ALLIED

Construction Products, LLC

TECHNICAL MANUAL

Manual Part Number 002003
May 3, 2002

4700 SERIES HO-PAC

Allied Ho-Pac Model 4700 Series
Document Change Notice

Date	Page	Change
8-27-99	Cover	New Design
8-27-99	38,40,42,	Art
8-27-99	39,41,43,45,47	Parts Lists
1-8-01	Throughout	Added new types
1-8-01	Throughout	Editting changes/rewrites
1-8-01	7 & 8	Updated Specs and Dimensions
1-8-01	9,10,11,12	Dimension Drawings
1-8-01	14,16,18,20	Decal Drawings
1-8-01	15,17,19,21	Decal Parts Lists
1-8-01	44,46,48,50	Parts Lists
1-8-01	45,47,49,51	Parts Drawings
1-8-01	52,53	Added Pin Kit & P/L
5-03-02	All	Update to Current Product and Documentation Standards

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Section **Page**

SECTION 1.0
INTRODUCTION

Ho-Pac Technical Manual: Part Number 002003

This Technical Manual is applicable to Ho-Pac:

Model: 4700 series
Serial Numbers: 4896 and above
Years of Manufacture: 1994 and beyond
Serial Number(s)_____

The model and serial numbers are located on the ID Plate mounted on the Ho-Pac as shown in Section 4.4 Decal, Lifting and Lubrication Diagrams.

This manual contains important information for the safe use and maintenance of the Allied Ho-Pac. Read this manual thoroughly before installing, operating or servicing the Ho-Pac. This manual must be easily accessible to operators, or service and transport personnel. Store this manual in a convenient location.

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

1.1 Safety Information

When using the Ho-Pac, safety procedures must be followed. See Section 4.0 for further safety guidelines.

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

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

1.2 Warranty Information

Warranty coverage of the Allied Ho-Pac depends on proper maintenance and operation of the Ho-Pac as detailed in this manual. Improper maintenance or operation shall void Ho-Pac warranty coverage.

Immediately upon receipt of the Ho-Pac, read all Allied warranty documents delivered with the unit for a thorough understanding of warranty coverage.

Record the Ho-Pac Serial Number in the space provided above.

1.3 Allied Product Policies

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

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

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

These exclusions apply to damage to the Ho-Pac, associated equipment, and injury to personnel.

SECTION 2.0
OVERVIEW

The Allied Ho-Pac is a boom-mounted, hydraulic powered, vibrating plate compactor and driver. It is used for soil compaction and sheet/pile installation. The Ho-Pac is typically mounted on either a rubber tired or track construction vehicle.

The Allied 4700 Ho-Pac can compact up to 3 foot lifts of granular materials and up to 2 foot lifts of loose clay soils to densities of 95% Proctor. Soils with moisture contents near their maximum density improve compaction effectiveness.

The Allied Ho-Pac vibrational compactor consists of the following major subassemblies:

The DYNAMIC ASSEMBLY includes the hydraulic motor, bearings, eccentric mass, housing frame and base plate. This assembly generates and transfers the vibratory energy to the soil.

The SUSPENSION SYSTEM has spring mounts that suspend and isolate the Dynamic Assembly from the Mounting Frame.

The MOUNTING FRAME houses the Suspension System and mounts to the boom of the carrier.

SECTION 3.0
PRINCIPLES OF OPERATION

The Allied Ho-Pac is a high energy compaction tool utilizing three compaction techniques:

- The IMPULSE FORCE generated by the rotating eccentric mass vibrates the soil near the base plate to eliminate voids between material particles.
- The VIBRATION FREQUENCY of 2000 r.p.m. provides maximum effectiveness for the consolidation and compaction of granular soil materials.
- The DOWN FORCE of the carrier provides a preload force to effectively transfer the vibrating energy and to compress the material.

Optimum compaction is usually obtained with two passes. The duration of the initial pass is dependent on depth and material. The second pass may require additional fill material and Ho-Pac repositioning to achieve a finished surface.

The Allied Ho-Pac can also be an effective sheet or pile driver. The Ho-Pac's vibrational energy is transferred through the sheet or pile to the soil. Sandy soils and moist clays are "softened" by the vibration which allows the sheet or pile to penetrate more easily.

SECTION 4.0
TECHNICAL INFORMATION

4.1 SPECIFICATIONS

The following specifications apply to all configurations of the 4700 Ho-Pac. Table 4-1 on the next page contains dimensions specific to each configuration.

Impulse Force	3030 lbs (13,500 N)
Cycles per Minute	2000
Sound Power Level	108 dBA (LWA)
Hydraulic Flow Required	7 gpm (26 lpm)
Operating Pressure - Load	1700-2200 psi (117-152 bar)
Operating Pressure - No Load	300-500 psi (20-35 bar)
Hydraulic Capacity	0.2 gal (0.7 l) Approximate

Base Plate

Dimensions	12 inch x 15 inch (30 cm x 46 cm)
Compaction Area	1.5 ft2 (0.14 m2)

Hydraulic Hose Size

Pressure Line	1/2 inch diameter (12 mm)
Return Line	1/2 inch diameter (12 mm)

Recommended Carrier Weights

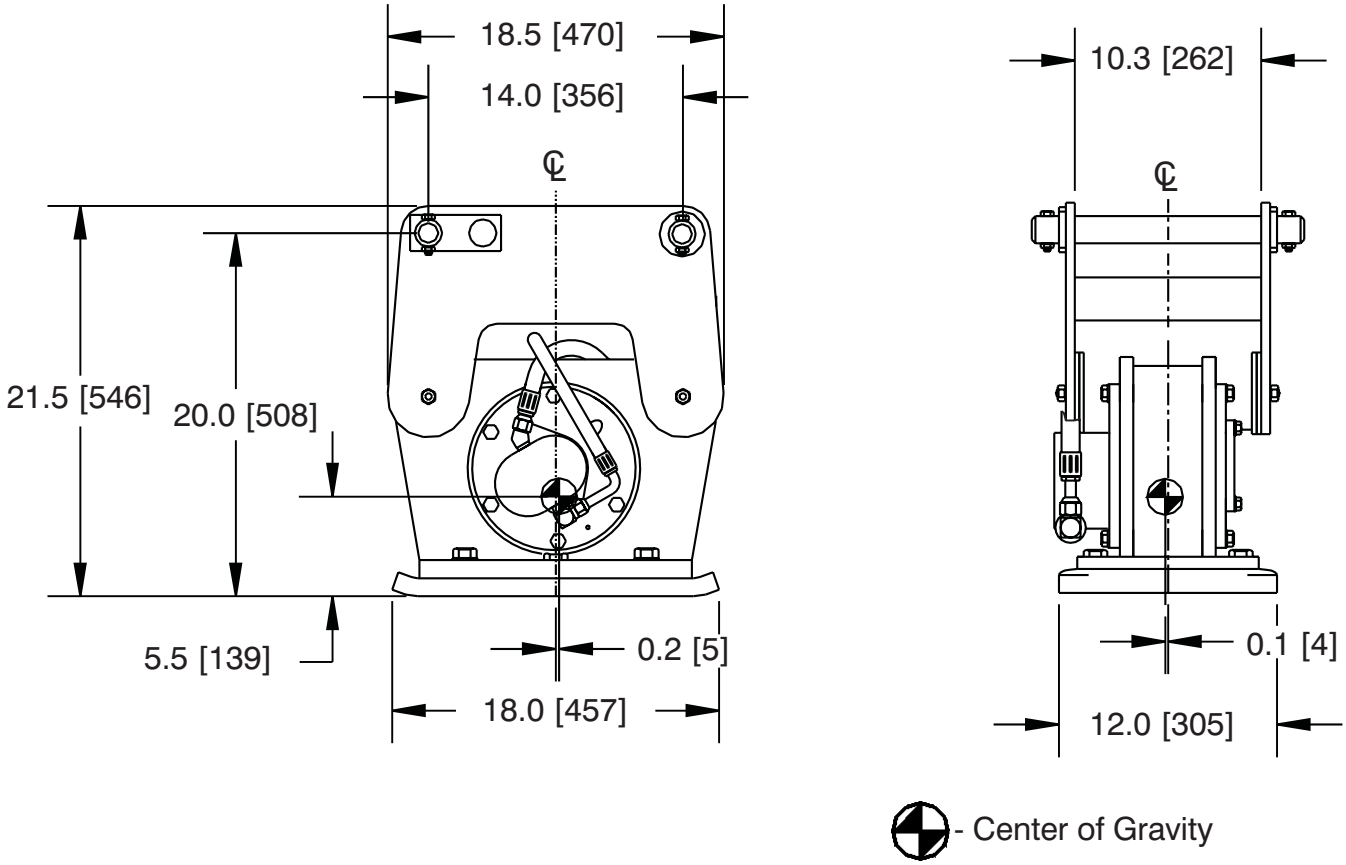
Backhoe	9000-15,000 lbs (4000-7000 kg)
Excavator	6000-15,000 lbs. (3000-7000 kg)
Skid Steer	4000 lbs & Up (2000 kg & Up)

Table 4-1. 4700 Ho-Pac Dimensions					
	STD*	**BSF**	**BSF With Swivel****	**Flat Top Custom**	**XSF**
Weight lbs (kg)	370 (168)	370 (168)	565 (256)	355 (162)	362 (164)
Height in. (mm)	21.5 (546)	21.5 (546)	30.9 (785)	19.3 (490)	21.5 (546)
Width in. (mm)	10.3 (262)	12.0 (305)	13.0 (330)	12.0 (305)	12.0 (305)
Depth in. (mm)	18.5 (470)	18.5 (470)	18.5 (470)	18.5 (470)	19.0 (483)
Mounting Pin Diameter in. (mm)	1.50 (38)	1.50 (38) 1.75 (44)	1.50 (38)	N/A	See Mounting Pin Kits Page 53
Max Boom Width in. (mm)	10.3 (262)	10.3 (262)	10.3 (262)	N/A	6.68 (170)

