HO-PAC®

Vibratory Plate Compactor / Driver

Model 1600

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.

TM103337

Contact Information and Revision History

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Continuous improvement of our products is an Allied policy. Allied reserves the right to change, edit, delete or modify the content of this document, including descriptions, illustrations and specifications without prior notification. The content of this publication describe the product at the time of its effective date, and may not reflect the product in the future. Specifications are based on published information at the time of publication. When changes become necessary, these will be noted in the table below. Earlier dated publications are immediately cancelled and superseded by publications with the most current date recorded. Material not in conflict with the most recent effective date shall remain in effect. For product or document updates go to www.alliedcp.com

Revision History for Document No. TM103337

Table of Revision History TM103337

Effective Date	Page	Summary of Change
18_feb	v	Revise Label Set
15_dec	Throughout	Minor revisions to text, tables and figures. Revise SR/MR bolt set.
13_may	21	Revise Bearing Lubrication Table 10.1.
10_oct	Throughout	Revise Safety Information
09_mar	31, 32, 33, 34	103335 add Begin SN-1600 to parts table & fig.
08_jul	7,8,9,12,32,34,36,38	Revise parts diagram
08_may	34	103335 revise parts diagram
08_apr	32-35	571576 revise bolt part number
07_mar	34, 35	103335 add parts table & fig. to include 572576 eccentric housing w/ weld-on tamper plate. Use becomes standard configuration.
07_jan	32, 33	103335 End SN-1599 terminate 103342 & 103333. Create parts table & fig. to include new bearing housing 571576. Begin SN-1600.
06_jun	6,27,31,33,35	Add new motor options. 719717 replaced by 572076.
04_oct	33,35	New hose 570748
04_jul	All	Original Issue of TM103337

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.

CAUTION

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

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.

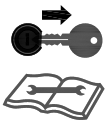
SAFETY Information – [cont'd]

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:

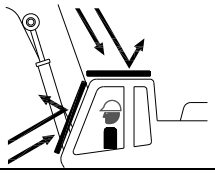
Read the manual before use. Refer to the manual for further details or procedures.

Read the Service Manual For Additional Information

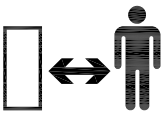


Shut off power & remove key before servicing

Fragments / debris becoming projectiles.



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

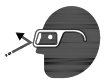


Personnel maintain a safe distance from the work tool, work zone

Identifies lift point

Personal Protection Equipment

Hearing protection



Safety eyewear

Gloves

Safety shoes

Falling object
Unsupported loads

Crush point / Falling part

x Falls into open excavations
x 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

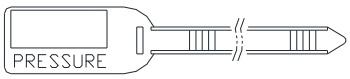
SAFETY Information – [cont'd]

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-2 for their location on the equipment.

Table S.1 Label Illustration and Description

Label	Figure	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-** Identifies approved lift points of the Allied work tool.
L5		**Pressure I.D.** – A red colored cable tie marked "PRESSURE" is attached to the pressure hose for ease of identification between hoses.
L6		**Oil Fill** - Identifies the location for adding oil to reservoir.
L7		**Oil Level** - Identifies the location for checking the oil level.
L8		**Company Logo** – Is the Allied brand identifier and is a registered trademark of Allied Construction Products, LLC.
L9	**Ho-Pac®**	**Product Identification** – Ho-Pac is a registered trademark of Allied Construction Products, LLC used for identifying the hydraulic vibratory plate compactor / driver.
L10	**1600**	**Model Identification** - Identifies the model of the Allied work tool.
L11		**Made in USA**
L12		**Equipment Identification** – Contains Manufacturer's Name and Address, Product Name, CE compliance marking, Model Number, Serial Number, Year of Manufacture, and Mass

SAFETY Information – [cont'd]

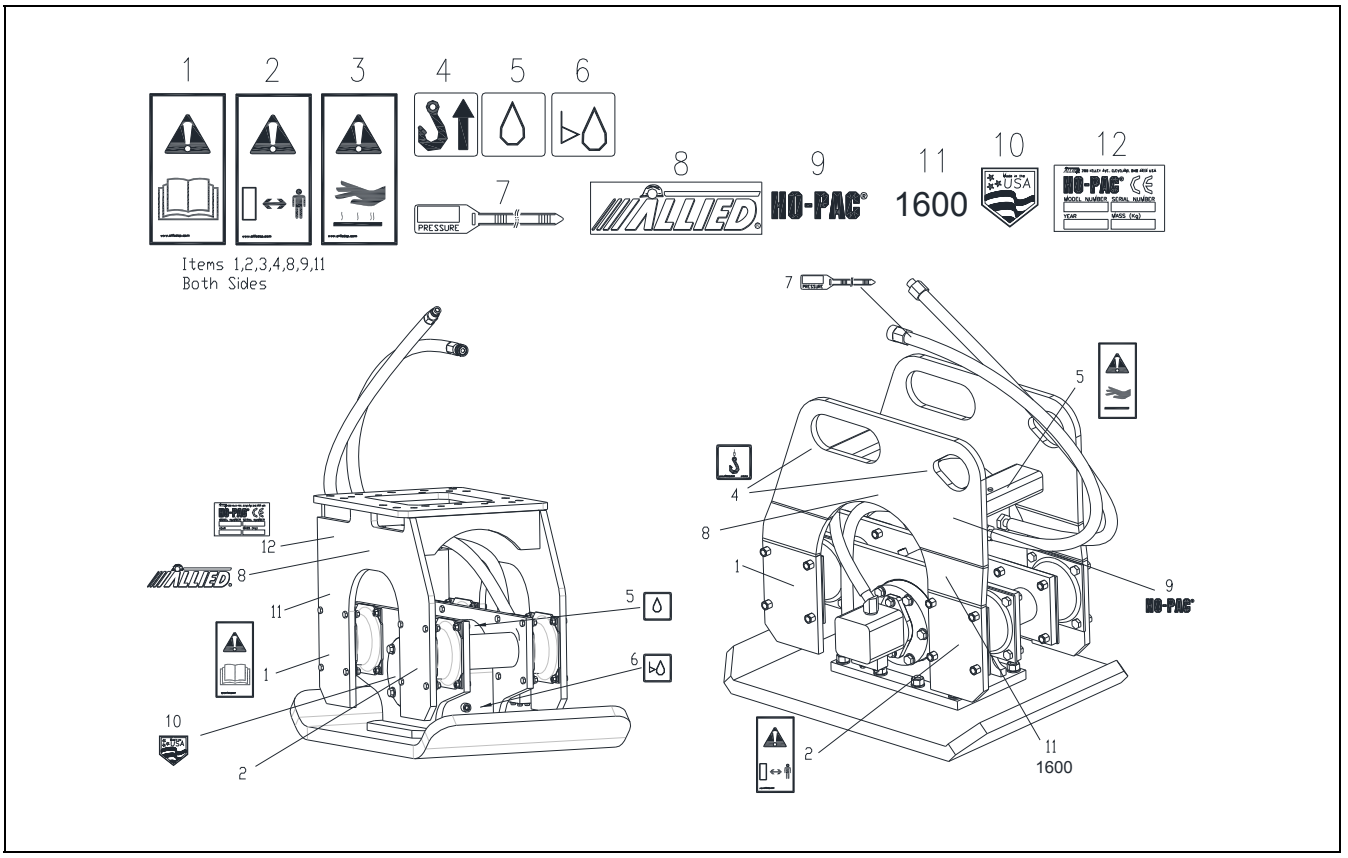


Fig. S-A - Label Placement – Flat Top Frame

Fig. S-B - Label Placement - VMS Frames

Table S.1 Information Labels

Item	Type	Description	Part No.	Qty	Remarks / Specifications
---		**Label Set**	**103339**	1	Set Includes items 1-11
L1	Safety	Label - Read Instructions / Manual	676984	2	
L2	Safety	Label - Stay Clear	840156	2	
L3	Safety	Label - Hot Surface	676983	1	
L4	Safety	Label - Lift Point	676982	4	
L5	Info	Label - Oil Fill	102728	1	
L6	Info	Label - Oil Level	A102729	1	
L7	Info	Tag - Pressure I.D.	818676	1	Located on Oil Supply Hose [PRESSURE]
L8	ID	Label - Allied Logo	676654	2	
L9	ID	Label - HO-PAC®	577554	2	
L10	ID	Label – Made In USA	815696	1	
L11	ID	Label - Model 1600	103341	2	
L12	ID	Plate – Equipment ID	676980	1	L12 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 shall 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 capable of recognizing existing and predictable hazards 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 equipment 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 establish controlled entry of the 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

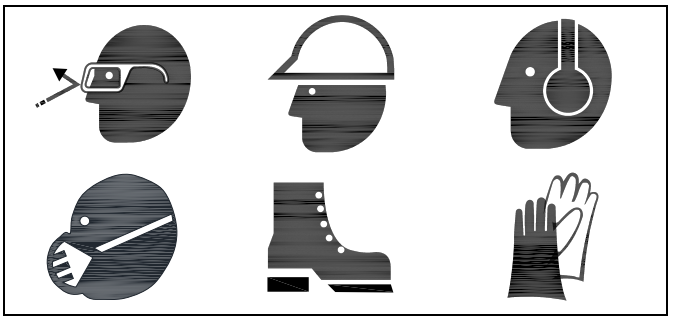
The safe and efficient use of the Allied equipment depends upon proper installation, operation, maintenance and repair. Operational safety programs must encompass all of these elements.

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.

Do not operate the work tool without proper 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 processed by the work tool.

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 with a broad range of carriers. In all instances it first must be confirmed through adequate research and testing, that the equipment is suitable to operate the Allied work tool. General specifications for this work tool, including the connecting dimensions, can be found in the Technical Data section of this manual and shall be strictly observed.

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.

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.

