

HO-PAC®

Vibratory Plate Compactor / Driver

**Model
400B**

**ALLIED**

Safety, Operation, Maintenance and Parts

Thoroughly read and understand the content of this manual before using the Allied HO-PAC. 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.



TM577696

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Revision History for Document No. TM577696.
The date of the revision is shown at the bottom
of each page.

**Table of Revision History for TM577696**

<u>Effective Date</u>	<u>Page</u>	<u>Summary of Change</u>
2016, Aug	26	Updated Parts list (hoses, adapters)
2015, Jan	All	Original Issue of TM577696

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

Information provided in safety messages is important to your safety. Safety 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

The safety alert symbol is represented by the exclamation point within an equilateral triangle. This symbol means - **ATTENTION, BECOME ALERT, YOUR SAFETY IS INVOLVED.**

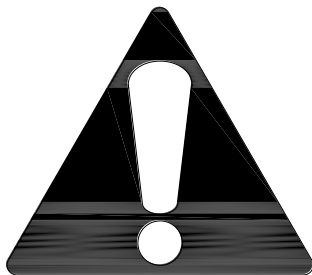


Fig. S1 Safety Alert Symbol

The Safety Alert Symbol (Fig. S1), either used alone or in conjunction with a signal word, is used to draw attention to the presence of potential safety 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.

Pictograms

Pictograms provide another element that further enhances the effectiveness of the hazard communication.

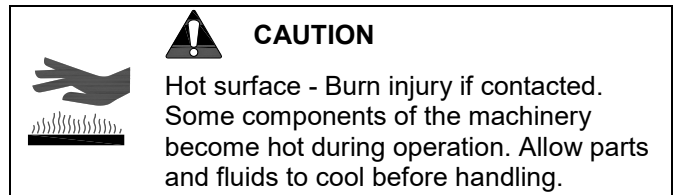


Fig. S-2 Example of Safety Message - Typical Format

Signal Words Used for Non-Hazard Messages

Other message types appearing in this manual utilize signal words 'IMPORTANT' and 'NOTE'. These communicate instructions and suggestions, but are not safety-related.

IMPORTANT – Special attention required. Contains information, which, if not followed, may diminish performance, interrupt reliability and production or cause equipment damage.

NOTE – Provides clarity and helpful tips. Highlight suggestions, which will enhance installation, reliability, or operation.

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:



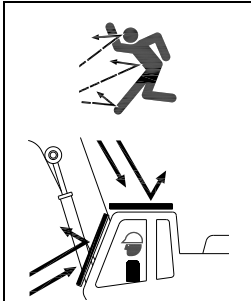
Read the manual before use.
Refer to the manual for further details or procedures.



Read the Service Manual For Additional Information

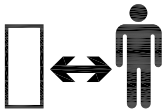


Shut off power & remove key before servicing



Fragments / debris becoming projectiles.

Install protective guards on cab to shield operator against fragments / debris



Personnel maintain a safe distance from the work tool, work zone



Identifies lift point



Personal Protection Equipment



Hearing protection

Safety eyewear



Gloves



Safety shoes



Falling object
Unsupported loads



Crush point / Falling part



- Falls into open excavations
- Trench collapse



Electric Shock



Gas / Oil under pressure



Hot surface



Fluid injection



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



A prohibited action is identified with the X-out or a circle with a diagonal slash.



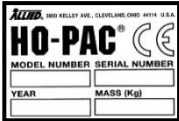
The check mark symbol is used to indicate actions and methods that are recommended, correct and approved

Safety Information – [cont'd]**Safety, Identification and Information Labels**

Information labels affixed to the Allied equipment include safety warnings, identification and instructions important to operation and service.

Keep all safety labels clean. Words and illustrations must be legible. Before operating this equipment, replace damaged or missing labels. Refer to the parts section for ordering information. Refer to Figure “S-3” for their location on the equipment.

Table S.1 Labels

Fig	Label	Description
L1		Read the Manual - Directs personnel to the manual for further information and instructions
L2		Stay Clear - Alerts personnel and by-standers to maintain a safe distance from the Allied work tool during operation.
L3		Hot Surface - Identifies surfaces of the Allied work tool that become hot during operation.
L4		Lift Point - Decal identifies approved lift points of the Allied work tool.
L5		Pressure Line Tag – A red colored cable tie marked “PRESSURE IN” is attached to the SUPPLY hose of the Allied work tool for ease of identification between hoses.
L6		Company Logo – Is the Allied brand identifier and is a registered trademark of Allied Construction Products, LLC.
L7		Product Identification – HO-PAC is a registered trademark of Allied Construction Products, LLC used for identifying the hydraulic vibratory plate compactor / driver.
L8		Model Identification - Decal indicates the model of the Allied work tool.
L9		Made in USA
L10		Equipment Identification - Manufacturer's Name and Address, Product Name, CE compliance marking, Model Number, Serial Number, Year of Manufacture, and Mass

Safety Information – [cont'd]

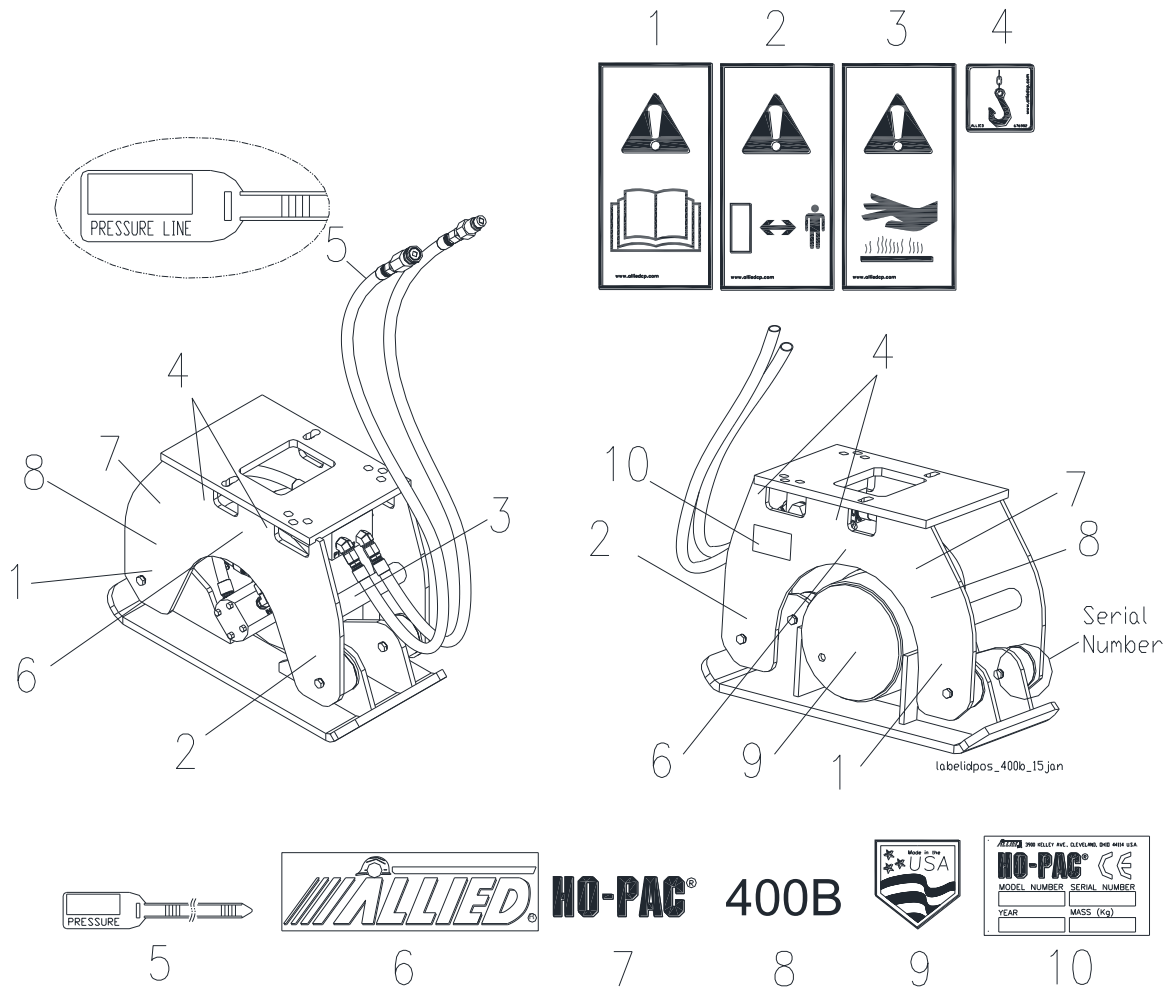


Fig. S-3 Label Positions

Table S.2 Information Labels

Item	Type	Description	Part No.	Qty	Remarks / Specifications
---	---	Decal Set	577555	1-Set	Set includes 1-8
L1	Safety	Label - Read Instructions / Manual	676984	2	
L2	Safety	Label - Stay Clear	676981	2	
L3	Safety	Label - Hot Surface	676983	1	
L4	Safety	Label - Lift Point	676982	4	
L5	Info	Tag - Pressure I.D.	818676	1	Located on Supply Line
L6	ID	Label - Allied Logo	676653	2	
L7	ID	Label - HO-PAC®	577554	2	
L8	ID	Label - Model 400B	577691	2	Items L8, L10 Not included in set
L9	ID	Label – Made In USA	815696	1	
L10	ID	Tag – Equipment ID	676980	1	Items L8, L10 Not included in set

Safety Information – [cont'd]



Attention Read the Manual

Read and follow all safety precautions in this manual. Improper installation, operation or maintenance of the Allied equipment could result in serious or fatal injury. Only qualified personnel may operate and service the Allied equipment. 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

This manual contains important instructions that should be followed during installation, operation and maintenance. When working with the Allied equipment all procedures and operations must be performed correctly so that unsafe situations may be avoided. Do not proceed beyond instructions or warnings that you do not fully understand. Read the entire manual to make sure you have a complete understanding of the requirements. Safety information becomes operation-specific in the sections that follow.

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
- Erecting barriers to control entry to established work zone
- The use of appropriate personnel protection equipment.

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 appropriate personnel protection equipment is available to personnel when working in hazardous conditions and enforce its use

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

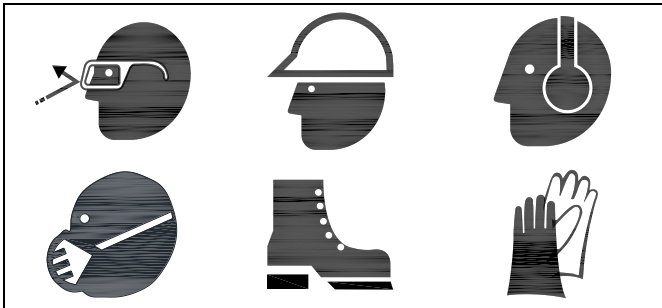
The safe and efficient use of the Allied equipment depends upon proper installation, operation, maintenance and repair. Operational safety programs must encompass all of these elements.

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

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

Personal Protective Equipment (PPE)

Personal protection equipment (PPE) shall be made available to any personnel operating or nearby the equipment that may be exposed to hazards such as falling, flying and splashing objects, or harmful dusts, fumes, mists, vapors, or gases. Approved PPE, when used correctly, helps protect against certain harmful effects from exposure with the identified hazard.