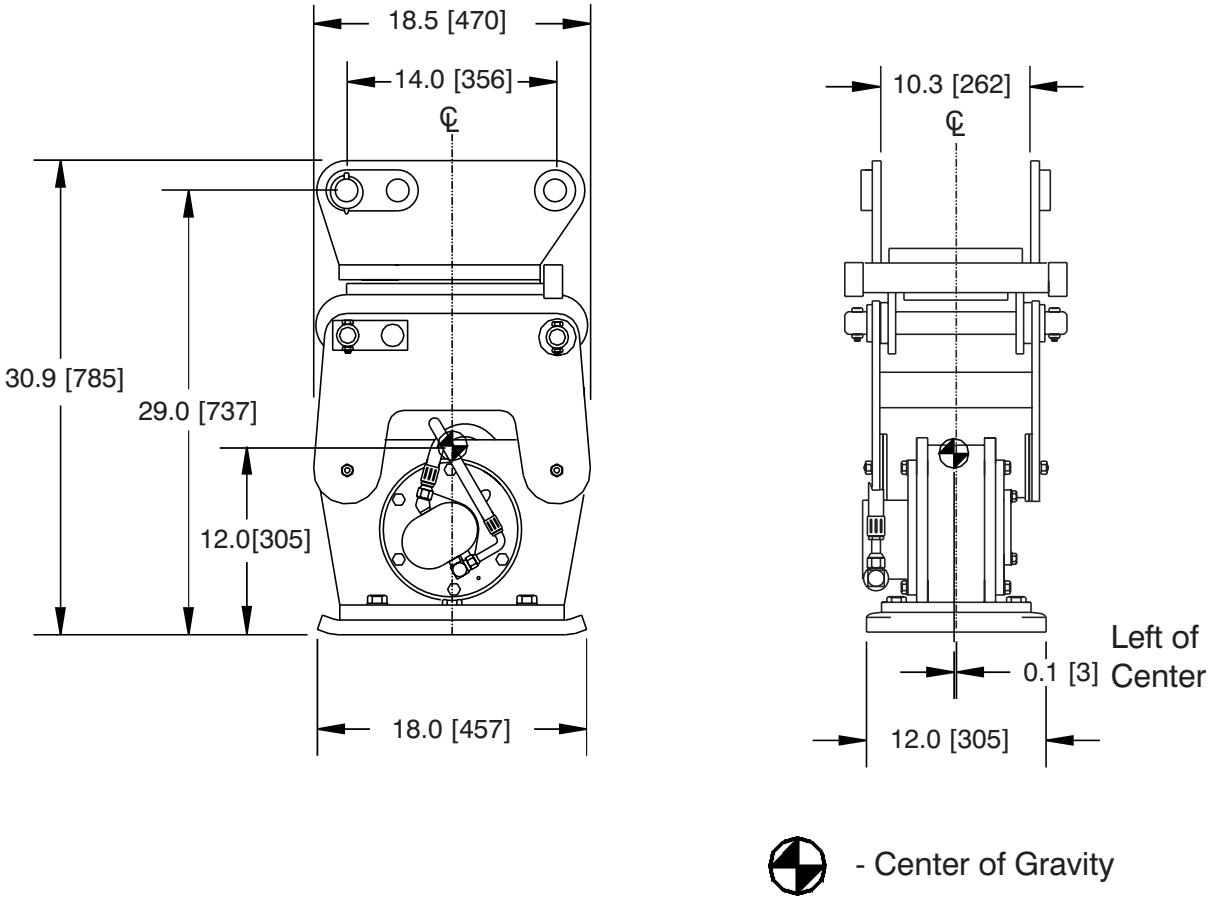
*This model has been discontinued.

**Swivel attachment may be locked in 0, 45, and 90 degree positions.

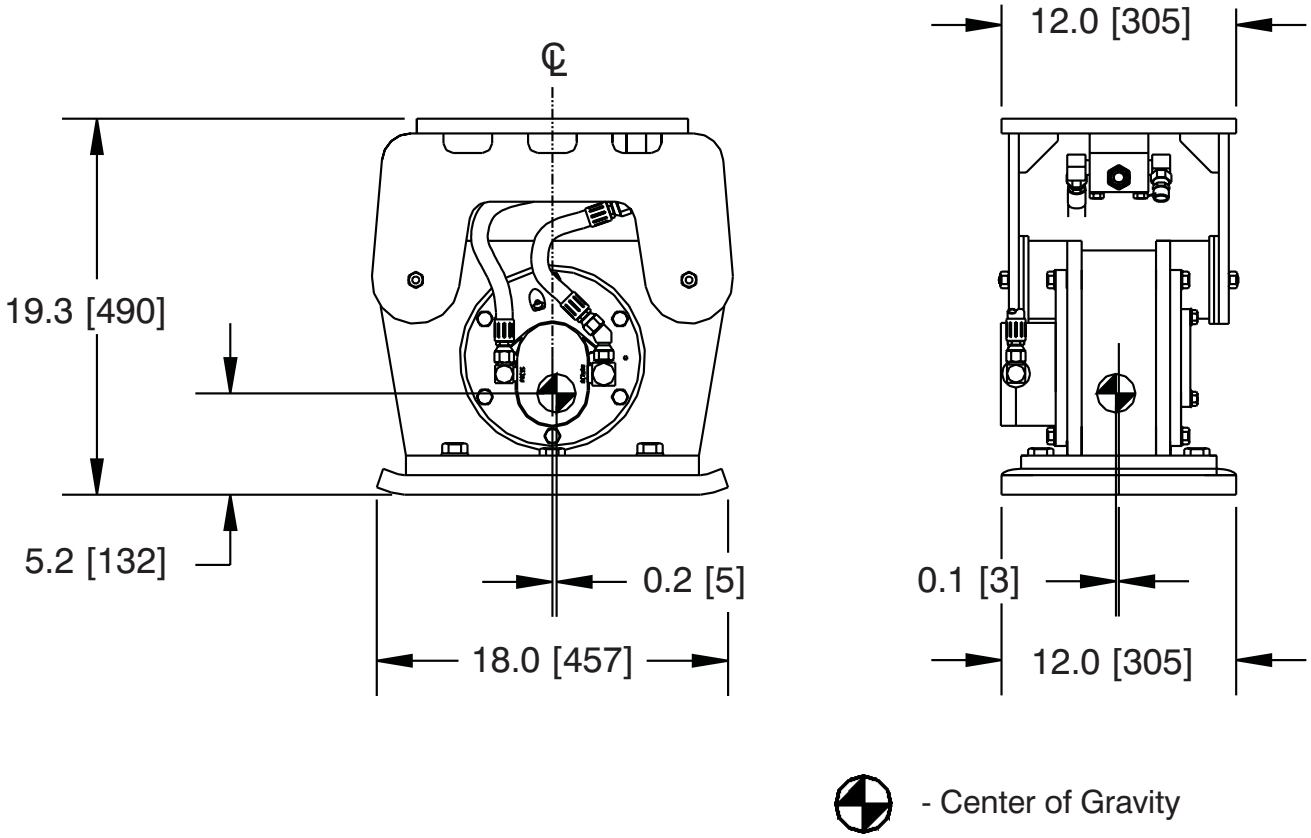
4.2 DIMENSION DIAGRAMS



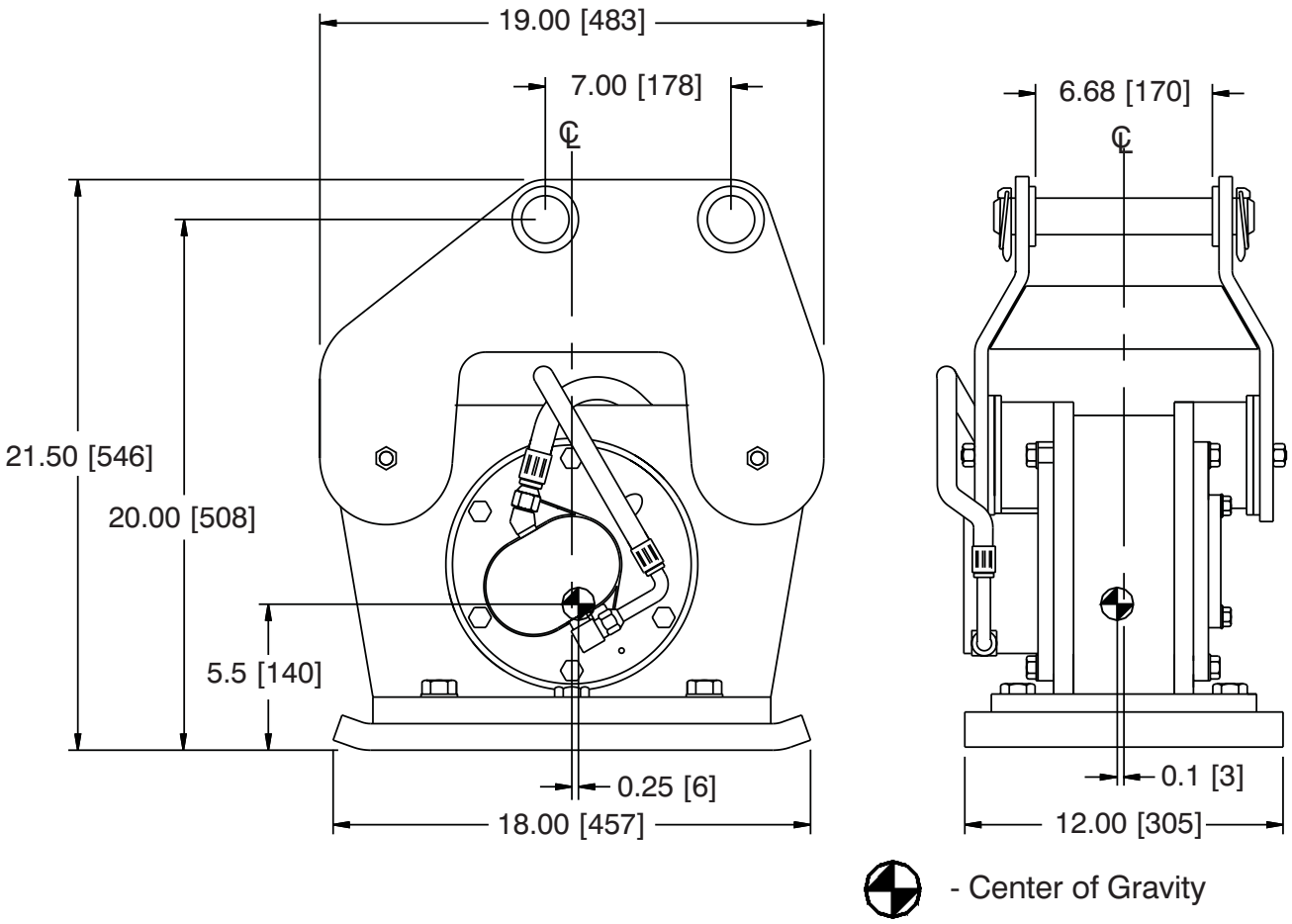
STD/BSF Dimension Diagram
The STD Model has been discontinued.



BSF with Swivel Dimension Diagram

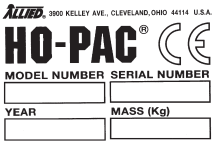


Custom Flat Top Dimension Diagram



XSF Ho-Pac Dimension Diagram

4.3 DECAL IDENTIFICATION



The ID PLATE (Identification Plate) contains the following information: Manufacturer's name and address, Product Name, CE compliance marking, Model Number, Serial Number, Year of Manufacture, and Mass.

The LIFT POINT decal identifies the location of the recommended lifting points of the Ho-Pac.

The LUBRICATION decal identifies the location and frequency of required lubrication. Refer to Section 10.2 for more information.