Table of Contents

Table of Contents - [cont'd]

1.0 Introduction & Scope

1.1 About 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.

Table 1.1 About This Manual

Document ID No.	TM103337
Type	Technical - Safety, Operation, Maintenance and Parts
Current Status	See Inside Cover
Product Name:	Ho-Pac®
Generation	III
Applicable Model[s]:	1600 Begin SN 01000
Years of Manufacture:	Begin 2003

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 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 about operating techniques for vibratory plate compactors / drivers
- Performance data for Ho-Pac models derived from field tests.

1.4.2 103467 Manual for Swivels (Option)

The optional swivel assembly allows the Ho-Pac to index at either 45° or 90° to the carrier. Turning the swivel is done manually.

2.0 Equipment Identification

2.1 Location of the Serial Number

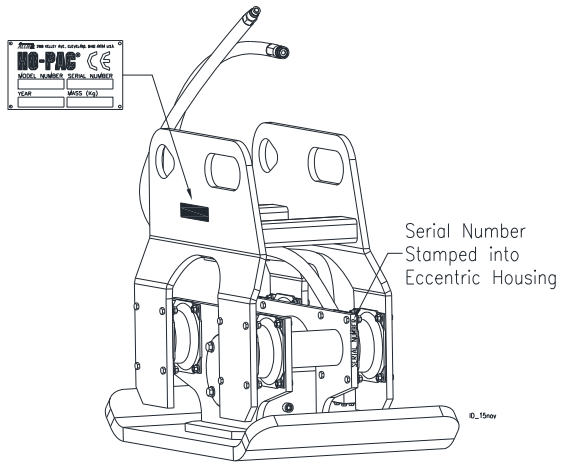


Fig. 2-1 Equipment ID Locations Identified

Refer to Figure 2-1. The Model and Serial Number assigned to this equipment is found on the Equipment ID Tag. The serial number is also stamped in the housing weldment – 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:

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

Fig. 2-2 Equipment ID 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.

Ho-Pac® Model 1600 [X]

Part number varies with top frame configuration

HP1600-FT Part No. 570319 [ ]

HP1600-V13 Part No. 103350 [ ]

HP1600-V16 Part No. 103360 [ ]

Other [ ]

Serial Number: _____

In service date: _____

- x Indicate the date in which the Allied equipment was placed into service.
- x Return the completed Warranty Registration form to Allied Construction Products, LLC.

Motor Option – GPM

25 [ ]

30 [ ]

43 [ ]

34 [ ] End Serial No. 1399

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 when used as a driver, will require modifications to the standard configuration along with additional training for operators and service personnel.
- 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
- 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

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

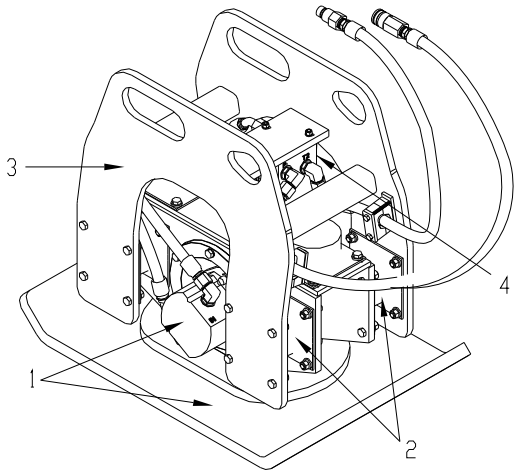


Fig. 4-1 Main Components Identified

1. Dynamic Assembly – Consists of the eccentric mass, bearings and rubber springs. The housing weldment with weld-on compaction plate is standard.

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

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

4. Control Valve – A multi-function valve is used to control the motor. 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** - Protects the motor against damage if the return circuit is not set up with an unrestricted, free-flowing open return. Also, controls deceleration of the hydraulic motor and eccentric mass.

- **Return line check valve** – Protects the motor against damage from reverse flow. Also provides a nominal back-pressure to ensure proper operation of 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. Vibrating frequency and the strength 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 Product Selection and Application Guide

5.1 Match Type of Compactor 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 Match to Compatible Size Carrier

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 while the 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

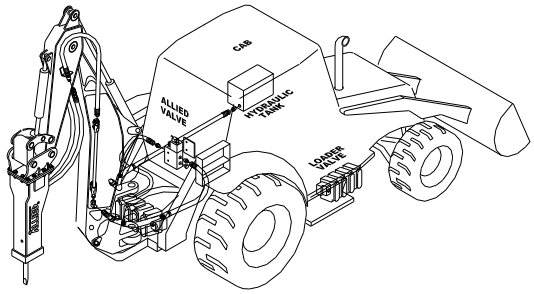


Fig 5-1 Allied Conversion Kit with AC-Series Valve

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 Mounting Overview

Figures and descriptions represent standard configurations.

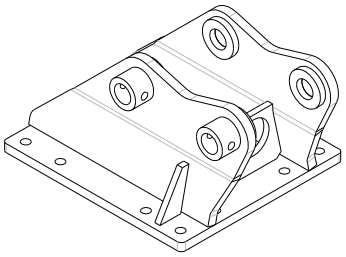


Fig. 6-1 Mounting Bracket

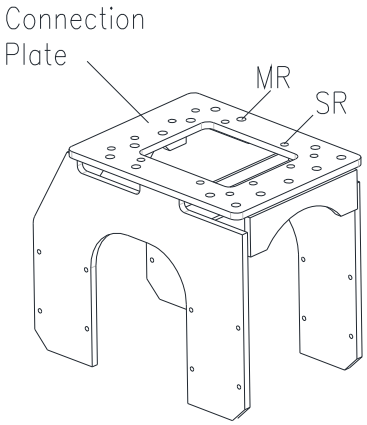


Fig. 6-2 Flat Top Frame

The combination of Top Frame and mounting components provide the connection point for attaching the Ho-Pac to the carrier.

There are two types of top frames available:

- x Flat Top (Fig. 6-2)
- x VMS (Fig. 6-3).

6.1.1 Flat Top Mounting

The Flat-Top frame design includes a connection plate for the bolt-on mounting bracket (Fig. 6-1). Connection plates are grouped by size into Allied mounting families. Dimensions of the plate, including thickness, bolt hole spacing, diameter and quantity will vary between mounting families. Connection plates are typically designed to accommodate two mounting families. Dimensions of the connection plate can be found in the Technical Data section of this manual.

Allied offers an array of bolt-on mounting brackets (Fig. 6-1) to fit virtually any carrier, including those equipped with pin-grab or hook-type mounting couplers.

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.

In Table 6.1, the mounting 'Family' designates a sizing system used by Allied to identify various connection plates. Flat top mountings are also used on Allied's hydraulic breakers.

Table 6.1 Mounting & Hardware for Ho-Pac 1600 with Flat Top

Family	Model	Bolt	FL Washer	Nut	Bolt Set
SR	1600-FT	719815 3/4 x 3 ¾ (x8)	798064 (x16)	658839 (x8)	574820
MR		719520 1 x 3 ½ (x8)	719521 (x16)	620600 (x8)	574821

Follow proper tightening procedures and torque.

6.0 Mounting Information [cont'd]

6.1.2 VMS (Variable Mounting System)

The VMS type frame (Fig. 6-3) is available as an option. The variable mounting system offers the combination of ease and versatility if the Ho-Pac is transferred between multiple carriers.

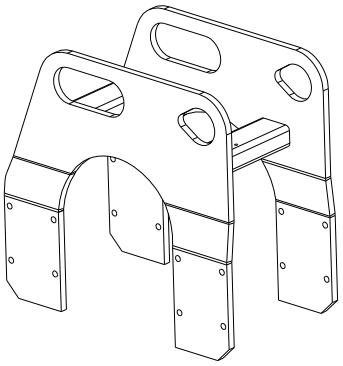


Fig. 6-3 VMS Top Frame

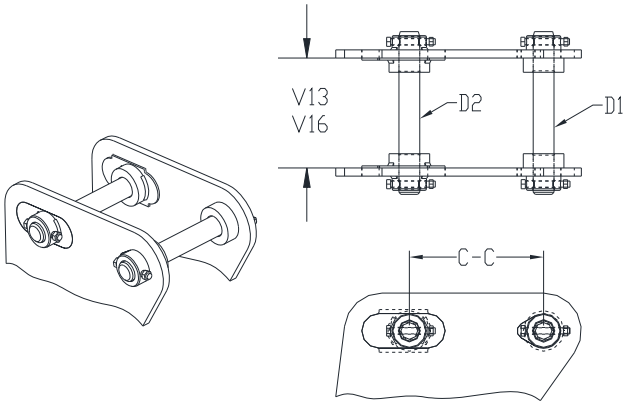


Fig. 6-4 VMS Adjustable Combinations

The VMS is adaptable to most pin grabbing type mounting couplers.

Components of a typical VMS kit are shown in Figure 6-5.

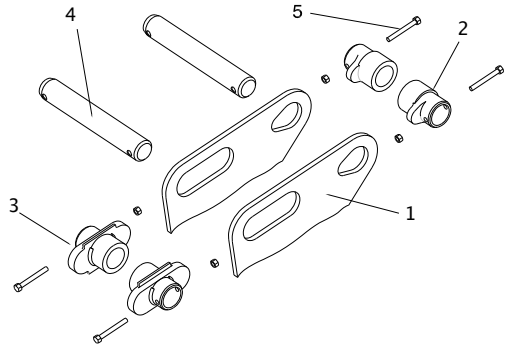


Fig. 6-4 VMS Mounting Components

1- VMS Top Frame (Not included with kit)
2- Collar
3- Plug
4- Mounting pin
5- Bolt, Nut

7.0 Installation & Removal

7.1 Attach the Allied Equipment to Carrier

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

7.1.2 Tools Required to Attach Ho-Pac to Carrier

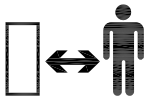
No special tools are required, but the following tools should be available:

- 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 Installation & Removal – [cont'd]

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 supply and return hoses are crossed.

