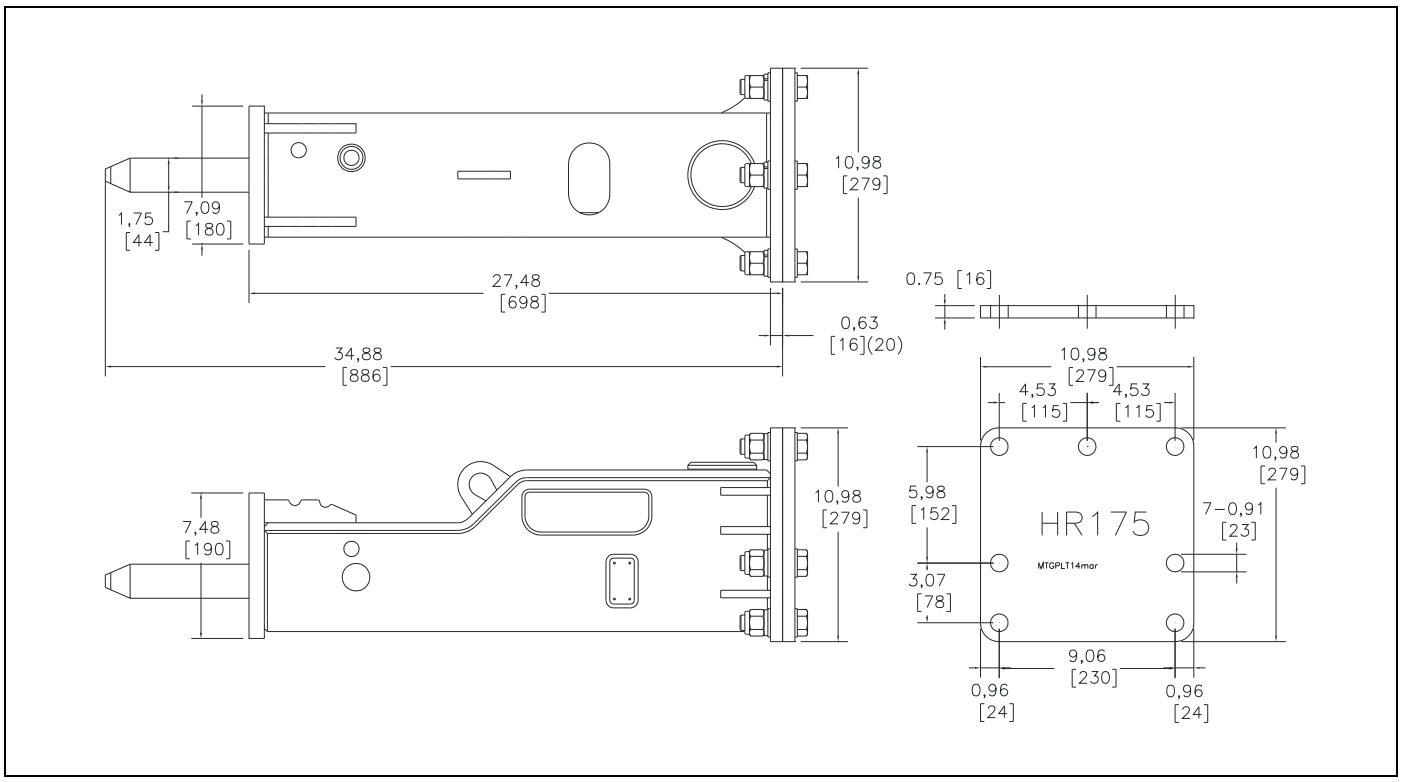


Fig. 14-2 General Dimensions HR175

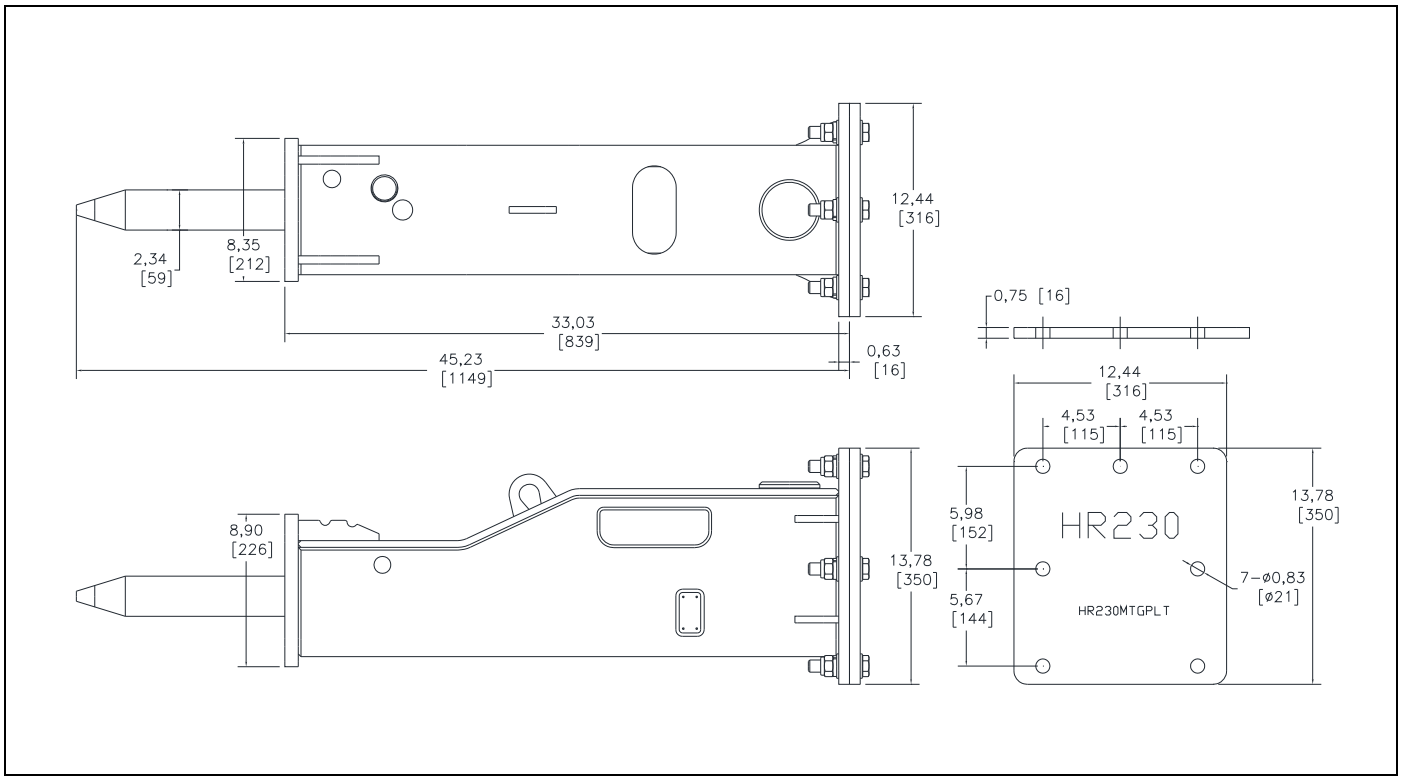


Fig. 14-3 General Dimensions HR230

14.0 Technical Information – [cont'd]

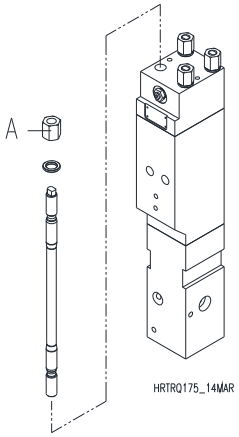


Fig 14-4 Fastener Torque

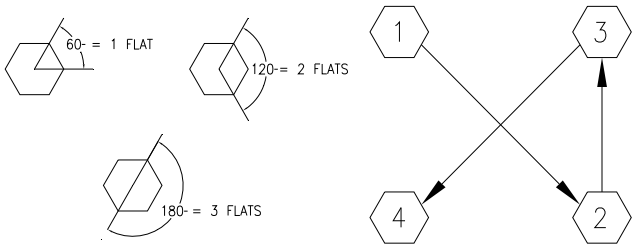


Fig. 14-5
Each Flat = 60° Rotation. Fastener Tightening Sequence

Table 14.2 A - Side Rod

Model	A- Side Rod Torque
HR175, HR230	Refer to Table 14.3

MPORTANT
• Apply Moly-Paste 676927 to threads at assembly. • Follow sequence (Fig. 14-5) to ensure each tie rod is evenly loaded. • Follow progressive tightening* steps 1-4. *Progressive tightening means the nut will be turned a little at a time. Never exceed 1 full turn without turning the other 3 nuts.