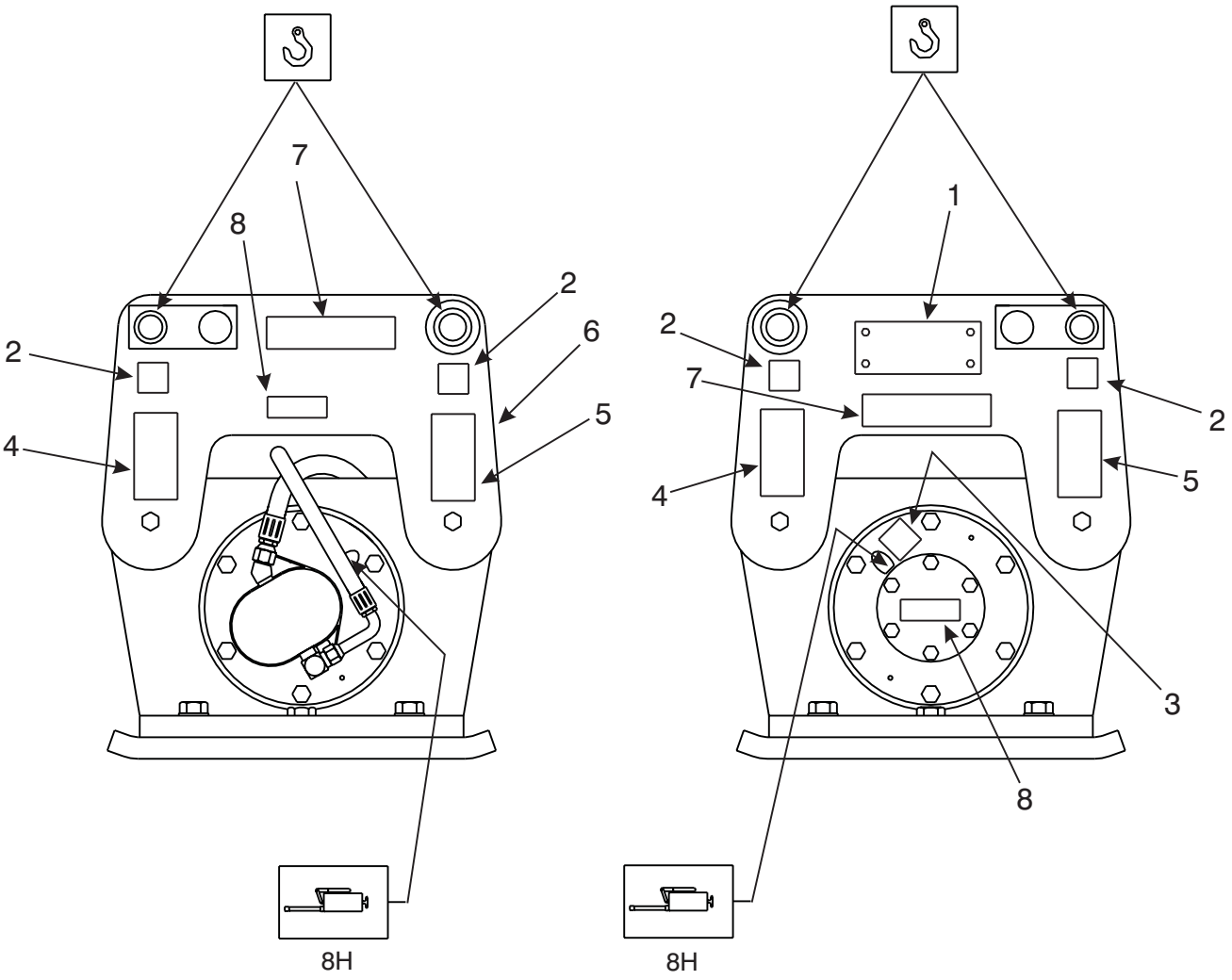
The STAY CLEAR decal indicates that personnel and by-standers are to maintain a safe distance from the Ho-Pac during operation.

The READ INSTRUCTION decal indicates that it is important for the operator to read the manual prior to transporting, installing, operating, or servicing the Ho-Pac.

The HOT SURFACE decal indicates that the hydraulic components may be hot and that proper protective equipment is required. These components include the quick disconnect couplings, hoses, hose fittings, and hydraulic motor.

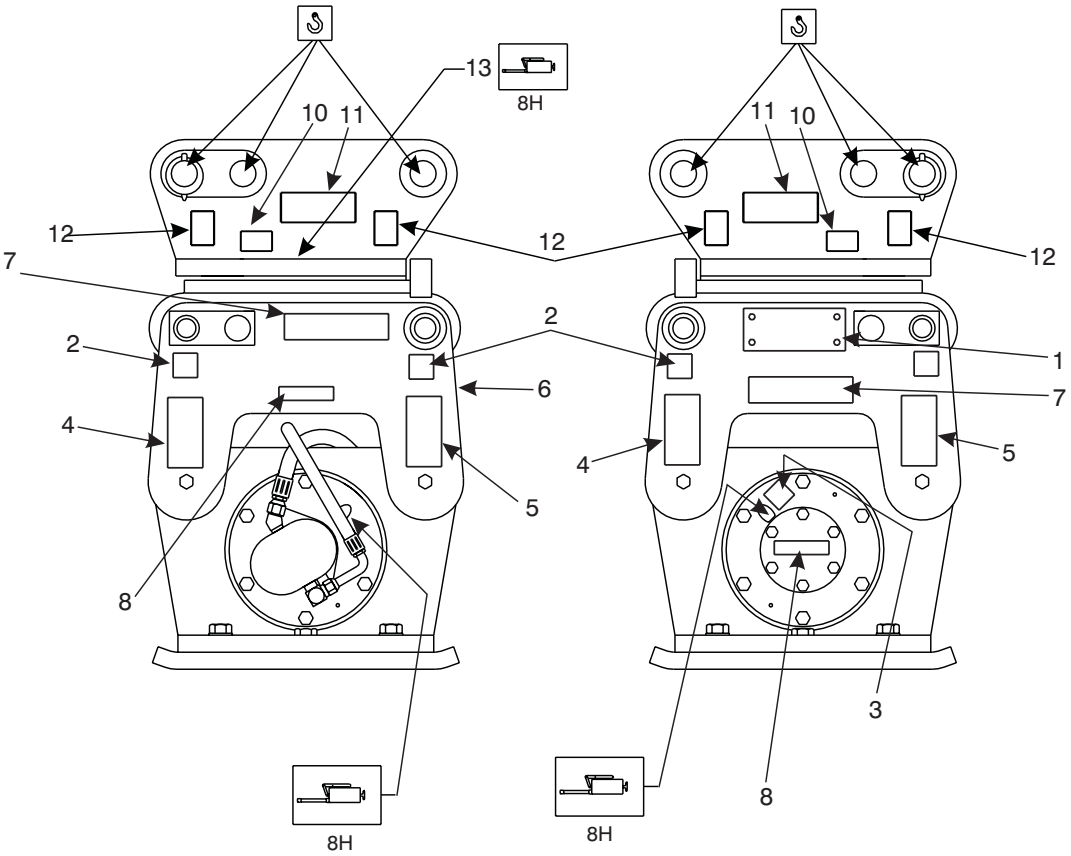
The ALLIED LOGO decal is the Allied brand identifier and is a registered trademark of Allied Construction Products, LLC.

4.4 DECAL, LIFTING AND LUBRICATION DIAGRAMS



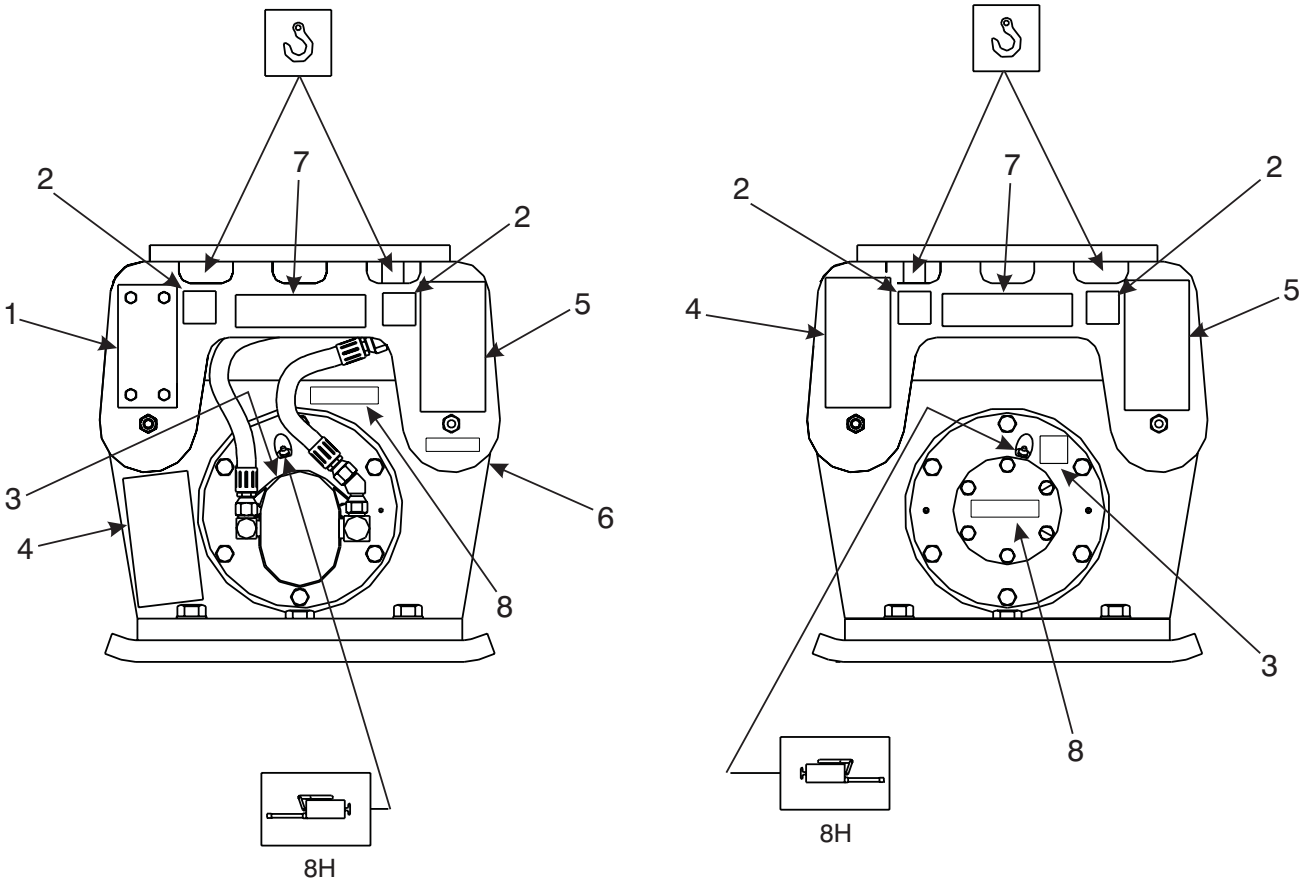
STD/BSF Decal & Lubrication Drawing
The STD Model has been discontinued.