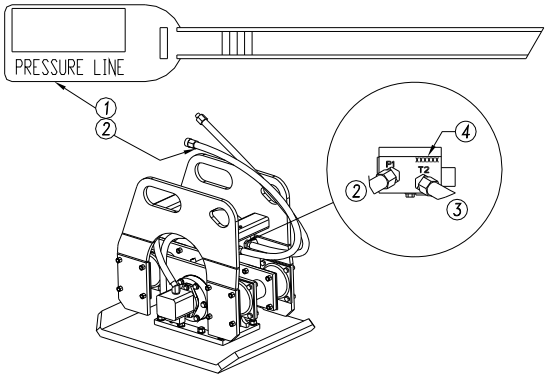


Fig. 7-1 Supply Hose with Tag & Valve Identified

1. Connect Supply [IN] and Return [OUT] hoses to carrier's hydraulic circuit.

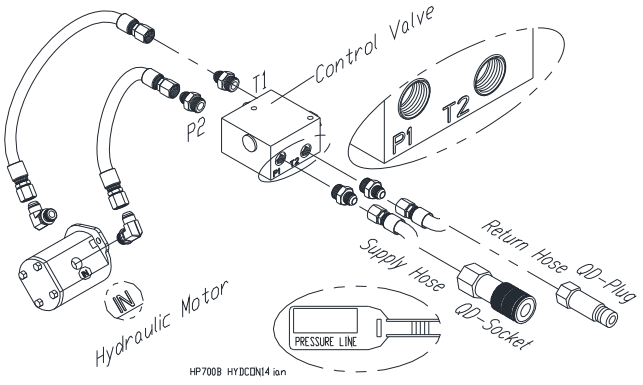


Fig. 7-2 Supply Hose, Valve & Motor Ports Identified

IMPORTANT

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

2. Raise the work tool off the ground and operate the bucket cylinder to ensure hoses will not be pinched or restricted.

3. Briefly test for proper operation. Tighten hoses and connections as necessary.

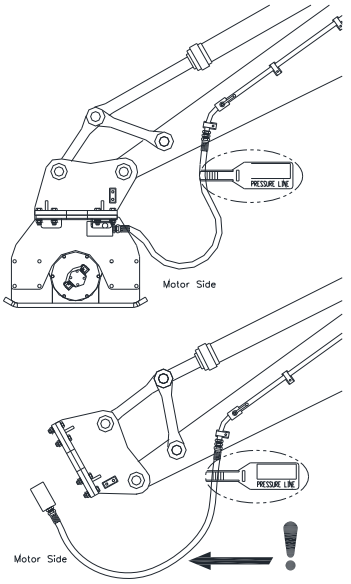


Fig. 7-3 Check hose length & routing for unrestricted movement

7.3 Removal From Carrier

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.

7.0 Installation & Removal – [cont'd]

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

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

Allied work tools are designed to provide optimum performance with reliable service life at the flow and oil pressure specified. Operating the work tool beyond the accepted data listed in the Specifications Table will damage the equipment. Use the form included in this manual when testing the machine's hydraulic circuit.

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 accumulated dirt and debris on the work tool as this may decrease performance.

3. Inspect the following for damage:

X Inspect rubber of spring mounts for cracks or separation from end plate

X Inspect hoses, seals, motor and valve for oil leaks

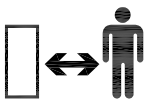
X Check for loose or missing fasteners

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

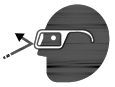
8.2 Operation

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.

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 repositioning of the Ho-Pac to achieve finished grade.

7. After compaction is complete, re-position the Ho-Pac and/or carrier to continue working.

***NOTE**:* Over-stretching the rubber springs will shortened spring life. Heat build-up from prolonged operating cycles will 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.

- Uneven or excessive down pressure applied to the rubber springs will create contact between the mounting frame and compaction plate. Do not stretch the rubber springs further than approximately one-half (1/2) their width.

- Do not use the Ho-Pac to lift or push materials.

- At temperatures below 32°F (0°C), allow the oil to warm before operating. Next, operate the Ho-Pac for a few minutes at idle speed with only light down pressure to warm the rubber springs.

- Do not operate the Ho-Pac if the hydraulic oil temperature exceeds 180°F (80°C)

- Do not operate the Ho-Pac underwater.

- Do not operate the Ho-Pac without the compaction plate attached. A dynamic imbalance may result in equipment damage.

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

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 continuously lubricated by oil splash. Add oil if below mark. Do Not Overfill.

9.1.1 Maintenance Schedule Overview

When properly installed, operated and maintained by qualified personnel, the Allied equipment requires a minimum of maintenance. The frequency of inspections and maintenance depend primarily on use.

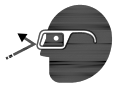
Table 9.1 specifies how often and what items need to be inspected in order to maintain the safety, reliability and performance of the Allied equipment. Intervals are based on standard (normal) operating conditions. Use regular component inspection to determine if interval adjustment is warranted.

A "walk around" includes an visual inspection all external components for any visible signs of wear, damage, loose, missing or unsecured fasteners, fluid leaks, and cracks in welds.

9.1.2 Conditional Maintenance

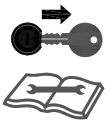
When operated under conditions of extreme temperatures, humidity, dust, muddy and wet soils or extended continuous use, components will require more frequent monitoring.

9.2 Safety Precautions During Service



CAUTION

Personal protection equipment, including safety eyewear, must be worn when equipment is operated and serviced.



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.

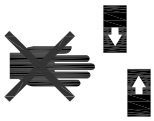
Service in safe work areas. Never service the Ho-Pac in the trench.

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.

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.

Replace hose 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

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 missing, damaged or loose connections.
- Check hoses and connections for oil leaks.

9.4 Carrier Oil Level and Quality

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 Oil-Lubricated Bearing System

The bearings are continuously lubricated during operation from the oil splash system located within the housing weldment.

CAUTION

Check the bearing oil level regularly. Make sure it is up to the 'FULL' line, and check for leaks if the level is low. For oil changes, keep to the schedule. Avoid mixing different oil types that may not be compatible. The best approach is to thoroughly flush out old fluids before adding a different type.

9.5.1 Vent Plug

The lubrication system is sealed to protect the oil from outside contamination. A vent plug is located on the housing weldment near the fill plug. It is a one-way passage used to vent any pressure build-up inside. A small amount of oil residue surrounding its location is normal.

9.0 Care & Maintenance - [cont'd]

9.5.2 Bearing Lubrication Oil Type and Capacity

Bearing Lubrication Oil – Type ISO VG32

The Allied Ho-Pac is factory filled with premium quality hydraulic oil ISO VG32 combining non-foam and anti-wear additives. The use of other oils shall be permitted only if they have a minimum viscosity of at least 12 cSt at an operating temperature of 66qC (150qF).

Oil Capacity – 3.9 qt.

Approximate oil capacity is 3.9 qt (3.7 l).
Do not overfill. Excess oil (from over-filling) will spray from the vent plug.

Oil Change Interval – 1000 Hours

Replace bearing oil every 1000 operating hours, or once per year. *Maintenance intervals are subject to adjustment if operating under extreme operating conditions.

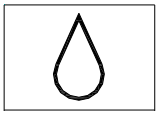
9.5.3 How To Check Oil Level

CAUTION

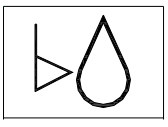
Hot surface - Burn injury if contacted. Some components of the machinery become hot during operation. Allow parts and fluids to cool before handling.

IMPORTANT

Contamination can shorten bearing life. Prevent dirt and debris from contaminating the oil. Always clean the area around the plugs prior to removal.



Oil Fill



Oil Level

Fig. 9-1 Oil Fill and Level Labels Identified

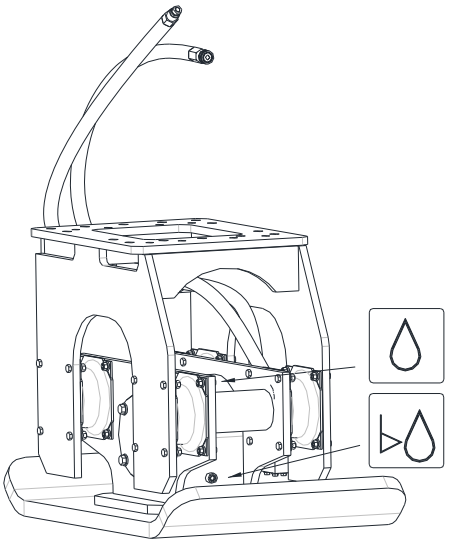
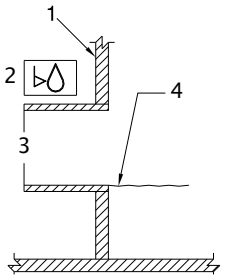


Fig. 9-2 Bearing Oil Fill & Level Plugs Identified

1. Position the Ho-Pac upright on a level surface with easy access to both the oil fill and oil level plugs.
2. Clean area around the oil level plug and remove.
3. The oil level should be visible at the lip of the opening.



1 Eccentric Housing

2 Label

3 Plug

4 Oil Level

Fig. 9-3 Oil Level for Bearings

9.5.4 How To Add Oil

1. Position the Ho-Pac upright on a level surface with easy access to the oil fill and level plugs.
2. Clean the area around the oil fill plug and remove.
3. Add oil until slight trickle from the opening.
4. Re-install and tighten oil fill and level plugs.
5. Wipe up any oil spills

9.0 Care & Maintenance - [cont'd]

9.5.5 How to Drain Oil

1. Position the Ho-Pac upright on a level surface with easy access to both the oil fill and oil level plugs. Refer to Figure 9-2.
2. Clean area around the oil level and fill plugs.
3. Loosen, but do not remove the plugs.
4. Point the plug downward so that oil will drain.
5. Place a suitable container to catch oil.
6. Remove oil level plug. Drain all oil.

IMPORTANT

If the oil is contaminated with water or dirt, flush the eccentric housing with clean oil prior to oil replacement. Properly dispose of used oil. Obey all local regulations for the disposal of these fluids.