Examples of PPE include safety eyewear, safety hat, hearing protection, dust mask, safety footwear, and gloves. (Shown Pictograms of PPE is not all-inclusive).

Those responsible for administering PPE shall train personnel with the proper selection and use of PPE to protect against misuse.

Safety Guards and Protective Barriers

A safety guard is a physical barrier designed to prevent access to danger areas. Guards are fitted to the Allied equipment to protect against unsafe situations that could not be eliminated through design measures. Guards are only effective when properly installed and in place. Guards shall not be removed unless for the purpose of inspection and service of

components. Reinstall all guards after service or adjustments are completed.

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 recognized hazard.

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.

Prevent accidental activation of the Allied work tool by locating the control switch in a guarded area.

Compatibility and Use With Other Equipment

Allied work tools are designed to deliver satisfactory performance when used with a broad range of equipment. In all instances it first must be confirmed through adequate research and testing, that the equipment is suitable to operate the Allied work tool. The technical data as well as information concerning connecting requirements can be found in this manual and shall be strictly observed.

Since carrier hydraulic circuits differ and options vary, careful review of the equipment's specifications along with thorough knowledge of the system's operation, including hydraulic and electric is required. If in doubt, and further assistance is required, it is the responsibility of the equipment owner to contact their authorized Allied dealer or Allied's Product Support Department.

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 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.

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1.0 Introduction & Scope

1.1 Purpose of this Manual

All information contained herein, including text, figures, captions, tables and descriptions is intended solely for use with the product identified in Table 1.1.

Prior to its use, confirm that the information recorded on the Equipment's Identification Tag corresponds with the model information located in Table 1.1.

1.2 About This Manual

Table 1.1 About This Manual

Document ID No.	TM577696
Type	Technical - Safety, Operation and Maintenance
Current Status	See Inside Cover
Product Name:	Ho-Pac
Generation (Series)	III
Applicable Model[s]:	400B
Years of Manufacture:	Begin 2015

Material presented in this manual may show equipment that is optional.

The content of this document 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. 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.

A summary of changes made to the content of this document is provided on the inside cover.

1.2 Purpose of this Manual

This manual has been prepared in support of the product 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.

This manual includes a spare parts list. Figures shown in the Parts Information Section of this Manual are for the purpose of parts identification and not

intended for use in the repair or service of the equipment.

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 Allied Customer Service.

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 local Allied dealer or Allied Customer Support. See inside cover for contact information.

1.4 Related Publications

Related publications for the product identified in Table 1.1. include the following:

1.4.1 Manual PN-103467 Swivel Option

The optional swivel assembly permits precise positioning of the Ho-Pac without repositioning of the carrier. Turning the swivel is done manually. Content in the Manual includes:

- Safety Information
- Applications/Intended Use
- Mounting Information
- Attaching To/From Carrier
- Technical Data/General Dimensions & Weights
- Pre-use Inspection
- Operation
- Maintenance/Lubrication/Repair
- Troubleshooting
- Lifting, Transport & Storage
- Spare Parts Information

1.4.2 Compaction Handbook 103392

The Compaction Handbook contains:

- Background information about soil, soil compaction and basic overview of different types of soil compaction equipment.
- General information on operating techniques for vibratory plate compactors / drivers
- Performance data for Ho-Pac models derived from field tests.

2.0 Equipment Identification

2.1 Location of the Serial Number

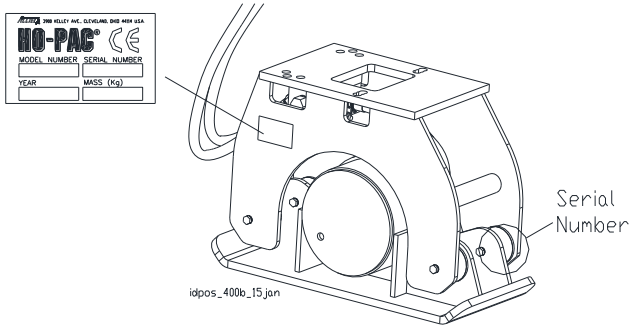


Fig. 2-1 Equipment Identification

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

1. On the Equipment ID Tag
2. Stamped in the lower assembly – motor side.

2.2 Equipment Identification Tag

Refer to Figure 2-2. The Equipment Identification Tag is affixed to the top mounting frame. It provides the following useful information:

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

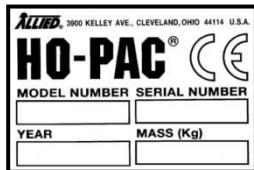


Fig. 2-2 Equipment Identification Tag

Verify that the information contained on the Tag corresponds with the information provided in Section 1 of this manual.

2.3 Owner's Record of the Equipment

Your local Allied dealer requires the Product Name, Model and Serial Number to better assist you with questions regarding parts, warranty, operation, maintenance, or repair. This information should be copied 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 Name: **Ho-Pac**

Model: **400B**

*Part Number: **577685C IN1,2/XR** ☐

*Part Number: **577695C FXS** ☐

Serial Number: _____

In Service Date: _____

Registration Date: _____

*Part number varies with top frame configuration

400B	Model (Weight approx.)
B	Sealed Bearings
IN1 IN2	Frame Type – Flat Top w/ Hole Patterns
FXS	Frame Type – Fixed Size Mini-X
C	Configure Motor Size Option

Motor GPM Option – Indicate for your records

☐ 6 GPM

☐ 9 GPM

☐ 14 GPM

☐ 18 GPM

3.0 Warranty Protection Summary

3.1 Overview

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

With all new Allied equipment, it is important to complete all sections the Warranty Registration form and return to Allied.

Warranty does not cover failures of the equipment resulting from incorrect installation, misuse, alterations by person other than authorized agents, abnormal operating conditions, use of non-Allied parts, unapproved service methods, or missed maintenance requirements.

For details regarding warranty terms and conditions, refer to document A100668.

3.2 Owner's Responsibilities

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

Keep the Allied equipment operating within its performance limits by familiarizing yourself with the specifications provided in the technical data and specifications tables. Improper installation, including failure to calibrate the carrier correctly may result in loss of performance or subject the equipment to conditions beyond their design.

The following outlines general maintenance policies required for the Allied equipment. The 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 faults with the work tool and know what corrective actions to take.
- Conduct regular checks and inspections as scheduled in the Care & Maintenance Section.
- 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.
 - Written records 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 the use, 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 installation, set-up, calibration
- Carelessness / Incorrect operating methods
- Inattention to re-lubrication and other maintenance requirements
- Misuse / Unapproved applications
- Inadequate or absence of training
- Use of non-genuine Allied replacement parts
- Unapproved modifications
- Use of grease, which is not or is only conditionally pumpable
- The use of a lubricant type that is unsuitable for the application.
- Contaminated lubricants.
- Improper disposal of used or contaminated lubricants.

The product is excluded from warranty if any of the above conditions result in damage to the Allied equipment, or the associated equipment or injury to personnel. Such conditions will be determined by Allied at its sole unfettered discretion.

4.0 Product Information

4.1 Description and Application - Typical

The Allied Ho-Pac® is a hydraulic powered, vibratory plate compactor and driver. It is designed for mounting on mobile equipment with hydraulic booms, such as rubber tired or track-type construction vehicles. The boom mounted Ho-Pac reaches out to work anywhere the machine can reach and allows the operator to keep a safe distance from the work tool.

4.1.2 Application and Use - Typical

The Ho-Pac is used for soil compaction. Applications include backfill compaction, base course preparation, finish surface treatment and embankment buildup.

The Ho-Pac can also be an effective sheet or pile driver. Vibration energy is transferred through the sheet or pile to the soil. Soils with 50% or more granular content are “liquefied” by the vibration, which breaks the skin friction, allowing the sheet or pile to penetrate more easily. Further information is available in the “[Compaction Handbook](#)”. To request a copy, contact your local dealer or Allied’s Customer Service. Ask for part number 103392.

4.2 Familiarization of Main Components

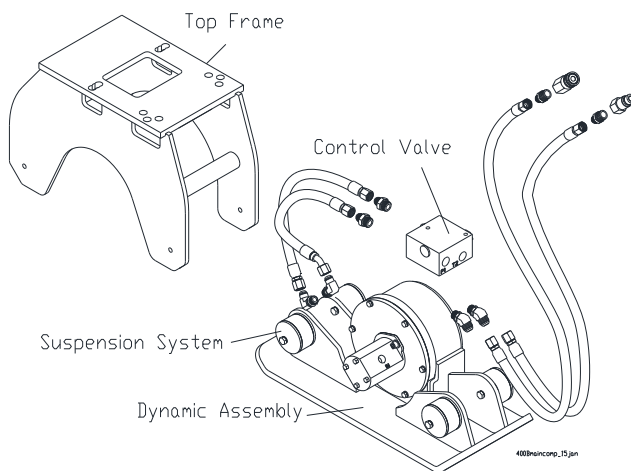


Fig. 4-1 Main Components

Major components and subassemblies:

Top Frame – The Top Frame serves as the connection point used to attach the Ho-Pac to the stick / linkage of the carrier.

Suspension System – Rubber Springs mounted between the Top Frame and Dynamic Assembly isolate the vibratory energy from the carrier.

Dynamic Assembly – Consists of the lower assembly, eccentric mass, bearings and rubber springs. The strength of vibration is affected by the motor's speed of rotation, weight of the eccentric mass and the distance between eccentric mass and shaft. The vibratory action and impulse force is transferred through the attached compaction plate.

Control Valve – All Ho-Pac models come standard with the multi-function control valve. Benefits include optimized operation with improved reliability of critical components such as the motor and bearings.

NOTE: The valve is factory pre-set and requires no further adjustments.

The control valve performs the following functions:

- **Flow regulator** – Protects the bearings from excessive loads by limiting oil flow that can over-speed the hydraulic motor.
- **Pressure control** – Protects the hydraulic components from over-pressure. This is factory pre-set at the maximum operating pressure plus 200 psi (14 bar).
- **Anti-cavitation circuit** - Controls deceleration of the hydraulic motor and eccentric mass. Also protects motor from damage on circuits not set up with an open return.
- **Return line check valve** - Prevents reverse flow to the hydraulic motor. Also provides a nominal back-pressure to ensure the proper operation of auxiliary valves, such as Allied's AC40 and AC75 priority flow control valves.

4.3 Principle of Operation

The vibratory action and impulse force are generated from the hydraulic motor turning the eccentric mass at a high rate of speed. The strength of vibration is affected by the rotation speed of the motor, weight of the eccentric mass and the off-center distance between eccentric mass and shaft.

The vibratory action and impulse force is transferred through the attached compaction plate.

Efficient compaction of granular type soils is further aided by the downward static pressure exerted by the weight of the carrier pressing against the rubber springs.

5.0 Ho-Pac Selection and Application

5.1 Match Compactor Type to the Application

The Allied Ho-Pac is a vibratory plate compactor, designed for mounting on mobile equipment with hydraulic booms, such as rubber tired or track-type construction vehicles. It is best suited for compacting granular type soils by combining three actions:

- Impulse Force
- Vibration Frequency
- Down Pressure (Static Weight)

5.1.2 Ho-Pac and Carrier Compatibility

The Allied work tool is designed to provide satisfactory operation with reliable service life when teamed with a compatible carrier. Balance the size of the Ho-Pac with the size of the carrier. If too small for the carrier, the compactor will be damaged by the carrier. Conversely, too large a compactor can damage an undersized carrier.