STD/BSF Ho-Pac Decal and Lubrication Parts List Part No. 981206 The STD Model has been discontinued.			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	676980	ID Plate
2	4	676982	Lift Point
3	2	676985	Grease 8 hr.
4	2	676981	Stay Clear
5	2	676984	Read Instructions
6	1	676983	Hot Surface
7	2	676651	Allied Logo
8	2	100156	Decal - Model 4700
9	1	818676	Pressure I.D. Tag (Located on Pressure Hose)



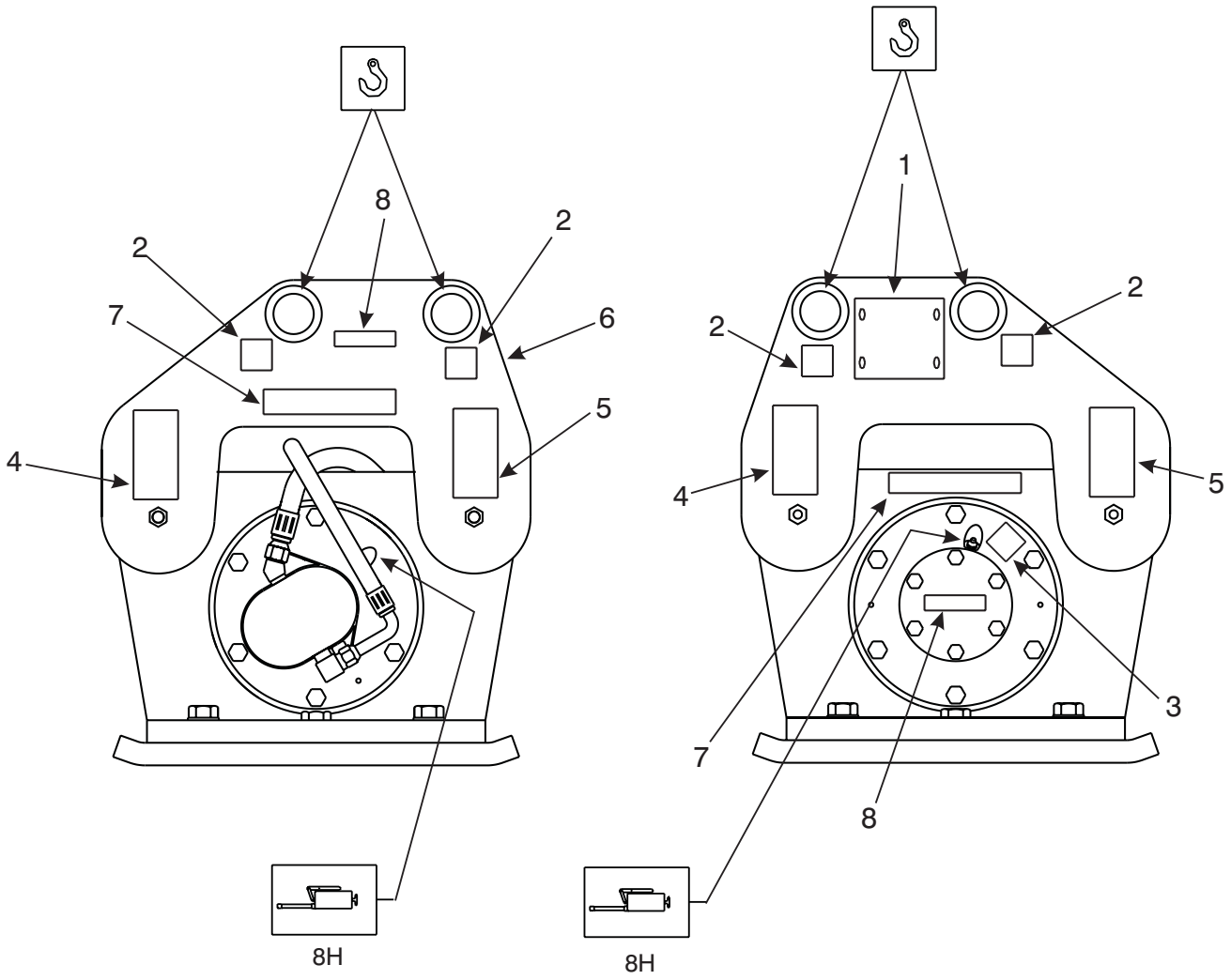
BSF Ho-Pac with Swivel Decal & Lubrication Drawing

BSF Ho-Pac with Swivel Decal and Lubrication Parts List			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
		981206	Standard Ho-Pac Decals
1	1	676980	ID Plate
2	4	676982	Lift Point
3	2	676985	Grease 8 hr.
4	2	676981	Stay Clear
5	2	676984	Read Instructions
6	1	676983	Hot Surface
7	2	676651	Allied Logo
8	2	100156	Decal - Model 4700
9	1	818676	Pressure I.D. Tag (Located on Pressure Hose)
		676957	Swivel Decals
10	2	815696	Made in USA
11	2	676651	Decal - Allied
12	4	676982	Lift Point
13	1	676985	Grease 8 hr.



Custom Flat Top Decal & Lubrication Drawing

Custom Flat Top Ho-Pac Decal and Lubrication Parts List Part No. 981206			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	676980	ID Plate
2	4	676982	Lift Point
3	2	676985	Grease 8 hr.
4	2	676981	Stay Clear
5	2	676984	Read Instructions
6	1	676983	Hot Surface
7	2	676651	Allied Logo
8	2	100156	Decal - Model 4700
9	1	818676	Pressure I.D. Tag (Located on Pressure Hose)



XSF Decal & Lubrication Drawing

XSF Ho-Pac
Decal and Lubrication Parts List
Part No. 981206

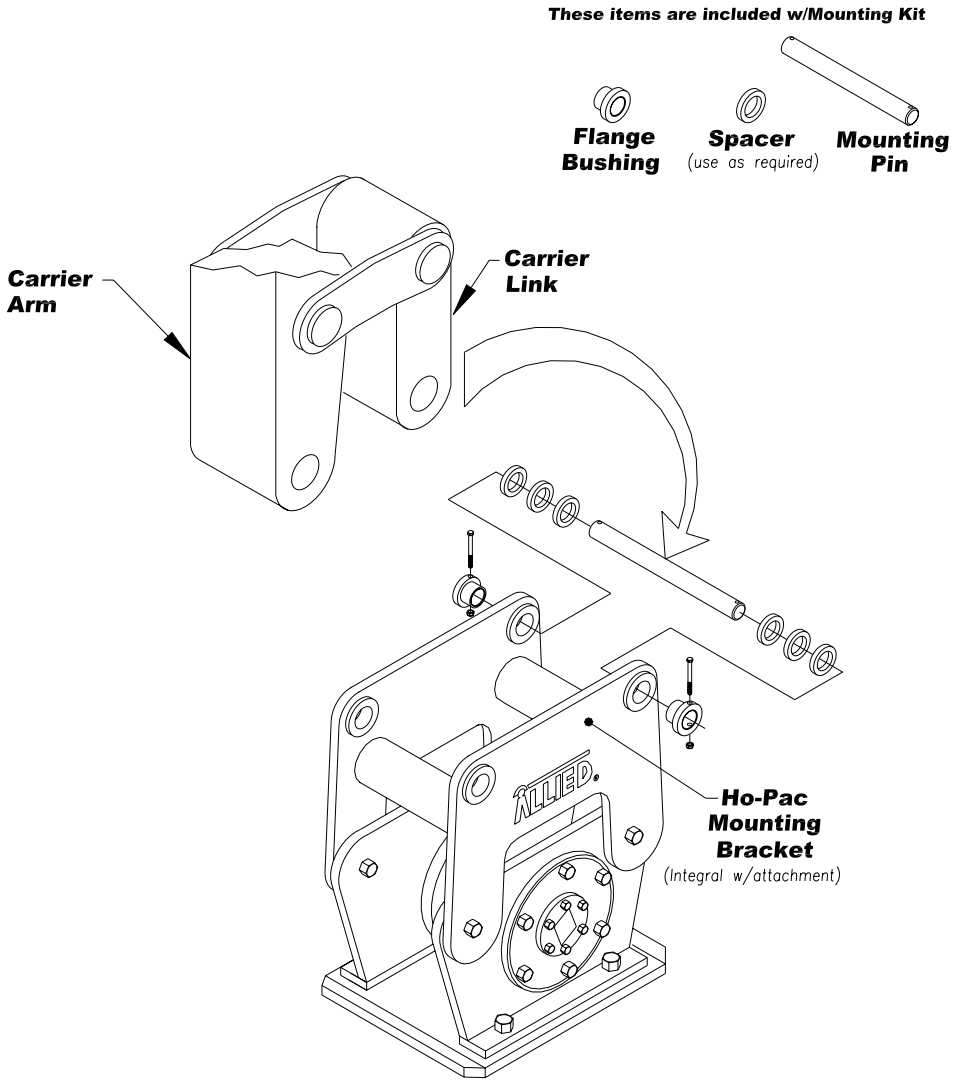
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	676980	ID Plate
2	4	676982	Lift Point
3	2	676985	Grease 8 hr.
4	2	676981	Stay Clear
5	2	676984	Read Instructions
6	1	676983	Hot Surface
7	2	676651	Allied Logo
8	2	100156	Decal - Model 4700
9	1	818676	Pressure I.D. Tag (Located on Pressure Hose)

MOUNTING INFORMATION

5.1 XSF Pin-On Mounting

Allied Pin-On Mounting Kits include all the components necessary for the mechanical installation of a Ho-Pac. The following illustration shows the contents of a typical XSF Mounting Kit.

The carrier arm and link fit inside the bracket and are secured with mounting hardware supplied by Allied. The hardware consists of 2 mounting pins, 4 flange bushings or collars, 2 pin retainer bolts and nuts, and 12 spacers which are used as required. Mounting pin kit part numbers and sizes are listed in the XSF Mounting Pin Kits parts list in Section 14.0. When an XSF Ho-Pac is purchased, the price includes the choice of one pin kit from the list; pin kits can be purchased separately. Quick coupler attachment may not be possible with this bracket.



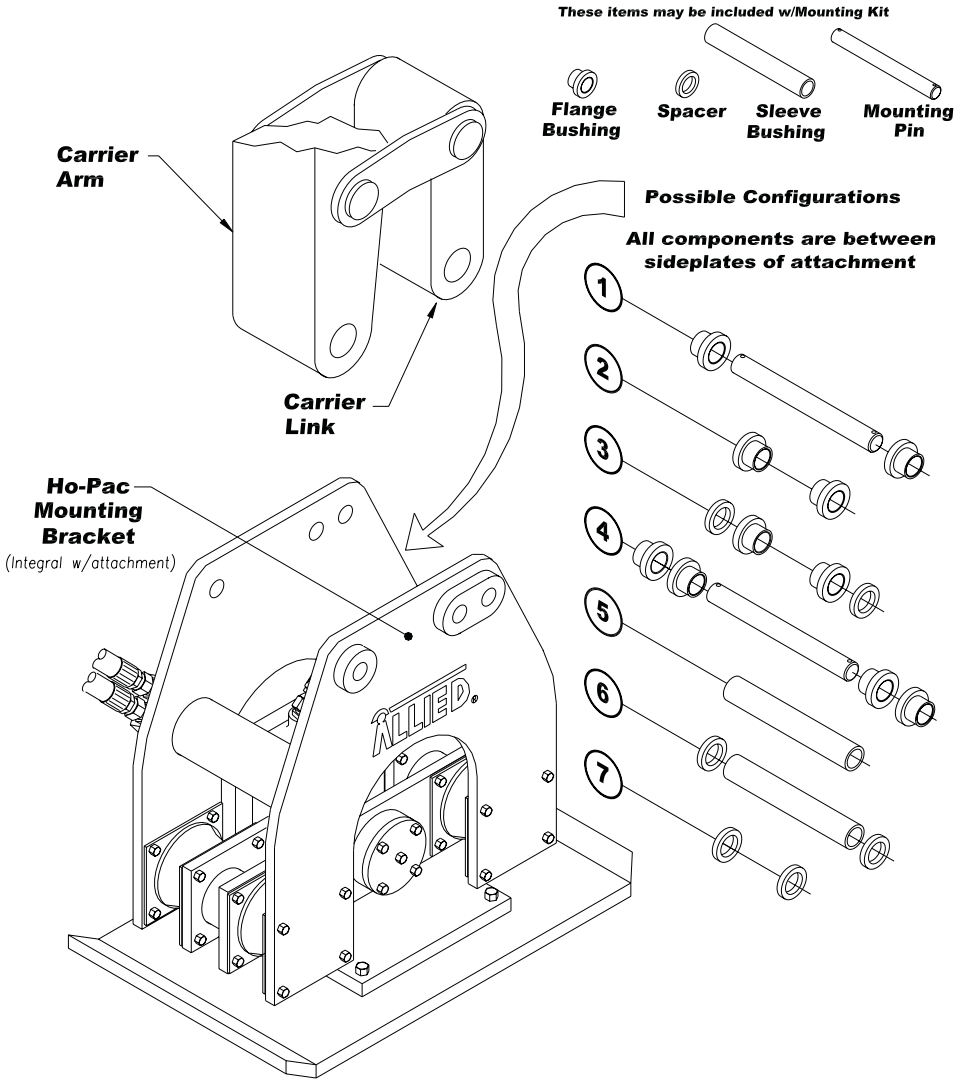
XSF Pin-On Mounting

5.2 BSF Pin-On Mounting

The BSF mounting has the following dimensions:

Stick Pin	1.75 Dia
Link Pin	1.50 Dia
Bracket Width	10.25
Pin CTC Distance	10.50 & 14.00

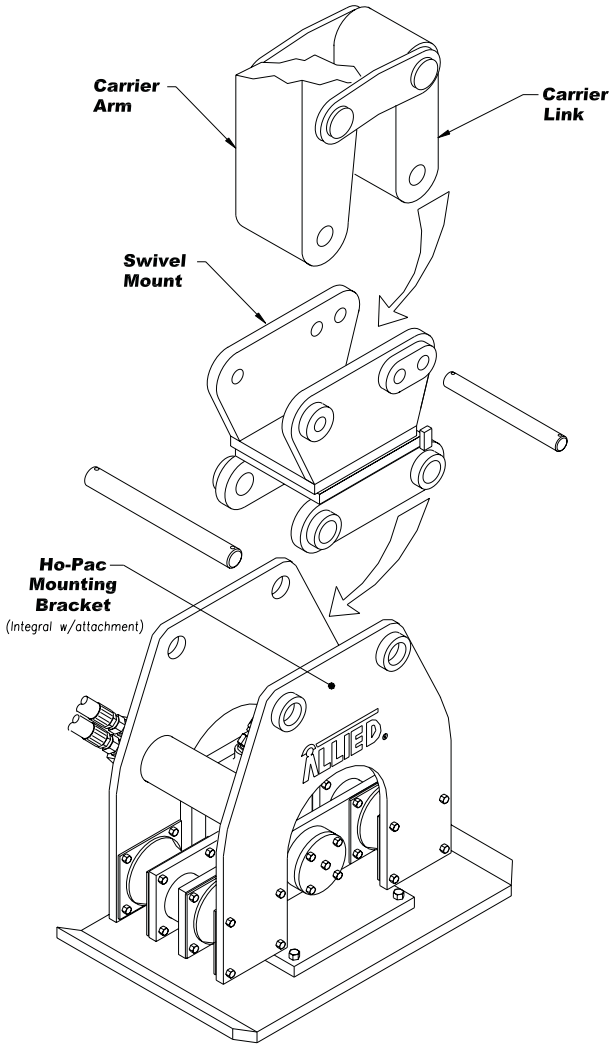
A BSF Mounting Kit is supplied with one of the configurations shown below, to adapt the standard Ho-Pac pin diameters and bracket width to fit a specific carrier. In configurations #2, 3, 4, 5 & 6 below, the kit includes bushings that fit into the carrier stick and link so that mounting pins smaller than the carrier OEM pins can be used. These smaller mounting pins are included in the kit.



BSF Pin-On Mounting

5.3 Swivel Mount

The swivel mount provides versatility in placing the Ho-Pac in operating position. The Ho-Pac can be turned or "swiveled" to operate at either a 45^{o} or a 90^{o} angle to the boom. This is especially good for compaction in trenches, or whenever the area of operation is not in line with the stick. The bottom of the swivel mount attaches to the Ho-Pac frame with mounting pins and related hardware or to the flat top with a fastener kit. The top of the swivel mount is attached to the carrier.



Swivel Mount

SECTION 6.0
GENERAL CONSTRUCTION SAFETY

6.1 Owner's Responsibilities

The equipment owner shall:

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

6.2 General Construction Safety

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

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

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

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

U.S. Government Printing Office
Superintendent of Documents
P.O. Box 371954
Pittsburgh, Pa. 15250

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

6.4 General Safety Summary

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

6.4.1 CAUTIONS and WARNINGS

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

⚠WARNING⚠

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

⚠CAUTION⚠

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

6.4.2 Personnel Precautions

- Always wear safety glasses, and protective clothing when operating or handling the Ho-Pac.
- All personnel in the immediate area must wear ear protection.

SECTION 7.0
CARRIER APPLICATION

The Allied 4700 Ho-Pac is designed for use and installation on skid steers, small to medium rubber tire backhoe loaders, and mini excavators. The carrier must have adequate lift and hydraulic capacities to properly and safely operate the Ho-Pac. Refer to Section 4.1 Specifications for carrier weights.

An Allied installation kit is recommended to properly install the Ho-Pac. Allied installation kits are specifically designed for each carrier. Each kit contains the proper mechanical and hydraulic components for optimum Ho-Pac performance.

Allied hydraulic kits utilize the Allied "AC" series valves. The "AC" series solenoid-operated valve provides regulated, priority flow at a controlled pressure.

Always follow hydraulic kit installation instructions. Carrier hydraulic circuit designs differ and damage to the Ho-Pac or carrier may result if the hydraulic kit is improperly installed. Contact Allied for installation recommendations.

SECTION 8.0
INSTALLATION & REMOVAL

8.1 Installation

⚠WARNING⚠
Always wear gloves and eye protection when connecting hydraulic connections, and installing mounting pins and hardware.

⚠CAUTION⚠
Mount only on carriers with adequate lift and hydraulic capacity. Under no circumstances shall the oil pressure supplied to the Ho-Pac exceed 2200 p.s.i. (150 bar).

⚠CAUTION⚠
The Ho-pac hydraulic return line must be open to tank. Hydraulic motor damage results if the return line is suddenly closed by incorrect hydraulic circuitry.

1. Prior to installation, carefully inspect:
   a. Spring mounts for cracks and other damage.
   b. Hoses and fittings for damage.
   c. Threaded fasteners, boom pins, and mounting hardware for damage.
2. Repair or replace any damaged components.
3. Follow hydraulic and mounting kit installation instructions.

⚠WARNING⚠
Keep hands and fingers clear of mounting pin holes, carrier linkage and other pinch points while equipment is being positioned.

⚠CAUTION⚠
During installation, instruct carrier operator to operate carrier controls only as instructed by the Ho-Pac installer.

⚠CAUTION⚠
Never install hydraulic hoses inside the operator's cab.

4. After installation and prior to use, briefly operate the Ho-Pac, then stop the Ho-Pac and re-check the following:
   a Hydraulic hoses and fittings for leaks.
   b. Mounting hardware for loose or missing parts.
   c. Bolt torques. See Section 10.3.

8.2 Removal

⚠WARNING⚠
Always wear gloves and eye protection when disconnecting hydraulic connections, and removing mounting pins and hardware.

⚠CAUTION⚠
Do not disconnect hydraulics if hoses are pressurized.

⚠WARNING⚠
Hoses, hydraulic motor and hydraulic fittings may be hot after operation.

⚠WARNING⚠
Keep hands and fingers clear of mounting pin holes, carrier linkage and other pinch points while equipment is positioned.

⚠CAUTION⚠
During removal, instruct carrier operator to operate carrier controls only as instructed by the Ho-Pac installer.

1. Position Ho-Pac safely on the ground.
2. Remove hydraulic connections.
3. Be sure unit is stable prior to removing mounting hardware.
4. Remove mounting hardware to remove Ho-Pac from carrier..
5. Reinstall mounting hardware on Ho-Pac to avoid loss or damage.

SECTION 9.0
OPERATION

The Ho-Pac is designed to operate with the carrier over a wide range of temperatures. Refer to the carrier's recommendations for operating temperature range.

⚠CAUTION⚠
At temperatures below 32°F (0°C), operate the Ho-Pac for a few minutes without down force to allow the spring mounts to warm.

⚠WARNING⚠
Wear ear protection as required by federal and local regulations.

⚠CAUTION⚠
Do not operate the Ho-Pac underwater. Bearing damage may result.

1. Daily before operating, carefully inspect:
   a. Spring mounts for cracks and other damage.
   b. Hoses and fittings for leaks and other damage.
   c. Threaded fasteners, boom pins, and mounting hardware for damage.
2. Repair or replace any damaged components prior to operation.
3. Daily, lubricate bearings. See Section 10.2.
4. Prior to compaction, the excavation shall be back-filled using other equipment.

⚠CAUTION⚠
Do not use the Ho-Pac to move materials. Ho-Pac damage may result.

5. Position carrier in-line with direction of work.
6. Position the Ho-Pac base plate parallel to the work surface and within view of the operator. The base plate must be in full contact with the work surface for maximum effectiveness.

⚠CAUTION⚠
Do not operate the Ho-Pac without base plate. A dynamic imbalance and equipment damage may result.

⚠WARNING⚠
Never activate the Ho-Pac unless the operator is seated in the operator's seat and in full control of the machine. Refer to carrier's instructions.

7. Activate the Ho-Pac with the switch located in the operator's cab.

⚠WARNING⚠

Keep personnel away from the Ho-Pac while in operation. Never operate the Ho-Pac with workers in close proximity to the Ho-Pac.

8. Apply down force with the carrier boom to stretch spring mounts approximately 1 inch (25 mm).

⚠CAUTION⚠

Do not allow mounting frame to contact base plate. Spring mount and frame damage may result.

⚠WARNING⚠

Ground vibrations may collapse trench walls. Stand clear.

9. As the material compacts, maintain a constant down force with the carrier. For larger areas, a repetitive, back and forth sweeping motion is effective. The initial pass is continued until compaction is no longer apparent, typically 10 to 15 seconds.
10. It may be necessary to adjust the idle speed of the carrier to maintain proper Ho-Pac flow requirements.

⚠CAUTION⚠

Do not operate Ho-Pac with hydraulic oil temperature above 180ºF (82ºC) or pressures above 2200 psi (150 bar).

11. It may be necessary to try different lift heights to determine the most effective lift to achieve the desired level of compaction. Compacted densities are reduced at the bottom of excessively high lifts.
12. After compaction is complete, re-position the Ho-Pac and/or carrier to continue working. It is not necessary to stop the Ho-Pac for minor carrier boom re-positioning.

⚠WARNING⚠

Operation of this equipment requires the operator's full attention.

13. Repeat compacted lifts as necessary to achieve finished grade.

SECTION 10.0
TROUBLESHOOTING

Listed below are several operating problems and their recommended corrective action.

1. Unit does not run:
   a. Insufficient oil pressure or flow. Check hydraulic supply system. Correct as required.
   b. Failed bearings. Inspect and replace bearings.
   c. Broken motor shaft or worn splines. Inspect and replace worn parts.
2. Unit runs erratically:
   a. Erratic oil pressure or flow. Check hydraulic supply system. Correct as required.
   b. Failed spring mount. Inspect and replace failed mount.
3. Unit runs with excessive noise or vibration:
   a. Failed bearing. Inspect and replace bearings.
   b. Loose bolts or mounting hardware. Inspect and tighten bolts.
4. Unit runs, but stalls under load:
   a. Pressure relief too low. Check hydraulic supply system. Correct as required.
   b. Failed bearing. Inspect and replace bearings.
   c. Motor worn or motor seals failed. Inspect and replace motor.

For conditions other than these, contact the Allied Technical Service Department.

SECTION 11.0
SERVICE AND MAINTENANCE

11.1 General Guidelines

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

> **⚠WARNING⚠**
> Follow all safety practices and wear appropriate protective equipment.

Use only genuine Allied replacement parts. Failure to use approved replacement parts may subject the operator to injury and the Ho-Pac to premature failure. The use of unapproved replacement parts voids the warranty.