7. Fill with new oil to proper level. Do Not Overfill. Use correct type.

9.6 How to Check Condition of Bearings

Due to the high loads and rotational speeds, 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.

9.6.1 Bearing Replacement

IMPORTANT

When repairs are made, 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.

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 replace bearings. Questions regarding maintenance, repair or operation can be directed to Allied Technical Service.

IMPORTANT

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

9.6.2 Bearing Removal

It will be necessary to remove the following items to access the bearing: Hydraulic motor, Bearing housing, Eccentric mass, 2nd bearing housing.

1. Ensure the bearing 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.

9.6.3 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 outer race of bearing.
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 and tighten bolts.

IMPORTANT

Apply thread locker to bearing housing bolts.

8. Install hydraulic motor and bolts.

9.0 Care & Maintenance - [cont'd]

9. Install hydraulic hoses.

9.7 Rubber Springs - Replacement

The rubber springs require periodic replacement. Factors that shorten the longevity of the rubber include abrasions, over-stretching and prolonged operating cycles that build-up heat in the rubber. Stopping the Ho-Pac during repositioning can help minimize heat-aging.

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.

CAUTION

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

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 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, washers and nuts.

IMPORTANT

Flat washer must be installed on the "Rubber Side" of mount. Refer to Figure 9-4.

7. Tighten bolt to proper torque. Refer to Table 9.2.

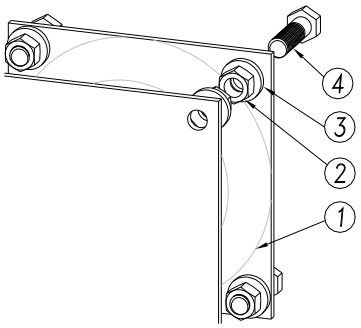


Fig. 9-4 Flat Washer (3) must be placed against "rubber side" (1) of Spring Mount

9.8 Threaded Fasteners – Replacement & Preparation

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.

- x A hardened washer must be used under the head of a bolt in a blind hole.
- x 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.
- x All threads must be free of damage and foreign debris. Surfaces to be bolted must be flat.
- x Do not apply thread lock compound to the bolt threads unless instructed to do so.
- x Lubricate bolt threads.

9.8.1 Bolts – Tightening Method, Pre-tensioning and Torque

- x Install all bolts by hand until finger tight.
- x Bolts should be systematically tightened starting from the most rigid part of the joint. Follow a crisscross pattern (Ref Fig. 9-5)
- x Use progressive tightening of bolts. Turn each bolt a little at a time until final torque is reached.

9.0 Care & Maintenance - [cont'd]

Step 1. Tighten all bolts to 1/3 of the final torque in Table 9.2.

Step 2. Repeat pattern and tighten all bolts until 2/3 of the specified torque is reached.

Step 3. Repeat pattern and tighten to final torque.

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

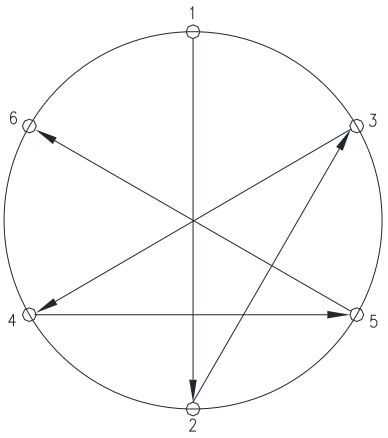


Fig. 9-5 Criss-cross Pattern for Bolted Assemblies

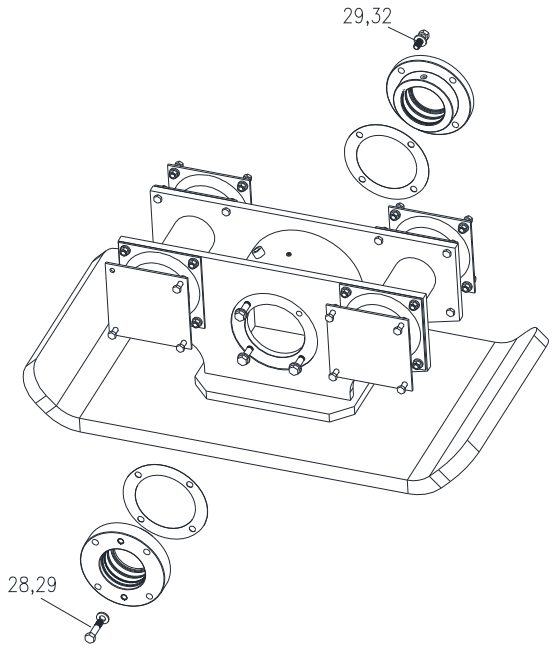


Fig. 9-6 Use Thread Locker on Bolts Identified

IMPORTANT

For compaction plate bolts only, apply a commercially available high strength thread locker (Example Loctite 271 or equivalent). Follow manufacturer's instructions for application.

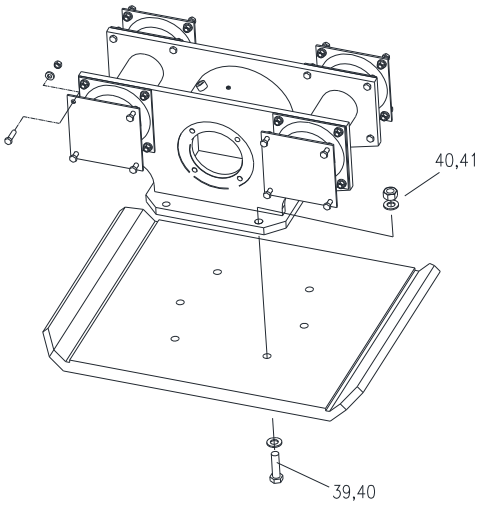


Fig. 9-7 Bolt-on Compaction Plate

Table 9.2 Standard Tightening Torque

SAE bolts are identified by radial lines on the head. Metric bolts identified by the class number on head.

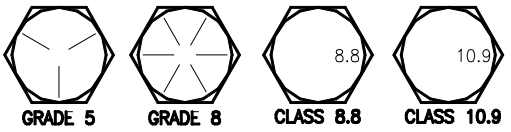


Fig. 9-8 SAE Bolt Head Markings & Metric Class

	SAE GR 8		CL 8.8		CL 10.9	
Size	ft-lb	Nxm	ft-lb	Nxm	ft-lb	Nxm
3/8	35	47				
1/2	85	115				
5/8	170	230				
3/4	280	380				
7/8	400	542				
1	650	880				

9.9 Hydraulic Motor & Flow Regulator Valve

NOTE: *The hydraulic motor and flow valve have no maintenance / adjustment requirements.*

10.0 Handling, Transport & Storage

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.

WARNING

Injury from falling object/debris. Hoisted items can be hazardous to bystanders or to the machine itself. Remove all unsecured items including loose parts, service tools and debris before item is hoisted.

CAUTION

Crush hazard. 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

Observe the following storage preparations.

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

11.0 Troubleshooting Guide

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

CAUTION

When working with the Allied equipment all procedures and operations must be performed correctly so that unsafe situations may be avoided. Do not attempt any repairs unless you have proper training, skills and tools. Understand all procedures before doing work. Do not proceed beyond instructions or warnings that you do not fully understand.

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
	Failed motor	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
	Imperfect bearing lubrication	Check oil level, quality & type
	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 internal bypass failed seals or worn gears	Inspect and replace motor
Operation smooth, but at reduced speed	Insufficient oil flow	Check carrier output If motor or flow regulator valve was replaced, check that the motor and valve are properly matched
Oil discharge from pressure relief vent	Oil level too high	Check oil level

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

If the carrier machine is equipped with an adjustable work mode switch, verify its proper setting for Ho-Pac operation.

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 [ºF]	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 176qF (80qC)

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.

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

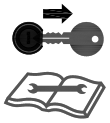
- When first installed on a carrier
- When repairs or modifications are made to the machine's hydraulic circuit.
- When the machine operates other hydraulic work tools.
- When the Ho-Pac is removed from one machine and attached to a different machine.
- Check the pressure every 250 operating hours is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

CAUTION

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

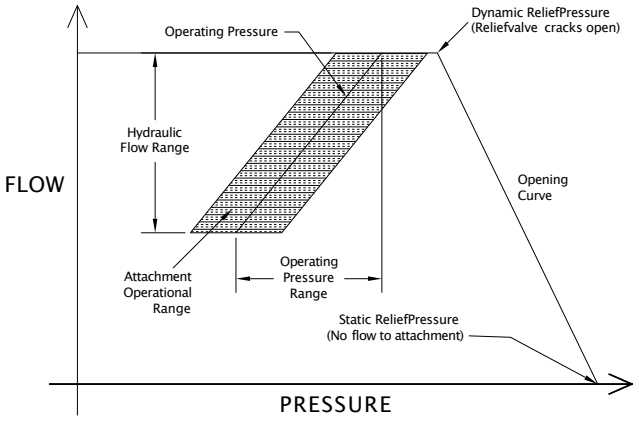


Fig. 12-1 Flow-Pressure Diagram

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.

12.4 Hydraulic Motor Options

Some Ho-Pac models offer different size motor options. Refer to the General Specifications Table for a list of available options.

12.4.1 Motor Rotation

The hydraulic motor is unidirectional, meaning it's designed to rotate in one direction only. Refer to Fig. 12-2. Viewed from the shaft end and with the idler gear (large portion of the motor) downward, the left-hand side port is marked [IN]. The right-hand port is marked [OUT].