5.1.3 Other Considerations

- **Reach** - Select a carrier size having sufficient reach to compact the deepest area of the trench or excavation. This will also help minimize the frequency of repositioning the carrier.
- **Lift Capacity** - Know how your machine is equipped and if any modifications have been made. Factors such as boom type, stick length, undercarriage, tracks, counterweights, etc., all affect the lifting capacity of the carrier. Also take into account any add-ons, such as a quick attach coupler. Consult the carrier manufacturer's manual for specifications.
- **Hydraulic Circuit** - Select a carrier equipped with a one-way hydraulic circuit and unrestricted free flowing return. It must maintain adequate flow and pressure without loss of hydraulic power to the Ho-Pac when carrier applies down-pressure. If not, motor speed slows and soil density targets won't be reached.

Undersized compactors (as well as underperforming compactors) are less economical to use because compaction is limited to smaller lifts and require additional passes. This generates other inefficiencies as longer running cycles result in loss of time, increased energy consumption and component wear.

Optimum efficiency is achieved only when proper operating technique is employed. How many passes it will take, along with the duration, will vary with

material type and lift. Additional fill material and repositioning of the carrier may be required to achieve a finished surface.

5.2 Auxiliary Hydraulic Circuit



CAUTION



Hydraulic circuits differ between machines. Improper oil flow or pressure can damage the Ho-Pac or carrier.

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

The Allied Ho-Pac is a hydraulic-driven work tool that is not self-powered. Satisfactory performance centers on the hydraulic circuit of the host machine to deliver proper flow and pressure requirements.

Generally, most machines will require some degree of conversion to make use of their hydraulic power. Conversions to machines equipped with a factory or dealer installed auxiliary circuit, however, may require little more than minor adjustments to flow and pressure settings.

Carefully follow all instructions, including those provided by the machine manufacturer, when making adjustments.

5.3 Allied Auxiliary Conversion Kits

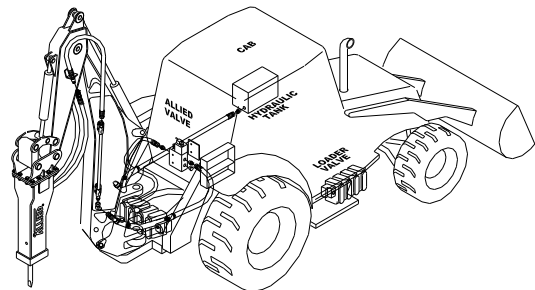


Fig 5-1 Allied Conversion Kit with AC-Series Valve

Allied conversion kits are available for almost any carrier. For machines without an auxiliary hydraulic circuit, the kit may include an "AC" series valve. These solenoid-operated valves will control flow and pressure to the work tool.

Requests for further information or assistance with Ho-Pac selection or conversion kits should be directed to your Allied dealer or by contacting Allied Sales or Product Support Departments.

6.0 Mounting Information

6.1 Top Mounting Frame Options

Options for mounting frames include the:

- 'Flat-top' (Fig. 6-1)
- 'XSF' top frame (Fig. 6-2).

6.1.1 Flat-top Frame

IMPORTANT

The Ho-Pac does not include a mounting bracket. Order separately. Bracket design is carrier specific. The carrier's bucket pins will be used whenever possible. Ordering requires complete information about the carrier, including make, model, series and serial number. If equipped with a quick coupler, additional information is required. Make, model, series and serial number.

The design of the Flat Top Frame is illustrated in Fig. 6-1.

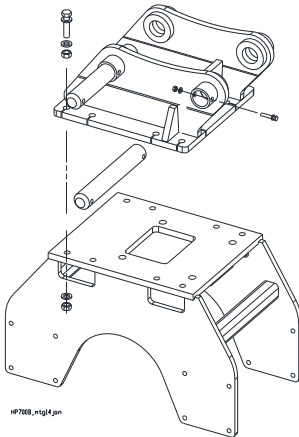


Fig. 6-1 Flat Top Frame and Mounting Bracket

NOTE: Mounting pin shown for reference. Allied brackets are typically designed to utilize the carrier's bucket pins.

Use the provided bolts to fasten the mounting bracket to the proper set of holes located in the top plate. With the bucket removed from the carrier and the mounting bracket bolted to the top frame, the Ho-Pac is ready to be attached to the carrier. It is attached to the carrier in the same manner as mounting a bucket.

Allied offers an array of mounting brackets (sold separately) to fit virtually any carrier, including those equipped with pin-grab or hook-type quick mounting couplers.

Each flat top frame has a series of holes located in the top plate. Dimensions of the bolt pattern are located in Section 12 of this manual.

Hydraulic breakers and other work tools from Allied share these same hole patterns. Information regarding bolts used for fastening the bracket is shown in Table 6.1.

Table 6.1 Flat Top Mounting Hardware (qty)

Family	Model	Bolt	FL Washer	Nut
IN1,2	400B			
XR	400B, 700B	572711 (x4)	816359 (x8)	817491 (x4)



Follow proper tightening procedures and torque. Table 9.2.

6.1.2 XSF Top Frame

The XSF top frame is available as an option and designed for mounting to small size excavators. Use the supplied mounting kit (Fig. 6-2) to adapt the top frame to the carrier. (**NOTE:** The XSF frame has limited fit-up with quick mounting couplers).

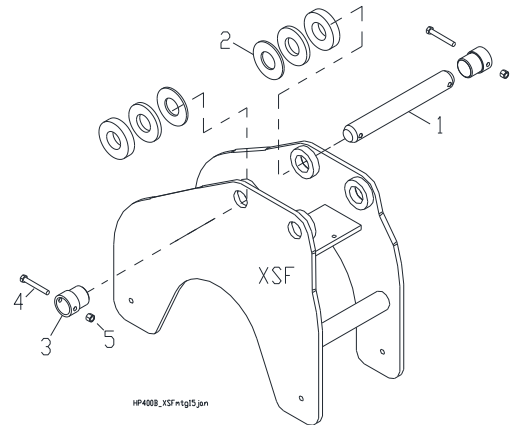


Fig. 6-2 XSF Top Frame and XSF Mounting Kit

1. Insert each supplied bushing (item 3) into pin bores of XSF top frame.
2. Spacers (item 2) are supplied in various thicknesses. Combine as needed to limit any side-to-side movement.
3. Install pins (item 1) and secure with nut and bolt.

6.0 Mounting Information – [cont'd]**6.1.3 XSF Mounting Kits****IMPORTANT**

Complete information about the carrier is required, including the make, model, series and serial number. Carriers equipped with a quick coupler will require additional information. (NOTE: The XSF frame has limited fit-up with carriers equipped with quick mounting couplers).

Match the carrier's pin diameter with the proper mounting kit listed in Table 6.2. Eliminate any gap using the supplied spacers having varying thicknesses.

Table 6.2 XSF Mounting Kits

<u>Bucket Pin Ø</u>	<u>Part No.</u>
25 mm	A101735
30 mm	100207
35 mm	100283
38 mm	100364
40 mm	100204
45 mm	100324
50 mm	101808
1.00"	100208
1.25"	100209
1.50"	A100210

7.0 Install / Uninstall Ho-Pac

7.1 Attach the Allied Equipment to Carrier

With the bucket removed and the mounting bracket bolted to the top frame, the Ho-Pac can be attached to the carrier. Installation can vary, but the mounting procedures are similar to mounting a bucket. Use standard mechanic's techniques and tools.

7.1.2 Tools Required to Mount Ho-Pac On Carrier

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

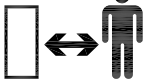
- PPE including Safety eyewear & gloves
- Sledge Hammer
- Drift pin / Alignment bar
- 3/4 drive socket wrench
- 3/4 drive metric sockets
- Grease gun
- Standard & Metric open end wrenches
- Rags
- Suitable container to collect fluids

7.1.3 Install Procedure – Typical



CAUTION

Personal protection equipment required when handling. PPE should include appropriate clothing, gloves, safety eyewear and shoes.



CAUTION

Both operator and assistant must be qualified in handling procedures. The operator must have an unobstructed view of the assistant and load at all times. The operator shall maintain full control of the machine at all times.



Crush hazard. Keep clear of crush points and moving parts. All directions and signals must be agreed upon in advance. Take signals from only ONE person.

The following describes basic procedures used to attach the Ho-Pac to a machine equipped with a typical pin on type mounting arrangement. Procedures may vary and you should always follow the instructions in the manual that is provided by the carrier manufacturer. For carriers equipped with a quick coupler, refer to the owner's manual furnished by the coupler manufacturer for instructions.

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

1. Operator: Move carrier and Ho-Pac to a firm level surface. Position the Ho-Pac with the hose side facing toward the carrier.
2. Assistant: Check that the Ho-Pac is stable and all loads are supported.
3. Operator: Maneuver the stick in between lugging of the mounting bracket. Align the stick pin holes to the holes in the mounting bracket.
4. Assistant: Clean pins of rust and debris before they are installed. Insert the stick pin and secure with keepers.
5. Repeat procedure for installing link pin.
6. Lubricate pins.

7.2 Connect Pressure and Return Lines



CAUTION

Hydraulic circuits differ between machines. Improper set up can damage the Ho-Pac or carrier. Only qualified personnel, having knowledge of the machine's systems should install.

Identify whether the carrier's pressure line is located on the right-hand or left-hand side. Do not guess. The Ho-Pac will not operate if these hoses are crossed.

IMPORTANT

Read, understand and follow the instructions included with the installation kit. The installation is not complete until the hydraulic circuit is tested for flow and pressure. Tools required for testing include a flow meter and pressure gages. Test procedures, along with a form to record the results of the flow test, can be found in the Technical Data section of this manual. Questions regarding testing procedures should be directed to Allied Technical Service.

IMPORTANT

Contamination can diminish service life. Prevent contaminating the oil. Always clean the area around connections prior to opening the hydraulic system.

7.0 Install / Uninstall Ho-Pac

IMPORTANT

Collect fluids in a suitable container. Clean up spilled fluids and obey all local regulations for the disposal of these fluids.

IMPORTANT

The Ho-Pac will not operate if the supply and return hoses are crossed. For ease of identification, the supply hose is tagged with a red colored cable tie and marked "PRESSURE".