Do not make any alterations to the Ho-Pac without written authorization from the Allied Engineering Department.

> **⚠WARNING⚠**
> Ho-Pac components are heavy. Use proper lifting and support equipment.

> **⚠WARNING⚠**
> Service the Ho-Pac in safe work areas. Never service the Ho-Pac on the carrier or in the trench.

Maintain clean oil. Follow the carrier manufacturer's recommendations for hydraulic oil grade and hydraulic system maintenance.

Clean and properly dispose of any spilled oil as required by governing regulations.

Contact the Allied Technical Service Department with questions regarding maintenance, operation or replacement parts.

> **⚠WARNING⚠**
> Never lubricate the Ho-Pac while it is operating.

11.2 Daily Maintenance

Clean and lubricate bearings daily or after 8 hours of operation. Refer to Section 11.5.

Clean and oil Ho-Pac.

11.3 Preventive Maintenance

After every 100 hours of operation, the Ho-Pac should be cleaned and inspected.

- Check all components for excessive wear.
- Check spring mounts for cracks and wear.
- Check all hardware for tightness. Refer to 11.6 for bolt torques.

The frequency of maintenance depends upon the operating environments and conditions of operation. Refer to 11.4 for additional maintenance considerations.

11.4 Conditional Maintenance

Clean and lubricate all Ho-Pac working surfaces under the following conditions:

- The Ho-Pac is operated in extremely humid weather conditions.
- The HoPac is operated in muddy or extremely wet soils.
- If reduced performance is observed.

11.5 Lubrication

The Allied Ho-Pac is simply lubricated through standard lubrication fittings. See lubrication diagram in Section 4.4

Under normal operating conditions, lubricate the bearings daily or after 8 hours of operation. During extreme operating conditions, such as high temperatures and dusty conditions, lubricate more frequently. The injection of grease into the bearing cavities not only provides lubrication, but also flushes impurities from the bearings to increase bearing life.

Use a premium quality, multipurpose, extreme pressure, petroleum based grease with lithium and anti-rust additives. Minimum oil viscosity shall be 14.5 cSt at 100º C.

Approved brands:
Shell Oil -Alvania EP2
Mobile Oil Co. - Mobilux EP2
Texaco Inc. -RB2.

1. Position Ho-Pac for easy access to lubrication fittings.
2. Carefully clean lubrication fitting prior to use.
3. At each lubrication point, inject 5 “shots” with a standard manual grease gun.

After Ho-Pac rebuild or for completely dry bearings, inject 20 “shots” in each lubrication point with a standard manual grease gun.

11.6 Bolts

Because the Ho-Pac is a vibratory tool, it is extremely important that threaded fasteners are properly tightened. Always follow the torque specifications in this section.

⚠CAUTION⚠
Replace any damaged fasteners prior to Ho-Pac operation. Use only Allied replacement parts.

1. Clean threaded fasteners and surfaces to be bolted.
2. Apply a light coat of grease to threads and washer faces, except for base plate bolts.
3. For base plate bolts only, apply a commercial grade, thread adhesive. Follow manufacturer’s recommendations. (Example: Loctite 271 Thread Adhesive/Sealant)
4. Initially tighten the bolts to 10 ft-lbs (14 N-m).
5. Tighten the fasteners according to the table below.

Diameter	Final Torque - Lubricated
3/8 inch	35 ft-lbs (47 N-m)
1/2 inch	80 ft-lbs (108 N-m)
5/8 inch	170 ft-lbs (230 N-m)
7/8 inch	400 ft-lbs (542 N-m)
1 inch	650 ft-lbs (880 N-m)

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

11.7 Bearing Failure & Replacement

Because of the high loads and rotational speeds, bearing failure is usually sudden. A scraping or rattling sound is an indication of imminent bearing failure. Visually inspect the bearings for broken or damaged components to determine if replacement is necessary.

Bearing service shall be performed in a properly equipped workshop. Use of a manual arbor press is recommended. Do not attempt to replace bearings in the field.

> **⚠ CAUTION ⚠**
> Use only Allied replacement parts.

Removal:

1. Remove hydraulic hoses from motor.
2. Remove the cover plate, hydraulic motor and adapter plate.
3. Remove bearing housing assembly from the main housing. It is not necessary to remove eccentric from main housing.

> **⚠ WARNING ⚠**
> Be careful that eccentric shaft does not fall and injure hands or fingers.

4. Remove the bearing from the housing by pressing on the bearing inner race from the interior side of the bearing housing. Properly support the bearing housing in the press.
5. If the outer race remains in the housing, do not pry out. Carefully place a small bead of weld, 1/8 inch (3 mm) along the inside diameter of the outer race. After the weld cools, the outer race can easily be removed.

Installation:

1. Thoroughly clean the bearing housing and eccentric shaft.
2. Pack the bearing with grease.
3. Slowly press the bearing into the housing. Apply contact pressure to the outer race only.
4. Install one bearing and housing onto the eccentric shaft.
5. Align in main housing.
6. Repeat with other bearing and housing.
7. Install cover plate, adapter plate and bolts.
8. Install hydraulic motor.

> **⚠ CAUTION ⚠**
> Follow bolt torque specifications. Refer to Section 11.3.

9. Install hydraulic hoses.
10. After completely assembled, follow installation and daily lubrication procedures.

11.8 Spring Mounts

The spring mounts are subject to aging and require periodic replacement. While mount life depends primarily on use, ex-

treme environmental conditions and other factors can shorten mount life.

1. Position Ho-Pac on flat, stable surface.
2. Adequately support or block the mounting frame to relax mounts.

> **⚠ WARNING ⚠**
> Do not place hands or fingers between Mounting Frame and Baseplate during removal of spring mounts or mount nuts.

3. Loosen all nuts prior to mount removal.
4. Remove mount nuts.
5. Remove mount.
6. Position new mounts and re-install nuts. See Section 10.3.

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

11.9 Hydraulic Motor

There are no user-servicable parts in the hydraulic motor. Contact the Allied Technical Service Department for further information.

11.10 Warranty Protection

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

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

SECTION 12.0
LIFTING & TRANSPORT

If the Ho-Pac is to be transported independently of the carrier;

1. Remove all loose debris from Ho-Pac.
2. If the swivel assembly is installed, lock swivel position with bolt.
3. Follow removal instructions in Section 7.2.
4. Secure hoses to unit to avoid accidental damage.
5. Lift Ho-Pac at approved lift points only with appropriate lifting equipment. See diagram in Section 4.4.

⚠WARNING⚠

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

6. Adequately stabilize and secure Ho-Pac for transport.

If the Ho-Pac is transported while installed on the carrier:

1. Remove all loose debris from Ho-Pac.
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.

SECTION 13.0
STORAGE

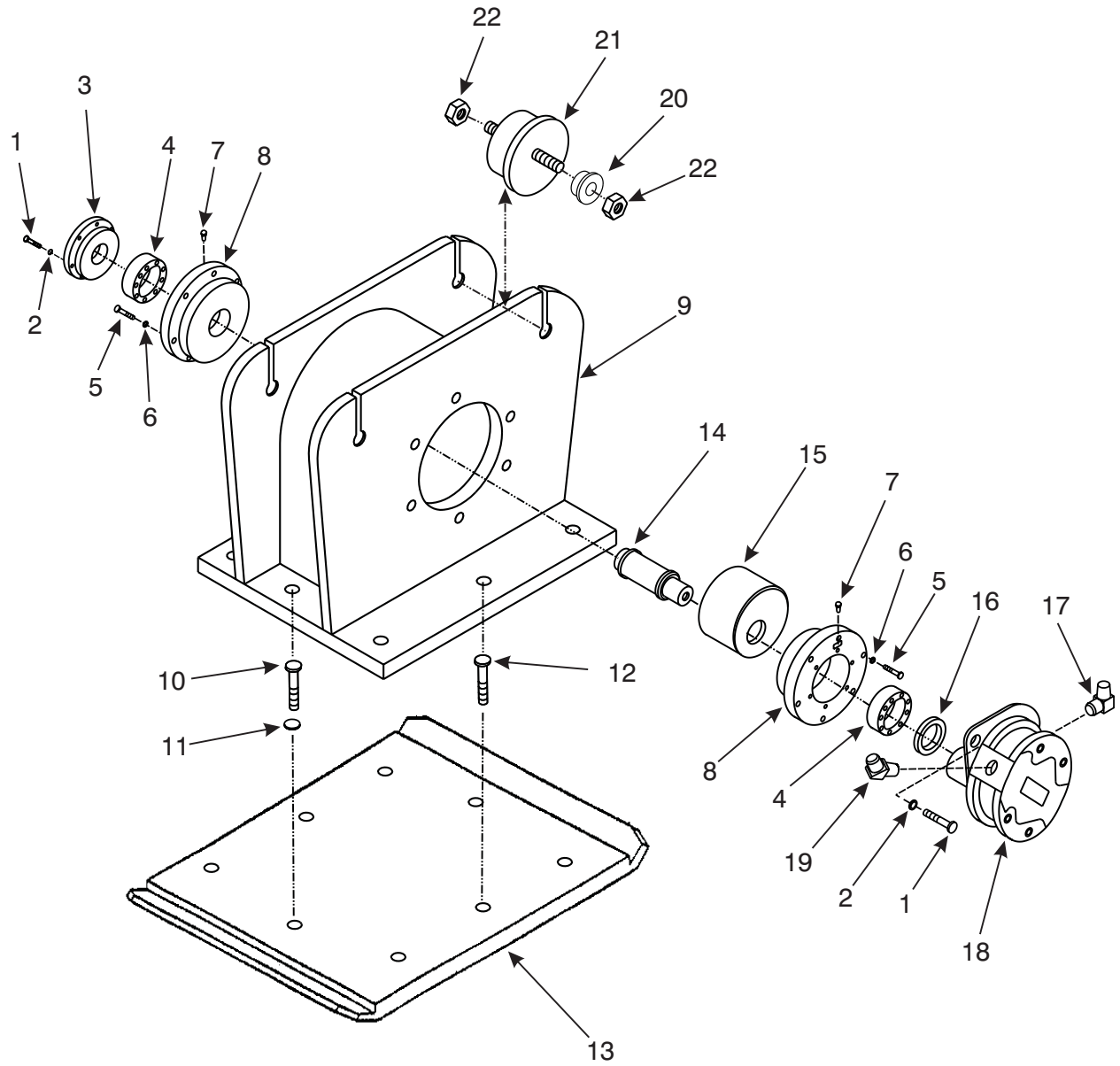
Several simple precautions are necessary for storage of the Ho-Pac.

1. Protect hydraulic connections from damage and debris. Plug hoses if hydraulic quick disconnects are not used.
2. Secure hoses to unit to prevent accidental damage.
3. Protect spring mounts and hydraulic hoses from weather and direct sunlight to reduce aging effects.
4. Support the Mounting Frame with blocks to minimize permanent sag in spring mounts.
5. Keep the motor full of oil and lubricate bearings to protect internal components.
6. Avoid wet or damp conditions to minimize rust.
7. Store in upright position.