CAUTION

Pressurizing the outlet port will damage the motor. Verify connections before pressurizing the hydraulic circuit. When viewed from the shaft end, the (IN) port is located on the left-hand side and the (OUT) port is on the right-hand side. **The motor is assembled for clockwise rotation.**

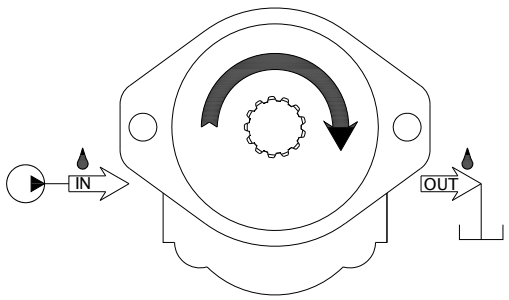


Fig. 12-2 Motor Rotation as Viewed From Shaft End

12.0 Technical Information – [cont'd]

12.4.2 Motor and Valve Combination

IMPORTANT

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 paired with a multi-function control valve to help optimize operation with improved reliability of critical components such as the motor and bearings.

12.4.3 Control Valve Function

The four functions of the valve 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 unrestricted, free flowing, and 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.

12.4.4 Control Valve – Adjustments

IMPORTANT

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

12.4.5 Control Valve – Part Number & Port Connections Identification

Refer to Figure 12-3. The part number of the control valve is stamped above connection port T2.

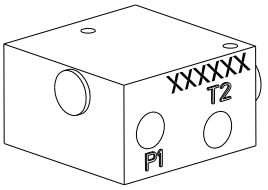


Fig. 12-3 Control Valve – Part Number Location XXXXXX Above Port T2 Identified

There are four (4) port connections located on the valve. Each port is stamped for identification. Refer to Fig. 12-4. The valve and motor ports are identified. The supply hose is also tagged [PRESSURE].

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).

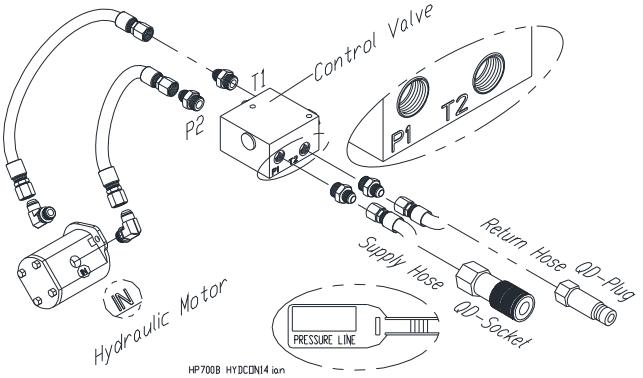


Fig. 12-4 Motor, Valve & Hose Connections Identified

IMPORTANT

The Ho-Pac will not operate if the supply and return hoses are crossed. **Pressurizing the outlet port of the motor will result in damage. Verify connections before pressurizing the hydraulic circuit.**

12.0 Technical Data

Table 12.1 Specifications for HP1600

Impulse Force			16,000 [71,170]	Lbs. [N]
Cycles Per Minute			2100	1/min
Sound Power Level			108 (Est'd)	DBA [LWA]
Hydraulic Flow [a]	SN-1399&Down		34 [129]	gpm [lpm]
	Motor Options SN-1400&Up	1	25 [95]	
		2	30 [114]	
		3	43 [163]	
Max Operating Pressure	SN-1399&Down		2300 [158]	psi [bar]
	Motor Options SN-1400&Up	1	3000 [207]	
		2	3000 [207]	
		3	2600 [180]	
Operating Pressure @ No Load			300-1000 [20-35]	
Auxiliary Circuit Relief Pressure	Dynamic [b]		Max Operating + 400 [28]	
	Static		Max Operating + 650 [45]	
Bearing Lubrication Oil Type / Capacity	Factory filled with ISO VG32 [d] / 3.9 qt. [3.7 l.]			
Hose Size	Pressure		1 [25]	Inch [mm]
	Return [c]		1 [25]	
Compaction Area	[Std]		6.4 [0.60]	Ft^2 [m^2]
	[Opt]		6.7 [0.67]	
Compaction Plate Dimensions	[Std]		29 x 32 [74 x 81]	Inch (cm)
	[Opt]		24 x 40 [61 x 102]	
Weight [f]	Flat-Top SR/MR [e]		1565 [710]	Lbs. [kg]
	VMS-13, VMS-16		1595 [725]	
Recommended Carrier Weight [g]	Backhoe		19-25 [8.6-11.4]	Lbs. x 1,000 [kg] x 1,000
	Excavator		20-45 [9-20.5]	

[a] Select the Motor / Valve Package most suitable with host machine. Optimal performance requires an auxiliary hydraulic circuit delivering the specified oil flow at a pressure equal to at least the dynamic relief pressure.

[b] Verify carrier's main relief is set at manufacturer's specifications. Set value must be equal to or greater than dynamic relief setting.

[c] Unrestricted, free flowing return of 100 psi or less. At elevated pressures, motor efficiency and shaft seal life are reduced

[d] Selection based on multiple factors including oil viscosity. Further details about bearing lubrication are found in the Care & Maintenance Section of this manual.

[e] Use with SR/MR family mounting brackets.

[f] Working weight with typical mounting bracket.

[g] Values listed are guidelines. Ensure the work tool is attached only to carriers with proven load-carrying capacity. Always consult the specifications of the equipment manufacturer for the load / lift chart.

12.0 Technical Data

General Dimensions – Model 1600

The Top Frame, along with the Mounting Bracket, provides the connection point for attaching the Ho-Pac to the carrier. Flat-top frames include two (2) hole patterns. The Ho-Pac does NOT include the mounting bracket. Order separately. Refer to Section 6 for further details.

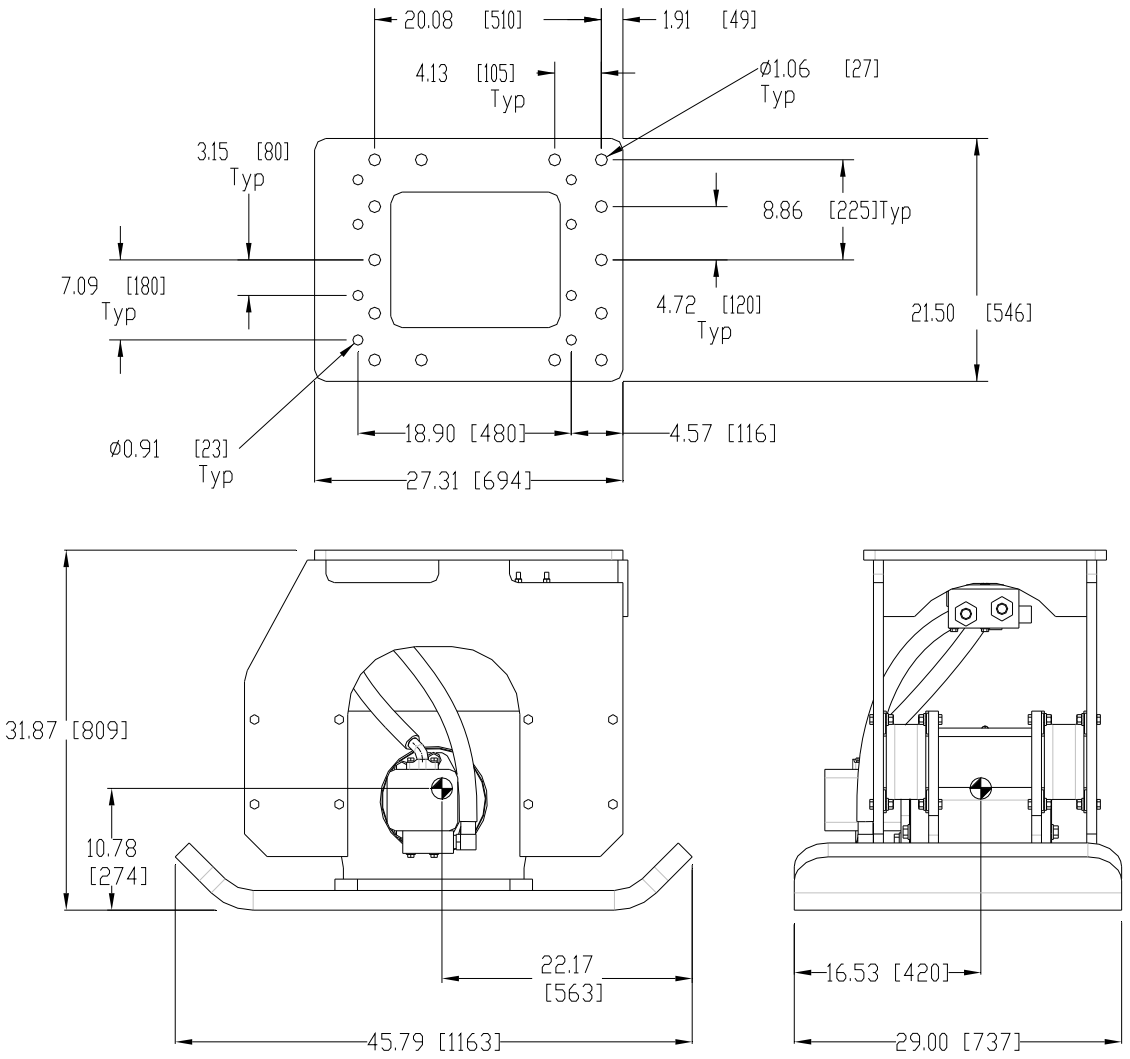


Fig. 12-5 – Configured with Flat Top Frame SR / MR ⊕ CG

12.0 Technical Data

General Dimensions – Model 1600

The Top Frame, along with the VMS Mounting Kit, provides the connection point for attaching the Ho-Pac to the carrier. Available VMS top frames include the VMS13 and the VMS16. The Ho-Pac includes one (1) VMS mounting kit.