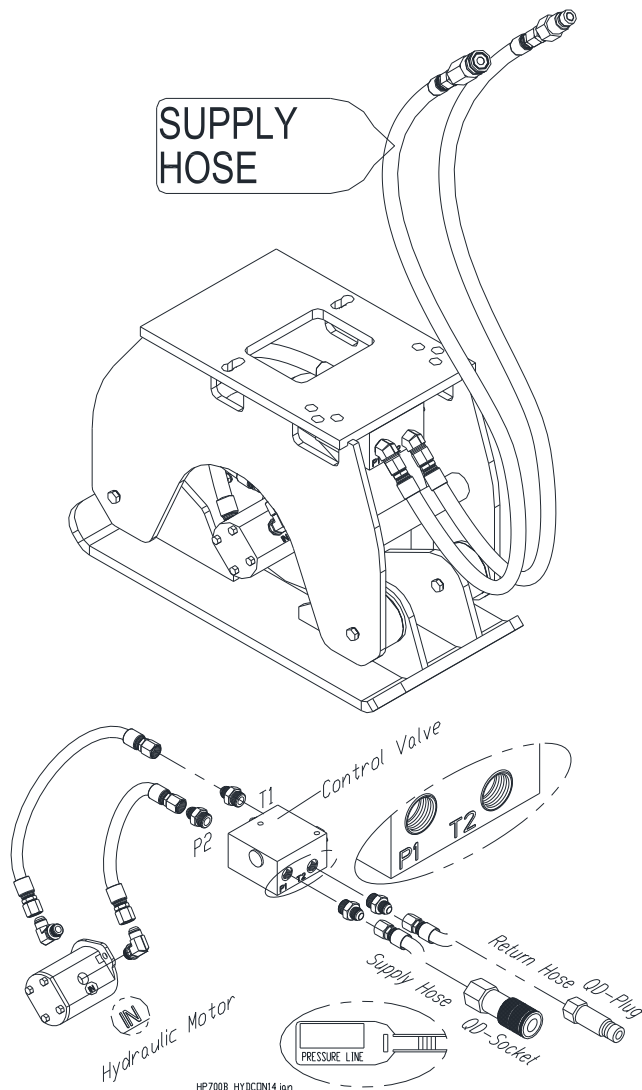


Fig. 7-1 Hydraulic Connections Identified

- Supply hose tagged with [Pressure Line]
- Supply hose connection to valve port [P1]
- Return hose connection to valve port [T2]

IMPORTANT

The control valve is attached to the mounting frame. The part number of the valve can be found stamped into the body above connection port T2.

1. Raise the Ho-Pac off the ground and operate the bucket cylinder to ensure hoses will not be pinched or restricted.

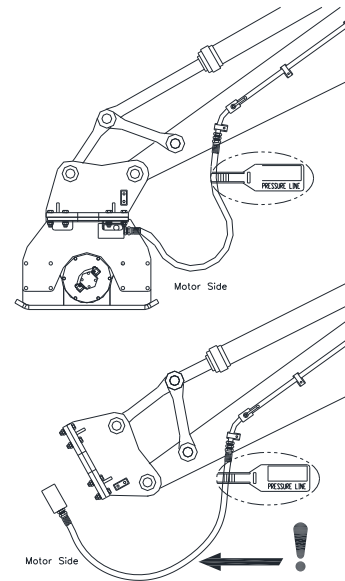


Fig. 7-2 Check hose length & routing for unrestricted movement

2. Briefly test Ho-Pac for proper operation. Stop and check for hydraulic leaks. Tighten hoses and connections as necessary.

IMPORTANT

Read, understand and follow the instructions included with the installation kit. The installation is not complete until the hydraulic circuit is tested for flow and pressure. Tools required for testing include a flow meter and pressure gages. Test procedures, along with a form to record the results of the flow test, can be found in the Technical Data section of this manual. Questions regarding testing procedures should be directed to Allied Technical Service.

7.0 Installation & Removal – [cont'd]

7.3 Removal From Carrier



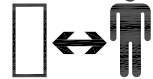
CAUTION

Hot surface - Burn injury if contacted. Some components of the machinery become hot during operation. Allow parts and fluids to cool before handling.



CAUTION

Fluid penetration hazard. Release pressure trapped in hoses before disconnecting. Wear appropriate protective equipment including safety eyewear and gloves.



CAUTION

Both operator and assistant must be qualified in handling procedures. The operator must have an unobstructed view of the assistant and load at all times. The operator shall maintain full control of the machine at all times.



Crush hazard. Keep clear of crush points and moving parts. All directions and signals must be agreed upon in advance. Take signals from only ONE person.

IMPORTANT

Collect fluids in a suitable container. Clean up spilled fluids and obey all local regulations for the disposal of these fluids.

1. Position work tool on stable ground.
2. Disconnect hydraulic connections.
3. With loads adequately supported, remove mounting pins and hardware.
4. Keep mounting hardware with Allied equipment to avoid loss or damage.

8.0 Operation

8.1 Pre-operation Checks

IMPORTANT

Operating the work tool beyond its performance limits will cause equipment damage. The Allied equipment is designed to provide optimum performance with reliable service life at the flow and oil pressure specified. Complete a test of the machine's hydraulic circuit using the form included in this manual. Follow the accepted data listed in Specifications Table.



CAUTION

Repair or replace any damaged components prior to operation. Do not operate work tool until all faults are corrected.

For safe and proper operation, perform a thorough daily inspection of the equipment before use.

Daily, before operating:

1. Ensure work tool is securely attached to the carrier. Check mounting pins and hardware for wear or damage.
2. Remove any excess dirt and debris that accumulated on the work tool as this may decrease performance.
3. Inspect the following for damage:
 - Inspect rubber of spring mounts for cracks or separation from end plate
 - Inspect hoses, seals, motor and valve for oil leaks
 - Check for loose or missing fasteners

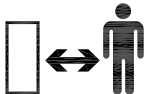
NOTE: Further details can be found in the Care and Maintenance Section of this manual.

8.2 Operation



CAUTION

Injury from flying debris. Do not operate the Ho-Pac with workers in close proximity of work zone.



Clear all personnel from work area before the Ho-Pac is operated.



CAUTION



Injury from flying debris. Personal protection equipment, including safety eyewear, must be worn when operating or servicing this equipment.



Risk of hearing impairment or loss. Hearing protection must be worn by all personnel exposed to prolonged high noise levels.



WARNING



Injury from falls into open excavations. Ground vibrations may collapse trench walls. Excavations must be shored to meet federal, state and local guidelines.

Erect barriers around open excavations to control entry into established work zone.



CAUTION

Never activate the work tool unless the operator is seated in the operator's seat and in full control of the machine. Follow instructions in the operator's manual provided with carrier.

1. Position carrier in-line with direction of work.
2. Position the Ho-Pac parallel to the work surface and within view of the operator. The compaction plate must be in full contact with the work surface for maximum effectiveness.
3. Activate the Ho-Pac with the switch located in the operator's cab.
4. Use the carrier to push down against the springs of the Ho-Pac. This will not only transfer the vibratory energy more effectively to the soil but also adds static pressure which assists with compaction.

IMPORTANT

Overstretching the rubber springs will contribute to early spring failure. Stretch the spring mounts no more than approximately one-half (1/2) their width.

8.0 Operation – [cont'd]

5. Maintain down pressure as the material compacts. For larger areas, decrease boom down-force and slide the compactor over the material with a repetitive, back and forth motion. The initial pass is continued until compaction is no longer apparent, typically 5 to 15 seconds. Run the compactor until maximum density is achieved but avoid unnecessary run time that can lead to loosening of soil previously compacted.
6. Repeat compacted lifts as necessary until a finished surface is achieved. Optimum compaction is usually obtained with two passes. The duration of the initial pass is dependent on depth and material. The second pass may require additional fill material and Ho-Pac repositioning to achieve finished grade.
7. After compaction is complete, re-position the Ho-Pac and/or carrier to continue working.

NOTE: Exposure to abrasions, over-stretching and heat build-up from prolonged operating cycles all contribute to shorter spring life. Stop the Ho-Pac during repositioning to help minimize heat-aging of rubber.

The rate of compaction to a 95% Modified Proctor will vary due to many factors, including variations in operator technique. Other factors that will produce different results include -

- Soil densities are reduced at the bottom of excessively high lifts. It may be necessary to try different lifts to determine the maximum and most effective lift that can be used and still achieve the required density.
- Compaction is affected by material type. Soils with 50% or more granular content are the most responsive to compaction through vibratory action.
- Moisture content is also critical to achieving maximum compacted densities of fill material. Fill materials may need conditioning prior to compaction.

IMPORTANT

Always practice proper operating techniques.

- Do not allow mounting frame to contact base plate. Spring mount and frame damage may result. Stretch the spring mounts no more than approximately one-half (1/2) their width.
- Do not use the Ho-Pac to lift or push materials. Damage to spring mounts and other components may result.
- Do not operate the Ho-Pac underwater. Bearing damage may result.
- Do not operate the Ho-Pac without the compaction plate attached. A dynamic imbalance may result in equipment damage.
- At temperatures below 32°F (0°C), operate the Ho-Pac for a few minutes without down force to allow the spring mounts to warm.
- Do not operate Ho-Pac with hydraulic oil temperature above 180°F (80°C)

The Allied Ho-Pac combines three actions that are highly effective in the compaction of granular type soils:

1. **Vibration** – The vibratory action is generated by the hydraulic motor that drives the out-of-balance eccentric mass turning at a high rpm. Granular soils are extremely responsive to consolidation by vibration. Soil particles are set in motion and settle under their own weight. The air surrounding these particles is forced out, which allows them to pack closely together.
2. **Impulse Force** - Generated by the centrifugal force of the rotating eccentric mass. When properly controlled, this also gives an impact force.
3. **Down Force** – A pressing force exerted by the carrier against the Ho-Pac springs.

8.3 Compaction Handbook

Further information is available in the "[Compaction Handbook](#)". To request a copy, contact your local dealer or Allied's Customer Service. Ask for part number 103392.

9.0 Care and Maintenance

9.1 Maintenance Schedule

Table 9.1 Maintenance Schedule

Item	Hours						N/A	Note
	10	50	250	500	1000	2000		
Visual inspection - Walk around	X							A, B
Re-check Fasteners Torque		X						C, B
Bearing Re-Lubrication							X	D

N/A – Non-applicable

Note

A) Refer to the list of parts to include during the inspection.

B) As recommended unless a change in performance is observed.

C) After first 50 hours of use

D) Bearings are lubricated for life and sealed. No re-lubrication is necessary nor possible.

9.1.1 Maintenance Schedule Overview

In Table 9.1, the method described for daily inspections is identified as a "walk around". All external components must be looked at for any visible signs of wear, damage, loose, missing or unsecured fasteners, fluid leaks, and cracks in welds.

9.1.2 Conditional Maintenance

When properly installed, operated and maintained by qualified personnel, the Allied equipment requires a minimum of maintenance.

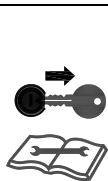
Table 9.1 specifies how often and what items need to be inspected in order to maintain the safety, reliability and performance of the Allied equipment. Intervals are based on standard (normal) operating conditions and must be adjusted accordingly if operating under harsh applications or extreme conditions. For example, if using water content hydraulic fluid or when operating under conditions of extreme temperatures, dust, high elevations, or extended continuous use, components will require more frequent monitoring. Use regular component inspection to determine if interval adjustment is warranted.

While the frequency of inspections and maintenance depend primarily on use, other factors such as extreme environmental conditions require additional measures.

Clean the Surfaces of Ho-Pac

- In conditions of extreme humidity
- Muddy and wet soils.
- If reduced performance is observed

9.2 Safety Precautions During Inspection



WARNING

Unless otherwise instructed, all maintenance is performed with the work tool supported on stable ground and the machine shut off.

Remove the ignition key, engage interlock and apply parking brake.



WARNING

Crush injury. Never rely on the rotation system or cylinders as a means of support when servicing the Allied equipment. Hydraulic cylinders are strictly lifting devices and not a structural support member.

Prevent sudden or unexpected movement by using proper blocking to support loads.