SECTION 14.0
PARTS INFORMATION

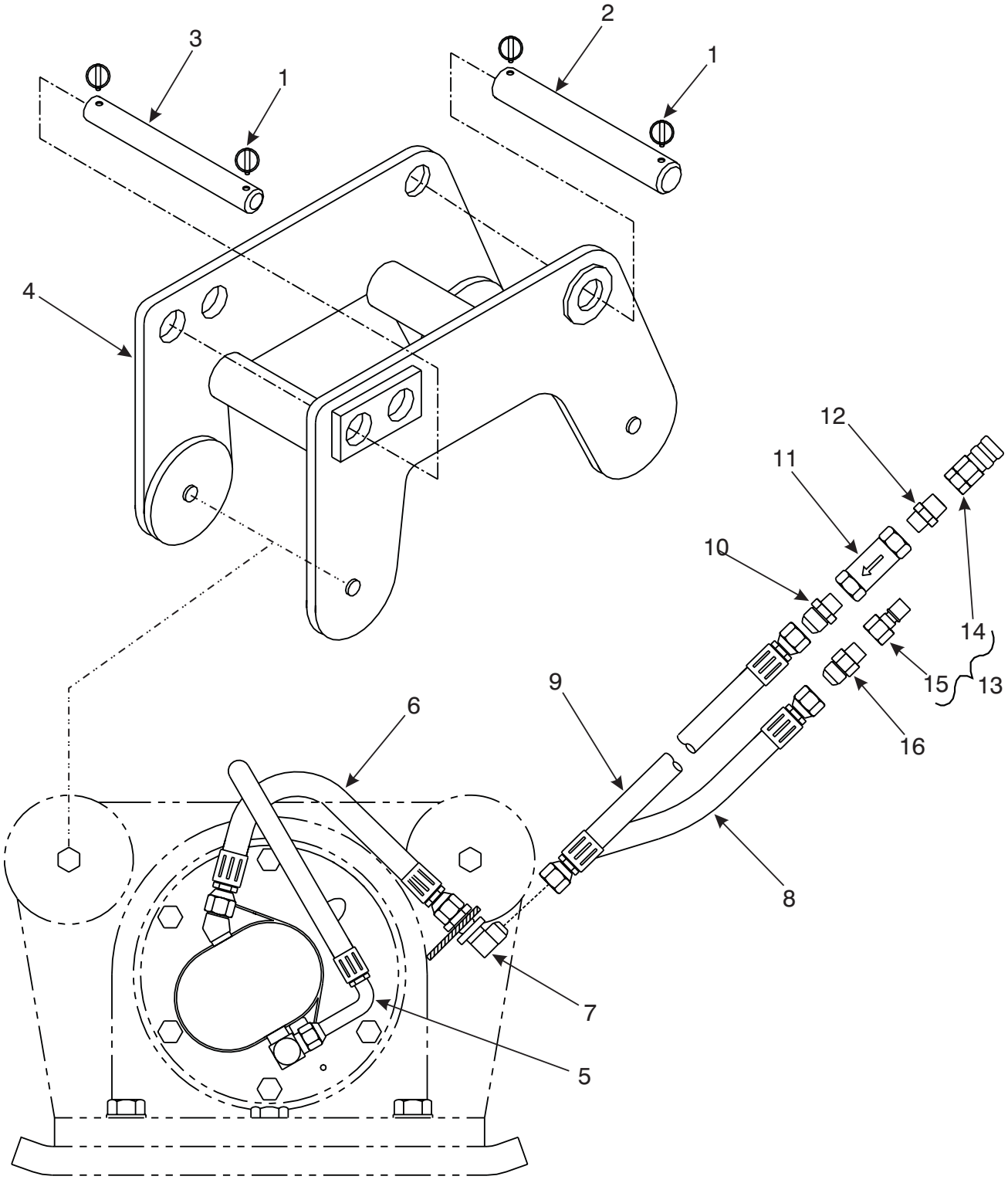
NOTE

The following illustrations and parts lists are typical models of the 4700 Ho-Pac. Specific assemblies and mounting configurations may vary.



Dynamic Assembly & Suspension System

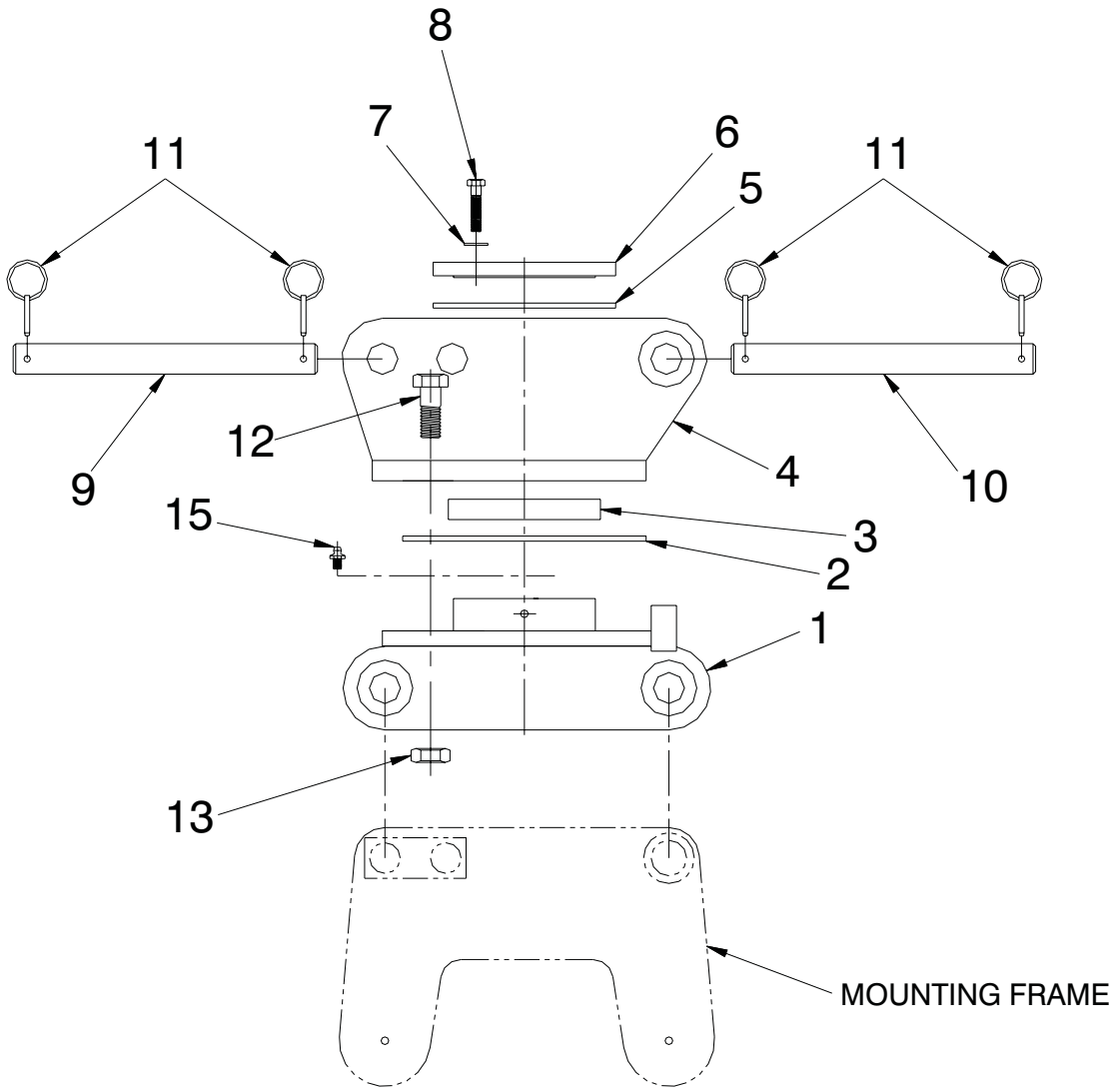
Dynamic Assembly & Suspension System Parts List Part No. 714704			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	8	708513	Hex Head Cap Screw
2	8	708514	Flat Washer
3	1	714715	Cover Plate
4	2	714714	Bearing
5	12	708621	Hex Head Cap Screw
6	12	708512	Flat Washer
7	2	798197	Grease Fitting
8	2	714713	Bearing Housing
9	1	714710	Eccentric Housing
10	6	865424	Hex Head Cap Screw
11	6	816359	Flat Washer
12	2	714719	Hex Head Cap Screw
13	1	714718	Compaction Plate
14	1	714712	Eccentric Shaft
15	1	714711	Eccentric
16	1	714717	Spacer
17	1	714844	90° Elbow
18	1	714716	Hydraulic Motor
19	1	676744	45° Elbow
20	4	102490	Spring Mount Bushing
21	4	714721	Spring Mount, Rubber
22	8	102491	Elastic Nut



STD/BSF Ho-Pac Mounting Frame
The STD Model has been discontinued.

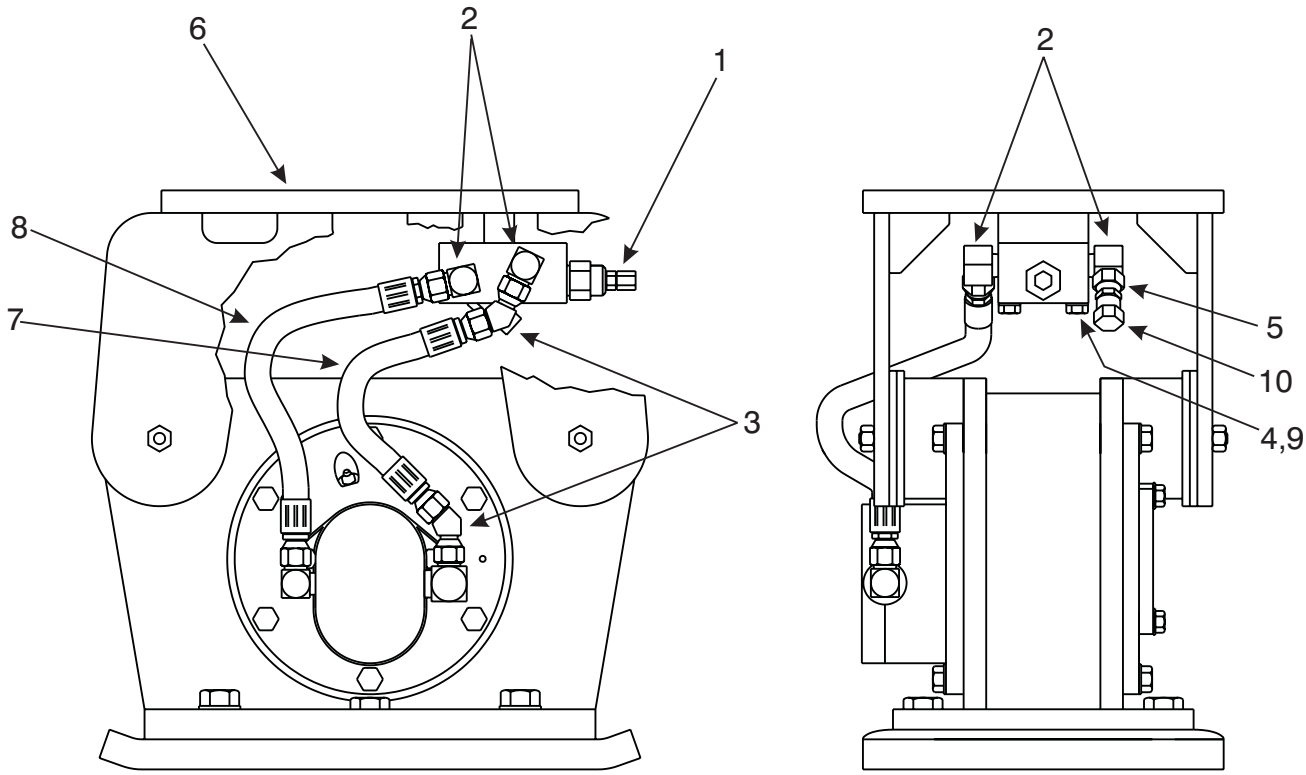
STD*/BSF Ho-Pac Mounting Frame Parts List Part No. 714700			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	4	617104	Klik Pin
2	1	653378	Pin - BSF Serial Number 5259 and above
	1	617080	Pin - STD Serial Number 5258 and below
3	1	617080	Pin
4	1	714720	Mounting Frame
5	1	676743	Hose Assembly (Return)
6	2	676745	Hose Assembly (Pressure)
7	2	881547	90^{O} Elbow
8	1	815047	Hose Assembly (Return)
9	1	815267	Hose Assembly (Pressure)
10	1	719056	Adapter
11	1	714723	Flow Valve
12	1	708532	Hex Pipe Nipple
13	1	670006	Q.D. Coupler Set (Includes Items 14 & 15)
14	1	670007	Q.D. Socket
15	1	670008	Q.D. Plug
16	1	653349	Adapter

*The STD Model has been discontinued.