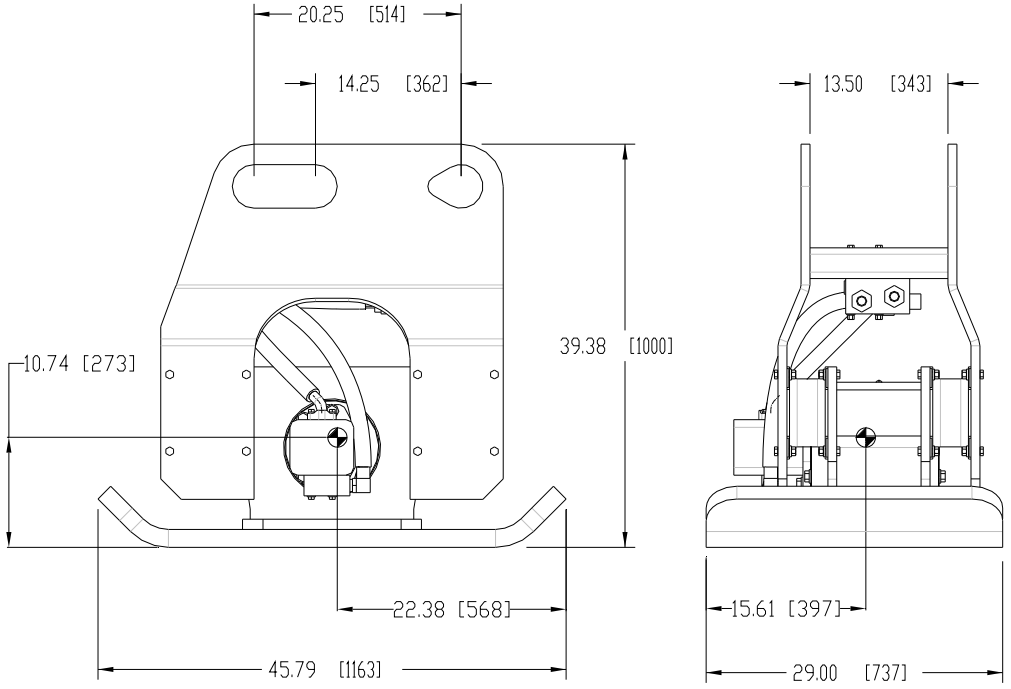


Fig. 12-6 Configured with VMS-13 Top Frame ⊕ CG

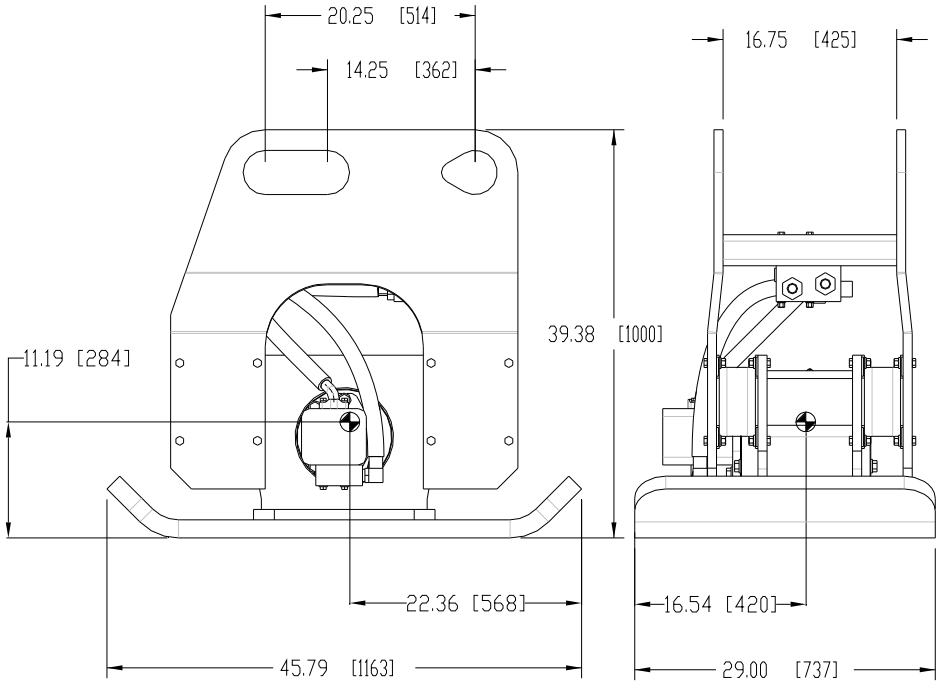


Fig. 12-7 Configured with VMS-16 Top Frame ⊕ CG

13.0 Spare Parts Information

13.1 Parts Section – Introduction & Scope

In this section, figures depict views that are intended for parts identification and not for purposes of repair or service of the product.

Verify that this is the correct document for your Allied attachment. Compare the information found on the equipment's identification tag with the information in Table 1.1. Refer to the figures in Section 2.0 of this manual for the location of this tag.

Material presented in this section, including tables, and figures describe typical standard configurations. Any and all figures that describe equipment as optional will require further review.

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

The figures found in this section illustrate and describe each part used in the assembly of the Allied product identified in Table 1.1. Tables and figures are common to all serial numbers except where noted. *Pay strict attention to any serial number restrictions.*

13.1.1 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.

13.1.2 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 and 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.

Part No.	**HP1600 Standard**
570319	Configured w/ Flat Top Frame

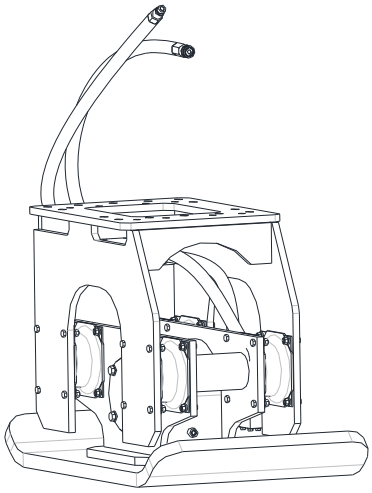


Fig. 13-1 Ho-Pac Model 1600-FT

Part No.	**HP1600 with VMS Options**
103350	Configured w/ VMS-13 Top Frame
103360	Configured w/ VMS-16 Top Frame

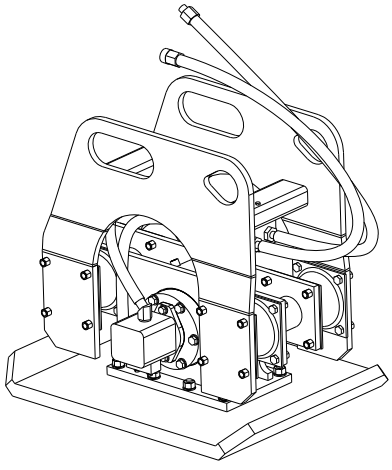


Fig. 13-2 Ho-Pac Model 1600-VMS

13.0 Spare Parts Information [cont'd]

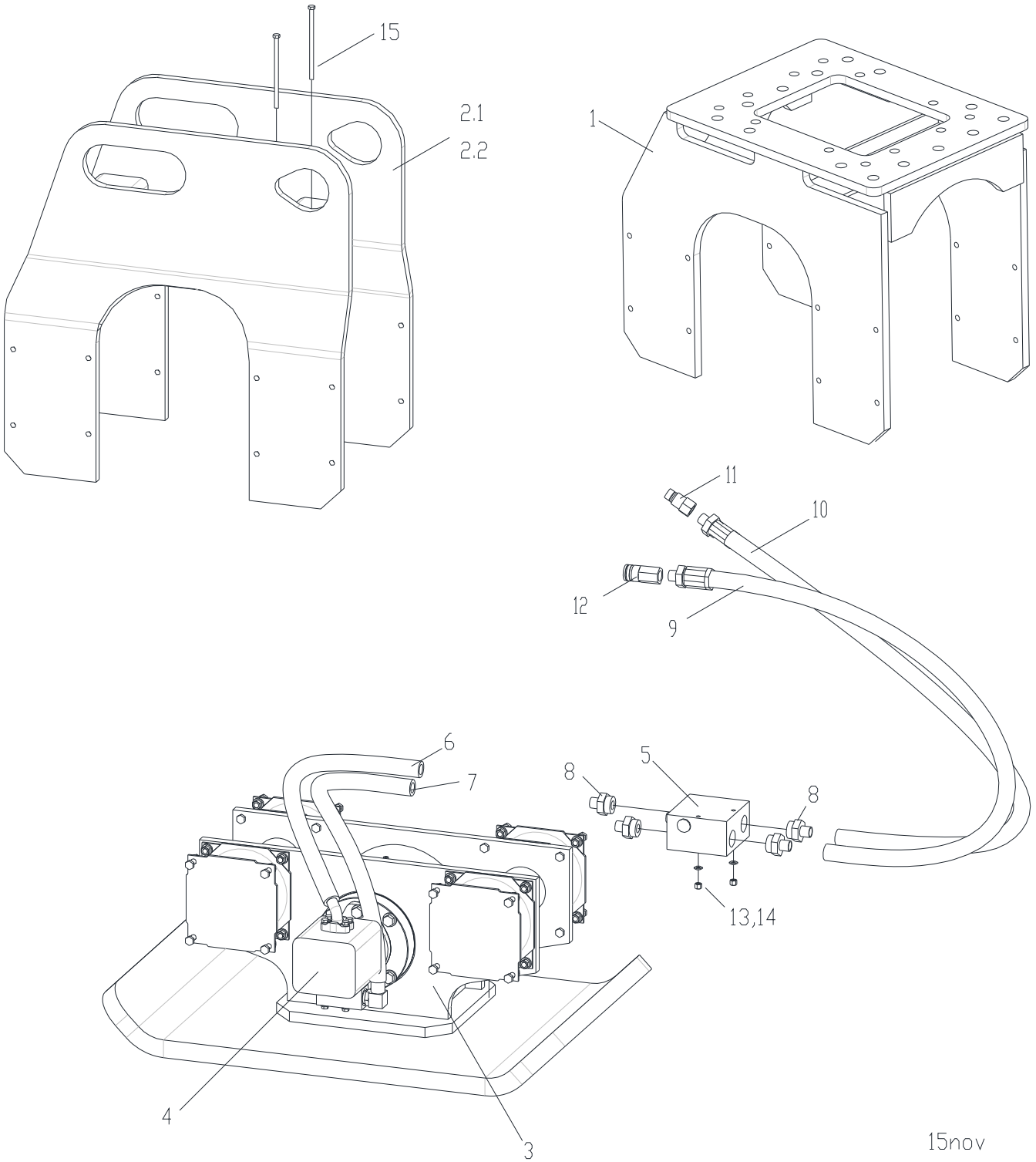


Fig. 13-3 Ho-Pac Model HP1600

13.0 Spare Parts Information [cont'd]

The Ho-Pac is offered in multiple configurations (i.e. Choice of Top Frame and Motor Options). Pay strict attention to captions, figures and notations as they identify product improvements (i.e. End S/N-1399, Begin S/N-1600).