WARNING

Pressurized system. When releasing pressure in the hydraulic system ensure load cannot fall or make unexpected movements.

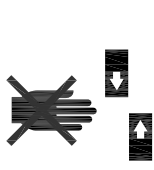
Refer to the hydraulic maintenance section for instructions on how to depressurize the hydraulic system.



WARNING

Perform service in safe work areas. Never service the Ho-Pac in the trench.

9.0 Care and Maintenance [cont'd]



WARNING

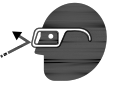
Crush injury. Any guard removed from the equipment for purpose of inspection or maintenance must be reinstalled before returning back to work.



WARNING

Injury from pressurized fluid. Fluid under pressure can penetrate skin. Never use hands to locate leaks. Use cardboard.

Regularly inspect hoses for damage. Replacement hoses must be the same type and pressure rating.



CAUTION

Personal protection equipment, including safety eyewear, must be worn when operating or servicing this equipment.



CAUTION

Hot surface - Burn injury if contacted. Some components of the machinery become hot during operation. Allow parts and fluids to cool before handling.

IMPORTANT

Do not make alterations to the Allied equipment without written authorization from the Allied Engineering Department.

9.3 10 Hour (Daily) Maintenance

- Remove all excessive dirt/debris on the Ho-Pac that can decrease performance.
- Check for loose or missing fasteners.
- Check components for excessive wear.
- Check spring mounts for cracks.
- Check fasteners for tightness. Check and replace any threaded fasteners that are missing or damaged. Follow proper torque procedures.
- Check hoses and connections for oil leaks.

Replace damaged or deteriorated hoses. Replace if any of the following conditions are present:

- Leak at end fitting that cannot be eliminated through proper tightening techniques
- 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

9.4 Oil Level and Quality of Carrier



CAUTION

Follow the recommended service intervals from the carrier manufacturer.

Check oil level in reservoir. Check records for last oil and filter service. Test oil quality. Review the manufacturer's maintenance schedule. It may specify operating conditions that require special attention to maintenance and adjusted service intervals.

Maintain clean oil in the carrier. Follow the recommendations from the carrier manufacturer for approved hydraulic oils and hydraulic system maintenance.

IMPORTANT

Contamination will diminish service life of components. Use care while performing service to hydraulic systems. Safeguard against contaminating the oil. Before connections are opened, ensure fluids are collected in a suitable container. Clean up any spilled oil. Obey all local regulations for the disposal of these fluids.

9.5 Bearing Lubrication System

Bearings are lubricated for life and sealed. No regular re-lubrication is necessary nor possible.

9.7.2 How To Check Condition of Bearings

Due to the rotational speeds and high loads, bearing failure is usually sudden. A rattling or scraping sound is a tell-tale sign of imminent failure. Visual inspection of bearing requires removal of the bearing housing.

9.0 Care and Maintenance – [cont'd]

9.7.3 Bearing Replacement

IMPORTANT

Use only genuine Allied replacement parts to protect total warranty coverage. Non-approved parts may impair performance or reliability.

IMPORTANT

Bearings are interference press fit into housing. Replacement requires a workshop equipped with a manual arbor or hydraulic press.

Use standard mechanic's techniques and tools to disassemble and assemble the Ho-Pac.

Questions regarding maintenance, repair or operation can be directed to Allied Technical Service. For questions regarding replacement parts, contact Allied's Customer Service.

9.7.4 Bearing Removal

1. Remove hydraulic motor.
2. Remove the motor side bearing housing from the eccentric housing.
3. Remove the eccentric mass.
4. Remove the other bearing housing.
5. Press bearing out of housing. Ensure housing is properly supported and press only against the bearing's inner race.



CAUTION

Crush injury. Eccentric mass is heavy. Handle carefully to avoid injury to hands or fingers.

IMPORTANT

Do not pry out the outer bearing race if it remains in the housing. Place a small weld bead, @1/8 inch (3 mm) along the inside diameter. When cool, remove the outer race.

IMPORTANT

Obey all local regulations for the proper disposal of all used fluids.

9.7.5 Bearing Installation

IMPORTANT

Handle new bearings with care to prevent damage. Do not remove from packaging until ready to install.



CAUTION

Bearings are interference press fit. Apply contact pressure to the outer race only. Do not hammer on the bearing rings.

1. Clean the bearing housing.
2. Lightly lubricate bearing's outer race.
3. Slowly press bearing into housing.
4. Clean and lubricate the eccentric shaft.
5. Slip bearing/housing onto shaft. **NOTE:** Close tolerance slip fit.
6. Repeat steps 1-4 with other bearing and housing.
7. Install the bearings and eccentric in to the eccentric housing. Install bolts.
8. Install hydraulic motor and bolts.
9. Install hydraulic hoses.

9.8 Spring Mounts - Replacement

The spring mounts are subject to aging and require periodic replacement. While spring life depends primarily on use, other factors, such as extreme environmental conditions can also shorten spring life.

Due to vibration and shock loads experienced by the Ho-Pac, all threaded fasteners must be checked frequently for loose, broken or missing bolts.



CAUTION

Some components of the Ho-Pac are heavy. Use approved lifting equipment to properly support and stabilize loads.



CAUTION

Crush injury. Do not place hands or fingers between mounting frame and compaction plate during removal of spring mounts.

Ensure all loads are adequately supported before performing any service work.

9.0 Care and Maintenance – [cont'd]

NOTE: If multiple mounts are to be replaced, it is recommended to replace one mount at a time.

1. Position Ho-Pac on flat, stable surface.
2. Support top mounting frame to remove weight from mounts.
3. Loosen all nuts. Remove nuts and washers.
4. Remove all bolts and mount.
5. Position new mount. Use alignment bar to align bolt holes.
6. Install new bolts and lock washers.
7. Tighten bolt to proper torque. Refer to Table 9.2.

9.9 Threaded Fasteners Tightening Torque

IMPORTANT

All threaded fasteners must be checked frequently for loose, broken or missing bolts. Keep threaded fasteners tight. Replace with new if missing or damaged. Replacement fasteners must be the same type and grade. Follow proper tightening procedures and bolt torque. Failure to follow these instructions when tightening can have serious consequences.

- A hardened washer must be used under the head of a bolt in a blind hole.
- With a nut and bolt combination, a hardened washer must be used under the element to be turned. AND the element not turned must be prevented from rotating during tightening.
- All threads must be free of damage and foreign debris. Surfaces to be bolted must be flat.
- Do not apply thread lock compound to the bolt threads unless instructed to do so.
- Lubricate bolt threads.

IMPORTANT

Keep fasteners tight. Replace missing or damaged fasteners with new. Replacement fasteners must be the same type and grade. Follow proper torque procedures. Refer to Table 9.2 for bolt torque.

9.9.1 Bolts - Proper Preparation, Pre-tensioning and Torque

1. Clean threaded fasteners and surfaces to be bolted.
2. Lightly lubricate threads.

IMPORTANT

Do not apply thread lock compound to the bolt threads unless instructed to do so.

1. Install all bolts finger tight.
2. Follow a crisscross pattern (Fig. 9-3) and tighten all bolts until 1/3 of the specified torque in Table 9.2 is reached.
3. Tighten all bolts again until 2/3 of the specified torque is reached.
4. Continue crisscross pattern and tighten to the full torque shown in Table 9.2.

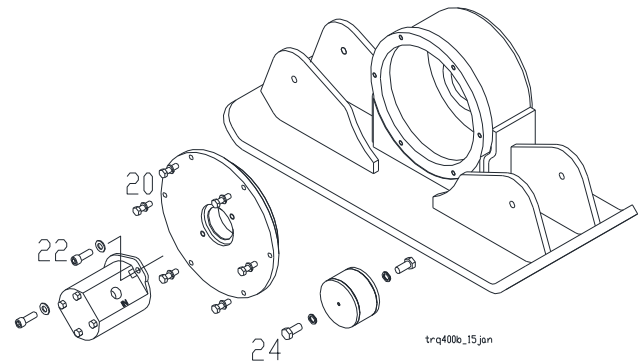


Fig. 9-1 Position of Threaded Fasteners

9.0 Care and Maintenance – [cont'd]

Table 9.2 Standard Tightening Torque

SAE Bolt Grade 5 and 8 markings.
Metric Bolt Property Class 8.8 and 10.9.

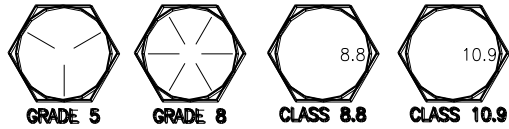


Fig. 9-2 Identifying Markings on Bolt Head

	SAE GR 8		CL8	
Size	ft-lb	N•m	ft-lb	N•m
3/8	35	47		
7/16	65	88		
1/2	85	115		
IN1,2				
XR			140	190

9.2.1 Tightening Method

- Bolts should be systematically tightened starting from the most rigid part of the joint.
- A hardened washer must be used under the head of a bolt in a blind hole.
- When a bolt and nut are used, a hardened washer must be used under the element to be turned.
- The part not turned must be prevented from rotating during this operation.

NOTE: After bolt installation, operate the Ho-Pac for a few hours, and then re-check bolt torques.

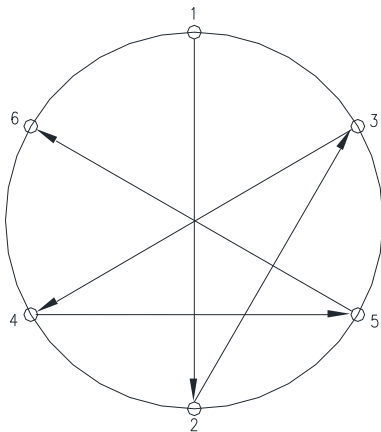


Figure 9-3 Tightening Sequence

10.0 Handling, Transport & Storage

Lifting & Transport Precautions



WARNING

Crush hazard. Injury may result if the Ho-Pac shifts or falls. Do not lift the Ho-Pac by the mounting pins or whip hose. Recommended lift points are identified with the HOOK symbol. 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 attachment is being lifted.





CAUTION

Crush injury. Keep hands and feet clear of crush points. Always use sufficient blocking to avoid accidental or sudden movement of the attachment.



10.1 Lifting & Transport

See Technical Data Section for the weight of the work tool.

10.1.1 When the attachment is transported independently of the carrier

1. Remove all loose debris from attachment.
2. If the swivel assembly is installed, lock swivel position with bolt.
3. Follow removal instructions in Section 7.
4. Secure hoses to unit to avoid accidental damage.
5. Lift attachment at recommended lift points. Refer to the Safety Section of this manual for their location.
6. Stabilize and secure the attachment adequately for transport.

10.1.2 When the attachment is transported while installed on the carrier

1. Remove all loose debris from attachment.
2. If the swivel assembly is installed, lock swivel position with bolt.
3. Secure hoses to unit to avoid accidental damage.

4. Inspect the mounting pins and hardware for damage and integrity.
5. Transport carrier in accordance with carrier manufacturer's recommendations.

10.2 Storage

During periods of non-use, protect against damage. Observe the following storage preparations.