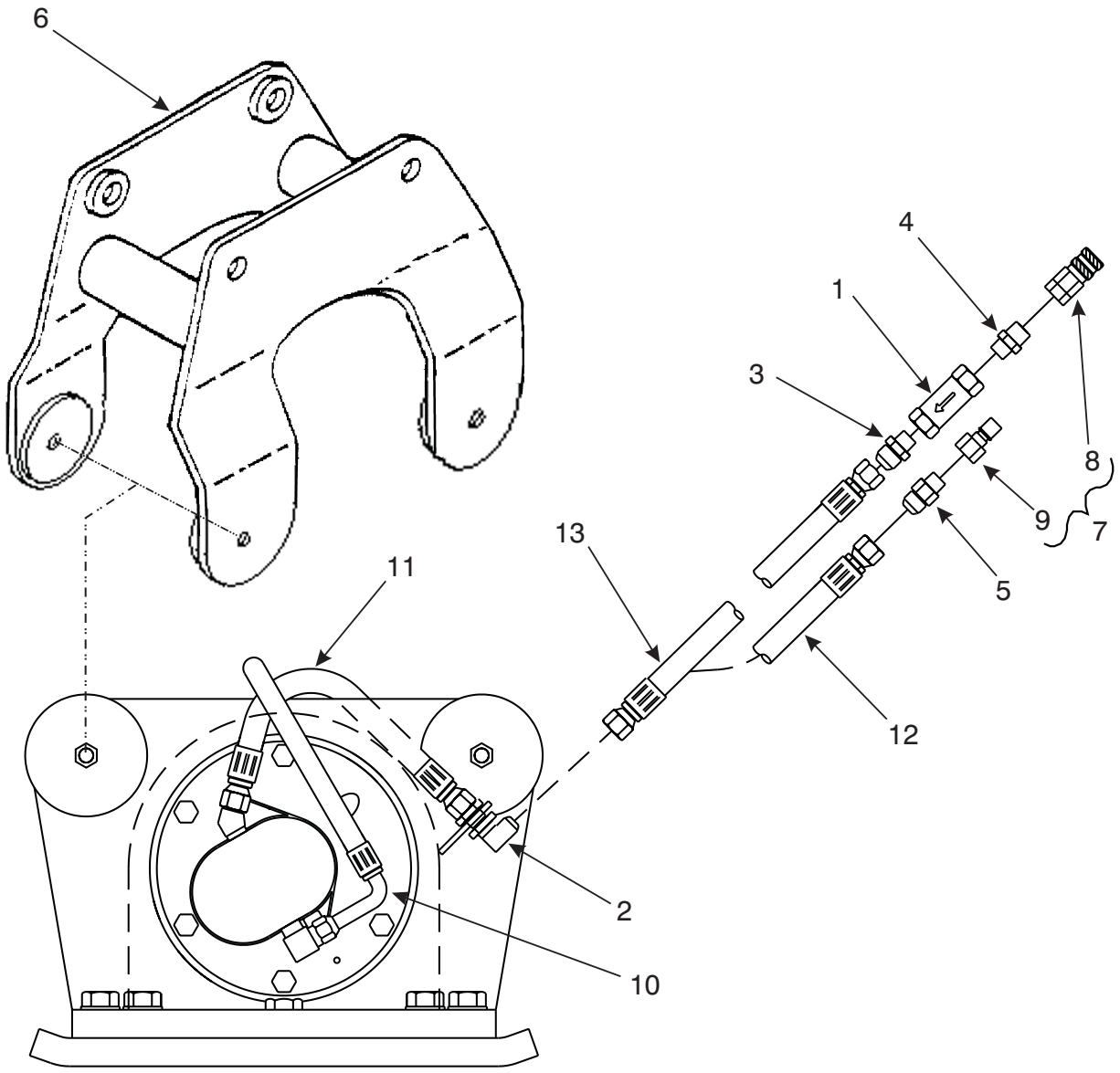
BSF Ho-Pac Swivel

BSF Ho-Pac Swivel Parts List Part No. 708808			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	708810	Swivel Base
2	1	617078	Lower Bearing
3	1	708594	Thrust Bushing
4	1	708809	Swivel Top
5	1	617079	Upper Bearing
6	1	617077	Thrust Plate
7	6	719021	Flat Washer
8	6	719710	Hex Head Cap Screw
9	1	617080	Boom Pin, 1.5” dia
10	1	653378	Boom Pin, 1.75 dia
11	4	617104	Klik Pin
12	1	551852	Hex Head Cap Screw
13	1	658837	Torque Nut
14	2	719613	90º Swivel Elbow (Replaces Item 7 BSF Ho-Pac)
15	1	798197	Lubrication Fitting



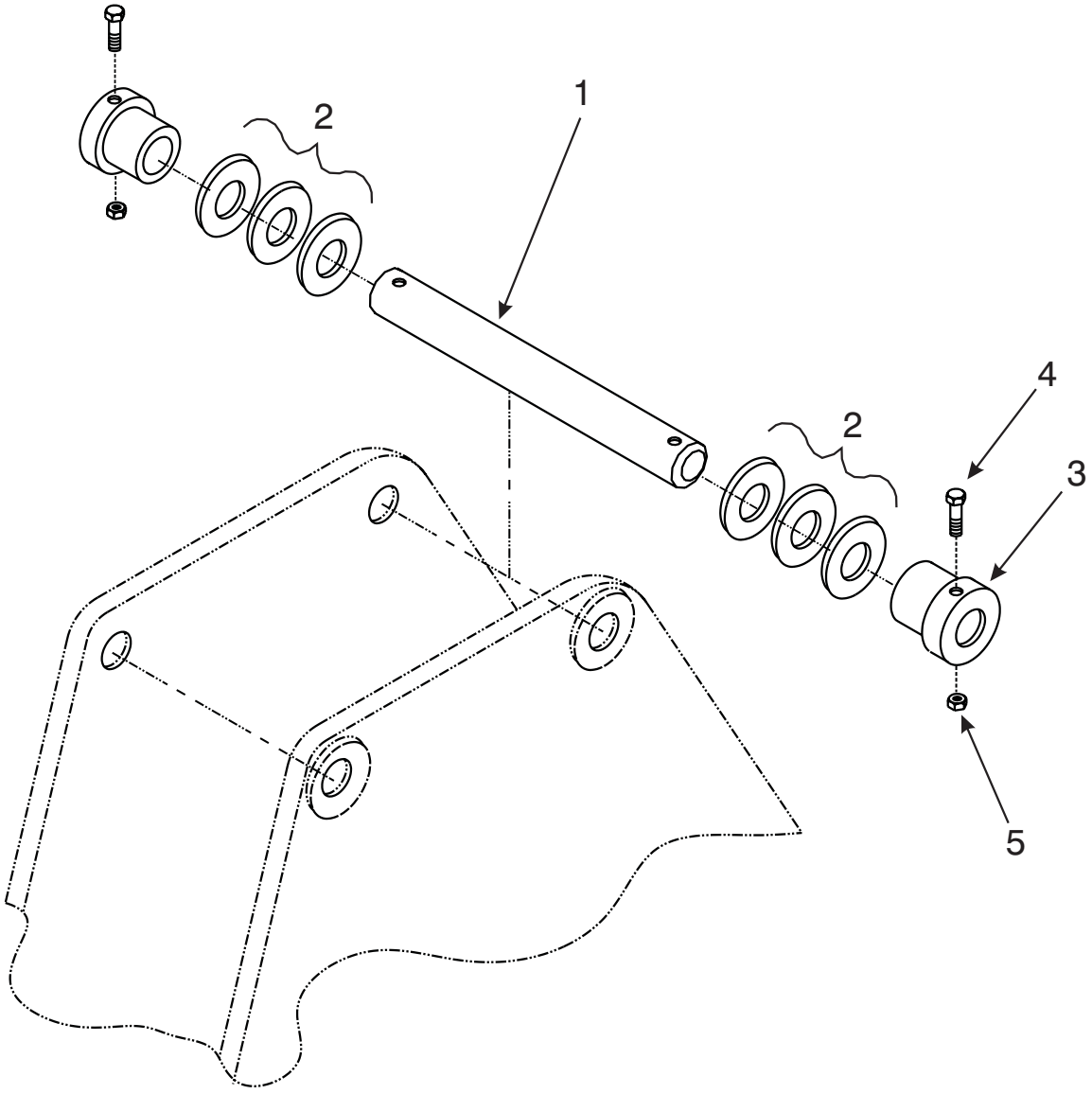
Custom Flat Top Ho-Pac Mounting Frame

Custom Flat Top Ho-Pac Mounting Frame Parts List Part Number 714416			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	719093	Flow Regulator Valve
2	4	714844	90° Elbow
3	2	903451	45° Elbow
4	2	653343	Hex Head Cap Screw
5	2	815454	Adapter w/Seal
6	1	714740	Mounting Frame
7	1	653480	Hose Assembly
8	1	676745	Hose Assembly
9	2	903713	Flat Washer
10	2	101279	Hex Cap



XSF Ho-Pac Mounting Frame

XSF Ho-Pac Mounting Frame Parts List Part Number 714741			
ITEM ONLY	QTY.	PART NO.	DESCRIPTION
1	1	714723	Flow Control Valve
2	2	881547	90° Elbow Union Bulkhead
3	1	719056	Adapter
4	1	708532	Hex Pipe Nipple
5	1	653349	Adapter
6	1	100526	Mounting Frame
7	1	670006	Q.D. Coupler Set (Includes Items 8 & 9)
8	1	670007	Q.D. Socket
9	1	670008	Q.D. Plug
10	1	676743	Hose Assembly (Return)
11	1	676745	Hose Assembly (Pressure)
12	1	815047	Hose Assembly (Return)
13	1	815267	Hose Assembly (Pressure)



Typical Mounting Pin Kit

XSF Mounting Pin Kits	
PART NO.	DESCRIPTION
101735	Pin Kit - 25mm Pin
100207	Pin Kit - 30mm Pin
100283	Pin Kit - 35mm Pin
100364	Pin Kit - 38mm Pin
100204	Pin Kit - 40mm Pin
100324	Pin Kit - 45mm Pin
101808	Pin Kit - 50mm Pin
100208	Pin Kit - 1.00” Pin
100209	Pin Kit - 1.25” Pin
100210	Pin Kit - 1.50” Pin

XSF Mounting Pin Kit Parts (Part numbers vary from kit to kit)	
Item No.	Description
1	Pin
2	XCS Spacer Kit (Use spacers as required)
3	Flange Bushing
4	Hex Head Cap Screw
5	Elastic Nut

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