Table 13.1 Ho-Pac HP1600-FT and HP1600-VMS

Item	Description	Part No.	Qty	Remarks / Specifications
1-15	**Ho-Pac HP1600-FT**	**570319C**	**1**	**Configured w/ Flat-Top Frame Item 1**
2.1-15	**Ho-Pac HP1600-VMS13**	**103350C**	**1**	**Configured w/ VMS13 Top Frame Item 2.1**
2.2-15	**Ho-Pac HP1600-VMS16**	**103360C**	**1**	**Configured w/ VMS16 Top Frame Item 2.2**
1	Flat Top Frame	570315	1	Standard SR / MR Mounting Bolt Pattern
2.1	VMS Top Frame	101554	1	Option-VMS13
2.2		101746		Option-VMS16
3	Dynamic Assembly	103335	1	Refer to Fig. 13-4 Table 13.2 for Details
4.1	Motor	Varies [a)]	1	Begin SN-1400 Motor Options Table 13.3
4.2	Motor-34 gpm	572076	1	End SN-1399 Table 13.3 for Details
5.1	Valve	Varies [a)]	1	Begin SN-1400 Motor Options Table 13.3
5.2	Valve-34 gpm	103352	1	End SN-1399 Table 13.3 for Details
6	Hose	101881	1	30"
7	Hose	102003	1	31"
8	Adapter	719059	4	
9	Hose	103297	1	96" Supply [IN]
10	Hose	103297	1	96" Return [OUT]
11	Quick Disconnect Plug	670008	1	
12	Quick Disconnect Socket	670007	1	
13	Flat Washer	653339	4	
14	Hex Nut	759808	2	
15	Hex Head Bolt	679530	2	

[a)] Improper pairing of motor and valve combination will result in poor compaction performance or bearing damage .

13.0 Spare Parts Information [cont'd]

Pay strict attention to captions, figures and notations as they identify product improvements (i.e. End S/N-1599, Begin S/N-1600).

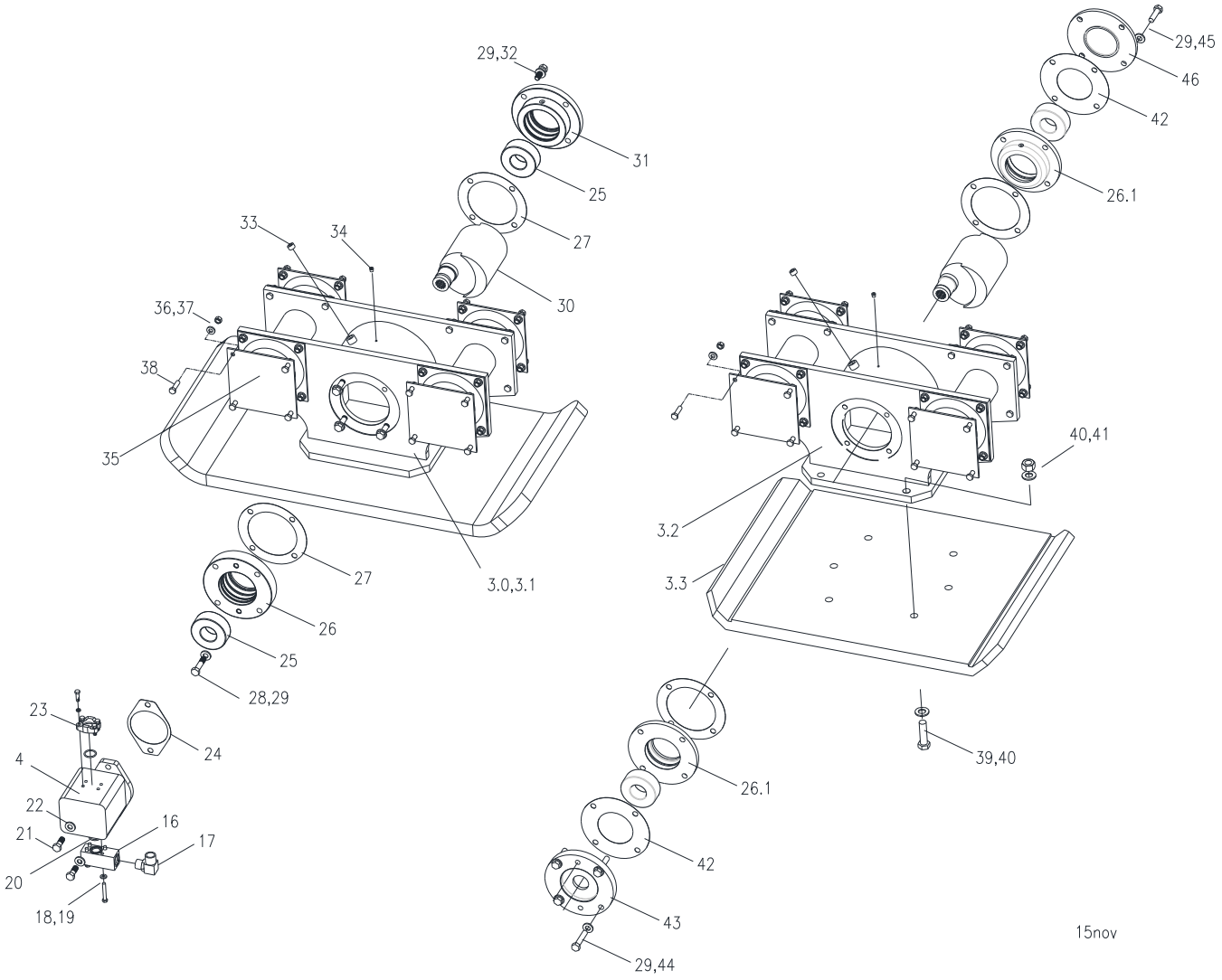


Fig. 13-4 Dynamic Assembly Begin SN-1600 (Left)
Dynamic Assembly End SN-1599 (Right)

13.0 Spare Parts Information [cont'd]

Pay strict attention to captions, figures and notations as they identify product improvements (i.e. End SN-1599, Begin SN-1600).

Table 13.2 Dynamic Assembly – Standard with Weld-on Compaction Plate (Bolt-on CP is option after SN-1599)

Item	Description	Part N°.	Qty	Remarks / Specifications
3.0	**Dynamic Assembly**	**103335**	**1**	**w/ Weld-on Compaction Plate**
3.1	Eccentric Housing	572576+572577	1	W/ Weld-on Compaction Plate Begin SN-1600
3.2	Eccentric Housing	103334	1	Bolt-on type End SN-1599
3.3	Tamper Plate	719603	1	Bolt-on type - Std Dimensions End SN-1599
4	Motor & Valve Option	Varies [a)]	1	Options Begin SN-1400. Details Table 13.3
16	Manifold	719012	1	
17	Elbow - 90°	719651	1	
18	Hex Head Bolt	719014	4	3/8" x 2 ½"
19	Flat Washer	903713	4	3/8"
20	O-Ring	719027	1	
21	Hex Head Bolt	719018	2	5/8" x 1 ¾"
22	Washer	953285	2	NL16
23	Split Flange Kit	719896	1	Kit Incl. O-ring & Hardware
24	Gasket	103701	1	Motor
25	Bearing	719007	2	
26	Bearing Housing	571575	1	Motor Side Begin SN-1600
26.1	Bearing Housing	103333	2	End SN-1599
27	Gasket	103711	2	Housing
28	Hex Head Bolt	659025	4	5/8" x 3
29	Flat Washer	719015	8	5/8"
30	Eccentric Mass	103336	1	
31	Bearing Housing	571576	1	w/ Closed End Begin SN-1600
32	Hex Head Bolt	653356	4	5/8" x 2 Begin SN-1600
33	Relief Plug	A102780	1	
34	Plug	656775	2	Socket Head 08NPT
35	Rubber Spring Mount	719649	4	

[a)] Improper pairing of motor and valve combination will result in poor compaction performance or bearing damage. End SN-1599 last production w/ 2-piece bearing housing and bolt-on compaction plate.

13.0 Spare Parts Information [cont'd]

Pay strict attention to captions, figures and notations as they identify product improvements (i.e. End SN-1599, Begin SN-1600).