- Do not drain oil unless fluid degradation warrants change. Keep the motor full of oil to protect internal components.
- Seal hydraulic connections to protect against contamination
- Store in upright position
- Support the mounting frame with blocks to minimize permanent sag in spring mounts.
- Protect rubber components such as spring mounts and hoses from exposure to direct sunlight to reduce aging effects
- Avoid wet or damp conditions to minimize rust

11.0 Troubleshooting

This guide identifies several commonly encountered conditions and the recommended corrective action. For conditions other than these, contact the Allied Technical Service Department.



CAUTION

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

Fault	Possible Cause	Corrective Action
No operation	Insufficient oil pressure or flow.	Check hydraulic supply system. Correct as required.
	Failed bearings.	Inspect and replace bearings.
	Broken motor shaft or worn splines.	Inspect and replace worn parts.
Erratic operation	Erratic oil pressure or flow.	Check hydraulic supply system. Correct as required.
	Failed spring mount.	Inspect and replace failed mount.
Operation with excessive noise or vibration	Failed bearing.	Inspect and replace bearings.
	Loose bolts or mounting hardware.	Inspect and tighten bolts.
Operation stalls under load	Pressure relief too low	Check hydraulic supply system. Correct as required.
	Failed bearing.	Inspect and replace bearings.
	Motor worn or motor seals failed.	Inspect and replace motor.
Operation smooth, but at reduced speed	Flow too low.	Check carrier output.
		If motor or flow regulator valve was replaced, check that the motor and valve are properly matched.

This Allied work tool is not self-powered. Its performance level is affected by a hydraulic system that is not operating to specification.

The Allied Ho-Pac is designed to provide optimum performance with reliable service life at a specific oil flow. There are four motor options to choose from.

If the machine is equipped with a work mode switch, verify the selector switch is set on the proper attachment setting for operating the Ho-Pac.

Use a flow meter to measure oil delivery and to verify the cracking pressure of the relief valve.

When troubleshooting, include all associated parts of the attachment circuit to exclude any possibility of a collapsed hose or other fault or malfunction.

Tools required for testing include a flow meter and pressure gages. Test procedures, along with a form to record the results of the flow test, can be found in the Technical Data section of this manual.

12.0 Technical Information

12.1 Testing the Hydraulic Circuit

The performance of the Allied work tool is impaired by a hydraulic system that is not operating correctly or set outside the accepted specifications.

Prior to use, test and calibrate the machine's hydraulic circuit. 'Test and calibrate' refers to the act of evaluating and adjusting to meet the accepted specifications of the Allied work tool. Refer to the

Technical Data Section of this manual for a list of these specifications.

Tools required to complete these tests include a flow meter and pressure gages. Tests are performed under varied conditions, including temperature, work mode, engine speed and load. Use the worksheet provided below to record test results.

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

Work Mode – Set to correct 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 – Oil temperature must be at normal operating temperature while testing. 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 the motor's outlet port.

If troubleshooting, include all associated parts of the attachment circuit to exclude any possibility of a collapsed hose or other fault or malfunction.



CAUTION

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

Testing procedures can vary depending on the specifics of your equipment. Consult your flow meter manual provided from the manufacturer for specific installation and testing instructions.

Verify the circuit to be tested is equipped with a relief valve. Before starting, be sure the restrictor valve on flow meter is open. Include the hoses attached to the work tool to eliminate possible faults, e.g. collapsed hose.

12.0 Technical Information – [cont'd]

12.2 Oil Pressure Check

IMPORTANT

The Allied work tool is designed to provide optimum performance with reliable service at the oil flow and pressure specified. Inattention to correct machine set up may result in equipment damage, diminished service life and poor efficiency.

Measure oil pressure whenever any the following conditions occur

- When first installed on a carrier
- When repairs or modifications are made to the machine's hydraulic circuit.
- When the machine operates other hydraulic work tools.
- When the Ho-Pac is removed from one machine and attached to a different machine.
- Check the pressure every 250 operating hours is recommended.

12.2.1 How to Measure the Oil Pressure

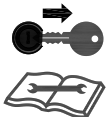


CAUTION

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



WARNING



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

Certain tests, such as measuring the oil pressure, can only be done while the Ho-Pac is operating.

- Lower the work tool to the ground and stop the carrier engine.
- Relieve hydraulic pressure in attachment circuit.
- Connect a pressure gauge [0-5000 PSI] to the supply hose at the [IN] side of the work tool.
- Use the provided form to record your results.

- Start the carrier and position the work tool with the tamping plate against the ground.
- Adjust the engine's rpm to the normal operating speed and set operating mode to "work tool".
- The test can begin after the normal operating temperature is reached.
- Start the work tool and record the pressure reading. It's normal for the pressure reading to increase and decrease as the carrier applies varying amounts of down pressure against the springs.
- Compare your results with the values listed in the General Specifications Table.
- When finished with the pressure-measuring test, lower the work tool safely on the ground and stop the engine. Relieve hydraulic pressure in attachment circuit. Remove test gauge.

12.3 Definition of Hydraulic Terms

For the purposes of this manual, the following terms are defined as:

Range – Represented by two values 'V1 – V2', range is the lowest-to-highest limit of a device that will allow it to adequately respond. The term "minimum flow" describes the least amount required that permits continuous operation that's 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 work tool.

The motor is coupled directly to the eccentric mass. The rotation speed of the motor must be kept inside a narrow flow range. Too little flow will under-speed the motor resulting in unsatisfactory performance. Excessive flow (above the accepted flow rate) does not improve compactor performance. Too much flow not only results in overheating the oil, but also causes the motor to over-speed which will add significantly higher loads that contribute to early bearing failure.

IMPORTANT

Never use a relief valve as a means to reduce the hydraulic oil flow. Oil by-passed over the relief valve will cause significant heat generation.

12.0 Technical Information – [cont'd]

Operating Pressure – A measure of the hydraulic oil pressure (values given in PSI / BAR) taken in the attachment's supply line during operation.

Oil pressure will fluctuate with change in soil density and amount of force exerted by the carrier. When raised off the ground, the flow of oil is under no load, and oil pressure is minimal. Each component of the hydraulic system has a maximum working pressure. For safety and reliability, pressure must be controlled so that no component is subjected to pressures beyond their design.

IMPORTANT

The operating pressure is not to be used as a relief valve pressure setting. Poor performance and significant heat generation will occur.

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 Ho-Pac applications, they are recommended over direct acting relief valves.



CAUTION

The relief valve is a safety device, used to protect the circuit against hydraulic overload. It is a required component.

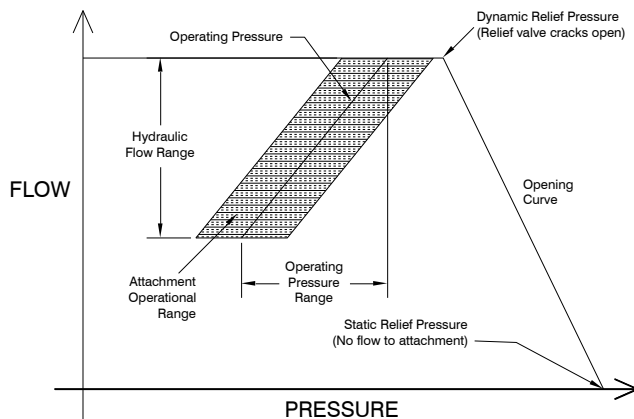


Fig. 12-1 Flow-Pressure Diagram

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 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. The opening curve is the rise of pressure between dynamic and static.

IMPORTANT

The hydraulic system of the carrier must be capable of providing the accepted oil flow at a pressure equal to at least the dynamic relief pressure.

12.5 Hydraulic Motor Options

There are four (4) motor options available.

12.5.1 How to Identify the Different Motors

The identification of the motor can be determined by measuring the length of the motor's body. Measure from behind the mounting flange to the rear plate. Compare your measurement with 'L' in Table 12.1.

Refer to Fig. 12-2. The motor is assembled for CLOCKWISE ROTATION. Motor ports are marked [IN] and [OUT]. When viewed from the shaft end and with the larger portion of the body downward, the [IN] port is located on the left-hand side.

IMPORTANT

The motor is assembled for clockwise rotation. Pressurizing the outlet port will damage the motor's internal components. Verify correct installation before pressurizing the hydraulic circuit.

Table 12.1 Motor Identification

Motor Option	Flow gpm [lpm]	"L" - Length inch [mm]	Part Number
1	6 [23]	3-1/8 [80]	See Table 13.3
2	9 [34]	4-1/2 [114]	
3	14 [53]	4-1/8 [105]	
4	18 [68]	4-9/16 [116]	

12.0 Technical Information – [cont'd]

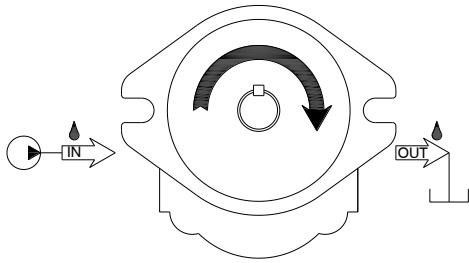


Fig. 12-2 [IN] & [OUT] *Motor Viewed From Shaft End

12.6 Motor and Valve Combination

IMPORTANT

The volume of oil flow affects the speed of the motor. Over-speeding can lead to early bearing failure. Poor performance will result from under-speeding. For the best efficiency, select the motor carefully and always confirm compatibility of motor and carrier. For a list of available motor options, refer to the General Specifications Table.

The motor is combined with a controller. This multi-function control valve helps optimize operation with improved reliability of critical components such as the motor and bearings.

12.7 Control Valve – Adjustments, Function, Identification & Port Connections

12.7.1 Control Valve – Adjustments

IMPORTANT

The valve is factory pre-set and requires no further adjustments.

12.7.2 Control Valve – Function & Benefit

The four functions are:

1. **Flow regulator** – Protects the bearings from damage by limiting the oil flow and preventing the hydraulic motor from over-speeding.
2. **Pressure control** – Protects the hydraulic components from over-pressure. This is factory pre-set at the maximum operating pressure plus 200 psi (14 bar).
3. **Anti-cavitation circuit** - Controls deceleration of the hydraulic motor and eccentric mass. Also protects motor from damage on circuits not set up with an open return.

4. **Return line check valve** - Prevents reverse flow to the hydraulic motor. Also provides a nominal back-pressure to ensure the proper operation of priority flow control valves, such as Allied's AC40 and AC75.

12.7.3 Control Valve – Part Number Identification & Port Connections

The part number of the control valve is stamped on the manifold and just above the T2 port.

IMPORTANT

For ease of identification, the valve body is stamped with the part number and the ports are stamped P1, P2, T1 and T2.

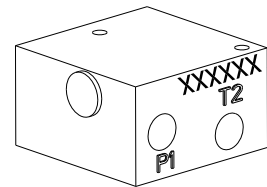


Fig. 12-3 Control Valve - Markings Identified (View of P1 & T2 Side)

XXXXXX: Marks Area Stamped with Part Number

P1: Incoming supply oil flow from carrier.

P2: Regulated oil flow to motor's [IN] port.

T1: Return oil flow from motor's [OUT] port.

T2: Return oil flow to the carrier (Tank).