Table 14.3 A Side Rod Torque Ft-Lbs [N.m]

Model	Step 1	Step 2	Step 3	Final Torque Step 4
HR175	75 [100]	150 [200]	225 [300]	300 [400]
HR230	90 [120]	180 [250]	270 [375]	360 [500]

Table 14.4 Mounting Bracket Torque Ft-Lbs [N.m]

Model	D – M20
HR175, HR230	250 [340]

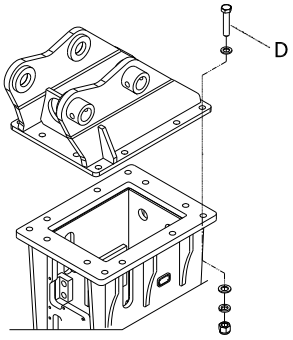
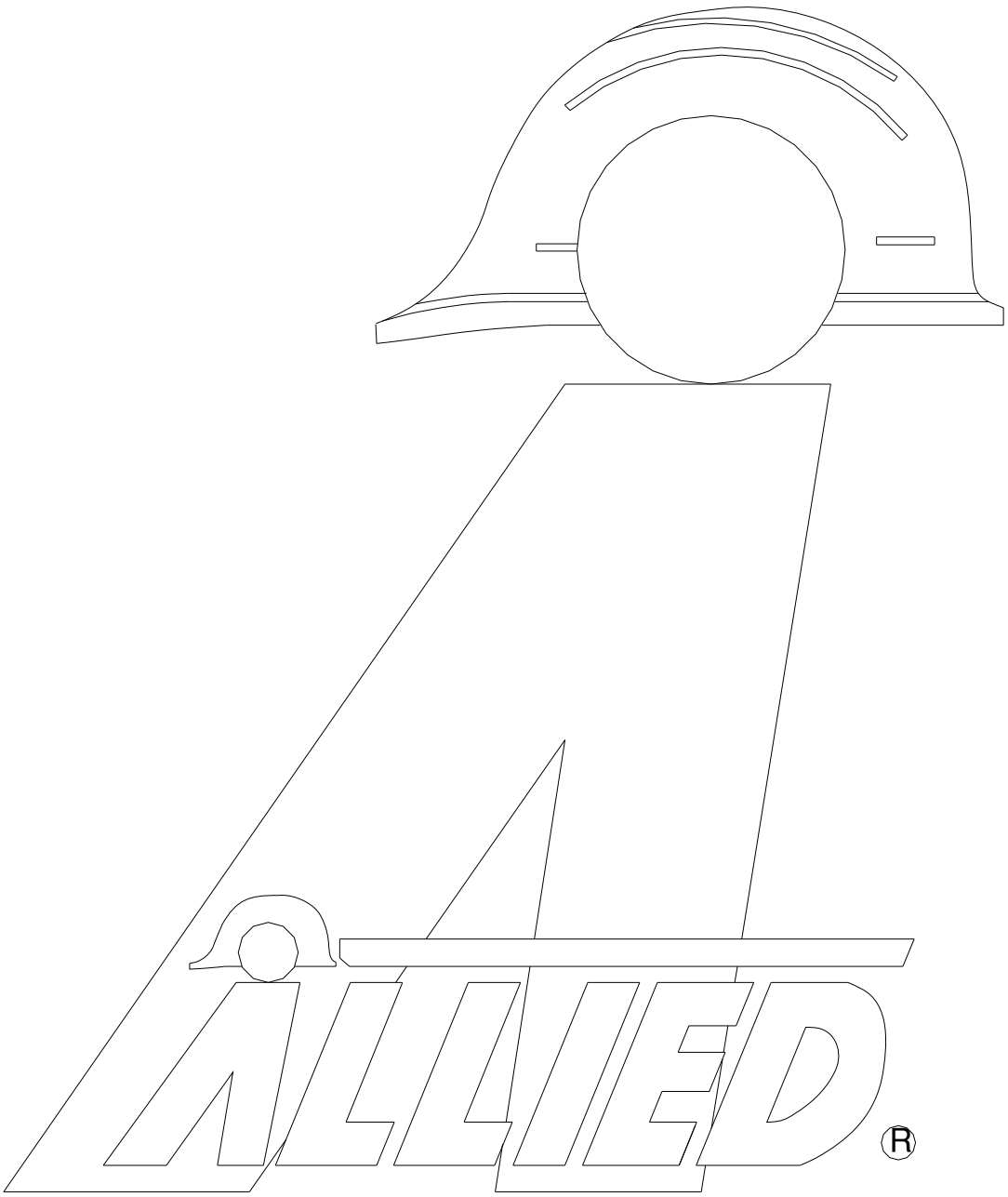


Fig 14-6 Mounting Bracket

15.0 Service Record

Service Performed	By	Date



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