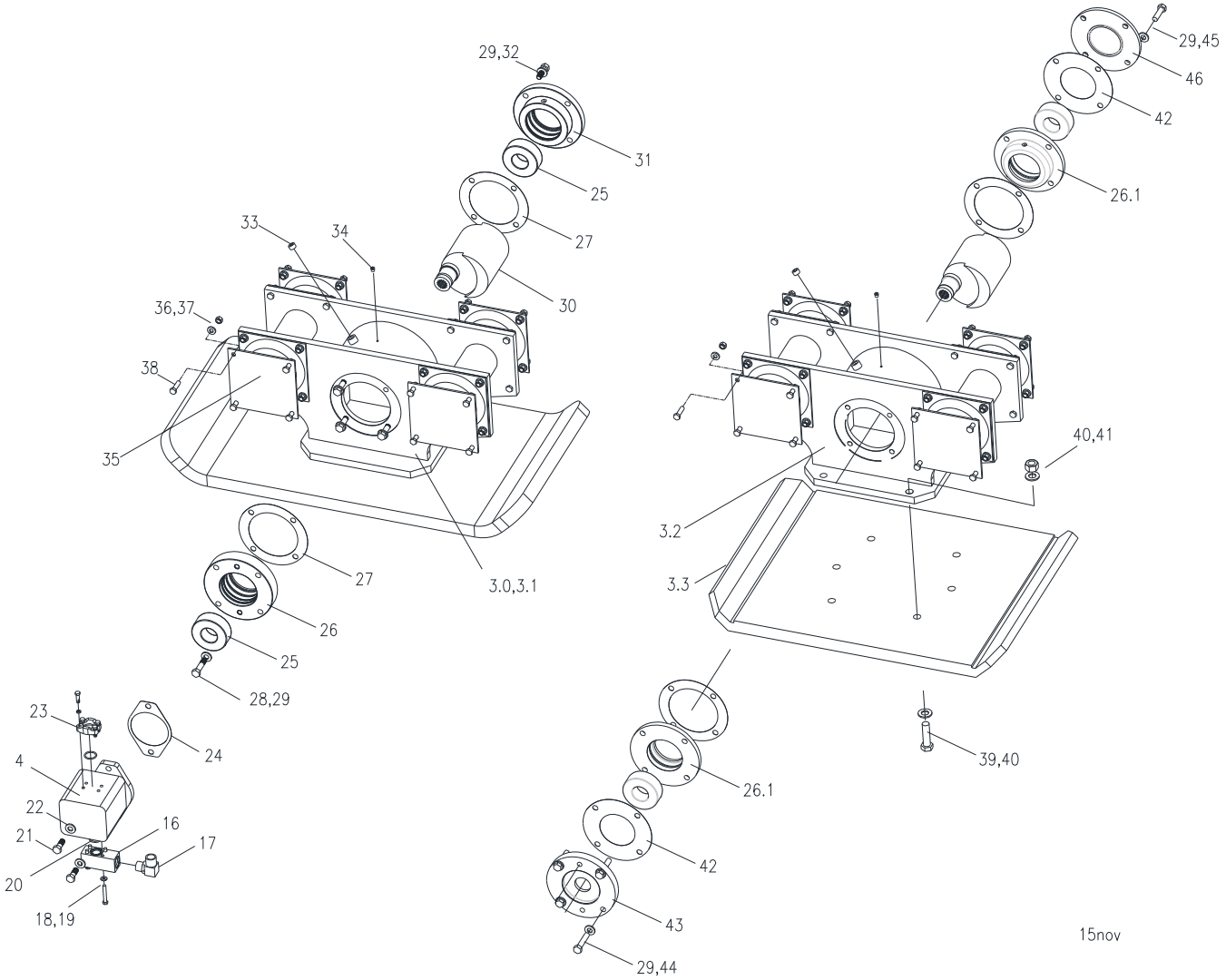


Fig. 13-4 Dynamic Assembly Begin SN-1600 (Left)
Dynamic Assembly End SN-1599 (Right)

13.0 Spare Parts Information [cont'd]

Pay strict attention to captions, figures and notations as they identify product improvements (i.e. End S/N-1599, Begin S/N-1600).

Table 13.2 Dynamic Assembly - Standard with Weld-on Compaction Plate (Bolt-on CP is option after SN-1599)

Item	Description	Part N$^{o.}$	Qty	Remarks / Specifications
36	Flat Washer	708512	32	½"
37	Hex Nut	708787	32	½"
38	Hex Head Bolt	719730	32	½"
39	Hex Head Bolt	719101	6	7/8" End SN-1399
40	Flat Washer	719003	12	7/8" End SN-1399
41	Heavy Hex Nut	719004	6	7/8" End SN-1399
42	Gasket	103710	2	End SN-1399
43	Adapter Plate	103343	1	End SN-1399
44	Hex Head Bolt	719013	4	End SN-1399 5/8 x 3"
45	Hex Head Bolt	719011	4	End SN-1399 5/8" x 2 1/4
46	Cover Plate	103342	1	End SN-1399

[a)] Improper pairing of motor and valve combination will result in poor compaction performance or bearing damage. End SN-1599 last production w/ 2-piece bearing housing and bolt-on compaction plate.

13.0 Spare Parts Information [cont'd]

Table 13.3 Motor & Valve Options

Option Begin SN-1400	"L" - Length Inch [mm]	Flow gpm [lpm]	Part Number Motor [a,c]	Valve [a]	Motor & Valve Package [b]
1	5-1/16 [129]	25 [95]	571884	571887	572072
2	5-1/4 [133]	30 [114]	571885	571888	572073
3	5-13/16 [148]	43 [163]	571886	571889	572074
Std. End SN1399	---	34 [128]	572076 (Was 719717)	A102647	---

[a] Incorrect combination of motor and valve will result in poor performance or equipment damage.
[b] Package includes one (1) Motor and one (1) Valve.
[c] Seal kit 573211 for all motors listed except 719717.

13.2.1 Motor and Valve Identification

The Ho-Pac is offered with multiple motor options. Pay strict attention to values, figures, captions and notations.

IMPORTANT

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

13.2.2 Motor Identification

Refer to Figure 13-5. 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 13.1 to determine the part number.

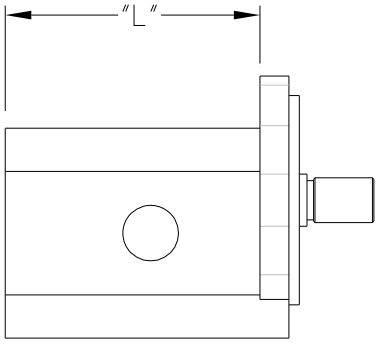


Fig. 13-5 Measure Body at "L" to Identify Motor

13.2.3 Valve Identification

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

IMPORTANT

For ease of identification, the part number of the control valve is stamped above the T2 port. Each of the four ports is stamped for identification.

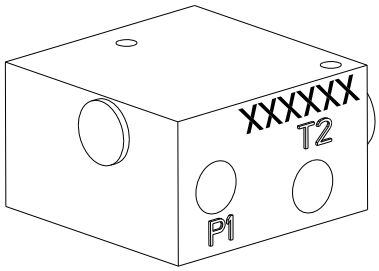


Fig. 13-6 Control Valve - Part Number Location Identified at XXXXXX

13.0 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 1600

Serial No. _____

Please fill out completely

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:**

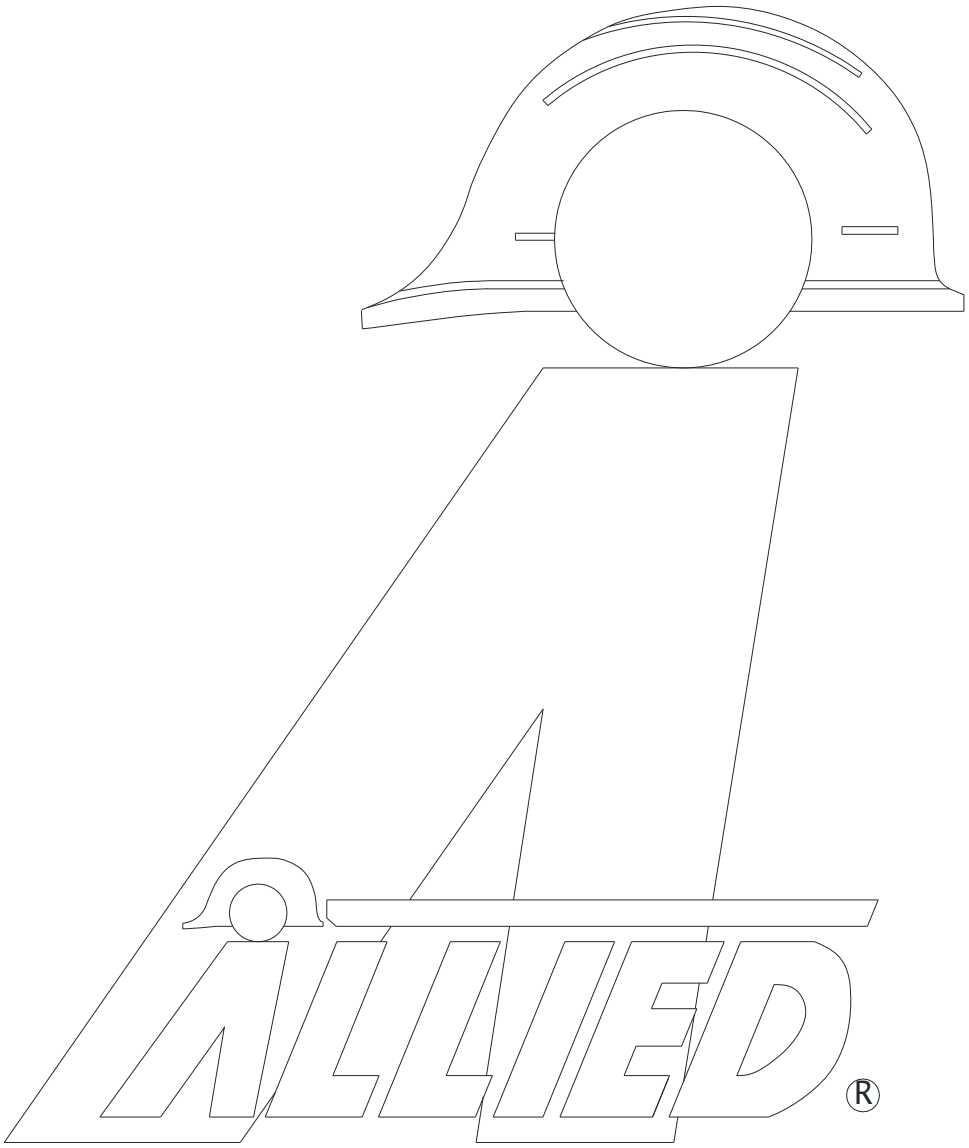
Initials

_____ ☐ Ship complete order only

_____ ☐ Ship available parts and contact customer on disposition of backordered parts

_____ ☐ Other – specify below

Notes



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