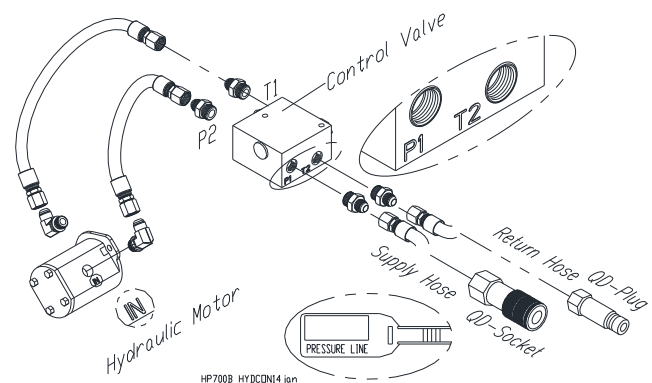


Fig. 12-4 Hydraulic Connections Identified

Supply hose tagged with Pressure Line ID Tag
Supply hose connection to valve port [P1]
Return hose connection to valve port [T2]

12.0 Technical Information – [cont'd]**12.8 General Specifications**

The Ho-Pac is offered in multiple configurations (i.e. Motor options). Pay strict attention to values, figures, captions and notations.

Table 12.2 General Specifications – 577685C

Impulse Force lbf [N]		4000 [1814]
Cycles RPM		2000
Oil Flow ^{a)} gpm [l/min]	Motor Options 1	6 [23]
	2	9 [34]
	3	14 [53]
	Std. Motor	18 [68]
Operating Pressure Max psi [bar]	Motor Option 1	2800 [193]
	2	2800 [193]
	3	2500 [172]
	Std. Motor	2000 [138]
Oil Pressure @ No Load psi [bar]		300-500 [20-35]
Auxiliary Circuit Relief Pressure psi [bar]	Dynamic ^{b)}	Max Operating + 400 [30]
	Static ^{c)}	Max Operating + 650 [45]
Compaction Plate Dimensions Inch [cm]	Std.	13 x 25 [33 x 63.5]
	Opt.	Contact Allied
Compaction Area Ft ² [m ²]	Std.	2.3 [0.21]
Hose Size $\varnothing$ Inch [mm]	Pressure	5/8 [16]
	Return	5/8 [16]
Weight ^{e)} Lbs [kg]	Std.	375 [170]
Carrier Range ^{f)} Lbs (1,000) [kg] (1,000)		3-12 [1.6-5.4]
Sound Power Level DBA [LWA]		106 (Est'd)

^{a)} Proper pairing of motor (and valve) with the carrier's oil flow is critical to reach target soil density and machine efficiency. Optimal motor speed (RPM) is attained only when the carrier's hydraulic circuit provides sufficient oil flow at a pressure equal to at least the dynamic relief pressure.

^{b)} Verify carrier's main relief is set to the value established by the manufacturer. Its value must be greater than the dynamic relief setting.

^{c)} At no time is oil pressure permitted to exceed 3000 psi at the Ho-Pac .

^{d)} Return line pressure (measured at the Ho-Pac) in excess of 150 psi [10 bar] will negatively impact service life of motor.

^{e)} Service weight – (Working weight) Equipped with typical mounting adapter.

^{f)} Mount only to carriers having adequate load-carrying capabilities.

12.0 Technical Information – [cont'd]

12.9 General Dimensions

The Ho-Pac is offered in multiple configurations. Pay strict attention to values, figures, captions and notations.

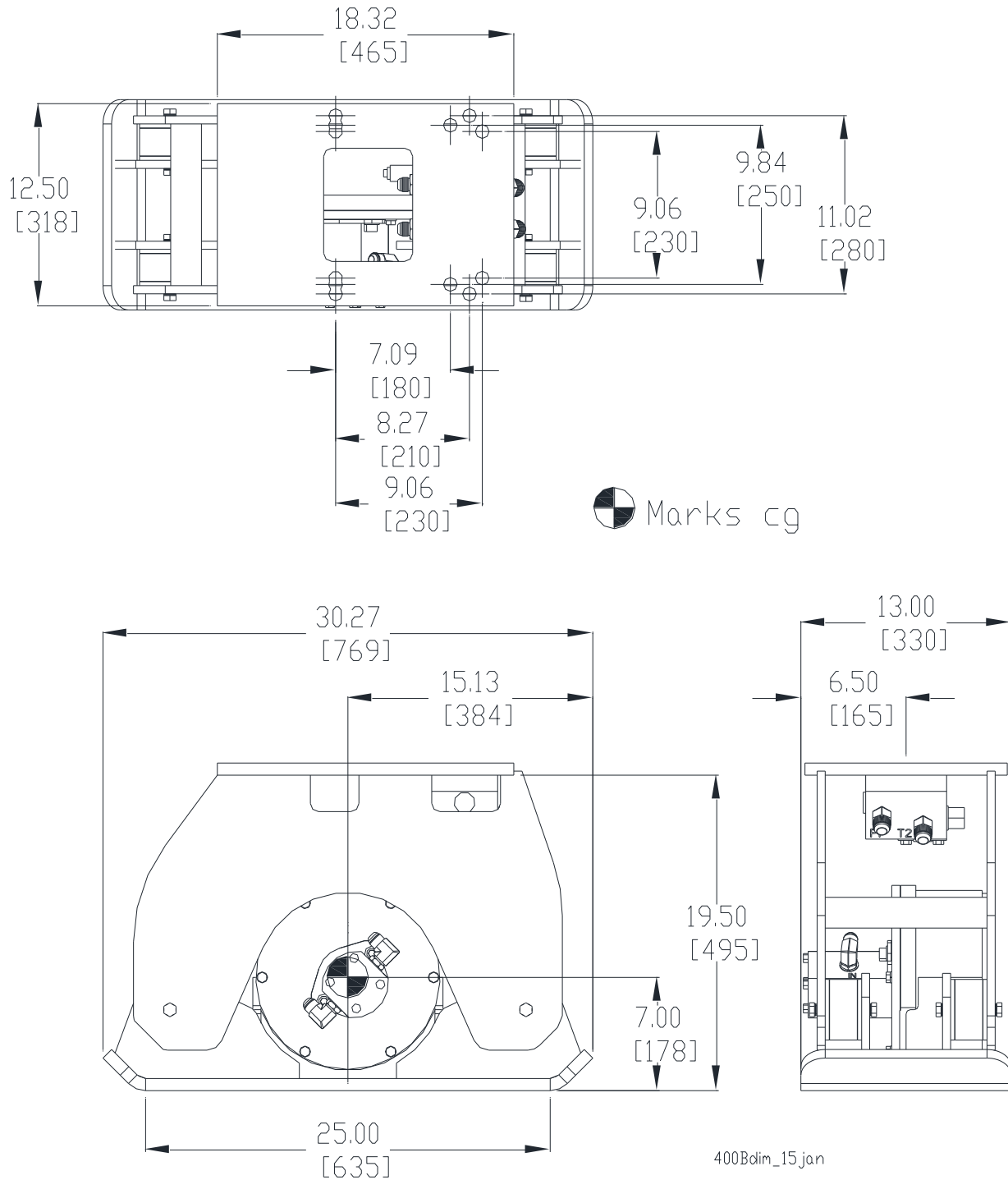


Fig. 12-5 Shown is Standard 400B with Flat Top Frame IN1,2/XR

13.0 Parts Information

13.1 Scope of the Parts Section

Verify that this is the correct document for your Allied work tool. Locate the equipment's identification label and confirm that information corresponds with the information recorded Table 1.1. Refer to the figures in Section 2.0 of this manual for the location of this label.

In this section, figures depict views that are intended for parts identification and not for purposes of repair or service of the product. Material presented in this manual, including tables, figures, captions and descriptions may show equipment that is optional.

The figures found in this section illustrate and describe the various parts used in the assembly of the Allied product identified in Table 1.1. Figures and descriptions represent standard configurations. Tables and figures are common to all serial numbers except where noted.

Pay strict attention to specifications, figures, captions and notations for items that may require further identification by serial number.

The Ho-Pac is offered with optional size motors. For help with identification of the motor and valve, refer to Table 13.3.

13.1.2 How to Use this Manual

The Allied work tool consists of separate components and partial assemblies. Components are identified with the aid of figures, captions, item key, part name and quantity. If needed, 'remarks' and 'specifications' will further clarify the part's description or denote assignment with select unit(s) by serial number.

13.1.3 Required Information for Parts Order

To order replacement parts, Allied recommends contacting the dealer from which the equipment was purchased.

To expedite the ordering process and ensure accuracy, please provide your dealer with the following information-

- Manufacturer – Allied Construction Products
- Product name - Ho-Pac®
- Model number
- Serial number
- Description of the part(s)
- Part number(s)
- Quantity

An order form is provided at the back of this manual. Actual processing time may vary depending on the quality of the information you provide on the form.

IMPORTANT

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.

13.0 Parts Information

The Ho-Pac is offered in multiple configurations (i.e. Motor options). Pay strict attention to figures, captions and notations.

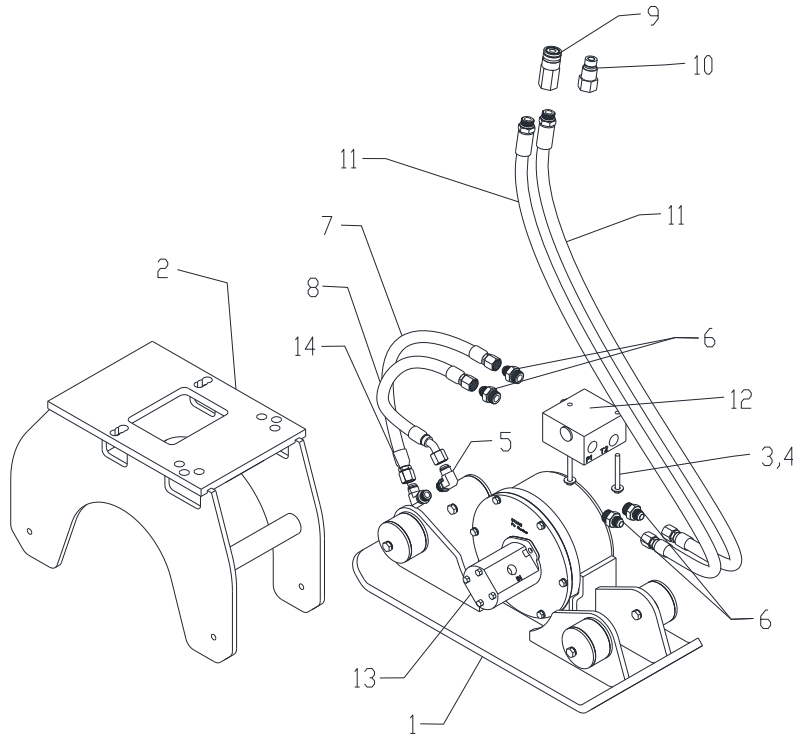


Fig.13-1 Parts View - 400B Ho-Pac

Table 13.1 400B Ho-Pac

Item	Description	Part No.	Qty	Remarks / Specifications
1-27	400B HO-PAC	577685C	---	w/ IN1,2/XR Flat Top Mounting Frame
1	Dynamic Assembly - Std.	577684	1	Refer to Fig. 13-2
2	Top Mounting Frame - Std.	577797	1	Flat Top IN1,2, XR Mtg Family
3	Washer	813292	2	FL3/8"
4	Hex Head Bolt	578101	2	3/8"
5	Elbow	102698	1	EL90° 10MJx10MORB
6	Adapter	677119	4	
7	Hose [T1]	573645	1	22"
8	Hose [P2]	573646	1	21"
9	QD Socket	102571	2	
10	QD Plug	101570	1	
11	Hose	574643	2	
12	Valve	Varies	1	See Table 13.3
13	Hydraulic Motor	Varies	1	See Table 13.3
14.1	Elbow	102698	1	EL90° 10MJx10MORB (use w/motor 572886)
14.2	Elbow	679306	1	EL90° 10MJx12MORB

13.0 Parts Information – [cont'd]

The Ho-Pac is offered in multiple configurations (i.e. Motor options). Pay strict attention to figures, captions and notations.

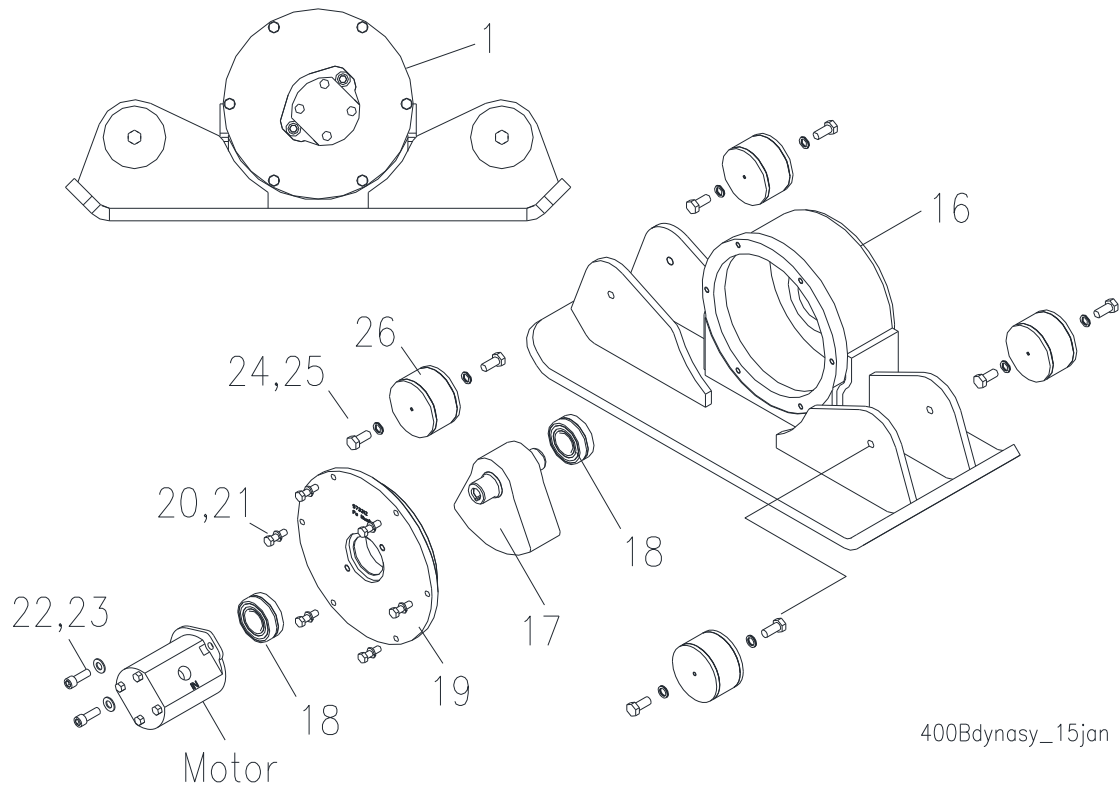


Fig.13-2 Parts View - 400B Ho-Pac

Table 13.2 Dynamic Assembly

<u>Item</u>	<u>Description</u>	<u>Part No.</u>	<u>Qty</u>	<u>Remarks / Specifications</u>
1	Dynamic Assembly	577684	1	Fig. 13-2 Config. w/ 13 x 25 CP Std.
16	Lower Assembly w/ CP	577686	1	Std. compaction plate 13 x 25
17	Eccentric Assembly	577683	1	
18	Roller Bearing	573260	2	
19	Bearing Housing	573312	1	
20	Hex Head Bolt	902538	6	3/8"
21	Lock Washer	798190	6	3/8"
22	Socket Head Bolt	572719	2	7/16"
23	Washer	708514	2	7/16"
24	Hex Head Bolt	574341	8	1/2"
25	Washer-NL	572080	8	1/2"
26	Rubber Spring Mount	574574	4	

13.0 Parts Information – [cont'd]

The Ho-Pac is offered in multiple configurations (i.e. Motor options). Pay strict attention to values, figures, captions and notations.

Table 13.3 Motor & Valve Package (6, 9, 14, or 18 gpm)

Option	"L" - Length Inch [mm]	Flow gpm [l/min]	Part Number			
			Motor	(Seal Kit)	Valve	Motor & Valve Package*
1	3-1/8 [80]	6 [23]	572886	103303	572887	573050
2	4-1/2 [114]	9 [34]	100469	103303	102514	100875
3	4-1/8 [105]	14 [53]	101445	103303	102515	100876
Std.	4-9/16 [116]	18 [68]	101323	103303	102516	100877

*Package includes one (1x) Motor and one (1x) Flow Regulator Valve. Also includes one (1x) Elbow.

Seal kits are available for the motor only. There are no user-serviceable parts in the flow regulator valve. Contact Allied Technical Service for further information.

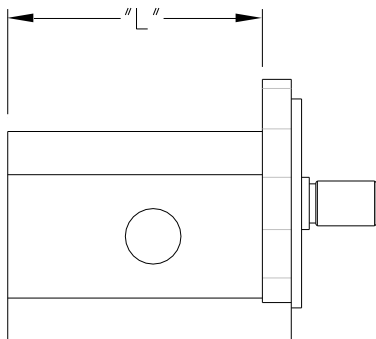
13.2 Motor and Valve Identification**IMPORTANT**

Incorrect combination of motor and valve will result in poor performance or damage.

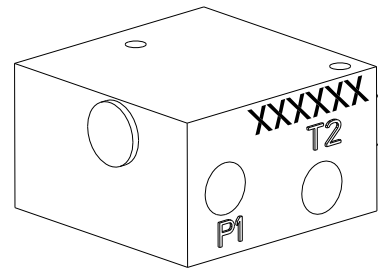
13.2.1 Motor Identification

Refer to Figure 13-3. When the part number of the motor is unknown, measure the body length.

Measure the distance ("L") from the back surface of the mounting flange to the rear of the motor body (not including bolts). Match with the dimensions in Table 13.3 to determine the part number.

**Fig. 13-3 Measure body "L" To Identify Motor****13.2.2 Valve Identification**

The part number of the control valve is stamped on the manifold just above the T2 port.

**Fig. 13-4 Control Valve - Location of Part Number Identified XXXXXX****IMPORTANT**

For ease of identification, the valve body is stamped with the part number and the ports are stamped P1, P2, T1 and T2.

14.0 How To Order Spare Parts

Your local Allied dealer requires the Product Name, Model and Serial Number to better assist you with questions regarding parts, warranty, operation, maintenance, or repair. This information should be noted in Section 2.3 of this manual.

Product Ho-Pac
 Model 400B
 Serial No. _____

Complete information is required

Line	Description	Part Number	Quantity	Price
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Your contact information

Your Name _____ Company Name _____
 Phone _____ Account Number _____
 Fax _____ Purchase order _____
 Email _____ Shipping carrier _____

*See note below

Billing Address _____ Shipping Address _____

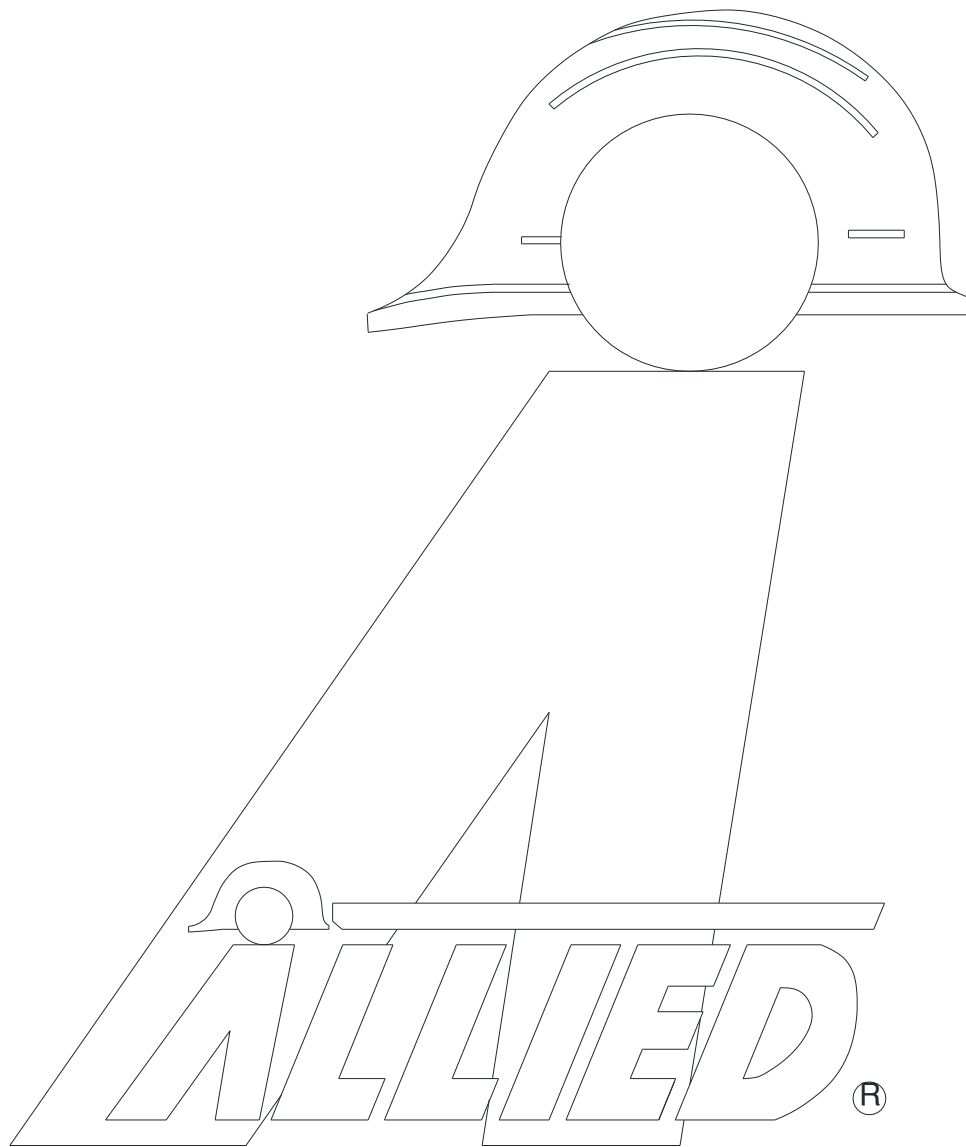
***Note: All backordered parts will be shipped when available via the same method as the original order unless initialed and checked below:**

Initials

- _____ ☐ Ship complete order only
 _____ ☐ Ship available parts and contact customer on disposition of backordered parts
 _____ ☐ Other – specify below

Notes

[illegible]



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e-mail: Sales@AlliedCP.com
website: <http://www.AlliedCP.com>